

3. EVALUATION OF ALTERNATIVES

Section 3.1 of the East-West Tie Transmission Project Environmental Assessment Terms of Reference – Amended (Appendix 1-I) indicated that the Environmental Assessment (EA) approach for the East-West Tie Transmission Project (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 will meet the requirements of subsection 6.1(2) and include an assessment of the “alternative methods” and the “do nothing” alternative but does not include an assessment of “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).

3.1 Alternatives to the Project

“Alternatives to” are functionally different ways to meet the need and achieve the purpose of a project (CEA Agency 2007) or “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 considers the “do nothing” alternative only.

3.1.1 Proceed with the Project

Proceeding with the Project would entail developing the transmission line and associated infrastructure according to the preferred alternative methods identified in Section 3.2 of the 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 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 proximity to the Project, 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, loss 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 considered in the EA Report 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.

3.1.2 Do Nothing

The do nothing alternative serves as a benchmark against which the consequences of proceeding with the Project can be measured in order to determine, amongst other things, whether the anticipated benefits of the Project outweigh its predicted adverse environmental effects. Moreover, the do nothing alternative 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.

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3.1.3 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 3.1.4.

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 and 2013 Long-Term Energy Plans (Ontario Ministry of Energy 2010, 2013). 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).	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.

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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
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> .
Screening Conclusion	Identified as the preferred alternative.	Not considered a feasible alternative.

3.1.4 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 in order to assist in selecting the preferred alternative.

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 eliminate 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 construction of the Project is needed when it considers an application for leave to construction the Project.

Proceeding with the Project will have environmental effects; however, the Project is not anticipated to have significant adverse net effects on the environment. 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.

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

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

3.1.5 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 supply electricity to 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. A detailed assessment of the potential environmental effects of the Project, which is made up of the alternative methods selected in the alternatives assessment presented below, is provided in subsequent sections of the EA Report (Sections 6 through 21).

3.2 Alternative Methods of Carrying Out the Project

As noted in the ToR, “alternative methods” of carrying out the Project (e.g., alternative route segments, local route refinements and alternative designs) are to be considered as part of the EA. Alternative methods are “different ways of doing the same activity” (MOECC 2014).

3.2.1 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 right-of-way (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 Network Inc. 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).

3.2.2 Alternative Route Segments

This section provides an overview of the assessment of alternative route segments and the process of identifying a preferred route for the Project. Additional details are provided 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 Reference Route, which generally parallels the existing East-West Tie transmission line, is 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 provided in a coordinated, efficient, and cost-effective manner before proposing new greenfield¹ 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;
- visual effect of the Project; and
- overall operational costs, as there may be efficiencies in ROW maintenance.

This was one of the 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 ROWs and corridors before seeking approvals for "greenfield" routes. The Reference Route was identified based on the following:

- The Independent Electricity System Operator (IESO) 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 Transformer Station (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 line ROW.

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

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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. The Township of Dorion also requested NextBridge review additional alternative route segments to reduce the number of affected private properties in the Dorion area and potential effects to the Ouimet Canyon area. An assessment of alternative route segments was completed to address this (Appendix 3-1).

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 purpose of collecting data and developing the inventory was to assist the Project team, agencies, local and Indigenous communities, the public, and other interested parties in better understanding the existing conditions to inform the evaluation of alternative route segments.

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 Ministry of Natural Resources and Forestry (MNRF) 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 out using a GIS database to compare 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 to date, including comments received during the public review of the ToR, was also considered, and cost considerations were included from a technical (constructability) perspective.

NextBridge determined, based on the assessment, that with three exceptions 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. The first exception relates to Pukaskwa National Park. Given that Parks Canada has determined that it is not prepared to authorize access to study a new transmission line through Pukaskwa National Park, the alternative around the park that is adjacent to a 115 kV transmission line and logging roads and crosses a cutover area is considered the best feasible alternative and, therefore, forms part of the preliminary preferred route. Also, based on feedback received through public consultation with the residents of the Township of Dorion and the results of the desktop GIS-based analysis, routing to the west of Ouimet Canyon Provincial Park is generally preferred in this area and has been identified as part of the preliminary preferred route.

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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 MNR. This additional assessment is included in Appendix 3-I and confirmed that the preliminary preferred route has more advantages and fewer disadvantages than the additional alternative route segments.

Consultation on the preliminary preferred route with residents and landowners at Loon Lake, including feedback received at the third round of Open House events, resulted in identification of an alternative route segment to the north of Loon Lake. A GIS-based analysis of this alternative route segment was carried out, as described in Appendix 3-I. Based on this feedback and the results of the GIS-based analysis, routing around Loon Lake was revised. The preferred route incorporates the input from Loon Lake residents and landowners and is shown in Figure 1-1. The preferred route is assessed in this EA Report.

3.2.3 Alternative Designs

Alternative designs were also considered to accommodate specific property owner, local and Indigenous community, individual, or other stakeholder concerns, or to minimize Project effects on an environmental or socio-economic feature (i.e., as a mitigation tool).

The following alternative designs are explored in the EA Report:

- transmission structure types;
- specific siting of transmission structures; and
- access and construction plan.

3.2.3.1 Transmission Structure Types

NextBridge has considered constructing the Project using a variety of transmission structure types. The final selection of specific structure types will be made during detailed engineering design. The main structure type is anticipated to be a double-circuit Guyed-Y lattice tower.

At a variety of locations along the ROW, alternative transmission structure types will be required to:

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

At each of these locations, specialized structures will be designed and used. These 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. Where it is feasible to use Guyed-Y structures, these structures are preferred based on foundation size, smaller surface disturbance, cost, and safety features. Section 4.2.2.1 provides additional detail about the transmission structure types anticipated to be used for the Project.

3.2.3.1.1 Kwinkwaga Ground Moraine Uplands Conservation Reserve and Forest Reserve

Most transmission structures are planned to be self-supporting towers rather than Guyed-Y structures where the Project is adjacent to the Kwinkwaga Ground Moraine Uplands Conservation Reserve and Forest Reserve. Self-supporting towers will be installed in the Kwinkwaga Ground Moraine Uplands Conservation Reserve and Forest Reserve. This alternative transmission structure type is planned to reduce overlap of the preferred route ROW with the Kwinkwaga Ground Moraine Uplands Conservation Reserve and Forest Reserve. Routing around Kwinkwaga Ground Moraine Uplands Conservation Reserve and Forest Reserve is not considered feasible. Alternative route segments in this area are discussed in detail in Appendix 3-I.

3.2.3.2 Specific Siting of Transmission Structures

Structure siting refers to the engineering selection of structure types, heights, and locations along a transmission line route considering public safety, potential environmental effects, transmission system reliability, and 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, structures have been positioned along the route considering the location of wetlands, water bodies, and other features and paralleling existing transmission lines, where feasible.

Transmission structures can be sited to span sensitive areas. The distance between transmission structures can be increased where a longer than typical span is required to span a sensitive area.

NextBridge will attempt to accommodate the preferences of landowners regarding positioning of towers, to the extent feasible. Specific siting of transmission structures will be determined during detailed design.

3.2.3.3 Access and Construction Plan

The construction and associated access plan consist of approximately 44% of the Project footprint. 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 environmental features;
- planning the smallest construction and access footprint possible to reduce environmental effects and cost while maintaining a conservative Project footprint for the 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.

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