



**GWP 128-90-00
Highway 11/17
Four-Laning from 0.3 km
East of Highway 587,
Easterly for 14.4 km**

**Environmental Study Report
Addendum (Final)**

December 2016

Submitted by



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Study Background

A Planning and Preliminary Design Study was completed in December 1995 for the four-laning of Highway 11/17 from Mackenzie to east of Pearl (Welch Creek) (GWP 372-90-00), which documented project justification, design alternatives and a recommended preliminary design. In January 1996, an Environmental Study Report (ESR) was completed and the improvements, as shown on **Figure 1**, received approval under the Ontario *Environmental Assessment (EA) Act*. The Ministry of Transportation, Ontario (MTO) subsequently designated the new corridor in 2003.

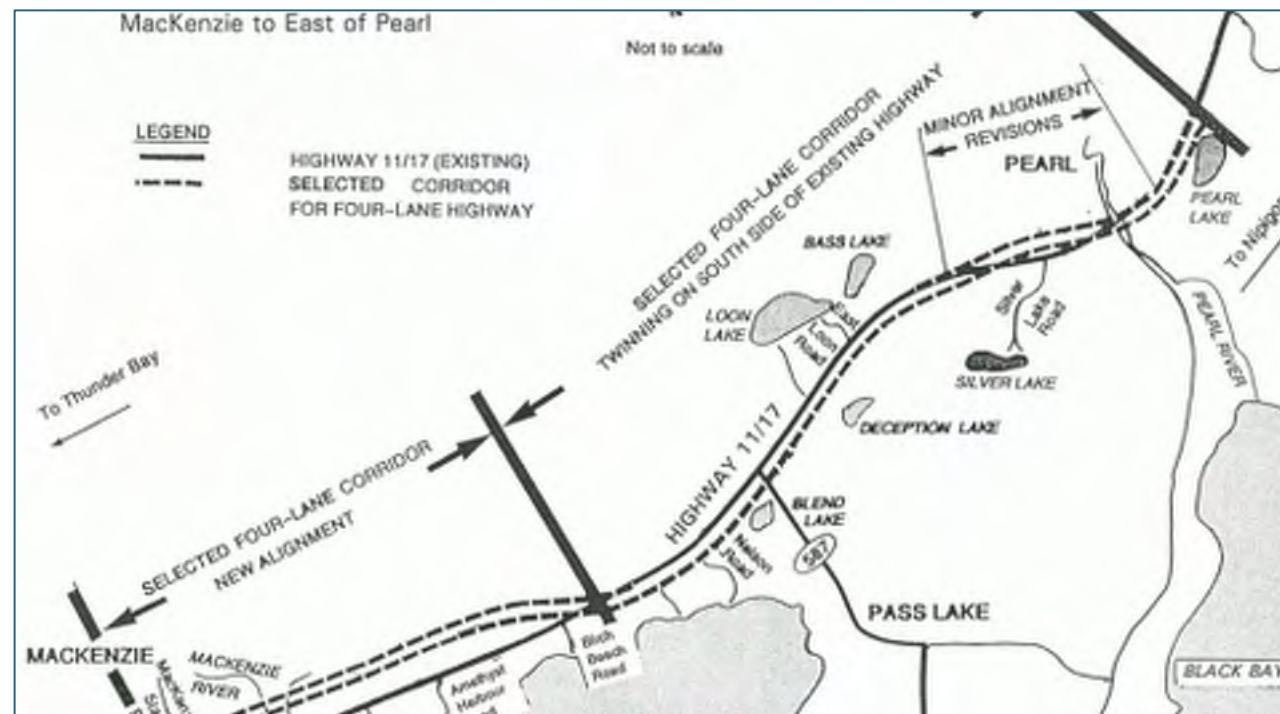


Figure 1: Highway 11/17 Alignment as Shown in Approved 1996 ESR

The 1996 improvements included a 90 m road right-of-way (ROW) on a new alignment location (located approximately 300 m north of the existing highway) from Mackenzie Station Road to just east of Birch Beach Road, and twinning Highway 11/17 to the south of the existing highway from Birch Beach Road to east of Pearl. Minor alignment revisions were identified in the vicinity of Silver Lake Road and Pearl Lake. Major design features of the four-lane highway included:

- Two driving lanes in each direction, resulting in a four-lane cross-section
- A minimum 30 m centre median which separates the opposing lanes of traffic (except in the vicinity of Pearl River where a 15 m median is used to reduce impact on potential fisheries resources)
- A minimum 90 m ROW (except at Pearl River where a 75 m ROW is provided)
- Public access to the highway at intersecting highways and side roads

- Private access at existing entrances or entrances provided for in previous property agreements, where feasible (right-in and right-out movements only)
- New entrances on the four-lane highway only as approved by the MTO.

1.1 Purpose of the Current Design Study

This project (GWP 128-90-00) is part of the overall planning, design and construction of Highway 11/17 four-laning between Thunder Bay and Nipigon. The Study Area is located within the Municipality of Shuniah from 0.3 km east of Highway 587, continuing easterly for 14.4 km (**Figure 2**).

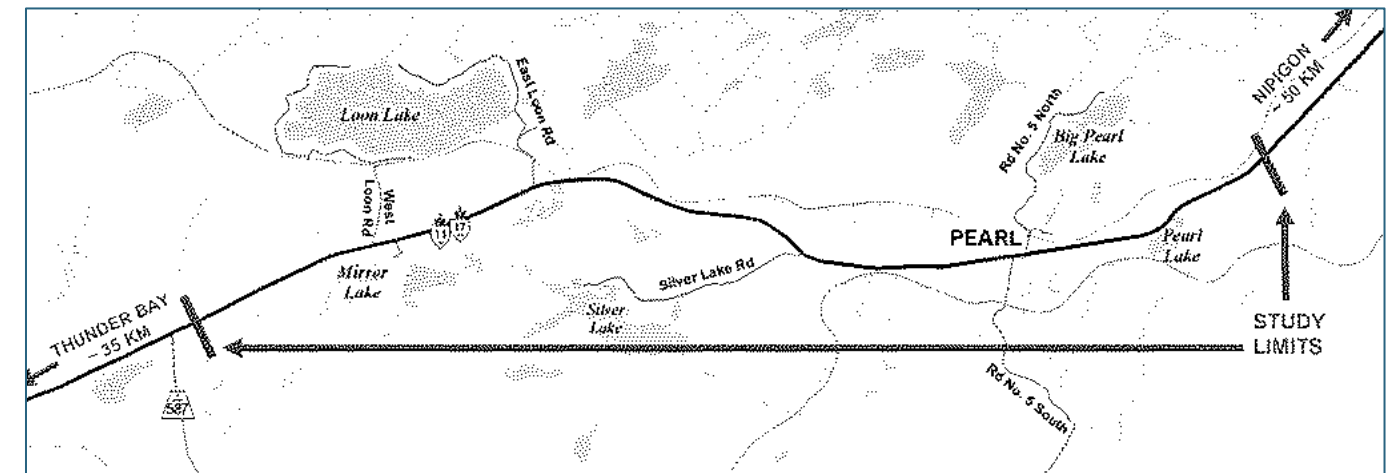


Figure 2: Study Area

The purpose of the current project is to review the 1996 approved plan (designated corridor), generate alternative road alignments for Highway 11/17 within the Study Area using current highway engineering standards, and select a preferred alternative which will be carried forward to Detail Design and construction. The work includes:

- Developing and evaluating alternative road alignments for Highway 11/17
- Updating existing conditions for the Study Area
- Selecting a preferred alignment and design concepts
- Property acquisitions
- Securing necessary environmental approvals for construction.

1.2 Purpose of the Environmental Study Report Addendum

This ESR Addendum documents the proposed changes to the approved 1996 ESR and follows the requirements of MTO’s Class Environmental Assessment (EA) for Provincial Transportation Facilities process. The review of this project identified the following changes that impact the original 1996 concept, commitments and mitigation of environmental impacts:

New Engineering Standards:

- Minimum ROW width increased from 90 m to 110 m to aid in flattening out highway slopes and increases the level of safety.

New Government Policies such as:

- MTO’s Class EA was approved under the *EA Act* in the fall of 1999 and amended in 2000
- MTO/DFO/MNRF Protocol for Protecting Fish and Fish Habitat on Provincial Transportation Undertakings, 2016
- Significant Wildlife Habitat Technical Guide, 2000 and Eco Region Criteria Schedules, 2015
- MTO Environmental Reference for Highway Design, 2013
- Ministry of Tourism, Culture and Sport Standards and Guidelines for Consultant Archaeologists, 2011
- Various Act and Regulations (e.g., provincial *Endangered Species Act, 2007 (ESA, 2007)*, enacted in 2008 and federal *Species at Risk Act, 2002*).

Changes resulting from review of 1996 Preferred Plan:

- Minor realignment of ROW between Highway 587 and East Loon Road to avoid impacts to the TransCanada Pipeline (TCPL)
- New alignment of Highway 11/17 south of the existing highway to run adjacent to the TCPL through the community of Pearl to allow for an improved crossing of Pearl River, avoids significant reconfiguration of the Road No. 5 South and Road No. 5 North intersections and removes private entrances from Highway 11/17 by utilizing an access road (the existing highway)
- Minor realignment of ROW north of Pearl Lake to avoid significant relocation of Hydro One Networks Inc. (HONI) towers and associated rock blasting.

This ESR Addendum documents the proposed changes, the public and agency consultation and input that went into the review and preliminary design of the preferred changes and to provide this information to the public for a final review.

1.3 Environmental Study Report Addendum Process

The current version of MTO’s *Class Environmental Assessment for Provincial Transportation Facilities* (Class EA) was approved under the *EA Act* in the fall of 1999 and amended in 2000. The MTO Class EA document defines a group of projects and activities and the EA processes that MTO has committed to follow for these projects. Provided that MTO Class EA process is followed and its requirements are met for a project, the requirements of the *EA Act* are fulfilled, so a separate approval under the *EA Act* is not required.

The 1996 approved plan followed the Class EA process for a Group B project and the 1996 ESR documented the process followed. Group B projects are major improvements to provincial transportation facilities and generally include:

- Improvements to existing highways and freeways providing a significant increase in capacity
- New interchanges or modifications to existing interchanges
- Major realignments
- New or modified water crossings or watercourse alterations
- New highway service facilities.

MTO’s Class EA requires that a Group B project be reviewed if construction has not commenced within five years, and a Design and Construction Report (DCR) has not been completed. A review or addendum to the ESR is also triggered if significant changes are made to the design of the project. Only the changes to the original study identified in an addendum report are eligible for a Part II Order request. The review and approval for an ESR addendum follows the same process used in the preparation of the ESR.

Figure 3 provides an illustration of the process followed for the Preliminary Design update and ESR Addendum process for this project.

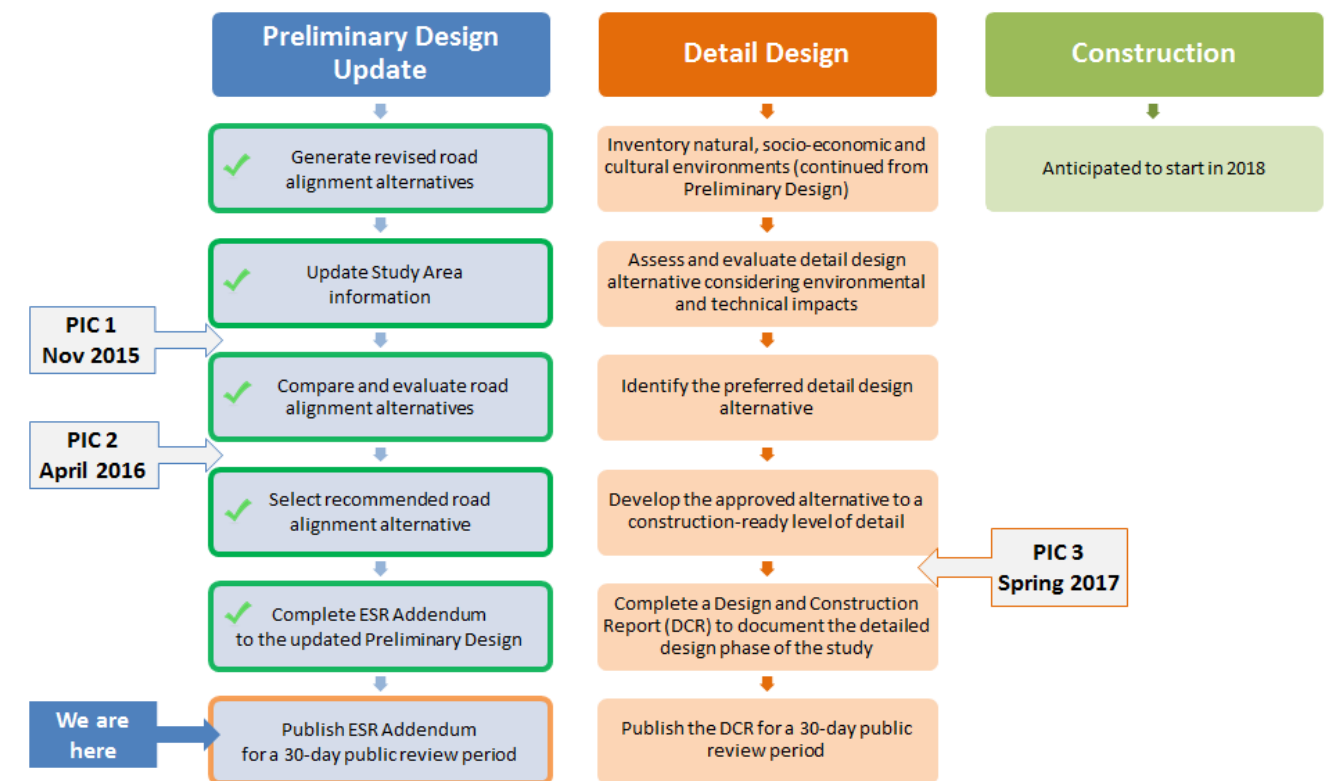


Figure 3: ESR Addendum Process leading to Detail Design and Construction

As required under the MTO Class EA, this ESR Addendum is made available to the public, other interested parties and external agencies for a 30-day review period. If there are no outstanding concerns and no requests for a Part II Order, the Addendum is deemed to have been approved under the *EA Act* and the proposed changes can be made to the approved project through the Detail Design process.

A Notice of ESR Addendum and the locations at which this report may be reviewed was provided to affected and interested parties via newspaper publications, direct notification letters to the project contact list and Canada Post admail (postal code POT 2M0), as well as having been posted on the project website (www.hwy11-17pearl.ca).

During the review period, parties are encouraged to bring their project concerns to the attention of MTO. If, after consulting with MTO's consultants and staff, serious unresolved concerns are unaddressed, a Part II Order request may be submitted to the Minister of the Environment and Climate Change (11th Floor Ferguson Block, 77 Wellesley Street West, Toronto, ON, M7A 2T5).

A copy of the Part II Order request should be sent to MTO and Dillon Consulting Limited (Dillon) at the following addresses:

Ministry of Transportation, Ontario
Attention: Roxanne Medendorp, P.Eng.
Area Manager Highway Engineering
615 James Street South
Thunder Bay, ON P7E 6P6

Dillon Consulting Limited
Attention: Brian Huston, P.Eng.
Project Manager
130 Dufferin Avenue, Suite 1400
London, ON N6A 5R2

2.0 Existing Conditions Update

This section of the ESR Addendum updates the existing conditions documented in the 1996 ESR. The section highlights changes to the environment since 1996 and summarizes field investigations completed as part of the current project. **Figure 4** illustrates some key features in the Study Area.

2.1 Related/Adjacent Studies

The following studies/projects that occurred after the 1996 ESR were considered by the project team in the development of the preferred plan:

- Previously completed construction contracts near the Study Area. The following contracts have occurred within the project limits since the completion of the original ESR:
 - GWP 175-99-00 (Highway 11/17 from Highway 587 to East Loon Road). Included repaving and vertical curve correction, installation of new culverts, extensions of existing culverts and regrading of roadside drainage ditches

- GWP 414-01-00 (Highway 11/17 from East Loon Road to Pearl Lake). Included repaving and widening (addition of turn lanes), installation of new culverts and regrading of roadside drainage ditches
- GWP 6004-08-00 (Highway 11/17 at Pearl Lake). Included pre-grading for future highway realignment under GWP 6170-04-00
- GWP 6170-04-00 (Highway 11/17 at Pearl Lake). Realignment of Highway 11/17 at Pearl Lake
- A current four-laning project under construction along Highway 11/17 near the Study Area, including Highway 587 (GWP 125-90-00)
- A future four-laning project expected to be completed at the east limits of this study, continuing east along Highway 11/17.

2.2 Cultural Resources

2.2.1 Archaeology

The 1996 ESR indicates that a pre-field study of Highway 11/17 from Thunder Bay to Nipigon was completed by Archaeological Services Inc. in March 1992. The report included an inventory of registered archaeological sites within the study corridor, as well as a summary of estimated archaeological site potential. No sites of significance were noted in the Study Area for this project. The 1996 ESR committed to completing an archaeological assessment during Detail Design.

As part of the 2016 existing conditions update, Northwest Archaeological Associates, Inc. Assessments completed a Stage 1 archaeological assessment of the Highway 11/17 corridor between Highway 587 and Pearl Lake in the spring of 2016. The Stage 1 archaeological assessment included a review of relevant landscape, historical and archaeological data for the Study Area and adjacent landscape. The assessment indicated that no registered archaeological sites are present within the Study Area. Three previous archaeological assessments in the area did not advance beyond Stage 1 and no archaeological resources were identified.

Based on the results of the recent Stage 1 archaeological assessment, portions of the Study Area are evaluated as holding archaeological potential. A Stage 2 archaeological assessment is recommended at undisturbed areas including areas throughout the Study Area.

The Stage 1 archaeological assessment has been provided to Ministry of Tourism, Culture and Sport (MTCS) for acceptance. The Stage 2 archaeological assessment will be completed during the Detail Design phase and the report will be provided to MTCS for acceptance.

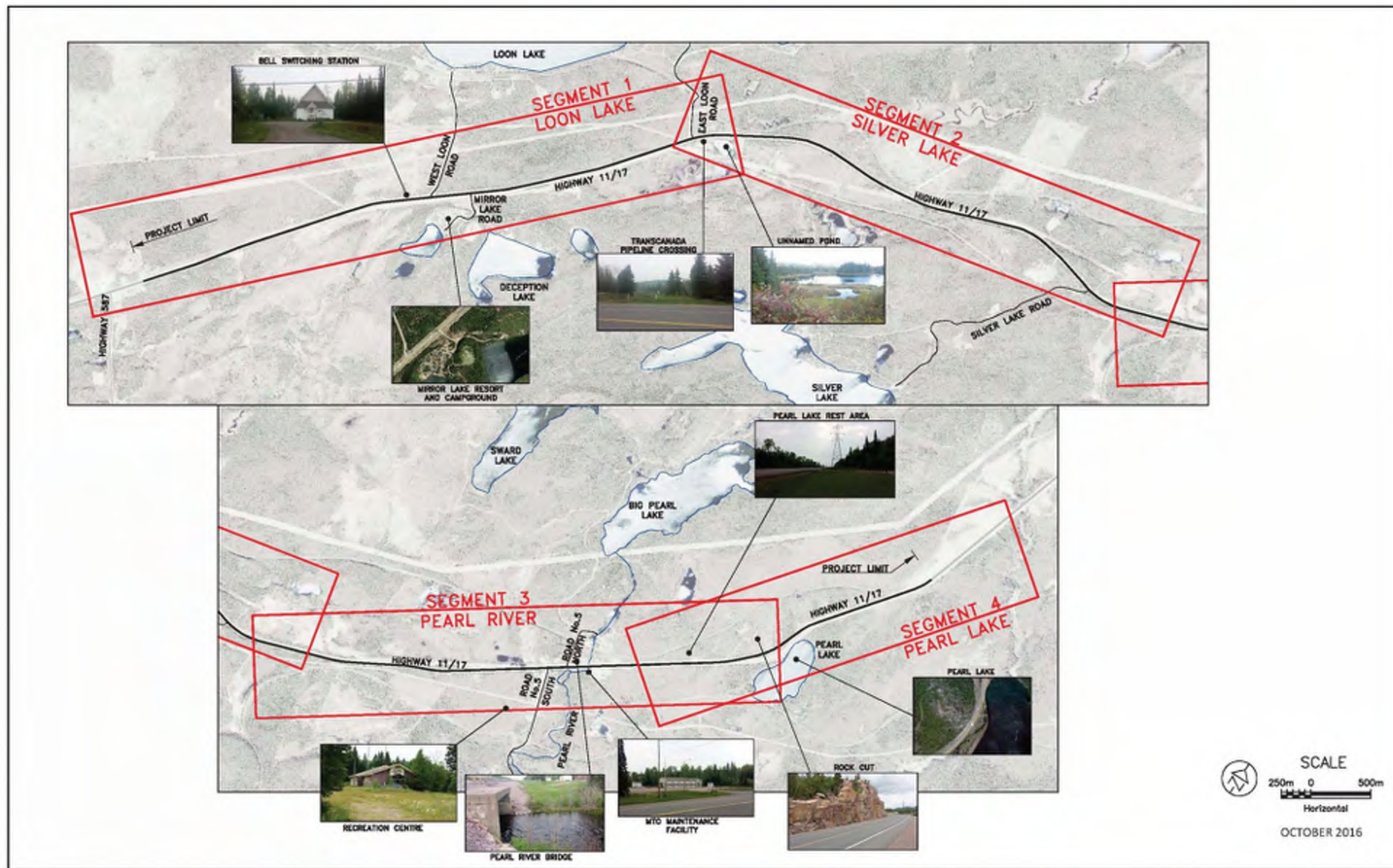


Figure 4: Key Features in Study Area

2.2.2 Built Heritage Resources and Cultural Heritage Landscapes

The 1996 ESR did not review built heritage resources or cultural landscapes as part of existing conditions. The MTCS now requires a checklist “Screening for Impacts to Built Heritage and Cultural Heritage Landscapes” be completed to help determine whether the EA project has the potential to impact cultural heritage resources. The screening checklist has been completed for this project. There is no built heritage or cultural heritage landscape features in the Study Area; therefore, a heritage impact assessment was not completed.

2.3 Terrestrial Environment

2.3.1 Existing Conditions Comparison between 1996 and 2016

The 1996 ESR addressed existing conditions for Wildlife, Vegetation and Environmentally Sensitive Areas (ESAs)/Areas of Natural and Scientific Interest (ANSIs) in the Study Area. A Terrestrial Ecosystem Assessment Report (TEAR) (under separate cover) was completed in August 2016 and provides a review of existing terrestrial features and the potential environmental impacts of the project following the requirements of MTO’s *Environmental Reference for Highway Design* (ERD; MTO, 2013). **Table 1** provides a comparison between the 1996 ESR and 2016 existing conditions assessment of Wildlife, Vegetation and ESAs/ANSIs in the Study Area.

Table 1: Comparison between 1996 and 2016 Terrestrial Existing Conditions

Factor	1996 ESR Existing Conditions	2016 Existing Conditions
Wildlife	Study Area was classified in the Ontario Land Inventory with slight to moderately severe limitations to produce wildlife. These limitations are a result of poor nutrient and moisture conditions in the soil, limiting the growth of vegetation suitable for food and cover. The class system ranks Class 1 as excellent and Class 7 as poor. The 1996 ESR indicated the area is rated as Class 3 for moose production and Class 4 and 5 for deer production. Correspondence with the Ministry of Natural Resources and Forestry (MNRF) indicated there were local concentrations of deer east of Pass Lake.	<p>The potential for Significant Wildlife Habitat (SWH) was based on the vegetation communities identified in the Study Area and signs of wildlife use. SWH within the Study Area includes:</p> <ul style="list-style-type: none"> • Habitat for Special Concern and Rare Wildlife Species • Amphibian Breeding Habitat (Woodland) (meadow marsh communities in proximity to woodlands) • Amphibian Breeding Habitat (Wetland) (wetlands and vernal pools) • Turtle Wintering Area • Reptile Hibernacula. <p>These potential wildlife habitats are principally associated with the forests and forest edges, waterbodies (e.g., watercourses, Pearl Lake, Mirror Lake, Deception Lake and Loon Lake) and wetlands.</p>

Factor	1996 ESR Existing Conditions	2016 Existing Conditions
		<p>Two Rare Vegetation Communities (Hardwood Swamp and Talus Slopes) were observed in proximity to the preferred alignment during field studies.</p> <p>2014 MNRF Moose Population Guidelines indicate a notable decrease in moose populations from surveys completed in 2011.</p>
Vegetation	Dominant trees in the forests along the existing highway corridor included White Birch, Poplar, Balsam Poplar, Black Spruce, White Cedar and White Spruce.	Seventy-one flora species were identified within the Study Area, including those listed in the 1996 ESR. There are no significant woodlands in the Study Area. Fourteen percent of species identified within the Study Area are either non-native or exotic species. None of the identified flora species are listed as SAR or considered to be provincially rare.
ESAs and ANSIs	<p>No Environmentally Sensitive Areas (ESAs) in the Study Area.</p> <p>Through secondary source information, the Loon Lake Earth Science Area of Natural and Scientific Interest (ANSI) was identified within the Study Area north of and adjacent to Highway 11/17 and east of West Loon Road. This area is a significant geological site due to rock outcrops with two elements of Gunflint Formation. The preferred alternative crosses the ANSI with the realigned West Loon Road, opposite Mirror Road. The MNRF expressed concerns regarding construction in this area. The 1996 ESR indicated impact to the ANSI will be confirmed during Detail Design and minimized during construction.</p>	MNRF was consulted with respect to the potential encroachment into the ANSI in late 2015 and in 2016. MNRF indicated that specific mitigation was not required to undertake the proposed activity; however, an alignment that minimizes encroachment and is limited to the edge of the ANSI is preferred. The MNRF also requested that layers of the ANSI be left exposed after any planned rock cut, and if possible, rock samples of the geological feature be preserved for educational purposes.

The following sections provide a summary of the 2016 existing terrestrial environment conditions in the Study Area that were not discussed in the 1996 ESR.

2.3.2 Wildlife Collisions

Collision data from 2008 to 2012 within the Study Area was provided by MTO and revealed 32 wildlife/vehicle collisions over the 5 year period. During Detail Design, wildlife-collision prone areas requiring improvements to drainage, flattening of slopes, in-filling of salt pools, removal of roadside vegetation/forest cover and appropriate signage will be identified.

2.3.3 Species at Risk and Species of Conservation Concern

The 1996 ESR did not address Species at Risk (SAR) or Species of Conservation Concern (SCC). Since 1996, the provincial *ESA, 2007* and the federal *Species at Risk Act, 2002* were introduced to protect species and associated habitats that could be present in the Study Area.

Seven SAR listed as Threatened or Endangered under the Ontario *ESA, 2007* have the potential to occur in the vicinity of the Study Area based on historical occurrence records. Sixteen SCC were identified as potentially occurring within the Study Area.

MNRF requested that targeted Eastern Whip-poor-will (SAR) surveys be completed within the Study Area. Dillon consulted with the MNRF regarding the survey locations and extent of potential habitat to be assessed. Whip-poor-will night-time point count surveys were completed by TBT Engineering Consulting Group on May 2, 2016, May 29, 2016 and June 17, 2016, during appropriate weather conditions. A total of 36 sampling points in the Study Area were selected for the survey. No Whip-poor-wills were observed during the field assessment.

No plant or wildlife SAR or SCC were observed during field studies. Two Rare Vegetation Communities (Hardwood Swamp and Talus Slopes) were observed during field studies and may be impacted due to proximity to the preferred alignment of the four-laning project.

2.4 Aquatic Environment

2.4.1 1996 Existing Conditions

The 1996 ESR referenced a *Fisheries Habitat Assessment, Pearl River Preliminary Design Study, MacKenzie to Pearl*, March 14, 1995 report that reviewed fish habitat and spawning at Pearl River. The 1996 approved alignment included an extension of the existing concrete box culvert at Pearl River, the construction of a wall adjacent to the stream and rechannelization of a 160 m braided section of Pearl River. The report concluded no Brook Trout were observed to spawn within either the braided channels or further downstream of the area identified as “potential Brook Trout spawning habitat”, although suitable substrate for spawning was identified. The Pearl River within the Study Area was considered to be Type 2 habitat (important to fish but does not limit overall productive capacity).

2.4.2 2016 Existing Conditions

The Fish and Fish Habitat Existing Conditions Report (August 2016) (under separate cover) was prepared in accordance with the *Environmental Reference for Highway Design (ERD, 2013)* and the *MTO Environmental Guide for Fish and Fish Habitat (Fish Guide, 2009)*. The fisheries assessment was undertaken to determine the existing aquatic physical and biological characteristics within the Study Area and document the results of an updated background information review including a detailed habitat assessment and fish community data collection, where necessary.

During field investigations, a total of six watercourse crossings were identified within the project limits with potential to sustain or contribute to a fishery. As shown on **Figure 5**, the following crossings are located along Highway 11/17 from west to east:

- Tributary to Blende River
- Tributary to Pearl River 1
- Unnamed Lake 1 on upstream side of Tributary to Pearl River 1
- Tributary to Pearl River 2
- Pearl River
- Pearl Lake.

Background data collected from previous reports and Department of Fisheries and Oceans (DFO) SAR distribution mapping demonstrates that the fish communities within the waterbodies consisted predominantly of cold and cool water species. In addition to baitfish, top predator species (e.g., Brook Trout, Rainbow Trout and Smallmouth Bass) are present within the Study Area. The results of the fish and fish habitat assessment at the six crossings, including specific details pertaining to the existing conditions within the Study Area, are provided in **Table 2**.

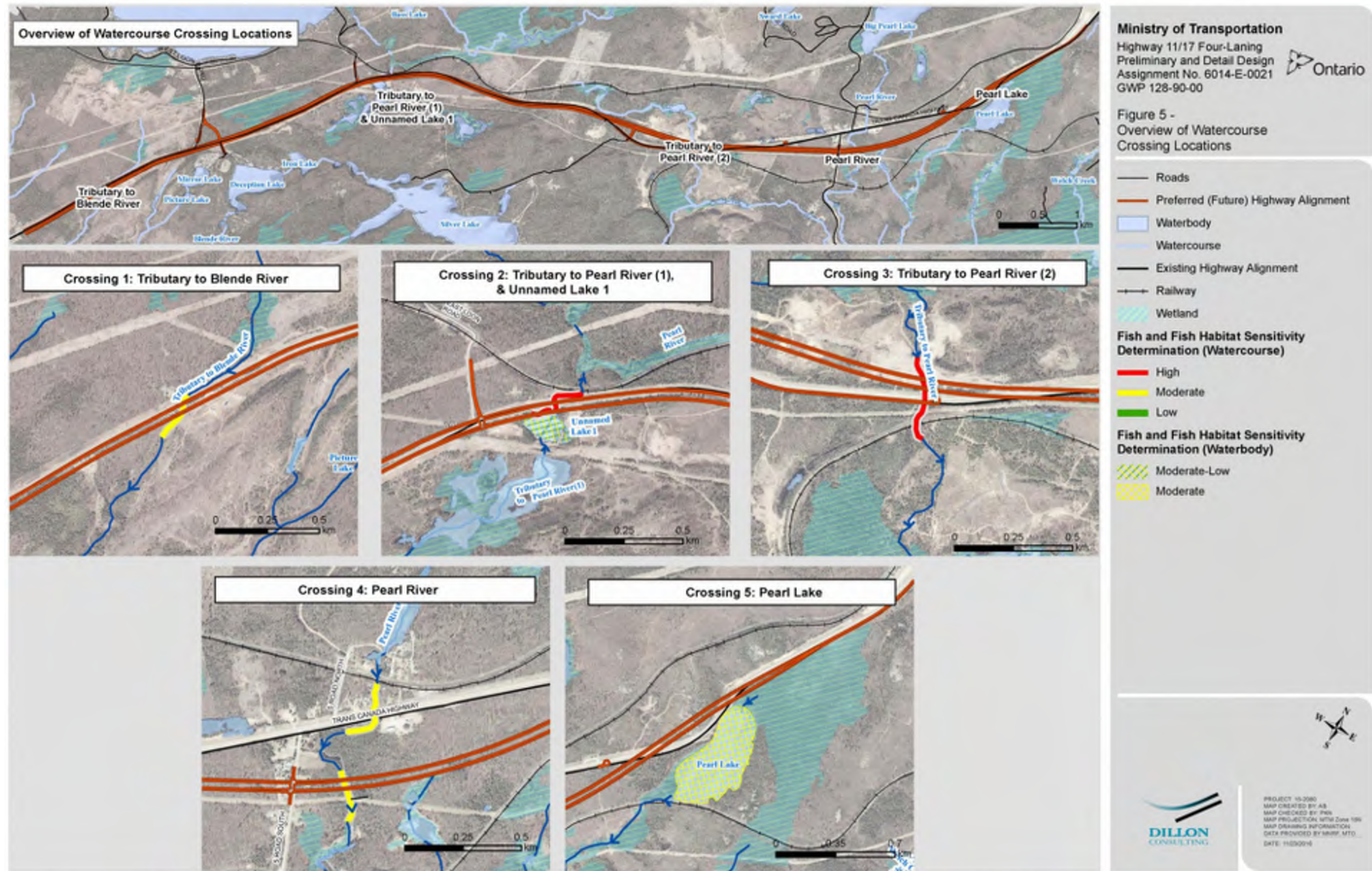


Figure 5: Overview of Watercourse Crossing Locations

Table 2: Existing Fish and Fish Habitat Conditions Summary

Waterbody	Flow (Permanent, Intermittent or Ephemeral)	Thermal Regime (Warm, Cool, Cold)	Substrate Type	Vegetation (Riparian, In-Stream)	Supports a Fishery (directly, indirectly or none)	Fish Species Present
Tributary to Blende River	Permanent	Cold	Detritus, gravel, sand, boulder, cobble, silt	<u>Riparian</u> : Mixed forest with shrub thicket along banks downstream, grasses and sedges in highway ROW <u>In-stream</u> : Terrestrial grasses, horsetail (<i>Equisetum</i> sp.)	Indirect	Rainbow Trout (through MNR consultation only)
Tributary to Pearl River 1	Permanent	Cold	Sand, detritus, silt, gravel	<u>Riparian</u> : Mixed forest, grasses and sedges in highway ROW <u>In-stream</u> : Cattails (<i>Typha</i> sp.), horsetail, sedges (<i>Carex</i> spp.)	Direct	Brook Trout (downstream of the highway only), Brook Stickleback, Fathead Minnow and Northern Redbelly Dace
Unnamed Lake 1	Permanent	Cool (based on temperature readings from the pond)	Silt and detritus	Cattails, pondweed (<i>Potamogeton</i> spp.), Yellow Pond Lily (<i>Nuphar</i> sp.)	Direct	Brook Stickleback, Fathead Minnow and Northern Redbelly Dace
Tributary to Pearl River 2	Permanent	Cold	Gravel, cobble, sand, detritus, silt	<u>Riparian</u> : Mixed forest <u>In-stream</u> : Terrestrial grasses	Direct	Silver Lamprey and Northern Brook Lamprey on DFO SAR mapping
Pearl River	Permanent	Cold	Cobble, boulder, gravel, sand, detritus	<u>Riparian</u> : Mixed forest, grasses in highway ROW <u>In-stream</u> : Terrestrial grasses; further downstream: sedge, Iris (<i>Iris versicolor</i>), Arrowhead (<i>Sagittaria</i> sp.)	Direct	Brook Trout, Brook Stickleback, Northern Redbelly Dace, Central Mudminnow, Longnose Dace, White Sucker, Unknown shiner spp.
Pearl Lake	Permanent	Cool	Detritus	<u>Riparian</u> : Mixed forest <u>In-stream</u> : Aquatic grass, pondweed, cattails	Direct	Smallmouth Bass, Brook Stickleback, Fathead Minnow, Bluntnose Minnow, Northern Redbelly Dace, Central Mudminnow

2.4.3 Fish and Fish Habitat Sensitivity

Each watercourse crossing was reviewed for sensitivity of fish and fish habitat using MTO Fish Guide (MTO, 2009) sensitivity ranking criteria, as follows:

- Tributary to Blende River – moderate
- Tributary to Pearl River 1 – high
- Unnamed Lake 1 on the upstream side of Tributary to Pearl River 1 – moderate-low
- Tributary to Pearl River 2 – high
- Pearl River – moderate
- Pearl Lake – moderate.

2.5 Social Environment

2.5.1 Existing Land Use

The existing land uses in the Study Area have not changed significantly since the 1996 ESR was completed. The 1996 ESR indicated that the four-laning of Highway 11/17 has the potential to have a positive effect on land use in the Study Area as it will improve the movement of goods and people throughout the area, as well as increasing safety and access to the area.

Residential land use in the Study Area generally consists of seasonal and permanent residences located along Highway 11/17, with a concentration in the community of Pearl at Road No. 5. Cottage developments are located around Loon Lake, Deception Lake and Bass Lake. Some tourism-related uses are in the vicinity of the Study Area, including amethyst mines located to the north.

There are no commercial uses within the Study Area. A small highway commercial area is located north and south of Highway 11/17, adjacent to the western Study Area limits at Highway 587, including a restaurant and gas bar. Recreational land uses are limited to the Mirror Lake Campground, located within the Study Area, south of Highway 11/17 at West Loon Road. An MTO Maintenance Patrol Yard is located in the Study Area, east of Road No. 5, near the Pearl River. A picnic/rest area is located west of Pearl Lake on the north side of Highway 11/17.

The Municipality of Shuniah Official Plan policies for future land use and transportation are generally consistent with the 1996 ESR. According to 2016 correspondence with the Municipality of Shuniah, there are no current land development applications for residential, recreational or commercial uses within the Study Area.

2.5.2 Provincial Policy Statement

Since 1996, changes to Section 3 of the *Planning Act, R.S.O. 1990, Chapter P.13* require that any decision made by the Crown “shall be consistent with” the Provincial Policy Statement, 2014 (PPS). The consistency of the proposed improvements (defined as “infrastructure” in the PPS) with the relevant Transportation Systems and Transportation and Infrastructure Corridors policies included in Sections 1.6.7 and 1.6.8 of the PPS is summarized as follows:

- The proposed improvements are safe, energy efficient, facilitate(s) the movement of people and goods, and are appropriate to address projected needs. The need for the four-laning of Highway 11/17 is to facilitate the movement of goods and people to meet current and projected needs
- The project makes efficient use of existing and planned infrastructure
- As required by Section 1.6.7.3 of the PPS, the project maintains “connectivity within and among transportation systems and modes”
- MTO’s Class EA planning and design process has integrated transportation and land use planning considerations at all stages of the project
- As required by Section 1.6.8.1 of the PPS, MTO is planning for and protecting the corridor and ROW for transportation facilities to meet current and projected needs.

Section 1.6.8.5 of the PPS requires that MTO, when planning for significant transportation facilities, consider the significant resources protected by Section 2 of the PPS, Wise Use and Management of Resources. No significant resources will be impacted by the project.

2.5.3 Navigation

The Pearl River culvert is included in MTO’s letter to Transport Canada for the “opt out” of the *Works Regime for Structures* under the *Navigation Protection Act (NPA)* (dated April 16, 2015). In addition, Pearl River is not a scheduled waterway under the NPA. Consequently, Transport Canada approval of the works under the Act is not required with the understanding that the public right to navigation be preserved.

2.5.4 Noise Assessment

The 1996 ESR concluded that an estimated ten residences will experience a minimum increase in noise levels of about 3 dBA, and is lower than the MTO standard of 5 dBA increase in noise level, and does not warrant mitigation. Concerns were received by MTO regarding the potential for an increase in noise at a property owner’s home. In response to this concern, MTO carried out a preliminary noise analysis adjacent to the property. The analysis determined that noise generated from the future four-lane highway will be essentially the same as existing ambient levels at this location. The 1996 ESR concluded that a future noise assessment study could be carried out in specific areas if deemed necessary during Detail Design.

The *Environmental Reference for Highway Design (ERHD, 2013)* and the methodologies described in MTO’s *Environmental Guide for Noise* (June 2009) [the Guide] were used to assess potential noise impacts in the

Study Area resulting from highway improvements. The objective of the Traffic Noise Study (2016) was to determine and compare present and future noise levels at Noise Sensitive Areas (NSAs) through traffic noise prediction modelling and to determine if new mitigation measures are required.

Traffic noise impacts of the proposed alignment options were assessed through a comparison of projected 2030 traffic volumes (ten years after construction) to 2016 existing traffic volumes. The existing 2016 Average Daily Traffic (ADT) volume is 3,500 vehicles and is projected to be approximately 4,000 vehicles by 2030. A commercial vehicle percentage of 28.7% was assumed and is expected to remain consistent after construction. The posted vehicular speed limit of 90 km per hour and a maximum road gradient of 3% throughout the project area were used in the model. Twenty-two receptors within noise sensitive areas were identified within 600 m¹ of the closest edge of pavement before and after the four-laning project.

Where increases in noise levels are predicted, the Guide stipulates mitigation efforts are required to be applied for the predicted “change in noise level above the ambient/projected noise levels with the proposed improvements” as follows in **Table 3**.

Table 3: MTO Noise Mitigation Guide

Change in Noise Level Above Ambient/Project Noise Levels with Proposed Improvements	Mitigation Effort Required
<5 dBA change and <65 dBA	<ul style="list-style-type: none"> • None
≥ 5 dBA change OR ≥ 65 dBA	<ul style="list-style-type: none"> • Investigate noise control measures on ROW • Introduce noise control measures within ROW and mitigate to ambient if technically, economically and administratively feasible • Noise control measures, where introduced, should achieve a minimum of 5 dBA attenuation, over first row receivers

The findings of the 2016 noise assessment concluded that the implementation of the preferred Preliminary Design will not result in a significant (equal or greater than 5 dBA) *change in noise level* at nearby receptors and mitigation is not warranted. Sound levels greater than 65 dBA are predicted at two homes by 2030. However, one home will be purchased due to the proposed location of the highway alignment. Mitigation, if applicable, will be considered during detail design.

¹ The STAMSON noise model has a maximum source to receptor distance of 500 m. For receptors located between 500 m and 600 m from the edge of pavement, source to receptor distance was conservatively assumed to be 500 m.

2.5.5 Source Water Protection and Groundwater Wells

The 1996 ESR included a hydrogeological assessment in the vicinity of the proposed Pearl River channel relocation, in the community of Pearl. The assessment focused on identifying the potential for and the occurrence of upwelling conditions within the Pearl River and the potential impact of the highway twinning on groundwater quality. The report indicates that the anticipated groundwater flow rate is expected to be small in Pearl River and groundwater samples met Ontario Drinking Water Guidelines with the exception of aluminum and manganese. The report concluded that minimal impact is expected on groundwater throughout the remainder of the Study Area.

The 1996 ESR indicates that there is limited aquifer potential in the Thunder Bay region as a result of the underlying bedrock and its proximity to the surface; the depth to groundwater varies throughout the Study Area from less than 10 m to 40 m. Groundwater is the main source of drinking water in the Study Area.

In 2014, the province established source protection areas and developed source water protection plans to protect drinking water. The Study Area is located in a vulnerable area within the Lakehead Source Protection Area. Vulnerable areas are related to a water supply source that is susceptible to contamination and for which it is desirable to regulate or monitor drinking water threats that may affect the water supply source. Vulnerable areas include (a) significant groundwater recharge areas, (b) highly vulnerable aquifers, (c) surface water intake protection zones, and (d) wellhead protection areas. According to the Ministry of Environment and Climate Change (MOECC) well data, there are 24 drilled groundwater wells in the Study Area, greater than 50 m in depth.

Although groundwater impacts are not anticipated, it will be determined if a groundwater assessment will be conducted during Detail Design. An assessment would evaluate groundwater conditions in the area and the potential impacts of the project on local wells and streams. An assessment would also provide design recommendations, mitigation measures and monitoring measures as required.

2.5.6 Waste Management

The 1996 ESR indicates that the McTavish Landfill site located south of Highway 11/17 at Silver Lake Road will receive access from a realigned entrance to the existing highway. The report indicates that the approved 1996 PDR alignment does not impact the operation of the site and access to the new four-lane highway, in all directions, will be provided via a new municipal road connection opposite Silver Lake Road. An environmental audit of the area of property required for the new four-lane highway was recommended.

The preferred Preliminary Design is similar to the approved 1996 PDR alignment through the landfill site area. Based on a review of the *2015 Water Quality Assessment* report (True Grit Consulting Ltd., March 2016) obtained for the site, the existing ROW is within the Contamination Attenuation Zone (CAZ) of the landfill site. One groundwater monitoring well is located north of the existing ROW (MW6) and one groundwater monitoring well is located south of the existing ROW (MW8D). As part of Detail Design, the

impact on the landfill monitoring wells will be assessed and some changes to the well locations may be required. This will be coordinated through MTO, MOECC and the Township of Shuniah.

3.0 Evaluation of Preliminary Design Alternatives

3.1 Introduction

Preliminary Design alternatives (alternative highway alignments) were developed for the four-laning of Highway 11/17, building on the preferred alternative identified in the 1996 PDR and using current highway engineering standards (e.g., 110 m ROW). The alternative highway alignments were developed at a preliminary design level of detail to provide an optimal, cost effective design while minimizing potential environmental impacts.

The project was divided into four segments, as shown in **Figure 6**, with separate alternative routes (or options) for each segment. The approximate limits within the segments are:

- Segment 1 – Loon Lake: Westerly limits of work to East Loon Road
- Segment 2 – Silver Lake: East Loon Road to Silver Lake Road
- Segment 3 – Pearl River: Silver Lake Road to picnic area near Pearl Lake
- Segment 4 – Pearl Lake: Picnic area near Pearl Lake to easterly limits of work.



Figure 6: Highway 11/17 Segment Locations

The alternative highway alignments were subjected to a two-step analysis and evaluation process, leading to the identification of the preferred alignment in each segment. The following sections provide a summary of the alignment options, the results of the evaluation and the preferred option by segment. An overview of the evaluation process, list of evaluation factors and criteria and the full comparative evaluation table with scoring by segment is provided in **Appendix A**.

3.2 Segment 1 – Loon Lake

3.2.1 Preliminary Alignment Options

Six options were developed for Segment 1 (**Figure 7**) and presented at the Public Information Centres (PIC) held for the project:

- **Option 1** – This option is the approved alternative from the 1996 ESR. The majority of the existing highway would be reused to become the westbound lanes. The highway would be twinned to the south, with the eastbound lanes on a new embankment
- **Option 2** – The existing highway platform would be reused in most areas for the eastbound lanes and be twinned to north
- **Option 3** – Both eastbound and westbound lanes would be realigned to the north of the existing highway
- **Option 4** – The existing highway would be mostly reused to become the eastbound lanes and the westbound lanes would be constructed to the north, similar to Option 2
- **Option 5** – This option realigns both eastbound and westbound lanes north of the existing highway, but further north than Option 3
- **Option 6** – The existing highway would be mostly reused to become the westbound lanes. The eastbound lanes would be constructed to the south, providing enough space to maintain the HONI towers within the median.

Option 2-1 was developed following PIC #1 to avoid impacts to the Bell Switching Station and replaces Option 2. In Option 2-1, the existing highway would be reused to become the westbound lanes with the eastbound lanes twinned to the south from the west project limits to West Loon Road. From West Loon Road to East Loon Road the existing highway would be reused to become the eastbound lanes and the westbound lanes would be twinned to the north.

3.2.2 Evaluation and Preferred Option

Along with the evaluation criteria described in **Appendix A**, the following factors were considered specific to Segment 1:

- Reusing/maintaining existing infrastructure as much as possible
- Enhancing the ANSI features. Consultation with MNR indicated a preference to preserve the existing exposed face of the rock formation located immediately north of the existing highway and/or to expose a flatter/larger rock face
- Limiting relocation of and impacts to HONI transmission towers
- Limiting property fragmentation

- Avoiding impacts to the Bell Switching Station. Consultation with Bell indicated the station services a large area and relocation would result in significant impacts. If relocation is required, the station would need to be moved onto an adjacent piece of land, which could cause project delays related to land acquisition or expropriation
- Limiting impacts to the existing TCPL highway crossing. All options result in a new crossing of the TCPL transmission main. The design profile avoids an earth or rock cut at the pipeline approach to limit impacts to the crossing.

Appendix A provides the comparative evaluation table and scoring of the six options for Segment 1. Option 2-1 is the preferred option in Segment 1. Option 2-1 avoids impacts to the Bell Switching Station and reuses a large portion of the existing highway platform in most areas for the eastbound lanes.

3.3 Segment 2 – Silver Lake

3.3.1 Preliminary Alignment Options

Three options were developed for Segment 2 (**Figure 8**) and presented at the PICs held for the project:

- **Option 1** – This option is the approved alternative from the 1996 ESR. The existing highway would be mostly reused to become the westbound lanes, and the eastbound lanes would be twinned to the south. The median width varies in the area of the existing HONI crossing to reduce the number of conflicts
- **Option 2** – The existing highway would be mostly reused to become the westbound lanes. The new eastbound lanes would be constructed south of the existing HONI transmission lines, tying into the southerly alternative in Segment 1 – Option 6
- **Option 3** – This option is a variation of Option 1 to reduce utility conflicts in the area of the existing HONI crossing. The existing highway would be mostly reused to become the westbound lanes, and the eastbound lanes would be constructed to the south with a varying median width.

Option 4 was developed following PIC #1 to eliminate the relocation required to the HONI A6P high voltage line and provides a uniform median width and improved horizontal geometry compared to the other three options.

3.3.2 Evaluation and Preferred Option

Along with the evaluation criteria described in **Appendix A**, the following factors were considered specific to Segment 2:

- Reusing/maintaining existing infrastructure as much as possible.

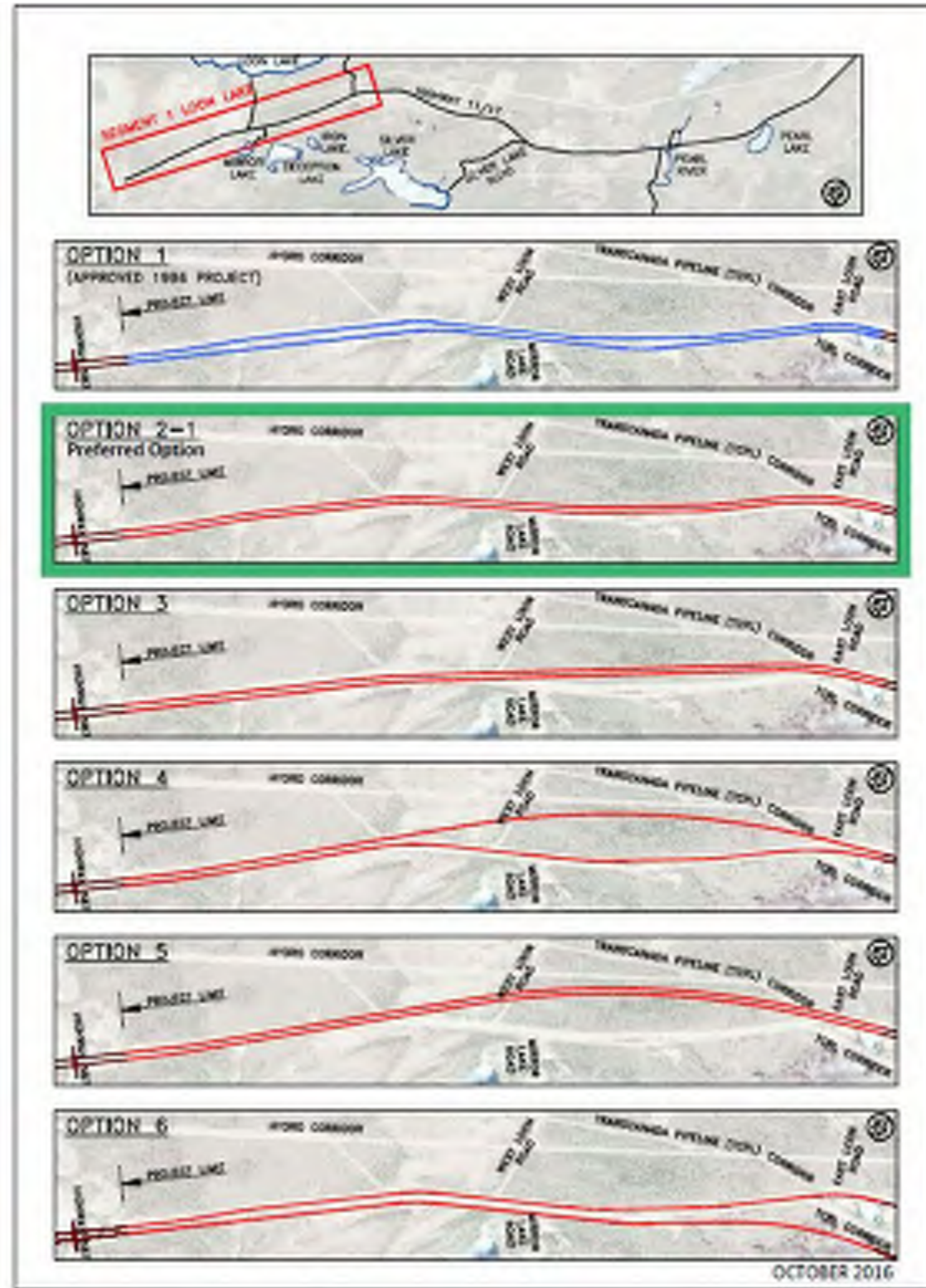


Figure 7: Segment 1 – Option Overview

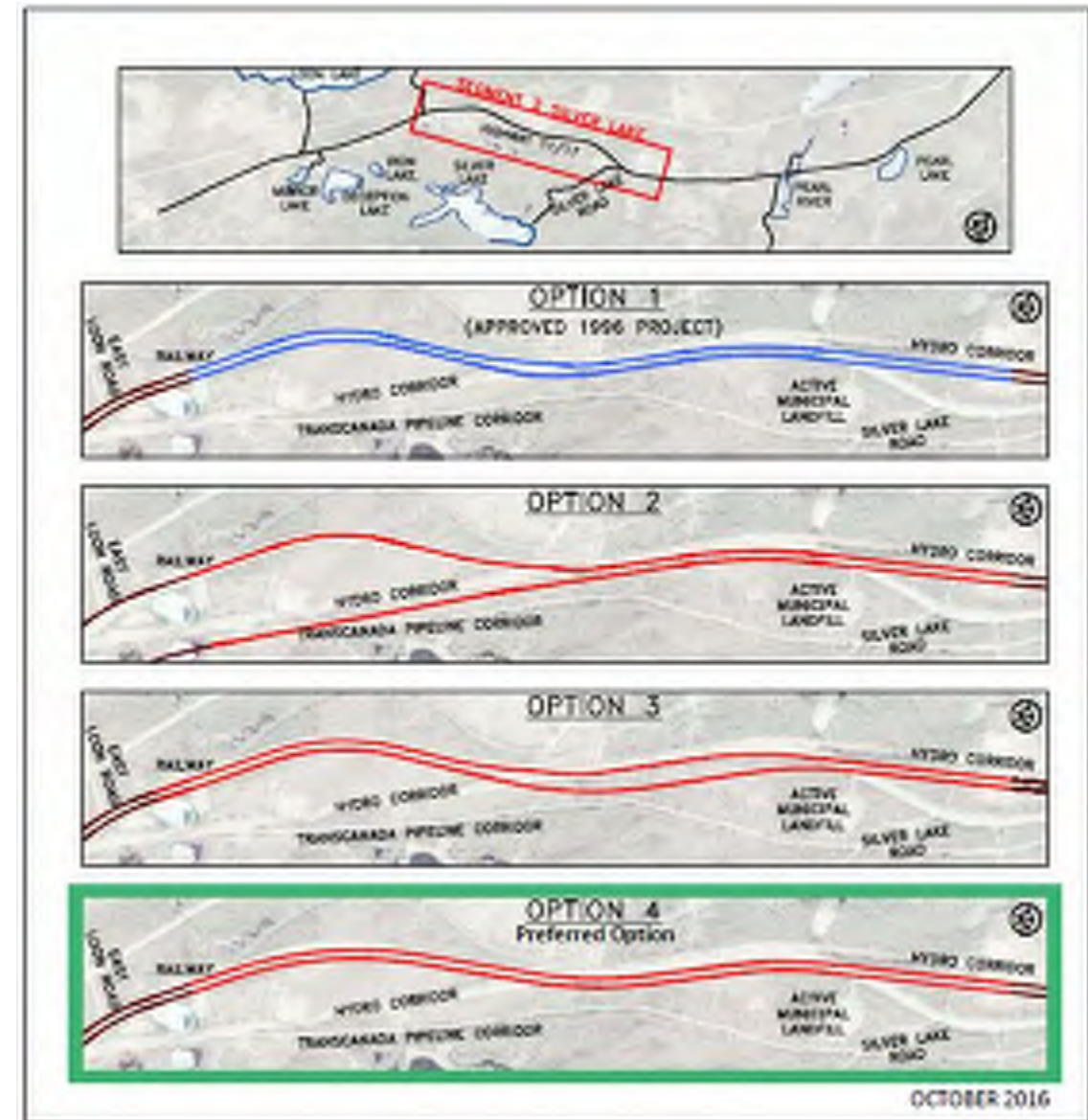


Figure 8: Segment 2 – Option Overview

- Minimizing impacts to the McTavish Landfill site in vicinity of Silver Lake Road, on the south side of Highway 11/17
- Limiting relocations of and impacts to HONI transmission towers
- Limiting impacts to the TCPL.

Appendix A provides the comparative evaluation table and scoring of the four options for Segment 2. Option 4 is the preferred option in Segment 2.

All alternatives in Segment 2 will require the relocation of some HONI towers. Option 4 provides the best opportunity for avoiding significant relocations of both steel and wooden towers.

3.4 Segment 3 – Pearl River

3.4.1 Preliminary Alignment Options

Three options were developed for Segment 3 (**Figure 9**) and presented at the PICs held for the project:

- **Option 1** – This option is the approved alternative from the 1996 ESR. The existing highway would be mostly reused to become the westbound lanes, and the eastbound lanes would be twinned to the south. There are three variations of this option with varying median widths to reduce impacts through the community of Pearl and to the braided segment of the Pearl River
- **Option 2** – This option realigns both the eastbound and westbound lanes south of the existing highway
- **Option 3** – The existing highway would be mostly reused to become the westbound lanes, and the eastbound lanes would be realigned independently to the south.

3.4.2 Evaluation and Preferred Option

Along with the evaluation criteria described in **Appendix A**, the following factors were considered specific to Segment 3:

- Reusing/maintaining existing infrastructure as much as possible to minimize construction costs
- Minimizing impacts to existing homes (and proximity)
- Reducing the number of entrances onto Highway 11/17
- Minimizing impacts to the Pearl River
- Limiting impacts to the TCPL.

Appendix A provides the comparative evaluation table and scoring of the three options for Segment 3. Option 2 is the preferred option in Segment 3. Option 2 avoids impacts to the braided channel of the Pearl River without compromising the median width, and removes numerous highway access points.

3.5 Segment 4 – Pearl Lake

3.5.1 Preliminary Alignment Options

Three options were developed for Segment 4 (**Figure 10**) and presented at the PICs held for the project:

- **Option 1** – This option is the approved alternative from the 1996 ESR. Portions of the existing highway would be reused to become the westbound lanes with improvements to the horizontal curves in the area of Pearl Lake
- **Option 2** – Both the eastbound and westbound lanes would be relocated north of the existing highway
- **Option 3** – Similar to Option 1, portions of the existing highway would be used to become the new westbound lanes for this alternative. The horizontal curves would be flatter, requiring a further shift to the north.

3.5.2 Evaluation and Preferred Option

Along with the evaluation criteria described in **Appendix A**, the following factors were considered specific to Segment 4:

- Reusing/maintaining existing infrastructure as much as possible to minimize construction costs
- Reducing impacts to Pearl Lake
- Limiting relocations of and impacts to HONI towers.

Appendix A provides the comparative evaluation table and scoring of the three options for Segment 4. Option 3 is the preferred option in Segment 4. Option 3 twins the existing highway to the north and utilizes the existing running lines of the HONI towers near Pearl Lake to avoid significant relocations and additional rock blasting due to a relocated HONI line at the rocky outcrop.

3.6 Summary of Preferred Preliminary Design

In summary, the preferred Preliminary Design (**Figure 11**) results in the following:

Segment 1 – Loon Lake

- The preferred plan deviates from the approved 1996 Preliminary Design alignment in the area between Highway 587 and East Loon Road. Highway 11/17 is twinned to the south with a 30 m wide median between Highway 587 and West Loon Road, and to the north between West Loon Road and East Loon Road
- Minor realignment of East Loon Road to tie-in to proposed Highway 11/17 alignment
- The existing skewed crossing location of the TCPL is reused and will potentially avoid impacts to the pipeline outside of the existing heavy casing limits
- The realignment of West Loon Road at Mirror Lake Road is unchanged from the approved 1996 Preliminary Design alignment.

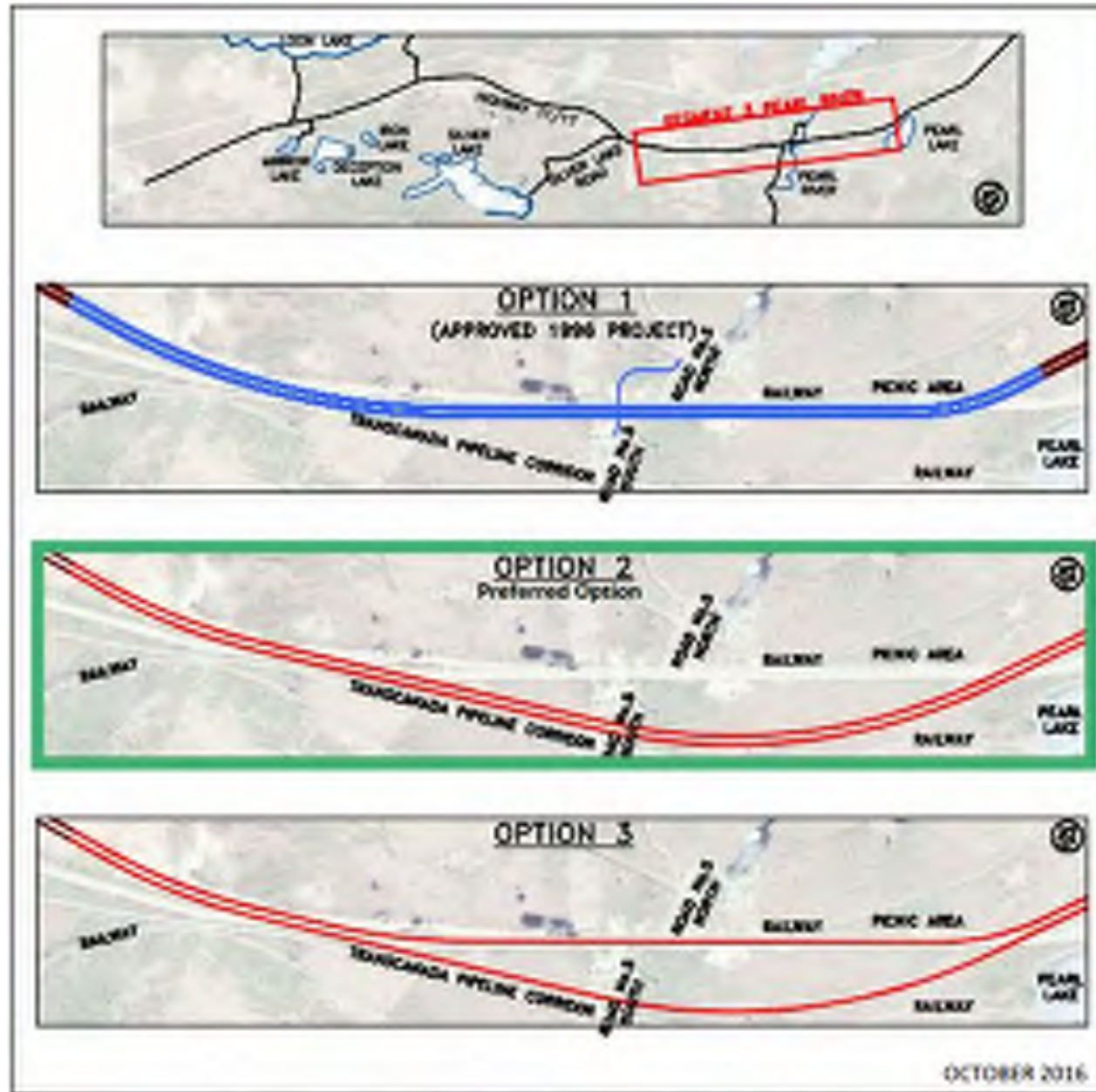


Figure 9: Segment 3 – Option Overview

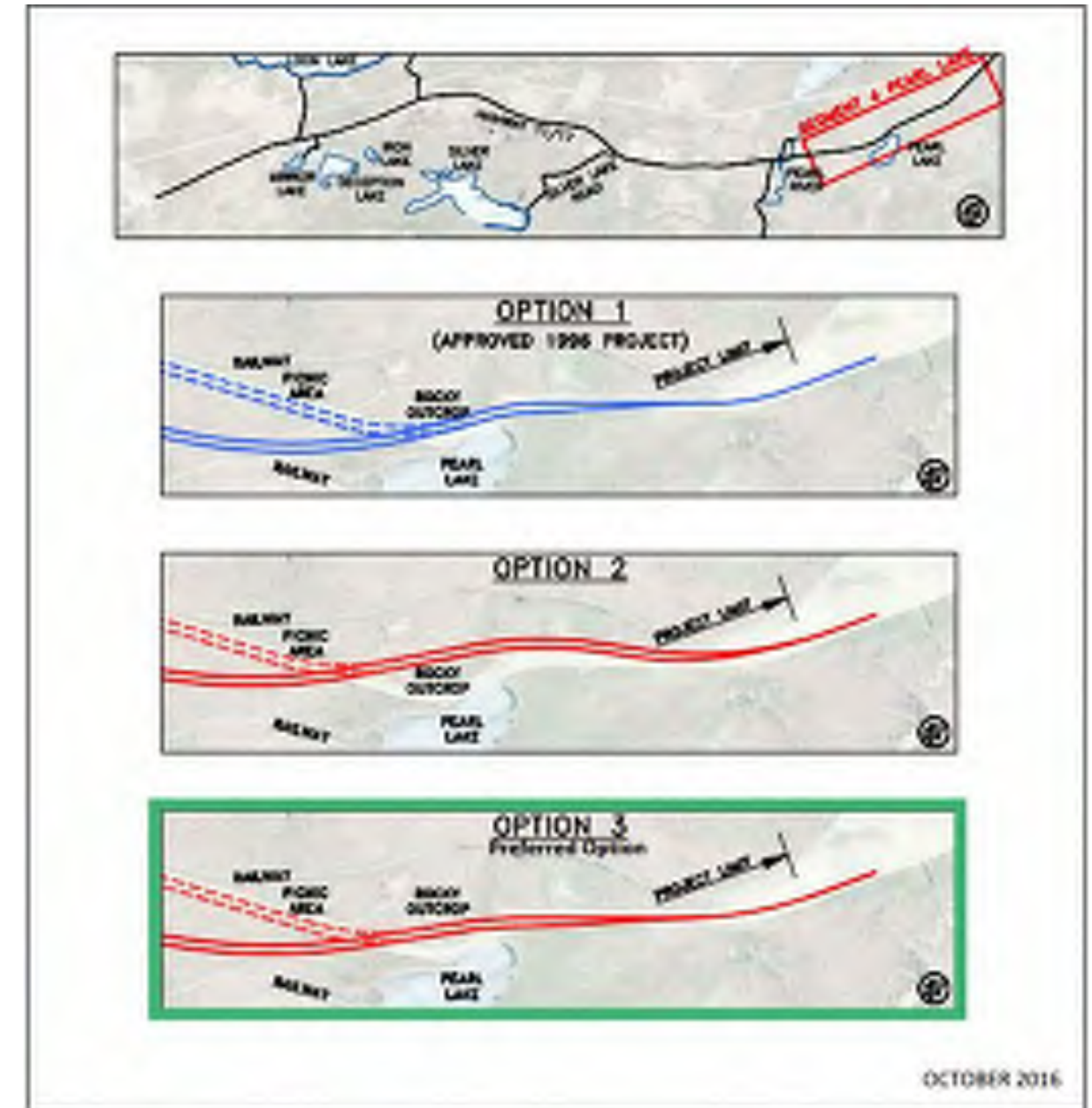


Figure 10: Segment 4 – Option Overview

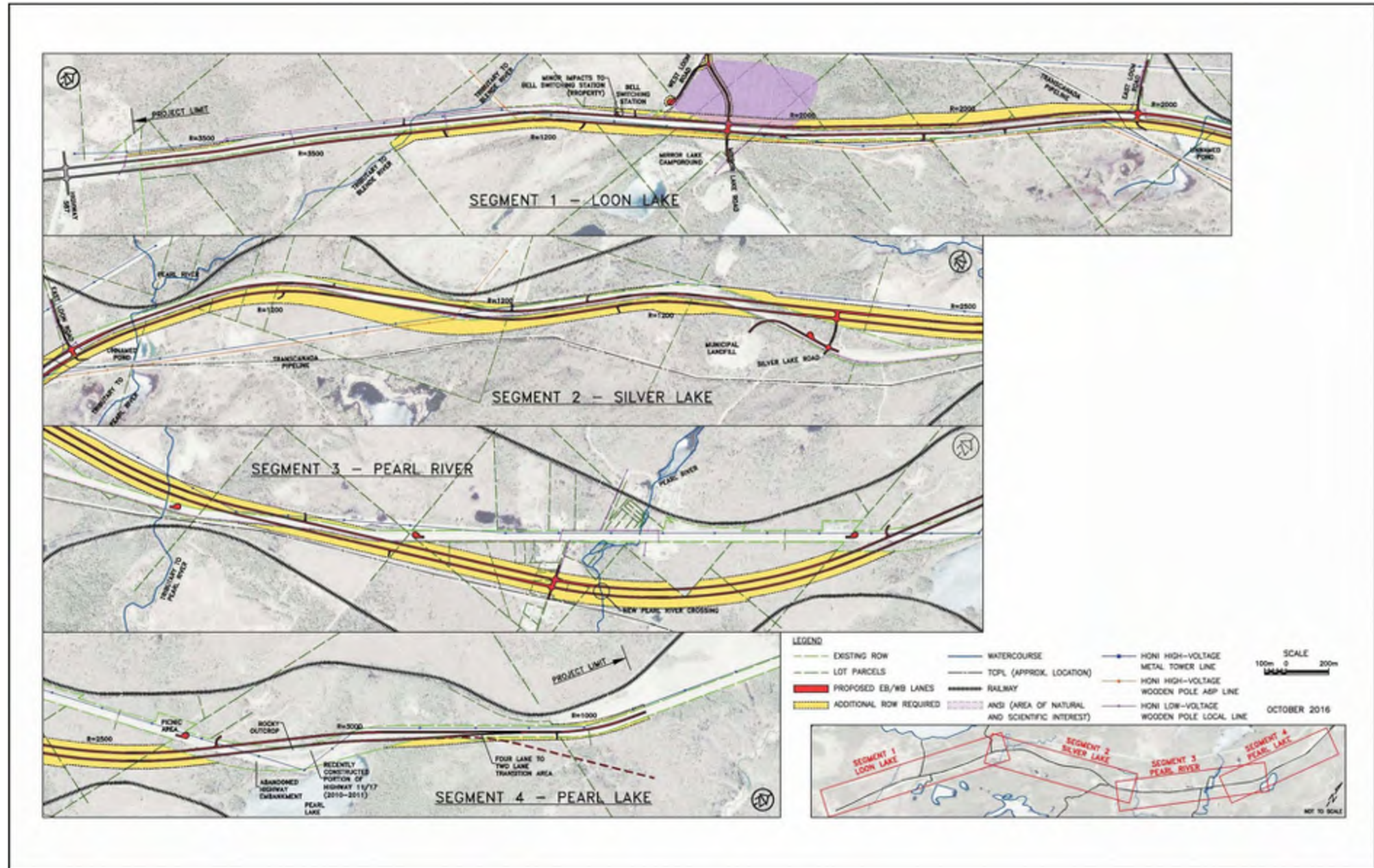


Figure 11: Preferred Alternative

Segment 2 – Silver Lake

- The approved 1996 Preliminary Design alignment is generally maintained between East Loon Road and Silver Lake Road and twins the highway to the south (west portion of Segment 2) and north (east end, near Silver Lake Road)
- Impacts to the HONI A6P wooden transmission line are avoided. The transition tower between the east-west and north-south running lines would likely require the most significant number of tower relocations, if impacted
- The existing horizontal radii are increased to 1200 m
- Results in Silver Lake Road being extended to the new highway alignment.

Segment 3 – Pearl River

- The preferred plan deviates from the approved 1996 PDR alignment in this segment by relocating Highway 11/17 south of the existing highway to run adjacent to the TCPL through the community of Pearl
- Allows for an improved crossing of the Pearl River and avoids significant reconfiguration of the Road No. 5 South and Road No. 5 North intersections
- Removes eight private entrances from Highway 11/17 by utilizing an access road (the existing highway)
- Four residential properties/homes are displaced with the new alignment south of Highway 11/17.

Segment 4 – Pearl Lake

- The preferred plan deviates from the approved 1996 Preliminary Design alignment in this segment in the area north of Pearl Lake by twinning the highway to the north of the existing highway
- Utilizes the existing running lines of the HONI towers near Pearl Lake to avoid significant relocation requirements, including additional rock blasting for HONI at the rocky outcrop.

This ESR Addendum documents the areas of the preferred plan that deviate from the approved 1996 Preliminary Design alignment, including the area of land required for the increased ROW width.

4.0 Consultation

This section summarizes consultation undertaken throughout the Class EA and Preliminary Design study. The consultation process included newspaper notices, letters/notices to property owners, external agencies and Indigenous Communities, unaddressed admail through Canada Post to all households and businesses serviced by Pass Lake Post Office (POT 2M0), and two Public Information Centres (PICs). Formal notices, provided in **Appendix B-1**, included:

- Notice of Study Commencement
- Notice of Public Information Centre #1
- Notice of Public Information Centre #2
- Notice of Submission of ESR Addendum.

All notices and project information was made available on the project website (www.hwy11-17pearl.ca) beginning October 14, 2015.

4.1 Contact List

The project contact list includes federal departments, Indigenous Communities, the local MPP, provincial ministries, the Municipality of Shuniah, Lakehead Region Conservation Authority, other local agencies, emergency services, utilities, and landowners potentially affected by the improvements to Highway 11/17 and local roads. The names and addresses of landowners were provided by the MTO property office. Notices were also sent to residents and businesses via Canada Post unaddressed admail (postal code POT 2M0) to reach a wider area. The contact list was updated throughout the project to add members of the public who attended the two PICs, completed comment forms, or contacted Dillon or MTO through the project website at www.hwy11-17pearl.ca. The agency contact list is provided in **Appendix B-4** and the Indigenous Community contact list is provided in **Appendix B-6**.

4.2 Notice of Study Commencement

The Notice of Commencement (**Appendix B-1**) was published in the Thursday, October 15, 2015 edition of the Thunder Bay Source and the Saturday, October 17, 2015 edition of the Thunder Bay Chronicle Journal. In addition to the Notice of Commencement, letters requesting Permission to Enter (PTE) were mailed to property owners along the Highway 11/17 corridor and adjacent to proposed alignment alternatives. The letter explained that property access may be required to complete environmental, geotechnical and survey field investigations.

Twenty comments were received in response to the Notice of Commencement. Comments from property owners related to requests for more information on property impacts and to be kept informed. Formal responses were provided in advance of PIC #1 (**see Section 4.4**).

4.3 Public Information Centres

Public Information Centre #1

PIC #1 was held on November 24, 2015, from 3:00 p.m. to 8:00 p.m. at the MacGregor Recreation Centre (800 Lakeshore Drive, Municipality of Shuniah). The Notice of PIC #1 (**Appendix B-1**) was published in the November 19, 2015 edition of the Thunder Bay Source and the November 21, 2015 edition of the Thunder Bay Chronicle Journal. Letters/notices were sent in advance of the PIC to invite property owners, external agencies and Indigenous Communities to attend.

The PIC displays are provided in **Appendix B-3**. A total of 55 individuals signed the meeting register. Almost all of the attendees were property owners within the Study Area. Representatives of the Municipality of Shuniah, Red Rock Indian Band, Silver Lake Campground, Mirror Lake Campground and Amethyst Mine Panorama also attended.

Public Information Centre #2

PIC #2 was held on April 26, 2016, 3:00 p.m. to 8:00 p.m. at the MacGregor Recreation Centre. The Notice of PIC #2 (**Appendix B-1**) was published in the April 16, 2016 edition of the Thunder Bay Chronicle and the April 21, 2016 edition of the Thunder Bay Source. Letters/notices were sent in advance of the PIC to invite property owners, external agencies and Indigenous Communities to attend. The PIC displays are provided in **Appendix B-3**. A total of 77 individuals signed the meeting register. Almost all of the attendees were property owners within the Study Area. Representatives of the Municipality of Shuniah, West Loon Campers Association and Mirror Lake Campground also attended.

4.4 Summary of Comments Received

In general, most comments received indicate that affected parties recognize that highway improvements are required to meet current design standards and accommodate future traffic increases. **Table 4** provides a summary of public comments received and **Table 5** provides a summary of agency comments received. Copies of public comments received are provided in **Appendix B-2**.

Table 4: Summary of Public Comments

Comment	Action Taken/Response
Concern about safety with highway-speed traffic conflicting with slower speeds of traffic entering or leaving the highway	Sight lines for both the highway and entrances will be improved through the design. The project team is reviewing the opportunity to reduce the number of entrances onto the highway. Under this project, the four-lane highway will be developed with partial access control as an interim configuration.
Interest in increasing the posted speed limit to 100 km/hr along the corridor	A posted speed limit increase will be considered and reviewed when the four-lane facility is designated as a controlled access highway (no at-grade intersections or driveway access).
Interest in wider paved shoulders or bicycle lanes to accommodate cyclists along the corridor. There is no alternative road adjacent to this section of the highway for cyclists	An alternative route for cyclists will not be provided. A wide fully paved shoulder will be available in each direction.
Concern about property impacts	Consultation with impacted property owners will continue throughout Detail Design.
Incorrect information regarding an inactive landfill located at East Loon Road and Highway 11/17, as shown on Land Use Map – A2 of the Municipality of Shuniah Official Plan	The Municipality of Shuniah was contacted to research landfill records and the municipality confirmed that there is no record of an inactive landfill in this area. However, it was reported that this site operated as a pit/quarry.

Comment	Action Taken/Response
Concern about impact on well water	Although groundwater and water well impacts are not anticipated, it will be determined if a groundwater assessment will be conducted during Detail Design. This assessment will evaluate groundwater conditions in the area and the potential impacts of the project on local wells and streams. The assessment will also provide design recommendations, mitigation measures and monitoring measures as required.
Concern about permit requirements for new and, existing entrances	Existing entrances will be permitted (for existing use only) unless four-laning results in serious safety concerns or construction impacts. Following a review, if they are not permitted and an alternative access cannot be provided, MTO will contact the property owner. Requests for access to existing parcels (that do not currently have entrances) will be reviewed from the perspective of safety, construction impacts and alternative access to determine if they will be permitted. In areas where the proposed highway follows a new alignment, private entrances will not be permitted. Any permitted entrances onto the divided highway will be “right-in right-out.”
Consider showing the existing highway as a dashed line as it is the public’s major point of reference. Please brighten the dashed lines for existing ROW boundaries	Comments noted.
Concern about socio-economic impacts associated with proximity of residence to new highway alignment	Although the new alignment presents an opportunity to reduce impacts at the Pearl River and enhances safety by reducing the number of entrances onto Highway 11/17 and providing a standard median width, it does result in impacts to property that cannot be avoided or mitigated. All of the alignments would result in some impact to residents being able to walk easily from one side to the other within Pearl. During Detail Design, the project team will review the potential to reduce clearing requirements within the MTO right-of-way to provide as much visual screening as is possible to property adjacent to the new alignment in Pearl. Access to the McTavish Landfill will be provided from a realigned entrance to the existing highway. Operation of the site is not expected to be impacted. As part of the design, the impact on the landfill monitoring wells is being assessed and some changes to the well locations may be required. This is being coordinated through MTO, MOECC and the Township of Shuniah.
Concern about impacts to McTavish Landfill	
Concern about picnic area impacts near Pearl Lake (need rest area on existing highway; however, not in the community of Pearl)	Access to the picnic/rest area located west of Pearl Lake on the north side of Highway 11/17 will no longer be available directly from Highway 11/17 with the new alignment and service road. The plans for the picnic/rest area will be reviewed during Detail Design.

Comment	Action Taken/Response
Positive benefits for community of Pearl but tourism access needs to be maintained	Existing tourism signage will be reinstated if temporarily impacted by construction.
Support of the preferred alignment in Segment 1 and no east-west connection between East Loon Road and West Loon Road	Comments noted. The preferred alignment for West Loon Road is unchanged from the approved 1996 PDR Alignment. Although the municipal regulations require a minimum of 10 acres to be developed, if MTO initiates the severance, the severance can be deemed as a legal lot as long as the proper set-backs and separation between well and septic systems are ensured. If the requirements to become a legal lot cannot be met, MTO will purchase a severed lot at a price determined from the existing parcel.
Concern about West Loon Road bisecting property and remnant parcel sizes (Municipality of Shuniah minimum lot size for residential development is 10 acres)	
Concern about increased noise	A traffic noise study was completed comparing the existing highway to the new four-lane facility with the proposed addendum changes. The noise study concluded that since the sound level increase due to the proposed four-laning is predicted to be less than 5 dBA, MTO guidelines indicate there is no requirement to consider noise mitigation features for this project. Mitigation, if applicable, will be considered during Detail Design.

Copies of agency comments received are provided in **Appendix B-4**.

Table 5: Summary of Agency Comments Received

Agency	Comments	Action Taken/ Response
Lakehead Region Conservation Authority	Provided a map showing the location of various water crossings within the Study Area that would typically be subject to the Authority's Development Interference with Wetlands and Alterations to Shoreline and Watercourses Regulations. However, under the <i>Conservation Authorities Act</i> , Section 28 (10)(c), any work conducted by MTO is not subject to these regulations and does not require a permit from LRCA. Permits/authorizations may be required by other agencies	Comments noted.
Municipality of Shuniah, Manager of Operations	Requested that up-to-date plans be provided to the municipality for review and comment	Consultation with the Municipality is ongoing.

Agency	Comments	Action Taken/ Response
Ministry of Tourism, Culture and Sport (MTCS)	Requested that impacts to archaeological resources, built heritage and cultural resources be included in the EA study, suggested engagement with local Indigenous communities, and to be kept informed	The Stage 1 and Stage 2 Archaeological Assessments will be submitted to MTCS for their records, when available.
Infrastructure Ontario (IO)	Requested that it be removed from the contact list if lands owned by the province are not affected	Removed from the project contact list.
Ministry of Northern Development and Mines (MNDM)	Advised that it has no concerns with respect to the impacts of the project on mining lands, geology and mineral resource potential or economic and community impacts. With respect to abandoned mine hazards, MNDM advised that there are three abandoned mine sites and one former Aggregate Resources Act site within a 2 km radius of the proposed highway improvements. Abandoned Mines Reports were provided by MNDM for each location	Comments noted. Mining claims will be cleared with MNDM as part of the process.
Ontario Provincial Police (OPP)	Provided its primary contact for the project	Added to the project contact list.
MTCS	Stage 1 Archaeological Assessment (AA) should be undertaken to delineate the extent of the AA carried out for the 1996 ESR, describe what resources, if any, were identified and determine what areas warrant further assessment. Deferring Stage 2 AA to the Detail Design phase of the project is appropriate. The MTCS Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes form should be completed to help determine whether cultural heritage resources will be impacted. If potential or known heritage resources exist, MTCS recommends that a Heritage Impact Assessment (HIA) be completed to assess potential project impacts	The Stage 1 AA was completed in Preliminary Design will be submitted to MTCS for their records. The Stage 2 AA will be completed during Detail Design. The MTCS form was completed and it was determined that no heritage resources will be impacted.

Agency	Comments	Action Taken/ Response
Ministry of Natural Resources and Forestry (MNR)	Interested in the protection of the Earth Science Area of Natural and Scientific Interest (ANSI) rock formation east of West Loon Road. Northerly limits of the ANSI are unknown. Specific mitigation is not required to undertake the proposed activity; however, MNR prefers an alignment that minimizes encroachment and is limited to the edge of the ANSI. The MNR requested that layers of the ANSI be left exposed after any planned rock cut, and if possible, rock samples of the geological feature be preserved for educational purposes.	The preferred alignment for West Loon Road is unchanged from the approved 1996 PDR alignment. The alignment of Highway 11/17 is shifted slightly to the north compared with the 1996 alignment. Alignment refinements will be reviewed further during Detail Design to minimize the encroachment along Highway 11/17.

4.5 Municipal Consultation

The project team attended a Municipality of Shuniah Council meeting to present the material in advance of each PIC. Presentations were made to Municipality of Shuniah Council on November 23, 2015 and on April 25, 2016. Meeting minutes and materials presented are provided in **Appendix B-5**.

The purpose of the first meeting was to provide an overview of the project, EA study process and to obtain input on the Preliminary Design alternatives and the local road improvements under consideration. The purpose of the second meeting was to provide an update on study progress, an overview of the evaluation of segment options and the preferred alternative road alignment, highlighting property and access impacts. Council stated that their preference is to use existing roadways for economic reasons, where possible, and were generally satisfied with the options presented. **Table 6** provides a summary of comments received from Council.

Table 6: Summary of Comments Received from Municipal Council

Comment	Action Taken/Response
Council requested information on property access, specifically at the following locations: McTavish Landfill site, aggregate pits on the north side of Highway 11/17 in Segment 2, aggregate pit owned by Shuniah in vicinity of the picnic area (adjacent to MTO lands)	The existing highway will become a service road to provide access to the landfill site. Existing accesses will be maintained for the aggregate pits. Exact locations are to be determined. PIC# 3 is scheduled during Detail Design to provide more detail on accesses
Has the project team contacted property owners that are impacted?	Letters and notices were mailed prior to PIC #1 and PIC #2. Landowners who are directly impacted were sent plans showing the area of land required for the alignment. Consultation is ongoing with impacted property owners.
If Shuniah receives calls from landowners, who should they be redirected to?	Calls should be redirected to the project team as noted on the Notice of PIC.
Requested notification if entrances are not maintained	Comment noted.

Comment	Action Taken/Response
Is the recently constructed area of Highway 11/17 in the area of Pearl Lake being re-used?	The existing road in this area may be used to maintain traffic during construction rather than constructing a detour route.
Is the picnic area/rest stop being maintained? Council requested that the rest stop be maintained due to the importance for the area. The municipality has received complaints that it is not open enough. It was also suggested that the location be reviewed; best location is in close proximity to the MTO ROW, not on the service road	MTO is reviewing this and Council’s preference is noted. The plans for the picnic/rest are will be reviewed during Detail Design.
Is emergency access reviewed as part of the project?	Not specifically. The purpose of the study is to improve overall access and movement of vehicles. MTO offered to meet with EMS/municipality to discuss any specific questions or concerns.

4.6 Indigenous Consultation

The closest First Nations to the Study Area are Fort William First Nation to the east (Fort William Indian Reserve #52) and Red Rock Indian Band (Lake Helen Reserve #53). The Study Area lies within the Robinson Superior 1850 treaty area.

The Aboriginal and Treaty Rights Information System (ATRIS) was used to determine the list of First Nations to be contacted about the study. Dillon sent a letter to the Ministry of Indigenous Relations and Reconciliation (October 13, 2015) to confirm the list of Indigenous Communities to be contacted and request information on the status of any outstanding land claims.

All project notices and accompanying letters from MTO were sent to the following Indigenous Communities:

- Métis Nation of Ontario
- Red Sky Métis Independent Nation
- Anishinabek Nation (UOI)
- Tribal Councils (Nokiiwin)
- Animbiigoo Zaagi igan Anishinaabek (AZA)
- Pic Moberg First Nation
- Whitesand First Nation
- Bingwi Neyaashi Anishinaabek (BNA)
- Ojibways of the Pic River First Nation
- Biinjitiwaabik Zaaging Anishinaabek (BZA)
- Kiashke Zaaging Anishinaabek (KZA)
- Red Rock Indian Band
- Pays Plat First Nation

- Michipicoten First Nation
- Long Lake #58 First Nation
- Fort William First Nation
- Thunder Bay Metis Council.

No comments have been received from Indigenous Communities. Indigenous Community consultation materials, including the contact list, are provided in **Appendix B-6**.

4.7 Utility Consultation

The project team met with the following utility companies to discuss the alignment alternatives, the selected preferred alternative, potential utility conflicts and relocation process:

- TransCanada Pipelines Limited (October 7, 2015)
- Hydro One Networks Inc. – Transmission Services (November 4, 2015)
- Bell Canada (November 25, 2015)
- Hydro One Networks Inc. – Distribution Services (July 13, 2016)
- Hydro One Networks Inc. – Transmission Services (August 19, 2016).

The realignment of Highway 11/17 will require relocation of utilities (**refer to Section 6.5.3**). The project team will continue correspondence with affected utility companies throughout Detail Design to provide project updates, determine utility conflicts and coordinate necessary utility relocations.

Utility consultation materials are provided in **Appendix B-7**.

5.0 Project Description

The 1996 ESR recommended twinning of Highway 11/17 south of the existing highway, resulting in two driving lanes in each direction (a four-lane cross-section) separated by a grassed median. Minor alignment revisions were identified between East Loon Road and Pearl Lake, shifting the highway north of the existing location. A minimum of 30 m wide centre median separating the opposing lanes of traffic was recommended except in the area adjacent to Pearl River, where a 15 m median was recommended to reduce the impact on potential fishery resources. The ROW width was a minimum of 90 m (except at Pearl where a 75 m ROW was provided).

Under this Class EA and Preliminary Design study, the 1996 approved plan was updated to utilize a 110 m ROW. The wider ROW width could result in new environmental impacts including social environment (property), natural environment (terrestrial and aquatic resources), cultural environment (archaeological resources) and utility impacts. These potential impacts are discussed further in **Section 6.0** of this report.

This ESR Addendum documents the areas of the preferred plan that deviate from the approved 1996 PDR alignment, including the area of land required for:

- The increased ROW width from 90 m to 110 m to aid in flattening out highway slopes and increases the level of safety (in accordance with current highway engineering standards)
- The minor realignment of the ROW between Highway 587 and East Loon Road to avoid impacts to the TCPL
- The minor realignment of East Loon Road to tie-in to proposed Highway 11/17 alignment
- The relocation of Highway 11/17 south of the existing highway to run adjacent to the TCPL through the community of Pearl to allow for an improved crossing of Pearl River, to avoid significant reconfiguration of the Road No. 5 South and Road No. 5 North intersections and to remove eight private entrances from Highway 11/17 by utilizing an access road (the existing highway)
- The minor realignment of ROW north of Pearl Lake to avoid significant relocation of HONI towers and associated rock blasting.

Design plates of the Preferred Design are provided in **Appendix C**.

5.1 Construction Timing

The highway four-laning for the Study Area is listed as an expansion project in the MTO 2016-2020 Northern Highways Program. Construction is anticipated to commence in 2018, subject to funding, planning, design, environmental approval, property acquisition and construction requirements.

5.2 Highway Engineering

Highway alignment alternatives were generated to address updates to current conditions, reduce overall capital costs, and improve constructability. A preferred alternative was selected after a comprehensive review and analysis of the impacts and benefits of each alternative, which included input and comments received from local residents, members of the public, external agencies, and the Municipality of Shuniah. The preferred plan consists of the following improvements:

Segment 1 – Loon Lake

- Between Highway 587 and West Loon Road, Highway 11/17 is twinned to the south with the westbound lanes maintained on the existing highway platform
- Between West Loon Road and East Loon Road, Highway 11/17 is twinned to the north with the eastbound lanes maintained on the existing highway platform
- The existing crossing location of the TCPL is generally maintained.

Segment 2 – Silver Lake

- Between East Loon Road and the McTavish Landfill, Highway 11/17 is twinned to the south with the westbound lanes maintained on the existing platform

- East of the McTavish Landfill site, Highway 11/17 runs parallel to the existing HONI corridor, north of the existing alignment
- Improvements to existing horizontal curves (larger radii) will result in areas of the existing highway platform being reconstructed for the westbound lanes.

Segment 3 – Pearl River

- Highway 11/17 eastbound and westbound lanes are realigned south of the existing highway and run adjacent to the TCPL through the community of Pearl.

Segment 4 – Pearl Lake

- Highway 11/17 eastbound and westbound lanes are realigned north of the existing highway in the area north of Pearl Lake.

5.2.1 Intersections and Municipal Roadways

There are six existing at-grade intersections along Highway 11/17 within the limits of work: West Loon Road, Mirror Lake Road, East Loon Road, Silver Lake Road, Road No. 5 South and Road No. 5 North.

West Loon Road and Mirror Lake Road

West Loon Road will be realigned and the intersection with Highway 11/17 relocated to become a common intersection with Mirror Lake Road. The common intersection will maintain full access to and from eastbound and westbound lanes (median crossover location).

There will be a significant grade difference between the north and south sides of the highway in the vicinity of the new intersection. Significant cut will be required for the construction of West Loon Road. Additional fill is required for the Highway 11/17 eastbound lane embankments at the intersection. Additional grade correction is recommended at Mirror Lake Road as the existing road connection from the highway is in excess of 11% slope.

Old West Loon Road will be connected to the new alignment of West Loon Road. The realigned portion of the road will be maintained in the existing location to maintain access to existing properties. A cul-de-sac will be installed at the existing intersection with Highway 11/17.

East Loon Road

The East Loon Road intersection will remain at the existing location on Highway 11/17 and will provide access to eastbound and westbound lanes (median crossover location). Minor adjustments to the profile will be required in the vicinity of the new intersection to match grades on Highway 11/17. Minor realignment of East Loon Road is required to tie-in to proposed Highway 11/17 alignment.

Silver Lake Road

Silver Lake Road will be extended to the new location of Highway 11/17 with access provided to the eastbound and westbound lanes (median crossover location). The intersection will be relocated east of the existing intersection, at a location of an existing access, to avoid significant rock cuts. Profile corrections will be required to match the grade of the new Highway 11/17 alignment.

Road No. 5 South and Road No. 5 North

A new intersection will be introduced on Road No. 5 South where the side road intersects Highway 11/17. No change is required to the horizontal alignment of Road No. 5 South. As the horizontal alignment of Highway 11/17 is within a curve at the intersection, the vertical alignment of Road No. 5 South will be reconfigured to match the highway crossfall.

There is no proposed work at Road No. 5 North; access will be maintained to old Highway 11/17.

5.2.2 Interchanges

The 1996 ESR included property protection for possible future interchanges located between West Loon Road and East Loon Road and 250 m west of Road No. 5 south. This addendum does not contemplate changes to interchange locations from the 1996 ESR. The development of future interchanges is related to the implementation of a controlled access highway and will be completed under a future study. The public will be given the opportunity to comment at that time.

5.2.3 Right-of-Way Requirements

The 1996 ESR identified a 90 m ROW requirement. The preferred plan accommodates an increased standard ROW width to a minimum of 110 m per updated standards. To accommodate areas of high fills and deep cuts, additional ROW beyond the minimum 110 m is required in some locations. Less than the 110 m minimum ROW width is recommended in areas where the horizontal alignment of the highway utilizes the existing highway platform and the vertical profile change is not considered significant (i.e., east of West Loon Road).

5.2.4 Property

Four-laning of Highway 11/17 will require additional property along Highway 11/17 to accommodate the 110 m ROW, changes to the horizontal and vertical alignments, and addition of two lanes separated by a centre median. Areas where additional property is required are identified on **Figure 12**.

5.2.5 Entrances

Existing entrances within the limits of work will be permitted for current use only. Each entrance will be reviewed in Detail Design from the perspective of safety, construction impacts and alternative access to ensure the existing location is appropriate.

Current Highway Access Management policy allows one entrance for each property parcel adjacent to the ROW. In accordance with current MTO policy and proposed property impacts, some entrances will be permanently closed (subject to review during Detail Design). Any permitted entrances onto the divided highway will be right-in right-out since access will be from one-way eastbound or westbound lanes. Access to the opposite direction will be at the nearest downstream intersection. The remaining entrances will be maintained on the proposed service roads developed from the unused sections of existing Highway 11/17. Access to the highway will be at the nearest intersection.

Future requests for access to existing parcels (that do not currently have entrances) will be reviewed by MTO from the perspective of safety, construction impacts and alternative access to determine if they will be permitted. Entrances will not be permitted in areas where the proposed highway follows a new alignment.

5.2.6 Utilities

Major utilities companies within the study limits include HONI, Bell Canada (Bell) and TCPL.

Hydro One Networks Inc.

There are two high voltage transmission lines within the Study Area, including wooden poles and steel towers. The following design criteria were confirmed by HONI:

- New towers should be located 15 m from the base of the tower to the edge of the travelled roadway
- Area around the base of the towers (15 m) should be flat for maintenance vehicles access
- Towers must be located on crown land or within registered easements. Minimum ROW is 30 m, but may vary for steel towers, and must be kept clear of debris
- HONI requires access to each tower and access along the HONI corridor.

Realignment of Highway 11/17 will require relocation of several steel towers and wooden poles. Relocation will be completed prior to construction of the Highway 11/17 four-laning project.

There is a HONI low voltage distribution line along Highway 11/17 from the west project limits to Pearl and continuing south on Road No. 5 South. Four-laning of Highway 11/17 will impact existing distribution lines in numerous locations. Relocation will be completed prior to construction of the four-laning of Highway 11/17.

Bell Canada

Existing Bell utilities within the Study Area include a switching station west of West Loon Road, Fibre Optic Transmission System (FOTS) along the north side of Highway 11/17, and copper cables along the south side of Highway 11/17. Bell also has a plant on an easement adjacent to the TCPL easement along the south side of Highway 11/17, and a cell tower accessed by Mirror Lake Road. Access to the cell tower must be maintained. The proposed alignment for the four-laning of Highway 11/17 avoids impacts to the Bell Switching Station. The existing FOTS and copper plant along Highway 11/17 will be impacted by the

four-laning of Highway 11/17 in numerous locations. Design and construction for the relocation will be completed prior to construction of the four-laning of Highway 11/17.

TransCanada Pipeline Limited

Highway 11/17 has one existing crossing over the TCPL natural gas main just west of East Loon Road. The crossing was constructed in 1959, and includes a 51.5 m section of heavy-walled pipe where it crosses under Highway 11/17. The existing crossing will be evaluated during Detail Design to determine if relocation is required or other mitigation strategies can be implemented. Relocation and/or mitigation will be completed prior to construction of the Highway 11/17 four-laning.

5.3 Structures

Existing Pearl River Structure (Site No. 48C/198/C)

An extension of the existing structural cast-in-place box culvert at Pearl River was recommended in the 1996 ESR to accommodate the widening of the highway. As the recommended alternative is now offline from the existing highway in this area, an extension is no longer required. No work is anticipated at the existing culvert.

New Pearl River Crossing

New structures will be required at the new Highway 11/17 alignment crossing of the Pearl River east of Road No. 5 South. The new structures will incorporate site-specific hydraulic, geotechnical, fisheries and terrestrial design criteria. The final type and the configuration of the new structures will be determined during Detail Design.

Other Structural Culverts

There are no other structural culverts (i.e., culverts 3.0 m in span or greater) anticipated within the project limits.

5.4 Drainage and Hydrology

The information provided on surface drainage in the 1996 ESR is still relevant; surface drainage along the existing highway is carried by roadside ditches and a series of non-structural circular pipe culverts that convey surface runoff through the highway corridor to receiving water systems. There are no storm sewers in the Study Area. The non-structural pipe culverts along the existing highway corridor generally consist of galvanized or polymer coated corrugated steel pipes (CSP).

The proposed four-laning of Highway 11/17 will include ditch drainage adjacent to the roadway and in the median. Areas where the new highway alignment is located outside of the existing corridor, specifically in the vicinity of Pearl River, new non-structural drainage culverts will be required to convey surface water runoff through the roadway embankment to receiving water systems. Within the highway twinning portion of the corridor, no significant changes to existing surface drainage patterns are anticipated. Where feasible,

the existing non-structural pipe culverts will be maintained and/or extended. Consideration for the replacement of existing non-structural culverts will be based on the assessed age and physical condition of infrastructure.

6.0 Environmental Impacts and Mitigation

This section of the ESR Addendum includes an impact assessment of the construction and highway operation based on the identified environmental sensitivities and the preferred Preliminary Design of the four-laning project, along with potential mitigating measures.

Table 7 summarizes the identified environmental concerns and, based on the identified environmental sensitivities and the preferred preliminary design of the four-laning project. The Preliminary Design is subject to refinements during the development of the Detail Design plan. Any potential refinements are not anticipated to increase impacts to the identified concerns.

6.1 Cultural Environment

6.1.1 Archaeological Resources

Northwest Archaeological Assessments completed a Stage 1 archaeological assessment of the Highway 11/17 corridor between Highway 587 and Pearl Lake. The Stage 1 archaeological assessment has been submitted to MTCS. Based on the results of the Stage 1 archaeological assessment, portions of the Study Area are evaluated as holding archaeological potential. The Stage 2 archaeological assessment will be completed for the approved alignment during Detail Design.

6.1.2 Built Heritage Resources and Cultural Heritage Landscapes

The MTCS checklist “Screening for Impacts to Built Heritage and Cultural Heritage Landscapes” was completed for this project and was submitted to MTCS. There are no built heritage or cultural heritage landscape features in the Study Area; therefore, a heritage impact assessment was not completed.

6.2 Natural Environment

6.2.1 Groundwater

Well water is used for drinking water throughout the Study Area. The depth to groundwater varies from less than 10 m to 40 m. According to MOECC well data, all known groundwater wells are drilled and are greater than 50 m in depth. Four groundwater wells associated with residential property will require decommissioning prior to construction and three wells have been identified as being potentially impacted (within 20 m of the ROW).

A groundwater assessment will be conducted as part of the next design phase. This assessment will evaluate groundwater conditions in the area of wells identified as being potentially impacted and the potential impacts of the project on streams. The assessment will also provide design recommendations, mitigation measures and monitoring measures as required.

6.2.2 Erosion and Sediment Control

Without the implementation of appropriate mitigation measures, excavation and grading activities associated with construction of the four-laning project may cause erosion and sedimentation. An Erosion and Sediment Overview Risk Assessment (ESORA) was completed and will be verified during Detail Design. The assessment is intended for projects where knowledge of erosion and sedimentation risk will assist in preliminary design decisions (i.e. route selection for the twinning of Highway 11/17). The assessment allows discussion on erosion and sediment control to begin with regulatory agencies at a preliminary level and also helps define the selection of appropriate control measures during Detail Design. In the assessment, similar areas of risk are group together and a risk value is applied. Site-specific erosion and sedimentation control measures will be developed during Detail Design in accordance with MTO’s *Environmental Guide for Erosion and Sediment Control during Construction of Highway Projects (MTO, 2007)*.

6.2.3 Fisheries and Aquatic Habitat

The impacts highlighted in the 1996 ESR to fisheries in the Pearl River are no longer relevant to the current study. The rechannelization of Pearl River and culvert extension are not required with the preferred Preliminary Design. The proposed design shifts the highway alignment further south to avoid the braided channel of the river.

It is expected that new culverts or culvert extensions may be required at the watercourse crossings to accommodate the new or widened highway lanes and shoulders of the preferred alignment. Channel alterations and/or partial realignments may be required to maintain proper flows through the ROW and new structures. Shoreline infilling is required at the upstream beaver pond at Tributary to Pearl River 1 to accommodate the new lanes and associated road shoulders. In general, construction activities at existing culverts within the ROW, including at crossing of the new preferred alignment, have the potential to affect fish and fish habitat. Impacts to fish and fish habitat will be presented in a separate Fish and Fish Habitat Impact Assessment Report during Detail Design once the design has advanced for the waterbody crossings. The assessment will also provide design recommendations, mitigation measures and monitoring measures as required.

6.2.4 Terrestrial Ecosystems and Wildlife Habitat

No plant or wildlife SAR or SCC were observed during field assessments within the preferred alignment of the Highway 11/17 four-laning project. Rare Vegetation Communities (Hardwood Swamp and Talus Slopes) were observed during field studies and may be impacted due to proximity to the preferred alignment.

The terrestrial impact assessment and mitigation measures will be completed during Detail Design when the footprint of the preferred alignment has been confirmed.

6.2.4.1 Loon Lake Area of Natural and Scientific Interest

The impacts to the Loon Lake ANSI located north of and adjacent to Highway 11/17 and east of West Loon Road are similar to 1996 ESR. However, Highway 11/17 is shifted slightly north at this location compared to the 1996 design. Consultation with MNRF confirmed that specific mitigation is not required to undertake the proposed activity; however, an alignment that minimizes encroachment and is limited to the edge of the ANSI is preferred. The MNRF also requested that layers of the ANSI be left exposed after any planned rock cut, and if possible, rock samples of the geological feature be preserved for educational purposes.

6.3 Land Use and Socio-Economic Environment

6.3.1 McTavish Landfill Site

Two groundwater monitoring wells associated with the McTavish Landfill Site located south of Highway 11/17 at Silver Lake Road, fall within the new ROW limits of the preferred alignment and will be impacted by construction. As part of Detail Design, the impact on the landfill monitoring wells will be assessed and some changes to the well locations may be required. This will be coordinated through MTO, MOECC and the Township of Shuniah.

Access to the McTavish Landfill will be provided from a realigned entrance to the existing highway. Operation of the site is not expected to be impacted.

6.3.2 Picnic Area

Access to the picnic/rest area located west of Pearl Lake on the north side of Highway 11/17 will no longer be available from Highway 11/17 with the new alignment and proposed service road. The plans for the picnic/rest area will be reviewed during Detail Design.

6.3.3 Property Impacts

The new alignment of Highway 11/17 is closer to some residential uses potentially causing noise, air quality, visual impacts and safety issues. Potential impacts will be mitigated by maintaining setbacks from the highway and vegetated buffers in key areas will be reviewed during Detail Design.

MTO will negotiate with individual property owners to provide fair market value for the required property. Property negotiation and acquisition is anticipated to occur in Detail Design.

Areas where additional property is required are shown on **Figure 12**.

6.4 Noise Impacts

The findings of the 2016 *Traffic Noise Assessment* concluded that the implementation of the preferred Preliminary Design will not result in a significant (equal or greater than 5 dBA) *change in noise level* at nearby receptors and mitigation is not warranted. Sound levels greater than 65 dBA are predicted at two homes by 2030. However, one home will be removed due to the full buy-out required for the new location of the highway alignment. Potential noise mitigation is under review at the remaining receptor where sound levels greater than 65 dBA are predicted.

6.4.1 Construction Noise

The Study Area is rural in nature and the existing sound environment is characterized by the sounds of nature, existing traffic noise along Highway 11/17, noise from rail traffic and noise from truck traffic at local gravel pits and logging areas.

Noise generated during construction of the four-laning of Highway 11/17, although temporary, is expected to impact both humans and wildlife. Nuisance noise during construction is associated with typical construction activities, operation of equipment and machinery, internal combustion engines, construction-related vehicular traffic and back-up beepers on mobile equipment. Construction related noise is expected to be variable and intermittent in nature.

Construction noise complaints (if any) will be investigated according to the provisions of the existing noise Guide. The Guide requires that any initial complaint from the public be verified by MTO to determine if the general noise control measures (per construction contract) are in effect. If not, MTO will warn the contractor of any problems and will take steps to enforce the contract.

6.5 Highway and Traffic Engineering

6.5.1 Traffic Impacts

Long term traffic impacts in the community of Pearl include a new intersection at Road No. 5 South and Highway 11/17, south of existing highway and entrance impacts to the MTO Maintenance Yard.

In most cases, right-in/right-out only access will be maintained for existing properties along the highway. Property entrances in the community of Pearl can be accessed from the new service road (existing Highway 11/17), including the MTO Maintenance Yard. No new entrances will be permitted on the new alignment.

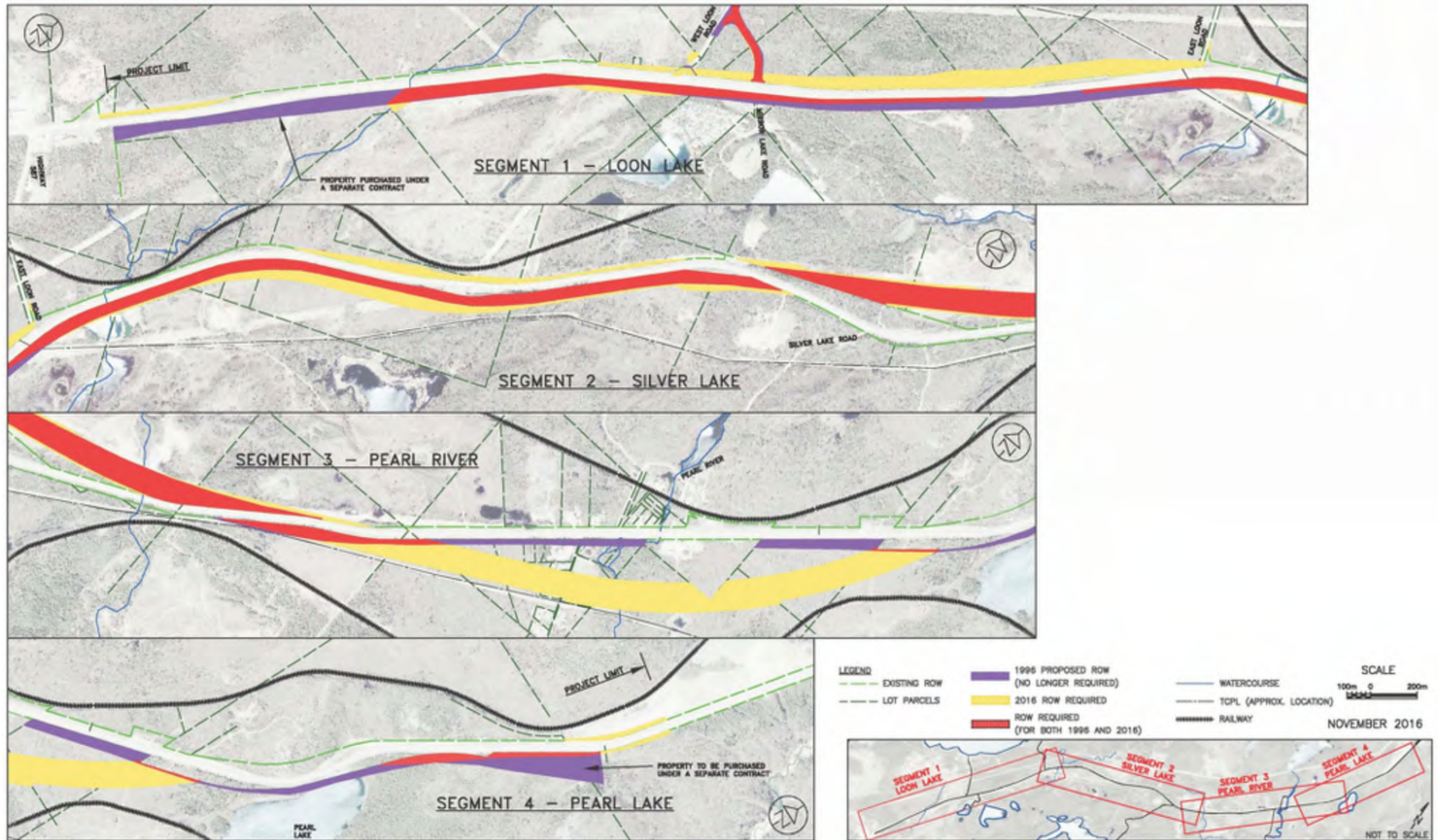


Figure 12: ROW Requirements

Short term property access disruptions and delays are anticipated during construction. Traffic management and construction staging/sequencing will be determined during Detail Design. Advance signing of construction zones will be provided.

6.5.2 Emergency Services

There is potential for emergency vehicle delays due to incidents on Highway 11/17 during construction. Impacts to emergency service response times are not anticipated with the proposed improvements. Traffic management and construction staging will be confirmed during Detail Design. Access to properties for residents and emergency service providers will be maintained at all times. Where temporary interruption of access is required, the contractor will either provide alternate access or consult with the landowner and EMS prior to closure.

6.5.3 Utilities

Realignment of Highway 11/17 will require relocation of several HONI steel towers and wooden poles. Four-laning of Highway 11/17 will impact existing distribution lines in numerous locations. Relocation will be completed prior to construction of the four-laning of Highway 11/17.

The four-laning of Highway 11/17 avoids impacts to the Bell Switching Station. The existing Bell FOTS and copper plant along Highway 11/17 will be impacted in numerous locations. Design and construction for the relocation will be completed prior to construction of the four-laning of Highway 11/17.

The existing crossing over the TCPL natural gas main just west of East Loon Road will be evaluated during Detail Design to determine if relocation is required or other mitigation strategies can be implemented. Relocation and/or mitigation will be completed prior to construction of the Highway 11/17 four-laning.

6.6 Drainage and Hydrology

Four-laning improvements require a new Pearl River crossing east of Road No. 5 South. Culvert extensions/replacements and new culverts will be designed to meet MTO drainage design criteria and incorporate erosion and scour protection, and fisheries protection measures, where applicable. Culvert configuration and erosion protection requirements will be finalized during Detail Design. Consideration for the replacement of existing non-structural culverts will be based on the assessed age and physical condition of infrastructure during Detail Design.

Addition of impervious surface (pavement) within the ROW may alter pre-construction hydrologic characteristics for runoff peak flow rates, runoff volumes and quality. Stormwater quality and drainage management will be reviewed during Detail Design. Sediment control measures will be identified during Detail Design and further developed prior to/during construction.

6.7 Environmental Clearances and Approvals

The ESR Addendum will be available for the required 30-day public and agency review period. If no Part II Orders are received by MOECC during this time, the ESR is approved under MTO's Class EA and cleared for *right-of-way designation* and *property acquisition/expropriation* for areas of the preferred plan that deviate from the approved 1996 Preliminary Design, including the area of land required for:

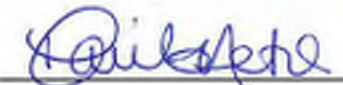
- The increased ROW width from 90 m to 110 m to aid in flattening out highway slopes and increases the level of safety (in accordance with current highway engineering standards)
- The minor realignment of the ROW between Highway 587 and East Loon Road to avoid impacts to the TCPL
- The minor realignment of East Loon Road to tie-in to proposed Highway 11/17 alignment
- The relocation of Highway 11/17 south of the existing highway to run adjacent to the TCPL through the community of Pearl to allow for an improved crossing of Pearl River, to avoid significant reconfiguration of the Road No. 5 South and Road No. 5 North intersections and to remove eight private entrances from Highway 11/17 by utilizing an access road (the existing highway)
- The minor realignment of ROW north of Pearl Lake to avoid significant relocation of HONI towers and associated rock blasting.

The approved mitigation and commitments outlined in the 1996 ESR and Addendum to that study will be carried forward to Detail Design.

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Paula Neto, MScPI, MCIP, RPP
Environmental Planner

Table 7: Summary of Environmental Concerns and Proposed Mitigation

I.D. #	I.D. # Sub-Issues	Issue/Concerns/Potential Effects	Potentially Concerned Agencies	Proposed Mitigation
1. Cultural Resources	1.1 Archaeological Resources	<ul style="list-style-type: none"> Potential destruction/disturbance of archaeological resources and deeply buried cultural deposits and unmarked human remains during construction 	MTO, MTCS	<ul style="list-style-type: none"> A Stage 2 Archaeological Assessment will be completed during Detail Design
2. Natural Environment	2.1 Groundwater Quality and Quantity during Construction	<ul style="list-style-type: none"> No impacts expected during construction. The Study Area is located in an area of low vulnerability for groundwater recharge with no nearby wellhead protection zones Four residential groundwater wells require decommissioning prior to construction and three wells have been identified as being potentially impacted (within 20 m of the ROW) 	MTO, MOECC, MNRF, LRCA, Municipality of Shuniah, residents	<ul style="list-style-type: none"> Further review of groundwater impacts will be completed during Detail Design
	2.2 Erosion and Sedimentation	<ul style="list-style-type: none"> Sediment flow into surface drainage affecting water quality and drainage 	MTO, MNRF, LRCA	<ul style="list-style-type: none"> ESORA will be finalized during Detail Design with site specific erosion and sediment control measures, as required
	2.3 Management of Excess Material and Property Contamination	<ul style="list-style-type: none"> Excess materials may be encountered during construction and requires proper management/disposal Property contamination may be encountered during construction and require proper management/disposal 	MTO, MOECC, Municipality of Shuniah	<ul style="list-style-type: none"> Further investigations (Phase I/Phase II ESAs) will be completed during Detail Design where required
	2.4 Fisheries and Aquatic Habitat	<ul style="list-style-type: none"> New culverts or culvert extensions will be required at watercourse crossings. Channel alterations and/or partial realignments may be required to maintain proper flows through the ROW and new required structures Shoreline infilling at the unnamed beaver pond at Tributary to Pearl River 1 (Crossing 2) Construction activities at existing culverts within the ROW, including at crossing of the new preferred alignment, have the potential to affect fish and fish habitat 	MTO, DFO, MNRF	<ul style="list-style-type: none"> Impacts to fish and fish habitat will be confirmed during Detail Design once the design has advanced for each waterbody crossing
	2.5 Terrestrial	<ul style="list-style-type: none"> Encroachment into confirmed SWHs: Rare Vegetation Communities such as Intolerant Hardwood Swamp and Active Talus – low treed No other SAR or significant trees of concern are anticipated to be permanently impacted by the removals Loss and/or disruption to wildlife and/or wildlife habitat Potential harm or harassment of SCC and SAR and habitat Encroachment into candidate significant wildlife habitats such as Specialized Habitat for Wildlife Potential destruction of migratory/protected birds nests, eggs and young during construction 	MNRF, LRCA, Municipality of Shuniah	<ul style="list-style-type: none"> Appropriate protection/mitigation measures for potential impacts on migratory and protected birds will be developed during Detail Design.
	2.6 Loon Lake ANSI	<ul style="list-style-type: none"> Realignment of West Loon Road will sever ANSI formation 	MTO, MNRF	<ul style="list-style-type: none"> If possible for educational purposes, expose layers of the ANSI geological formation after planned rock cutting preserve rock samples.
3. Social Environment	3.1 McTavish Landfill Site	<ul style="list-style-type: none"> Two groundwater monitoring wells associated with the McTavish Landfill Site will be impacted by construction. Access to the McTavish Landfill will be impacted 	MTO, MOECC, Municipality of Shuniah	<ul style="list-style-type: none"> Options for decommissioning and reinstating the groundwater monitoring wells in a new location will be reviewed during Detail Design in consultation with MOECC and the Municipality of Shuniah Access to landfill will be provided from a realigned entrance to the existing highway
	3.2 Impacts to Picnic/Rest Area at Pearl	<ul style="list-style-type: none"> Access no longer available from Highway 11/17 	Municipality of Shuniah, local residents, travelling public	<ul style="list-style-type: none"> The plans for the picnic/rest area will be reviewed during Detail Design.

I.D. #	I.D. # Sub-Issues	Issue/Concerns/Potential Effects	Potentially Concerned Agencies	Proposed Mitigation
	3.3 Property Impacts	<ul style="list-style-type: none"> • New alignment of highway is closer to some residential uses potentially causing noise, air quality, visual impacts and safety issues • Property acquisition required at some widening locations, including full buy-out of four homes • Entrance impacts, including permanent closures 	MTO, MOECC, Municipality of Shuniah, local residents	<ul style="list-style-type: none"> • Impacts mitigated by maintaining setbacks from highway; vegetated buffers in key areas will be reviewed during Detail Design • MTO will negotiate with individual property owners to provide fair market value for the required property. Property negotiation and acquisition is anticipated to occur in Detail Design • Existing entrances will be reviewed in Detail Design from the perspective of safety, construction impacts and alternative access to ensure the existing location is appropriate
	3.4 Traffic Noise	<ul style="list-style-type: none"> • Due to shift in highway alignment in some areas, noise increases for some receptors; however, does not exceed the 5 dBA criteria 	MTO, MOECC, Municipality of Shuniah, local residents	<ul style="list-style-type: none"> • Potential noise mitigation is under review where sound levels greater than 65 dBA were predicted (one receptor) by 2030
	3.5 Construction Noise	<ul style="list-style-type: none"> • Temporary noise impacts during construction 	MTO, MOECC, Municipality of Shuniah, local residents	<ul style="list-style-type: none"> • Construction noise will be minimized by implementing construction best management practices and contractor compliance with local noise by-law • Complaints from construction will be investigated according to the provisions of the existing MTO noise guideline
4. Highway and Traffic Engineering	4.1 Long-term Traffic Impacts	<ul style="list-style-type: none"> • Traffic impacts in the community of Pearl include: <ul style="list-style-type: none"> ○ New intersection at Road No. 5 South and Highway 11/17, south of existing highway ○ Entrance impacts to MTO Maintenance Yard ○ Relocation of designated highway Picnic Area/rest stop in Pearl is required • In most cases, right-in/right-out only access will be maintained for existing properties along the highway 	MTO, Municipality of Shuniah/EMS, local residents, travelling public	<ul style="list-style-type: none"> • Property entrances in community of Pearl can be accessed from service road (existing Highway 11/17), including the MTO Maintenance Yard • No new entrances will be permitted on the new alignment
	4.2 Short-term Traffic Impacts	<ul style="list-style-type: none"> • Access disruptions and delays during construction 	MTO, Municipality of Shuniah/EMS, local residents, travelling public	<ul style="list-style-type: none"> • Traffic management and construction staging will be confirmed during Detail Design
	4.3 Emergency Services	<ul style="list-style-type: none"> • Potential emergency vehicle delays due to incidents on Highway 11/17 during construction • Impacts to emergency service response times are not anticipated with the proposed improvements 	MTO, Municipality of Shuniah, local residents, travelling public	<ul style="list-style-type: none"> • Mitigation measures to be developed in consultation with emergency service providers during Detail Design to maintain appropriate emergency response times
	4.4 Utilities	<ul style="list-style-type: none"> • Highway and municipal road improvements conflict with utilities 	HONI, Bell, TCPL	<ul style="list-style-type: none"> • Utility conflicts and relocation routes will be confirmed during Detail Design • Relocation of utilities will be coordinated with utilities during Detail Design
5. Drainage and Hydrology	5.1 Impacts on Culverts	<ul style="list-style-type: none"> • Four-laning improvements require a new Pearl River crossing east of Road No. 5 South • Existing non-structural pipe culverts will be maintained and/or extended 	MTO, MOECC, MNRF, LRCA, Municipality of Shuniah	<ul style="list-style-type: none"> • All culvert extensions/replacements and new culverts will be designed to meet MTO drainage design criteria and incorporate erosion and scour protection, and fisheries protection measures, where applicable • Culvert configuration and erosion protection requirements will be finalized during Detail Design • Consideration for the replacement of existing non-structural culverts will be based on the assessed age and physical condition of infrastructure during Detail Design
	5.2 Drainage/ Stormwater Management	<ul style="list-style-type: none"> • Addition of impervious surface (pavement) within ROW may alter pre-construction hydrologic characteristics for runoff peak flow rates, runoff volumes and quality 	MTO, MOECC, MNRF, LRCA, Municipality of Shuniah	<ul style="list-style-type: none"> • Stormwater quality and drainage management will be reviewed during Detail Design • Sediment control measures will be identified during Detail Design and further developed prior to/during construction