

## **3. EVALUATION OF ALTERNATIVES**

This section of the amended Environmental Assessment (EA) Report considers a reasonable range of alternatives for the East-West Tie Transmission Project (the Project).

Section 6.1(2) of the Ontario *Environmental Assessment Act, R.S.O. 1990* (Government of Ontario 2003) states that proponents are to consider alternatives in the EA of an undertaking. There are two types of alternatives: alternatives to the undertaking, and alternative methods of carrying out the undertaking. Both types of alternatives are defined and evaluated in this section.

Section 3.1 of the East-West Tie Transmission Project Environmental Assessment Terms of Reference (ToR) – Amended (NextBridge 2014; refer to Appendix 1-I) indicated that the approach for the Project will be a focused EA in accordance with subsections 6(2)(c) and 6.1(3) of the *Environmental Assessment Act* (Government of Ontario 2003). Therefore, the evaluation of alternatives meets the requirements of subsection 6.1(2) and includes an assessment of the “alternative methods” and the “do nothing” alternative, but does not include an assessment of other “alternatives to” the project or re-examine the “purpose of the undertaking” as this planning process has already been completed by the Ontario Power Authority (now the Independent Electricity System Operator [IESO]).

### **3.1 Input from Consultation and Engagement**

Consultation and engagement for the Project included Indigenous communities, regulatory agencies, property owners, interest holders, Crown interests, and the general public. Consultation activities are described in Section 2 of the amended EA Report. The draft and final EA Reports were each subject to a public review and comment period. Comments received on the draft EA Report, responses and change log are provided in Appendix 1-III. Comments received on the final EA Report and responses are provided in Appendix 1-IV. The following concerns related to alternatives assessed were raised during consultation and engagement and from comments received on the draft and final EA Reports:

- Ministry of Environment and Climate Change (MOECC), Ministry of Natural Resources and Forestry (MNRF), and Métis Nation of Ontario expressed concern that many responses to comments on the draft EA Report were provided in Appendix 1-III of the final EA Report and not integrated into the body of the final EA Report. Suggested changes acknowledged in responses to comments on the draft EA Report but not incorporated into the final EA Report have been incorporated into the amended EA Report where appropriate.
- MNRF indicated concern with the preferred route right-of-way (ROW) crossing sensitive environmental features in provincial parks and conservation reserves. These concerns are addressed in Section 3.3.1.6 and Appendix 3-II.
- MNRF indicated concern where field work had not been conducted on greenfield sections of the preferred route. Field work on portions of the greenfield sections of the preferred route were conducted in 2017 and are discussed in Section 3.3.1.4 and the field data are incorporated into the Vegetation and Wetlands assessment (Section 12) and the Wildlife and Wildlife Habitat assessment (Section 14).

MNRF was concerned that the alternatives analysis conducted in 2015 (NextBridge 2015) was not considered in the body of the final EA Report. The results of the 2015 alternatives analysis (NextBridge 2015) are summarized in Section 3.3.1.

## **3.2 Alternatives to the Project**

“Alternatives to” the Project are the “functionally different ways of approaching and dealing with a problem or opportunity” (MOECC 2014). Given that the provincial government has already analyzed options for supplying electricity for northwestern Ontario and identified the Project as the preferred alternative, and in accordance with the approved Terms of Reference (ToR), this section compares the “do nothing” alternative, against the recommended undertaking of the project only.

### **3.2.1 Proceed with the Project**

Proceeding with the Project would entail construction and operation of the transmission line and associated infrastructure according to the preferred alternative methods identified in Section 3.3 of the amended EA Report, which collectively form the preferred undertaking (or Project) for which NextBridge Infrastructure LP (NextBridge) is seeking EA approval. A more detailed description of the Project is presented in Section 4 of the amended EA Report.

Proceeding with the Project would have environmental, economic, and technical costs and benefits. From an environmental perspective, most potential adverse effects would be physical and biological (natural environment) and restricted to areas in the Project footprint (i.e., areas of direct disturbance) or immediately adjacent to the Project footprint, while the considerable potential socio-economic benefits would likely extend to a provincial scale.

Potential adverse effects of proceeding with the Project include permanent landscape alteration, soil compaction, clearing of vegetation in the Project footprint, and nuisance effects such as increased dust, noise, and vibration from vehicular traffic during the construction and operation phases. These potential effects are addressed in more detail in Sections 6 through 21. Mitigation measures are also considered to address these potential effects during applicable Project phases (i.e., construction and operation). The socio-economic benefits of proceeding with the Project, summarized in Section 18, are expected to outweigh potential adverse environmental effects.

### **3.2.2 Do Nothing**

The “do nothing” alternative serves as a benchmark against which the consequences of proceeding with the Project can be compared with to determine, amongst other things, whether the anticipated benefits of the Project outweigh its predicted adverse environmental effects. Evaluation of the do nothing alternative “identifies the implications of doing nothing to address the problem or opportunity that has been identified” (MOECC 2014). It also serves to highlight the advantages of proceeding with the Project.

If the do nothing alternative were selected, the Project would not be carried out and transmission capacity in northwestern Ontario would not be increased. As such, none of the potential effects of the Project would take place and the existing environmental conditions (natural, social, economic, cultural, and built) would remain unchanged.

### **3.2.3 Screening Assessment of Alternatives to the Project**

The screening assessment of alternatives to the Project is summarized in Table 3-1. The nine screening questions laid out in Table 3-1 have been adapted from the MOECC (2014) *Code of Practice: Preparing and Reviewing Terms of Reference for Environmental Assessments in Ontario* as a means to carry out the initial evaluation of the alternatives to the Project. These questions complement the qualitative discussion provided in Section 3.2.4.

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**Table 3-1: Screening Assessment of the Alternatives to the Project**

Screening Questions	Alternatives to the Project	
	Proceed with the Project	Do Nothing
1. Does the alternative provide a viable solution to the problem or opportunity to be addressed?	Yes. The Project is a viable solution to the problem.	No. This alternative would not meet the purpose of the Project.
2. Does the alternative use proven technologies, and is it technically feasible?	Yes. All components of the Project use proven, technically feasible technologies.	Not applicable
3. Is the alternative consistent with provincial government priority initiatives?	Yes. The Project will promote economic growth and create jobs in northwestern Ontario.	No. The provincial government has various initiatives to responsibly grow the North and has identified the Project as a priority in the 2010, 2013 and 2017 Long-Term Energy Plans (Ontario Ministry of Energy 2010, 2013, 2017). Construction of the Project has been identified by the Lieutenant Governor in Council as a priority project through an Order in Council that took effect on March 4, 2016.
4. Could the alternative affect sensitive environmental features?	Yes. The Project has the potential to affect sensitive environmental features (without mitigation measures).	No. The do nothing alternative would result in no incremental environmental effects.
5. Is the alternative practical, financially realistic, and economically viable?	Yes. The Project is economically viable and has been recommended as the preferred option for meeting northwestern Ontario's supply need (OPA 2013). The IESO report to the Ministry of Energy in December 2017 confirmed this position, and stated that the Project "remains as the IESO's recommended option to maintain a reliable and cost-effective supply of electricity to the Northwest for the long-term" (IESO 2017)	No. The do nothing alternative is economically disadvantageous.
6. Is the alternative within NextBridge's ability to implement?	Yes. NextBridge is composed of companies experienced in development and operation of transmission line projects.	No. NextBridge could elect to do nothing; however, in doing so it would not fulfil the activity for which it was designated, namely to develop the Project.
7. Can the alternative be implemented within the Project study area?	Yes. All components of the Project will be implemented within the Project study area.	Yes. The do nothing alternative would take place within the Project study area.
8. Is the alternative appropriate to the EA?	Yes. This alternative has been presented to stakeholders.	Yes. The do nothing alternative provides a baseline against which the effects of proceeding with the Project can be measured.
9. Is the alternative able to meet the purpose of the <i>Environmental Assessment Act</i> ?	Yes. This alternative will be implemented in keeping with the purpose of the <i>Environmental Assessment Act</i> .	Yes. This alternative could be implemented in keeping with the purpose of the <i>Environmental Assessment Act</i> .
<b>Screening Conclusion</b>	<b>Identified as the preferred alternative.</b>	<b>Not considered a feasible alternative.</b>

Notes: Grey shaded cells indicate the least desirable alternative. White cells represent the preferred alternative for each screening section. EA = environmental assessment; IESO= Independent Electricity System Operator.

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## 3.2.4 Advantages and Disadvantages of Alternatives to the Project

A more qualitative comparison of the two alternatives is provided below. This is followed by a comparison of their respective advantages versus disadvantages to assist in selecting the preferred alternative to the Project.

Development of the Project has the potential to have a notable effect on the local economies of communities in northwestern Ontario and on the province as a whole. Moreover, the Project is expected to provide a much needed economic boost to northwestern Ontario, which is currently suffering from a downturn in the forestry sector and reductions in mining sector opportunities. Development of the Project is expected to result in economic benefits in the form of job creation, contracts, business opportunities, and the purchase of local goods and services.

The Northern Development Division of the Ontario Ministry of Northern Development and Mines promotes economic growth, infrastructure enhancements, and investment in northern Ontario and markets the region globally for investment and to create export opportunities. These interests of the provincial government would not be served by the do nothing alternative. Furthermore, if the do nothing alternative were selected, government and local businesses would forego income from which future investments in social services, capacity building, and infrastructure could be made. Selecting the do nothing alternative would preclude the potential benefits of the Project for a wide range of stakeholders, including local communities, since wages and taxes would be lost.

Selecting the do nothing alternative would not be responsive to the province’s recognized prioritization of the Project. The Lieutenant Governor in Council has declared that the construction of the Project is needed as a priority project through an Order in Council that took effect on March 4, 2016. Following this declaration, the Ontario Energy Board (OEB) must accept that the Project is needed when it considers an application for leave to construct the Project.

Proceeding with the Project will have environmental effects; however, the potential disadvantages of proceeding with the Project can be reduced through the implementation of mitigation measures that address potential adverse effects on the physical, biological, and socio-economic environment during Project construction and operation. Therefore, the preferred alternative is to proceed with the Project. Consideration of the advantages and disadvantages of the alternatives to the Project was carried out to further examine the potential effects of the two alternatives on the environment and to focus on the clear advantages and disadvantages offered by both alternatives. The results of the analysis of advantages and disadvantages are provided in Table 3-2.

**Table 3-2: Advantages and Disadvantages of Alternatives to the Project**

Alternative	Advantages	Disadvantages
Proceed with the Project	<ul style="list-style-type: none"> <li>■ Meets the need to make sure of the long-term reliability of the electrical supply in northwestern Ontario</li> <li>■ Economic benefits in the form of employment, contracts, business opportunities, or the procurement of goods and services</li> <li>■ Promotion of economic growth in northwestern Ontario</li> <li>■ Increased tax revenues</li> <li>■ Consistent with provincial priority initiatives</li> </ul>	<ul style="list-style-type: none"> <li>■ Potential effects on the environment including permanent landscape alteration, soil erosion and soil compaction, loss of vegetation and wildlife habitat in the Project footprint, and nuisance effects such as increased dust, noise, vibration, and vehicle emissions</li> <li>■ Potential effects on land, resources, traditional activities, or other interests of local and Indigenous communities</li> </ul>
Do nothing	<ul style="list-style-type: none"> <li>■ No potential effect on the environment</li> <li>■ No potential effect on land, resources, traditional activities, or other interests of local and Indigenous communities</li> </ul>	<ul style="list-style-type: none"> <li>■ Does not meet the need to make sure of the long-term reliability of the electrical supply for northwestern Ontario</li> <li>■ No economic benefits in the form of employment, contracts, business opportunities or the procurement of goods and services for local and Indigenous communities</li> <li>■ No economic growth in northwestern Ontario</li> <li>■ No increased tax revenues</li> <li>■ Not consistent with provincial priority initiatives</li> </ul>

### **3.2.5 Identification of the Preferred Alternative**

NextBridge elected to proceed with the Project as the preferred alternative based on the considerations and assessment described above, as it best addresses the need to make sure of the long-term reliability of the electrical supply in northwestern Ontario. The do nothing alternative would not meet the purpose of the Project, would not be consistent with provincial priority initiatives, and would be economically disadvantageous. The do nothing alternative would not cause adverse environmental effects; however, potential benefits to northwestern Ontario would also not be realized. This comparative evaluation of the Project against the do nothing alternative provides confirmation that, on balance, the advantages of proceeding with the Project exceed those of not proceeding with it.

A detailed assessment of the potential environmental effects of the Project, which includes consideration of the alternative methods presented below, is provided in subsequent sections of this amended EA Report (Sections 6 through 21).

## **3.3 Alternative Methods of Carrying Out the Project**

As noted in the ToR, “alternative methods” of carrying out the Project are to be considered as part of the EA. Alternative methods are “different ways of doing the same activity” (MOECC 2014). These methods include alternative route segments, local route refinements, and alternative locations and alternative designs of the components required to support the construction and operation of the Project. Through an analysis of the route refinements and Project components, alternatives have been evaluated with the goal to assist in selecting the preferred alternative.

Alternative methods were identified and considered to address specific concerns identified by property owners, local and Indigenous communities, or other stakeholders, including to avoid or minimize Project effects on an environmental or socio-economic feature (i.e., as a mitigation measure).

The following alternative methods are evaluated in this amended EA Report:

- alternative route segments (Section 3.3.1);
- local route refinements (Section 3.3.2);
- alternative siting of transmission structures (Section 3.3.3);
- alternative transmission structure types (Section 3.3.4);
- alternative access and construction plan (Section 3.3.5); and
- alternative siting of laydown yards and construction camps (Section 3.3.6).

### **3.3.1 Alternative Route Assessment**

The alternative route assessment is focussed on the evaluation of route alternatives that was undertaken to determine the preliminary preferred route. This alternative route assessment uses the criteria and indicators provided in the approved ToR to identify the route that is preferred from environmental, socio-economic and technical perspectives. The evaluation documented in this report considers the following “alternative methods”:

- Alternative routes between the Lakehead Transformer Station (TS) and Wawa TS (Section 3.3.1.4);
- Alternative routes around federal lands (Section 3.3.1.5); and
- Alternative routes around provincial parks, conservation reserves and protected area (Section 3.3.1.6).

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### 3.3.1.1 Selection and Evaluation of Alternative Route Segments

The assessment of the original reference route considered routes examined during the OEB's competitive bid process as well as additional alternative route segments identified by the community of Dorion and in response to comments from the MNRF and other stakeholders. These additional alternative route segments were identified within, or adjacent to, existing previously disturbed rights-of-way such as roads, highways, pipelines, transmission corridors, and rail lines. A Geographic Information System (GIS) was used to systematically evaluate potential alternative route segments using the criteria and indicators provided in the ToR. Feedback received from the Open Houses and other Indigenous engagement and public consultation activities, including comments received during the public review of the ToR, were also considered. Cost was also reviewed from a technical (constructability) perspective.

Additional data, such as information from Indigenous communities relating to knowledge and values in traditional territory, and from private land owners where access has been granted, as well as comments and concerns from Ministry representatives, has been incorporated to refine preferred route, as discussed below.

### 3.3.1.2 Identification of Alternative Route Segments

Three main types of criteria were used to identify the alternative corridor segments:

- natural environment;
- socio-economic; and
- technical, including constructability and typical costs which is derived primarily from technical constraints.

Natural environment criteria generally include minimizing effects to features such as wetlands, water bodies, wildlife and protected areas, to the extent practicable. Socio-economic criteria include maximizing conformity with local land use policy, and minimizing effects to features such as residences, camps, recreational properties, tourist areas, commercial and industrial developments, built-up areas, mines and other infrastructure, constrained infrastructure corridors, and Indigenous traditional land used for traditional activities, to the extent practicable. General routing considerations that were taken into account when making decisions regarding selection of alternative route segments are provided in Table 3-3.

**Table 3-3: General Routing Considerations**

Factor	Preference
Natural	Minimize potential disturbance to significant natural features and protected areas (i.e., Area of Natural and Scientific Interest [ANSIs], Species at Risk, environmentally sensitive areas, wetlands and water bodies), Critical Landform/Vegetation Associations (CLVAs) and adhere to appropriate setback requirements
	Minimize the number of water body crossings and reduce potential for effects to woodlands, wetlands, fish and wildlife habitats, and natural areas. Minimize use of areas with unstable slopes
Socio-Economic	Maximize the distance from cultural heritage resources (archaeological, built heritage and cultural heritage landscapes)
	Minimize incompatibility with existing sensitive land uses (i.e., First Nation reserves, historic sites, residences and built-up areas, agricultural lands, forest management areas, mining claims, tourist areas)
	Minimize the use of private properties (i.e., use of existing ROW is favoured to minimize disruption to property owners, primarily dwellings)
	Minimize potential disturbance to residences (and traditional lands if applicable) that may be affected by construction activities
	Minimize potential disturbance to commercial and industrial properties that may be affected by construction activities

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**Table 3-3: General Routing Considerations**

Factor	Preference
Socio-Economic (continued)	Minimize potential disturbance to institutional and recreational properties that may be affected by construction activities, including tourism lakes
	Maximize conformity with local land use policy
	Minimize potential disruption to local traffic
	Minimize potential effects to water wells, aquifer recharge areas and active mining/aggregate operations
Technical	Find the shortest and most direct routes
	Minimize rail and road crossings
	Minimize use of areas with an insufficient amount of construction workspace or challenging/uneven terrain
	Minimize the number of overhead electric transmission line crossings
	Select the best topographical/terrain areas for the route (dry, flat and stable ground is favourable)

Notes: ANSI = Area of Natural and Scientific Interest; Critical Landform/Vegetation Associations (CLVAs).

### 3.3.1.3 Alternative Route Segments

An overview of the assessment of alternative route segments and the process of identifying a preferred route for the Project is provided in detail in Appendix 3-I.

The reference route and three Alternative Routes to avoid certain Federal lands (two First Nation reserves and Pukaskwa National Park) were identified by NextBridge as part of a screening process completed during the bid process organized by the OEB. The original route, identified as the “reference route” in the ToR, paralleled the existing Hydro One Networks Inc. (Hydro One) East-West Tie transmission line, and was consistent with the *2014 Provincial Policy Statement* (Government of Ontario 2014), which recommends making the best use of existing infrastructure and corridors, and that infrastructure be constructed in a coordinated, efficient, and cost-effective manner before proposing new greenfield<sup>1</sup> developments that do not parallel existing developments.

This approach is supported by the *2014 Provincial Policy Statement* (Government of Ontario 2014) under the *Planning Act, 1990* (Government of Ontario 2003) and past environmental hearing decisions such as the Bruce to Milton Transmission Reinforcement Project (December 2008). In some cases, paralleling existing linear facilities can potentially reduce the following:

- New access to undisturbed lakes and other natural areas (i.e., greenfield areas) by using existing access roads;
- Disturbance to forest interior wildlife and/or their habitat;
- Potential effects on the habitat of woodland caribou and other species at risk;
- New ROW required where overlap with the existing ROW is possible;
- Overall line length and angles (corners) as existing lines are generally shorter and straighter than greenfield routes (i.e., routes that are not parallel or adjacent to existing disturbance);
- Visual effect of the Project; and
- Overall operational costs, as there may be efficiencies in ROW maintenance.

<sup>1</sup> A greenfield is a parcel of land that has not been previously developed (Heid 2004).

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These were Ontario Power Authority's (OPA's) considerations in selecting the reference Route (also referred to as the "Reference Option" by the OPA) and is consistent with the direction to other electricity transmitters in the past from provincial agencies and ministries to make use of existing rights-of-way and corridors before seeking approvals for greenfield routes. The reference route was identified based on the following:

- The Independent Electricity System Operator and OEB identified and acknowledged the reference route.
- The bidding process to select a designated transmitter focused on the reference route.
- NextBridge examined the reference route during the bidding process.
- The reference route is the shortest distance to connect the Lakehead TS and Wawa TS with a connection at Marathon TS (following existing transmission facilities).
- The use of the reference route is consistent with provincial policy as it is generally adjacent to the existing East-West Tie transmission line ROW.

It was determined that additional alternative route segments should be identified and assessed as potential alternatives to the reference route to confirm the best route from an environmental, socio-economic, and technical perspective based on comments received during the ToR phase of the Project.

To inform the assessment of alternative route segments between Lakehead TS and Wawa TS (with a connection at Marathon TS), the existing physical, environmental, and socio-economic conditions in the study area were documented using a GIS inventory developed by the Project team. The inventory was generated based on a review of records published through secondary sources and provided by government agencies. Environmental features were mapped based on primary data sources (i.e., field reconnaissance, field surveys) and secondary data sources (i.e., published data sources, electronic databases, aerial photographs, published literature and journals, and map interpretation). Information received from the consultation and engagement program was also considered. Methods used to retrieve information included visiting agency offices, local libraries, internet research, and correspondence with agencies and other stakeholders.

The preliminary preferred route was identified by comparing the routes that were originally proposed by NextBridge during the OEB's competitive bid process (i.e., the reference route that generally parallels the existing East-West Tie line and three alternative route segments around certain federal lands) with a series of 37 additional alternative route segments, as requested by the MNR and other stakeholders. The alternative route assessment used the criteria and indicators provided in the approved ToR to identify the route that is preferred from environmental, socio-economic, and technical perspectives (i.e., more advantages than disadvantages).

The analyses were carried by comparing the alternative route segments using desktop data, including secondary source information such as official plans, maps, orthophotographs, data provided by government agencies, and other existing published literature. Feedback received from Open Houses, Indigenous engagement, and public consultation activities (e.g., face-to-face meetings with property owners) completed at the time, including, including comments received during the public review of the ToR, was also considered, and cost considerations were included from a technical (constructability i.e., construction is feasible) perspective.

NextBridge determined, based on the assessment, the preliminary preferred route is generally adjacent to the existing East-West Tie line and it has more advantages and fewer disadvantages than the alternative route segments. Several exemptions of local refinements to the preferred route are discussed in Section 3.3.2.

### **3.3.1.4 Alternative Route Segments between Lakehead TS and Wawa TS**

The reference route was divided into a series of segments based on geographic constraints and the location of existing, previously disturbed rights-of-way to allow for a more detailed analysis of alternatives. A description of

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the analysis, including the key advantages and disadvantages for the alternative routes, is provided in Appendix 3-I for the following segments:

- Segment A (Municipality of Shuniah to the Township of Nipigon);
- Segment B (Township of Nipigon to the Town of Marathon);
- Segment C (Town of Marathon to the Township of White River); and
- Segment D (Township of White River to the Municipality of Wawa).

Some alternative route segments cross more than one segment of the reference route such as the submarine option in Segment A and segment D and the preliminary preferred alternative around Pukaskwa National Park compared with the reference route which passes through it Segment C to Segment D.

Potential alternative route segments in each segment of the reference route were identified. Alternative routes were evaluated against the reference route to determine the route, on balance, that has the most advantages from an environmental and socio-economic perspective and meets technical requirements and the screening criteria provided in Appendix 3-I. After the screening was completed, the route with the most advantages that met the screening criteria was chosen as the reference route and identified in Section 2.2 of Appendix 3-I was identified.

### **3.3.1.5 Alternative Route Segments around Federal Lands**

Alternative routes were identified to avoid Pukaskwa National Park and the Pays Plat First Nation and Michipicoten First Nation reserves. Alternative routes around these federal lands that were identified are described and shown on Figures 9 and 10 of Appendix 3-I. The reference route used for comparison purposes generally parallels the existing Hydro One corridor.

The existing Hydro One corridor crosses Pukaskwa National Park and was built prior to the designation of the National Park. NextBridge produced a Project Description Report for Parks Canada which documented the proposed undertaking, the environment crossed by the Project, potential environmental and socio-economic effects, and mitigation measures that could be applied to minimize adverse effects. Although the reference route through Pukaskwa National Park offers more advantages compared to the identified alternatives around the Park, Parks Canada determined that they were not prepared to authorize access to study a new transmission line through Pukaskwa National Park. Parks Canada re-iterated this position in 2015. Therefore, the alternative route around the Park was considered the best available route and became a segment of the preferred route.

Alternative routes were identified around Pays Plat First Nation Reserve. The reference route through Pays Plat First Nation was identified as the preferred route because there are no existing, previously disturbed rights-of-way to follow around the reserve and therefore the alternative would be considered a greenfield route.

Alternative routes were identified to avoid the Michipicoten First Nation Reserve lands. The reference route was determined to be the preferred route when comparing to the alternative routes as it best met the screening criteria as outlined in Appendix 3-II.

### **3.3.1.6 Alternative Route Segments around Provincial Parks, Conservation Reserves and Protected Areas**

The comparative evaluation of the alternative route segments adjacent to, through and around provincial parks and conservation reserves is provided in Appendix 3-I. Criteria and indicator matrices used to support the analysis are presented in Appendix 3-II. All the criteria and indicators were evaluated with the focus of the discussion on advantages and disadvantages and notable differences between route segments. The results are presented for each provincial park or conservation reserve, from west to east along the Project.

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Additional alternative route segments around provincial parks and conservation reserves were identified and assessed in response to feedback on the assessment from the MNRF. This additional assessment is included in Appendix 3-I-B and confirmed that the preliminary preferred route has more advantages and fewer disadvantages than the additional alternative route segments.

A number of alternative route segments, including a route alternative that avoided provincial parks or conservation reserves, was previously evaluated for impact to protected areas in Appendix 3-I (NextBridge 2015). Subsequently, no new alternative route segments were proposed for Black Sturgeon River Provincial Park to be assessed. However, each alternative was re-evaluated with new start and end points along the preferred route.

### **3.3.1.6.1 Protected Areas Where New Alternative Route Segments Were Assessed**

Six alternative route segments were identified to avoid provincial parks and conservation reserves. Each of these alternative route segments was mapped, the available spatial information was extracted, and then the comparative evaluation of alternatives was completed using the method described in Appendix 3-I and discussed in Section 3.3.2 of Appendix 3-II.

Alternative route segments were evaluated as a result of the individual assessment for the following protected areas:

- Kama Cliffs Conservation Reserve;
- Gravel River Nature Reserve (Provincial Park);
- Gravel River Conservation Reserve;
- Kwinkwaga Ground Moraine Uplands Conservation Reserve;
- Kwinkwaga Ground Moraine Forest Reserve;
- Pukaskwa River Provincial Park;
- Ruby Lake Provincial Park; and
- Nimoosh Provincial Park.

#### **3.3.1.6.1.1 Kama Cliffs Conservation Reserve**

For the Kama Cliffs Conservation Reserve, four alternative route segments were evaluated against the reference route that went through the conservation reserve. The preferred route was chosen as it is the shortest route, adjacent to existing infrastructure, has the least overlap with roads, least greenfield disturbance, and has the smallest area of the ROW with potential to overlap with recreational activities.

#### **3.3.1.6.1.2 Gravel River Nature Reserve (Provincial Park)**

For the Gravel River Nature Reserve, three alternative route segments were assessed in addition to the reference route. The preferred route, which went through the park, was chosen as a result of the route having the following advantages: it is the shortest route, is adjacent to an existing infrastructure corridor, crosses the least amount of infrastructure (roads and rail lines), crosses the least number of settlements, least greenfield disturbance, and is the farthest away from occupied dwelling and buildings.

#### **3.3.1.6.1.3 Gravel River Conservation Reserve**

For the Gravel River Conservation Reserve, three alternative route segments were considered to avoid the conservation reserve. The preferred route segment that went through the conservation reserve was chosen as it is the shortest route, is adjacent to an existing infrastructure corridor, least greenfield disturbance, crosses the fewest number of roads, and crosses the fewest number of settlements.

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### **3.3.1.6.1.4      *Kwinkwaga Ground Moraine Uplands Conservation Reserve***

Three alternative route segments were assessed to avoid the Kwinkwaga Ground Moraine Uplands Conservation Reserve. The segment of the route through the CR was chosen as the preferred route as the route is adjacent to an existing infrastructure corridor, is farthest separated from existing communities, and has the least greenfield disturbance

### **3.3.1.6.1.5      *Kwinkwaga Ground Moraine Forest Reserve***

The same alternatives that were evaluated for the Kwinkwaga Ground Moraine Uplands Conservation Reserve were evaluated for the Kwinkwaga Ground Moraine Forest Reserve. Since each of those alternatives also avoided the forest reserve, no additional alternatives were considered; however, they were evaluated in the context of this forest reserve, distinct from the other conservation reserve. The advantages of the segment of the preferred route in the Kwinkwaga Ground Moraine Forest Reserve are that the route is adjacent to an existing infrastructure corridor, is farthest separated from existing communities, is farthest separated from potential points of reception (PORs), crosses the fewest number of potential dwellings, and avoids Pic Mobert First Nation and Pic Mobert First Nation reserve expansion lands.

### **3.3.1.6.1.6      *Pukaskwa River Provincial Park***

Two alternative route segments were assessed to avoid the Pukaskwa River Provincial Park. The preferred route was chosen over the two alternative route segments as it requires less greenfield clearing, and follows existing logging roads and cutover areas.

### **3.3.1.6.1.7      *Ruby Lake Provincial Park***

The preferred route was chosen in comparison to three alternative route segments as it is the shortest route; parallels an existing utility corridor; avoids CLVAs; has the smallest area of the ROW with potential overlap with recreational activities, least amount of greenfield disturbance and areas of established treaties; and has the smallest areas of potential impact to important geological formations.

### **3.3.1.6.1.8      *Nimoosh Provincial Park***

The segment of the preferred route that transects Nimoosh Provincial Park has been chosen in comparison to three alternative route segments as a result of the following advantages: the route is adjacent to an existing infrastructure corridor, is farthest separated from potential PORs, and has the smallest area of overlap with potential aggregate sources. It has the smallest area of the ROW with potential to overlap with recreational activities, least greenfield disturbance and areas with established treaties. It also has the smallest areas of potential impact to important supportive environments and Significant Wildlife Habitat (SWH), crosses the least amount of wetlands, avoids CLVAs, and has the smallest area of overlap with potential caribou habitat.

### **3.3.1.7      *Routing to the North or South of the Existing East-West Tie***

A comparative analysis was carried out to determine the side of the existing East-West Tie ROW that would be preferable for siting the Project. The analysis concluded that the north side of the existing East-West Tie ROW is preferred, except for the segment of the line between the Town of Marathon and the Township of White River where generally paralleling an existing Hydro One 115 kV transmission line (Circuit M2W) ROW is preferred. The rationale for this decision is provided in Appendix E of the approved ToR (Appendix 1-I).

### **3.3.1.8      *Alternative Route Segments Around Loon Lake and Dorion***

An alternative route assessment was conducted for an alternative route segment around Loon Lake which extended to avoid the Town of Dorion. Consultation on the preliminary preferred route with local residents, landowners, and fishing club representatives near Loon Lake, including feedback received at the second and third round of open houses, resulted in identification of alternative route segments around Loon Lake. The Township of

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Dorion requested that NextBridge review additional alternative route segments to avoid affecting property in the Dorion area and potential effects to the Ouimet Canyon Area. In December 2015, NextBridge prepared the *Alternative Route Assessment for the East-West Tie Transmission Project* (NextBridge 2015), which included an evaluation of alternative route segments, as requested by the MNRF and other stakeholders. The reference route was assessed in each area in comparison to alternative route segments representing other route options to identify the preliminary preferred route.

NextBridge assessed three separate route segments including the preferred route segment around Loon Lake, Preliminary Preferred Loon Lake Segment and the twinning option that follows the existing East-West Tie transmission line. The alternatives assessment criteria and indicators were used in the alternative route report (NextBridge 2015) were used to assess the new alternative route segments. Field work has been conducted along the segments of the refinements of the preferred route around Loon Lake and for greenfield route segments to assess the natural factors. A comparative evaluation of the alternative route segments around Loon Lake and the Town of Dorion and the criteria and indicator tables were used to support the analysis provided in Table 3-4. Incorporation of this alternative route segment into the preferred route represents a local route refinement from the preliminary route. The criteria and indicators that were assessed to determine the Loon Lake Dorion Re-Route reference route are provided in Appendix 3-III.

The assessment of alternative route segments around Loon Lake resulted in the identification of a preferred alternative route segment in this area. The preferred alternative route segment around Loon Lake is the alternative route segment identified by Loon Lake stakeholders as the preferred alternative, with minor refinements to improve constructability. This greenfield route is the preferred route segment as it has the smallest area of mapped water bodies, largest area with previous logging disturbances, the least number of transmission line crossovers and has the most advantages when compared to the preliminary preferred route. A summary of the advantages and disadvantages of the Loon Lake and Dorion Re-route segment compared to the reference route and twinning option segment that parallels the existing Hydro One Transmission Line is provided in Table 3-4.

**Table 3-4: Loon Lake and Dorion Re-route Segments Advantages and Disadvantages**

Advantages	Disadvantages
<b>Alternative Route Segment Around Loon Lake</b>	
<ul style="list-style-type: none"> <li>■ relocation of domestic properties</li> <li>■ Smallest area of the ROW that overlaps with potential aggregate resources</li> <li>■ Smallest area of mapped water bodies (not including water bodies) in the ROW</li> <li>■ Least number of mapped water bodies crossed by the ROW</li> <li>■ Largest area of the ROW with previous logging disturbance</li> <li>■ Least number of roads crossed by the ROW</li> <li>■ Least number of transmission line corners</li> <li>■ Least number of transmission line crossovers</li> <li>■ Preferred by Loon Lake stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>■ Largest area of the ROW that overlaps with mining claims</li> <li>■ Largest area of the ROW that overlaps with mapped unevaluated wetlands</li> <li>■ Greatest number of mapped water bodies crossed by the ROW</li> <li>■ Crosses the Greenwich windfarm</li> </ul>

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**Table 3-4: Loon Lake and Dorion Re-route Segments Advantages and Disadvantages**

Advantages	Disadvantages
<b>Preliminary Preferred Route Segment</b>	
<ul style="list-style-type: none"> <li>■ Smallest area of the ROW that overlaps with a mining operation or claim</li> <li>■ Smallest area of the ROW that overlaps with mapped unevaluated wetlands</li> <li>■ Least number of mapped water bodies crossed by the ROW</li> <li>■ Smallest area of the ROW that overlaps with potentially SWH</li> </ul>	<ul style="list-style-type: none"> <li>■ Longest route</li> <li>■ Largest area of the ROW that overlaps with potential aggregate resources</li> <li>■ Largest area of mapped water bodies (not including watercourses) in the ROW</li> <li>■ Greatest number of mapped water bodies crossed by the ROW</li> <li>■ Smallest area of the ROW with previous logging disturbance</li> <li>■ Greatest number of roads crossed by the ROW</li> <li>■ Greatest number of transmission line corners</li> <li>■ Greatest number of transmission line crossovers</li> <li>■ Not favoured by Loon Lake stakeholders</li> </ul>
<b>Twinning Option Route Segment</b>	
<ul style="list-style-type: none"> <li>■ Shortest route</li> <li>■ Least amount of the ROW not in water bodies</li> </ul>	<ul style="list-style-type: none"> <li>■ Largest area of archeological potential</li> <li>■ Will require relocation of domestic properties in Dorion</li> <li>■ Crosses the largest number of fish bearing water bodies</li> </ul>

ROW = right-of-way; SWH = significant wildlife habitat.

### 3.3.1.9 Alternative Route Segments around Caribou Category 1 Habitat

An alternative assessment was completed to consider a route and infrastructure alternatives in relation to a section of Category 1 habitat located approximately 3.6 km northeast from Terrace Bay that spans approximately 18.6 km of the preferred route ROW. For a comparative assessment, an alternative route segment was developed that deviates around or avoids this section of Category 1 habitat for caribou wintering and nursery areas. Other alternative route segments were considered, but only one alternative route segment was assessed as there were no reasonable alternatives to the south because of Lake Superior. The preferred route segment that crosses the caribou Category 1 habitat was determined to be the preferred route because it is expected to have less overall impact on the environment, is 5.8 km shorter, and crosses less area of woodland caribou continuous habitat than the alternative route segment. A summary of the criteria and indicators that were assessed to determine this section of the reference route is displayed in Appendix 3-III. Figures displaying the preferred route and the alternative route are in Appendix 3-II. A summary of the advantages and disadvantages of the preferred route compared to the alternative route segment is provided in Table 3-5.

Temporary workspaces were also considered and siting these areas within this section of Category 1 habitat was avoided whenever possible. The placement of all laydown yard, storage yards and construction camps was avoided, with the exception of one laydown yard which was required to cover a large length of the ROW (approximately 20 km) as laydown yards are typically required every 6 to 10 km. Its placement was selected adjacent to the TransCanada Highway to reduce new access requirements and associated disturbances to bring in equipment and materials. Placement of the laydown yard outside of the boundaries of the along this section of the preferred route ROW was not feasible due to challenging topography and bedrock outcrops in alternate areas not in the Category 1 habitat, which could require blasting causing further disturbance.

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**Table 3-5: Caribou Wintering and Nursery Areas Alternative Segment Advantages and Disadvantages**

Advantages	Disadvantages
<b>Caribou Wintering and Nursery Area Alternative Route Segment</b>	
<ul style="list-style-type: none"> <li>■ Avoids caribou wintering and nursery areas</li> <li>■ Avoids bat hibernaculum areas</li> </ul>	<ul style="list-style-type: none"> <li>■ No existing infrastructure</li> <li>■ Greenfield route – not adjacent to the existing transmission line</li> <li>■ Crosses largest area of caribou continuous habitat</li> <li>■ More water body crossings</li> <li>■ Longer route</li> </ul>
<b>Preferred Route Segment</b>	
<ul style="list-style-type: none"> <li>■ Shortest total length of ROW</li> <li>■ Parallels existing infrastructure</li> <li>■ Fewer water bodies crossed</li> <li>■ Crosses the least amount of caribou continuous habitat</li> </ul>	<ul style="list-style-type: none"> <li>■ More permanent and temporary access roads constructed</li> <li>■ Adjacent to two areas of bat hibernaculum</li> <li>■ Crosses caribou wintering and nursery areas</li> </ul>

ROW = right-of-way.

A small segment at the end of a caribou travel corridor located 18 km from the Town of Wawa crosses the reference route, which is the preferred route for this section. Only 45.2 ha of the caribou travel corridor extends on the other side of the reference route. For a comparative analysis, an alternative route was considered to avoid the caribou travel area. Approximately 1.2 km of the ROW is crossed by the caribou travel corridor. The reference route through the caribou travel area was determined as the preferred route to avoid an additional greenfield route segment. A summary of the advantages and disadvantages of the preferred route compared to the alternative route segment is provided in Table 3-6.

**Table 3-6: Caribou Travel Area Alternative Segment Advantages and Disadvantages**

Advantages	Disadvantages
<b>Caribou Travel Area Alternative Route Segment</b>	
<ul style="list-style-type: none"> <li>■ Avoids caribou travel area</li> </ul>	<ul style="list-style-type: none"> <li>■ No existing infrastructure</li> <li>■ Greenfield route – not adjacent to the existing transmission line</li> <li>■ Longer route</li> </ul>
<b>Preferred Route Segment</b>	
<ul style="list-style-type: none"> <li>■ Shortest total length of ROW</li> <li>■ Parallels existing infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>■ Crosses caribou travel area</li> </ul>

ROW = right-of-way.

### 3.3.1.10 Alternative Route Segments around Species at Risk and Species of Concern

Alternative route segments to the reference route were identified to avoid bat hibernaculum areas and eastern whip-poor-will sites. For each of the known values for these species, an alternative route segment was mapped and is displayed in Appendix 3-III. A summary of the criteria and indicators that were assessed to determine the reference route as a preferred route, in comparison to the alternative segments, can be found in Appendix 3-III.

#### Alternative Route Segments for Bat Hibernacula

For areas of bat hibernacula sites, two separate greenfield alternative route segments were assessed to avoid 400 m from bat hibernacula. There are two other bat hibernacula sites along the reference route which were assessed in the caribou wintering and nursery area alternative. The first bat hibernaculum alternative route segment assessed was around Cook Lake. The second alternative assessment that was completed for bat

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hibernacula was at Fire Mountain. The reference route was chosen as the preferred route for both alternative routes assessed as it parallels the existing Hydro One transmission line, is the shortest route, and requires the least greenfield disturbance. A summary of the advantages and disadvantages of the preferred route compared to the alternative route segments is provided for the Cook Lake Bat Hibernacula in Table 3-7 and for the Fire Mountain Bat Hibernacula in Table 3-8.

**Table 3-7: Bat Hibernacula Cook Lake Alternative Segment Advantages and Disadvantages**

Advantages	Disadvantages
<b>Cook Lake Bat Hibernacula Alternative Route Segment</b>	
<ul style="list-style-type: none"> <li>■ Avoids bat hibernacula site</li> </ul>	<ul style="list-style-type: none"> <li>■ Crosses a larger area of continues caribou habitat</li> <li>■ Longer ROW</li> <li>■ Larger greenfield area required</li> </ul>
<b>Preferred Route Segment</b>	
<ul style="list-style-type: none"> <li>■ Crosses less continuous caribou habitat</li> <li>■ More life science values</li> <li>■ Shorter route</li> <li>■ Existing infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>■ Crosses bat hibernacula site</li> </ul>

ROW = right-of-way.

**Table 3-8: Bat Hibernacula Fire Mountain Alternative Segment Advantages and Disadvantages**

Advantages	Disadvantages
<b>Fire Mountain Bat Hibernacula Alternative Route Segment</b>	
<ul style="list-style-type: none"> <li>■ Avoids bat hibernacula site</li> </ul>	<ul style="list-style-type: none"> <li>■ Crosses a larger area of continues caribou habitat</li> <li>■ Longer ROW</li> <li>■ Larger greenfield area required</li> <li>■ More water bodies crosses</li> </ul>
<b>Preferred Route Segment</b>	
<ul style="list-style-type: none"> <li>■ Crosses less continuous caribou habitat</li> <li>■ More life science values</li> <li>■ Shorter route</li> <li>■ Existing infrastructure</li> <li>■ Crosses fewer water bodies</li> </ul>	<ul style="list-style-type: none"> <li>■ Crosses bat hibernacula site</li> </ul>

ROW = right-of-way.

## Alternatives Route Segments for Whip-poor-will Sites

Eastern whip-poor-will were identified along the reference route south of Kwinkwaga Ground Moraine Uplands Conservation Reserve. Whip-poor-will were identified at these three locations by surveyors that heard male eastern whip-poor-will. By using coordinates and compass bearings to the direction of the calling birds, a GIS triangulation method was used to determine the centroid of the breeding territory. The three areas locations where whip-poor will were identified were assessed for alternative route segments. The same alternative route segments that were assessed to determine the preferred route through the Kwinkwaga Ground Moraine Conservation Reserve was used in addition to two other alternative route segments to determine the preferred route along this part of the reference route. The reference route was chosen as the preferred route because it parallels the existing Hydro One transmission, is the shortest route, and requires the least amount of greenfield disturbance. A summary of the advantages and disadvantages of the preferred route compared to the alternative route segments is provided in Table 3-9, Table 3-10 and Table 3-11.

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**Table 3-9: Eastern-Whip-Poor Will Site 1 Segment Advantages and Disadvantages**

Advantages	Disadvantages
<b>Eastern-Whip-poor will Site 1 Alternative Route Segment</b>	
<ul style="list-style-type: none"> <li>■ Avoids eastern-whip-poor-wills</li> </ul>	<ul style="list-style-type: none"> <li>■ Larger greenfield disturbance</li> <li>■ Larger area of ROW</li> <li>■ Crosses larger area of archeological potential</li> </ul>
<b>Preferred Route Segment</b>	
<ul style="list-style-type: none"> <li>■ Shorter route</li> <li>■ Existing infrastructure</li> <li>■ Larger greenfield route</li> </ul>	<ul style="list-style-type: none"> <li>■ Crosses eastern whip-poor-will area</li> </ul>

ROW = right-of-way.

**Table 3-10: Eastern-Whip-Poor Will Site 2 Segment Advantages and Disadvantages**

Advantages	Disadvantages
<b>Eastern Whip-poor-will Site 2 Alternative Route Segment</b>	
<ul style="list-style-type: none"> <li>■ Avoids eastern-whip-poor-wills</li> </ul>	<ul style="list-style-type: none"> <li>■ Larger greenfield disturbance</li> <li>■ Larger area of ROW</li> <li>■ Crosses larger area of archeological potential</li> <li>■ More water crossings</li> </ul>
<b>Preferred Route Segment</b>	
<ul style="list-style-type: none"> <li>■ Shorter route</li> <li>■ Existing infrastructure</li> <li>■ Larger greenfield route</li> <li>■ Less impact to potential archaeological sites</li> <li>■ Less water crossings</li> </ul>	<ul style="list-style-type: none"> <li>■ Crosses eastern whip-poor-will area</li> </ul>

ROW = right-of-way.

**Table 3-11: Eastern-Whip-Poor Will Site 3 Segment Advantages and Disadvantages**

Advantages	Disadvantages
<b>Eastern Whip-poor-will Site 3 Alternative Route Segment</b>	
<ul style="list-style-type: none"> <li>■ Avoids eastern whip-poor-wills</li> </ul>	<ul style="list-style-type: none"> <li>■ More life science values crossed</li> <li>■ Larger greenfield disturbance</li> </ul>
<b>Preferred Route Segment</b>	
<ul style="list-style-type: none"> <li>■ Less life science values crossed</li> <li>■ Existing infrastructure</li> <li>■ Larger greenfield route</li> </ul>	<ul style="list-style-type: none"> <li>■ Crosses whip-poor-will area</li> </ul>

### 3.3.1.11 Alternative Route Segments Around Aggregate Sites

An analysis of alternatives was completed to assess the development of greenfield route segments as an alternative to avoid three separate active aggregate sites along the reference route. The three aggregate sites crossed by the Project are Tonnes Hacquil Site, Site Chief Xavier and Site AV Terrace Bay. The reference route through the aggregate sites was determined as the preferred route as it follows existing infrastructure and will not require the development of 6 km of combined greenfield route segments. A summary of the criteria and indicators that were assessed to determine this section of the reference route is provided in Appendix 3-III.

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## 3.3.2 Local Route Refinements

In addition to the alternative route segments identified above, and based on comments received from various stakeholders, it was determined that some localized route refinements should be considered and assessed as potential alternatives. Some segments of the reference route could not be sited adjacent to the existing Hydro One East-West Tie transmission line because of technical, social, or environmental constraints. These segments are referred to as “greenfield route refinements” in this analysis of local route refinements. NextBridge has performed an analysis of the effects on the key technical and social economic factors related to construction in a greenfield area. Construction of a transmission line in previously undeveloped areas will create new access, alter landscape and could potentially affect caribou migration routes. The effects of the Project in greenfield areas is equally considered with brownfield sites (i.e., areas of previous disturbance) in Section 6 through 21 of this amended EA Report. For instance, when assessing the effects on vegetation and wildlife, the effects were quantitatively and qualitatively assessed for the complete portion of the transmission line including the greenfield and brownfield sections of the Project. The values or environmental and socio-economic features that are crossed by, or adjacent to, the greenfield route refinements are shown in Appendix 3-III. Mitigation measures that have been applied during Project design or will be implemented during construction and operation are provided in Sections 6 through 21 of the amended EA Report, the Construction Environmental Protection Plan (CEPP; refer to Appendix 4-II), the Operation Environmental Management Plan (OEMP; refer to Appendix 4-III) and the Site Specific Mitigation Table (Annex 5). The mitigation measures are applicable to all Project components, including the greenfield route segments.

There are four greenfield route refinements that deviate from the existing Hydro One transmission line (i.e., the reference route). An alternatives assessment of the four route refinements was completed for these sites that were not assessed as alternative route segments for federal lands, provincial parks and conservation reserves, and the Dorion Loon Lake route refinement. Environmental, socio-economic and technical factors were considered when comparing the greenfield route refinements to the original reference route.

These four local route refinements are listed in Table 3-12 and described below, and a quantitative evaluation of each greenfield route refinement is compared against a reference route alternative and is displayed in Appendix 3-III.

**Table 3-12: Local Route Refinements**

Local Route Refinement	Length of Route Segment (km)	Furthest Distance (m) between Greenfield Segment and Existing Hydro One ROW	Start Kilometer Post	End Kilometer Post
Kama Hills Provincial Park Greenfield	2.0	76	108.12	110.14
Angler Creek Internment Camp Greenfield	2.2	274	230.25	232.54
Hydro One Crossover Greenfield	5.9	983	2.69	8.50
Hemlo Mine Greenfield	7.1	991	28.77	36.18

km = kilometre; m = metre; ROW = right-of-way.

### 3.3.2.1 Kama Hills Nature Reserve (Provincial Park) Greenfield

A route refinement was identified to deviate from the Hydro One transmission line to avoid the Kama Cliffs Nature Reserve, which is wholly within the Kama Cliffs Conservation Reserve. This refinement was identified because of comments from the MNRF requesting an alternate route segment to minimize impacts to the values within the park. This route refinement crosses Camp 81 Road and continues through the Kama Cliffs Conservation Reserve, while remaining outside and to the north of the Kama Hills Nature Reserve (Provincial Park), and then runs southeast along the Hydro One transmission line corridor for a distance of approximately 3.6 km. A comparative evaluation of the alternatives for this route segment was conducted. The reference route paralleling the existing Hydro One Transmission Line and the greenfield alternative were of identical length and area within the ROW and both crossed the Kama Cliffs Conservation Reserve for approximately 11 km. Due to similar impacts between the

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two routes the greenfield route was selected to preserve the values within the Kama Hills Nature Reserve (Provincial Park). Additional details about considerations within the conservation reserve are presented in Appendix 3-III, Section 19, Appendix 19-IV, and Annex 5. A summary of the criteria and indicators that were assessed to determine this section of the reference route is provided in Appendix 3-III. A summary of the advantages and disadvantages of the Kama Hills Natural Reserve greenfield segment compared to the reference route segment that parallels the existing Hydro One Transmission Line is provided in Table 3-13.

**Table 3-13: Kama Hills Nature Reserve (Provincial Park) Segments Advantages and Disadvantages**

Advantages	Disadvantages
<b>Kama Hills Nature Reserve (Provincial Park) Greenfield Segment – Preferred Route</b>	
<ul style="list-style-type: none"> <li>■ Less settlements intersected</li> <li>■ Avoids Kama Hills Nature Reserve (Provincial Park)</li> </ul>	<ul style="list-style-type: none"> <li>■ Greenfield route – not adjacent to the existing transmission lines</li> </ul>
<b>Reference Route - Kama Hills Nature Reserve (Provincial Park) Segment – Adjacent to Existing Hydro One East West Line</b>	
<ul style="list-style-type: none"> <li>■ Existing infrastructure present</li> </ul>	<ul style="list-style-type: none"> <li>■ Disruption of settlements causing relocation</li> <li>■ Impacts Kama Hills Nature Reserve (Provincial Park)</li> </ul>

### 3.3.2.2 Angler Creek Internment Camp Greenfield

The Angler Internment Camp, also known as Camp X and Camp 101, was a German prisoner of war (POW) and Japanese-Canadian internment camp located to the north of Angler Creek, near the Town of Marathon, Thunder Bay District. The Angler Internment Camp is one of the very few internment camps in Canada and a rare representative example of a purpose-built camp for both prisoners of war and civilian internees. This site meets criteria as an archeological site and is subject for historical research with potential to yield information contributing to the understanding of internment policy, site selection, camp construction and other topics such as daily life for guards and internees. The Angler Internment Camp is one of a small number of POW and internment sites in Ontario (and nationally), and in its features and history demonstrates an uncommon and unique aspect of the province’s cultural heritage.

During the consultation for the Project, stakeholders raised concerns about the potential effects of the route on the Angler Internment Camp. As a result, the Angler Creek Internment Camp route refinement was identified to deviate from the Hydro One transmission line corridor for approximately 2 km to avoid impacts to the site, and then cross two Hydro One 115 kV transmission lines and run generally southeast along the north side of the Hydro One transmission line corridor for a distance of approximately 4.1 km into Marathon TS located on Peninsula Road, approximately 1.4 km southwest of Hwy 17.

This proposed route refinement was also addressed in the *2017 Draft Heritage Impact Assessment* (NextBridge 2017) undertaken for the Project that determined that, without mitigation measures, the Angler Internment Camp was at risk of direct adverse impact from the Project. Recommendations from the assessment included clear marking and avoidance of the site, including prevention of vehicle access. For more details, refer to Section 16 and Appendices 2-III and 2-IX. A comparative evaluation of this route segment has been completed for the Angler Camp Creek Internment Camp which displayed similar environmental impacts to the route paralleling the existing Hydro One transmission lines as the preferred route that is located east of the current line. A summary of the criteria and indicators that were assessed to determine this section of the reference route is displayed in Appendix 3-III. A summary of the advantages and disadvantages of the Angler Creek Internment Camp greenfield segment compared to the reference route segment that parallels the existing Hydro One Transmission Line is provided in Table 3-14.

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**Table 3-14: Angler Creek Internment Camp Segments Advantages and Disadvantages**

Advantages	Disadvantages
<b>Angler Creek Greenfield Segment – Preferred Route</b>	
<ul style="list-style-type: none"> <li>■ Shortest distance of temporary access roads</li> <li>■ No permanent access roads</li> <li>■ Less water bodies crossed</li> <li>■ Less area for archeological potential</li> </ul>	<ul style="list-style-type: none"> <li>■ 1.4 ha of CLVAs in the ROW</li> <li>■ No existing infrastructure</li> </ul>
<b>Reference Route Segment – Angler Creek – Adjacent to Existing Hydro One East West Line</b>	
<ul style="list-style-type: none"> <li>■ Presence of existing infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>■ Crosses the most water bodies</li> <li>■ Crosses fish bearing water bodies</li> <li>■ Area of archeological potential</li> </ul>

Critical Landform/Vegetation Associations (CLVAs); ha = hectares; ROW = right-of-way.

### 3.3.2.3 Hydro One Crossover Greenfield

A route refinement near the Lakehead TS was identified as a result of consultation with Hydro One, to minimize the crossings of the Hydro One transmission line from eight to four crossings based on the following considerations.

- Avoid adverse impacts to any aspect of the reliability and security of supply for customers that may result from new projects.
- Minimize the extent of outages in severe cases. If a failure of the new transmission line occurs it may result in interruption of circuit T1M transmission line causing potential outages in the town of Marathon. Interruption of this transmission line may significantly aggravate the impact of the initial failure causing unnecessary interruptions to many customers in the Northwest.
- Avoid long outages that could have the possibility to last for long durations because of the difficulty in accessing and repairing the lines in these locations.
- Increased risk and difficulty with the right-of-way maintenance and line work. Due to the narrow angle between the two rights-of-way of the new transmission line and existing Hydro One line at the locations, the two will merge and cross for more than one span. Any work for either line will pose a risk of unintentional damage or interruption to the other line and may result in an unnecessary outages impacting the reliability of the system and the customer.

A comparative evaluation of the greenfield route was conducted that determined this segment of the reference route to be placed north of the existing Hydro One Line to avoid disruptions to Hydro One customers in northern Ontario. A summary of the criteria and indicators that were assessed to determine this section of the reference route is displayed in Appendix 3-III. A summary of the advantages and disadvantages of the Hydro One Crossover greenfield segment compared to the reference route segment that parallels the existing Hydro One Transmission Line is provided in Table 3-15.

**Table 3-15: Hydro One Crossover Segments Advantages and Disadvantages**

Advantages	Disadvantages
<b>Hydro One Greenfield Segment – Preferred Route</b>	
<ul style="list-style-type: none"> <li>■ Less structures required</li> <li>■ Less temporary access roads</li> <li>■ Less crossings of existing transmission line</li> </ul>	<ul style="list-style-type: none"> <li>■ No existing infrastructure</li> </ul>
<b>Reference Route – Hydro One – Adjacent to Existing Hydro One East West Line</b>	
<ul style="list-style-type: none"> <li>■ Existing infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>■ Requires the construction of more temporary access roads</li> <li>■ Crosses larger amount of settlements</li> <li>■ Larger area of archeological potential</li> <li>■ Interferes with the operation and maintenance of existing Hydro One transmission lines</li> </ul>

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### 3.3.2.4 Hemlo Mine Greenfield

The route refinement is around an existing Hydro One Line (which is planned to be relocated) has been refined through consultation with Barrick Gold Corporation to avoid the Hemlo property which consists of an underground and open pit mine. Having the reference route intersect the Hemlo Mine boundaries would restrict the 200 m high rock pile perimeter and contain further expansion to Hemlo Mine operation. Routing the Project through an active mine site was identified as a concern, as it could result in impacts to the mining operations and ongoing safety considerations for construction and maintenance of the transmission line.

A comparative evaluation of this route segment was conducted between the line adjacent to the existing HydroOne transmission line and the preferred route to the north of the transmission line. A summary of the criteria and indicators that were assessed to determine this section of the reference route is displayed in Appendix 3-III. A summary of the advantages and disadvantages of the Hemlo Mine greenfield segment compared to the reference route segment that parallels the existing Hydro One Line is provided in Table 3-16.

**Table 3-16: Hemlo Mine Segments Advantages and Disadvantages**

Advantages	Disadvantages
<b>Hemlo Mine Greenfield Segment</b>	
<ul style="list-style-type: none"> <li>■ Less temporary and permanent access roads</li> <li>■ More existing temporary access roads</li> <li>■ Crosses less trails</li> <li>■ Does not impact operations at Hemlo Mine</li> </ul>	<ul style="list-style-type: none"> <li>■ No existing infrastructure</li> </ul>
<b>Reference Route – Hemlo Mine – Adjacent to Existing Hydro One East West Line</b>	
<ul style="list-style-type: none"> <li>■ Shortest total length of ROW</li> <li>■ Existing infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>■ More permanent and temporary access roads constructed</li> <li>■ More dwellings in ROW</li> <li>■ Impacts operations at Hemlo Mine</li> </ul>

ROW = right-of-way.

### 3.3.3 Alternative Siting of Transmission Structures

Structure siting refers to the engineering selection of tower locations along a transmission line route considering public safety, potential environmental effects, transmission system reliability, and technical considerations such as cost. Structure siting is affected by a number of factors such as terrain, environmental and permitting restrictions, design limitations of supporting structures, and the location of existing infrastructure such as roads, railways, pipelines, and other transmission lines. For the Project, transmission structures can be sited so that the conductors span sensitive areas; therefore, structures have been planned along the route considering the location of wetlands, water bodies, and other features and paralleling existing transmission lines, where practicable. The distance between transmission structures has been increased where a longer than typical span is required to span a sensitive area. For example, transmission structures on either side of Pukaskwa River will be spaced further apart and back from the river banks to minimize visual impacts to those using the river.

NextBridge has attempted to accommodate the preferences of stakeholders regarding positioning of structures. Additional site-specific siting of transmission structures will be determined during detailed design once additional ground-truthing for proposed structure locations is complete.

### 3.3.4 Alternative Transmission Structure Types

NextBridge has identified different structure types to be used for the Project to suit the environment and will use each where most appropriate. Detail about the transmission structure types anticipated to be used for the Project are provided in Section 4.2.2.1. Where it is practicable to install, Guyed-Y structures are preferred based on foundation size, smaller surface disturbance, cost, and safety features. The main structure type is anticipated to be a double-circuit Guyed-Y lattice tower.

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Alternative transmission structure types will be required at a variety of locations along the ROW to:

- provide additional height and conductor spacing for longer spans;
- support increased loads at turning points; and
- reduce the required ROW width.

A specialized structure will be installed at these locations. The specialized structures are anticipated to be more robust in design than the typical Guyed-Y structures and may also require more substantial foundations, guy wires, and/or anchors.

Self-supporting towers are expected to be used rather than Guyed-Y structures where reduced ROW width is required. For example, alternative route segments around the Kwinkwaga Ground Moraine Uplands Conservation Reserve and the Forest Reserve were evaluated (Appendix 3-II), but no reasonable alternatives were identified. To reduce overlap of the preferred route ROW with the Kwinkwaga Ground Moraine Uplands Conservation Reserve and Forest Reserve lands, self-supporting towers will be installed and the ROW will be narrower than if Guyed-Y structures were used.

The final site-specific selection of structure types will be made during detailed engineering design.

### 3.3.5 Alternative Access and Construction Plan

Construction requires the ability to access each tower with heavy equipment, set up sufficient laydown yards and storage yards to stage construction materials to keep pace with construction, and identify construction camp locations with the required amenities. NextBridge has reviewed and considered different construction and access plan alternatives to meet the following goals:

- refining the access roads to avoid additional private landowner parcels or Crown interest holders for new access road easements;
- refining the access roads, laydown yards and storage yards, to avoid sensitive features;
- planning the smallest construction and access footprint possible to reduce environmental effects and cost while maintaining a conservative Project footprint for the amended EA Report so there is flexibility and room within the Project footprint for additional optimization during detailed design and continued construction planning;
- sufficient laydown yards for construction using either helicopter or ground equipment; and
- sufficient access roads to each of the towers during either snow-free or winter construction.

The development of temporary and permanent roads are required for the construction and maintenance of the Project. NextBridge's access plan was developed to use existing roads as much as practicable, and limit the construction of new access roads to areas where required. As discussed in detail in Section 4, the number of access roads have decreased from that presented in the final EA Report to minimize impacts, effects and alterations on the areas land use. A comparison of the lengths and ROW areas for access roads included in the Project footprint for the final EA Report and the amended EA Report is provided in Table 3-17. Based on the comparison, the total length of temporary and permanent access roads has decreased by 23.3% in the amended EA Report compared to the final EA Report, and the total ROW area for temporary and permanent access roads has decreased by 61.3%. This reduction is based on evaluating alternatives and consideration of comments provided by stakeholder during the EA and planning processes.

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**Table 3-17: Comparison of Access Road Lengths and Right-of-Way Area for the Project Footprint Considered in the Final EA and Amended EA Reports**

Access Road Type	Access Road Length (km)			Access Road Right-of-Way Area (Ha)		
	Final EA Report	Amended EA Report	Change from Final EA to Amended EA (%)	Final EA Report	Amended EA Report	Change from Final EA to Amended EA (%)
<b>Temporary Access Roads</b>						
New	213	79	-62.9	398	165	-58.6
Improvement / Widening	557	319	-42.7	1,085	465	-57.1
Existing	692	707	2.1	1,381	422	-69.4
<i>Subtotal</i>	<i>1,462</i>	<i>1,105</i>	<i>-24.4</i>	<i>2,863</i>	<i>1,052</i>	<i>-63.3</i>
<b>Permanent Access Roads</b>						
New	17	24	42.0	32	49	50
Improvement / Widening	26	31	18.2	52	46	-11
Existing	7	0	-98.1	15	0	-99.5
<i>Subtotal</i>	<i>50</i>	<i>55</i>	<i>8.8</i>	<i>99</i>	<i>94</i>	<i>-4.5</i>
<b>Total</b>	<b>1,513</b>	<b>1,160</b>	<b>-23.3</b>	<b>2,962</b>	<b>1,146</b>	<b>-61.3</b>

EA = environmental assessment; % = percent; - = negative; km = kilometre; ha = hectares.

NextBridge will continue to refine the construction and access plan as Project development continues and will continue to consult with stakeholders.

### 3.3.5.1 Helicopter Usage

Ground access for materials, equipment, and personnel distribution may be supplemented by helicopter transport. The use of helicopters to bring equipment, materials and labour into protected areas for construction was considered as an alternative to the construction of access roads. Helicopters may be useful for air lifting materials in to challenging terrains, and help to avoid terrestrial disturbances created by upgrading or construction of access roads. Ground-based activities such as clearing, grading and excavations will be required for the ROW and the footings for the structures as there are not acceptable alternative aerial methods. The use of helicopters poses additional health and safety risks associated with clearing and construction of the line that are avoided with ground-based clearing and construction. Risks to worker safety are high in helicopter operations and include the following potential risks:

- Danger to ground workers working in heavy slash conditions.
- Extreme downwash of the blades causing flying debris, broken branches and tree tops.
- Hookers, that are responsible for attaching cables to felled logs, have to work directly under the helicopter.
- Communication between ground workers is impacted by the helicopter noise.
- Falling debris and logs are a risk.
- The helicopter flight path options are limited based on a 60-m-wide ROW, increasing the potential for injury.
- Chainsaw work (hand falling, required to support heli-logging) is dangerous with major implications for safety management.

### **3.3.6 Alternative Siting of Laydown Yards and Construction Camps**

Laydown yards and construction camps to support the Project have been sited to avoid federal lands, provincial parks and conservation reserves. As well, site-specific alternative locations or avoidance has been adopted based on feedback received from stakeholders. For example, based on comments from the MNRF, laydown yards south of Ouimet Canyon Provincial Park have been removed from the Project footprint to avoid disturbance to views from the park. Similarly, the proposed construction camps will be sited in consultation with landowners, as discussed in Section 4.

If additional laydown yards, storage yards and construction camps are required these will be located within previously disturbed areas, and/or at reasonably flat with stable soil sites, wherever practicable.