



Essa Township 5th Line Bridge Rehabilitation

Schedule 'C' Municipal Class Environmental Assessment
Public Information Centre No. 1

November 29, 2021



Introduction

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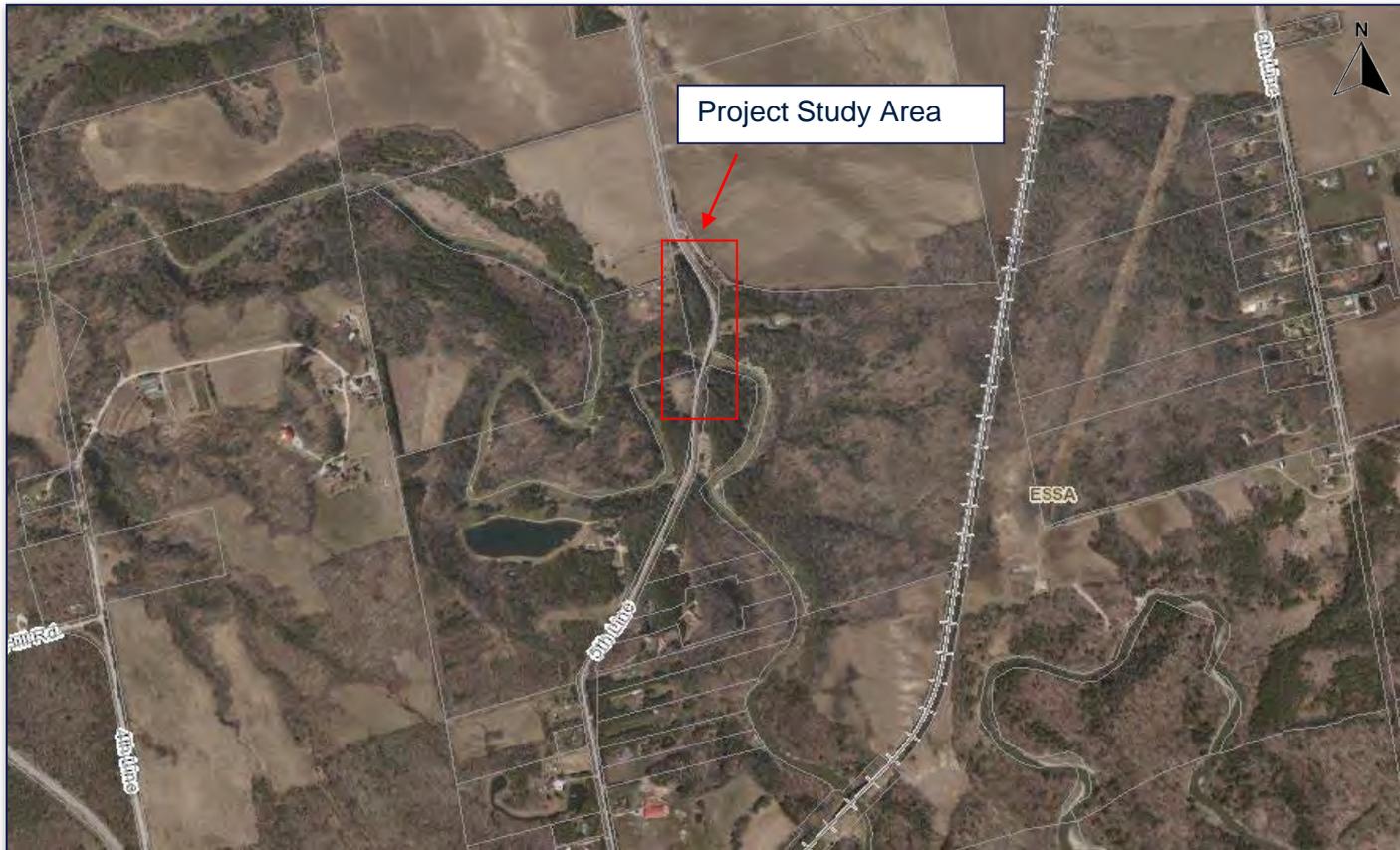


Agenda

1. Project Background and Study Area
2. The Municipal Class Environmental Assessment Process
3. Existing Conditions
4. Alternative Solutions Considered
5. Comment Period 1
6. Evaluation of Alternative Solutions
7. Next Steps
8. Comment Period 2

Study Area

- Bridge No. 9 is located on the 5th Line, north of 20th Sideroad and south of Sideroad 25.



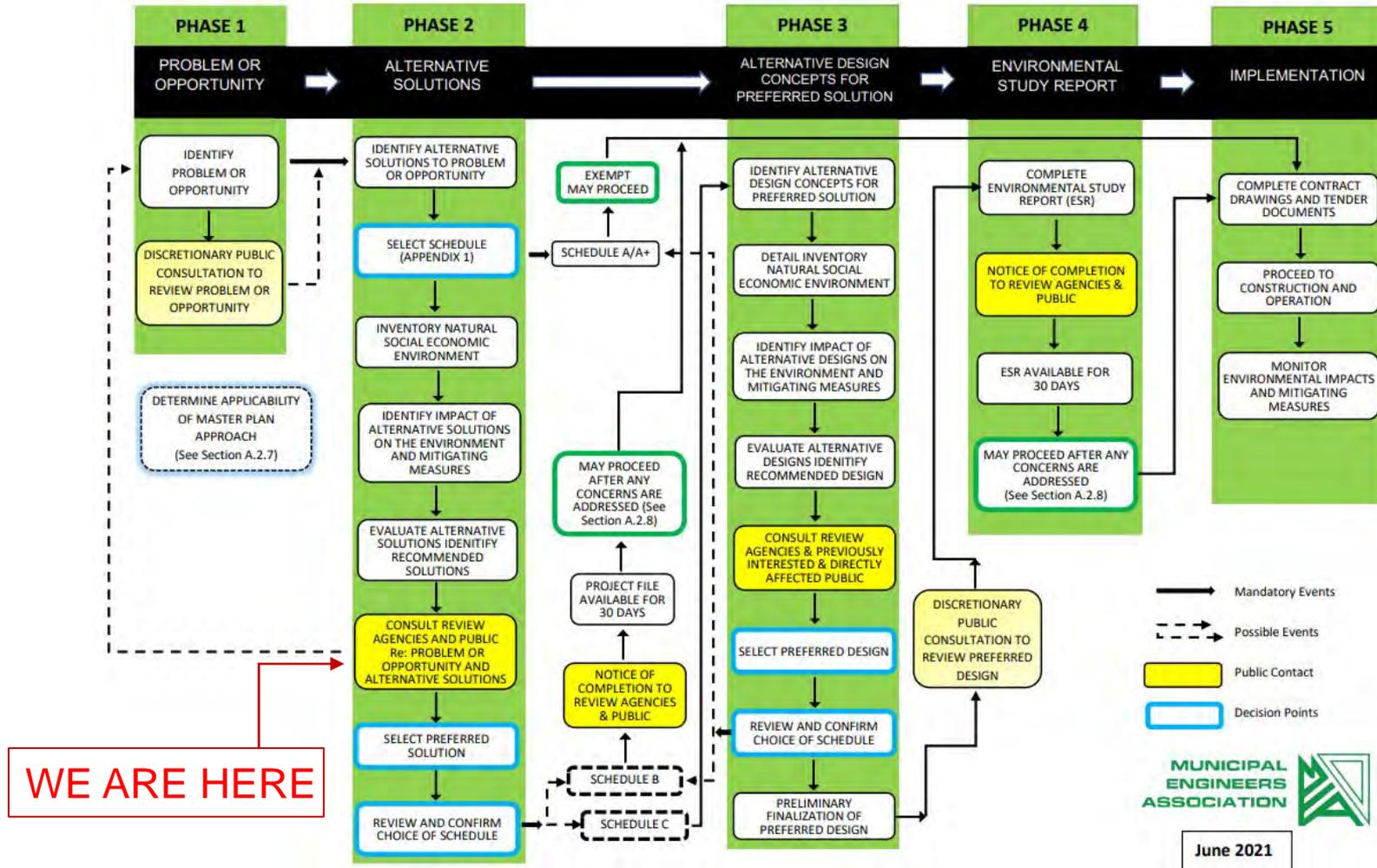
Project Background

- The Township of Essa has retained the services of the Ainley Group to undertake a Municipal Class Environmental Assessment (Class EA) to evaluate options that would address deficiencies associated with Bridge No. 9 on the 5th Line over the Nottawasaga River.
- Bridge No. 9 and the 5th Line provide a key transportation link between the communities of Angus, Baxter, and Alliston. The existing structure is estimated to have been constructed circa 1950, making it approximately 70 years old at the present time. The bridge currently operates as a single-lane structure, with sightlines on the southbound approach being below standard requirements for the posted speed limit.
- In 2019 an inspection of Bridge No. 9 was completed following the Ontario Structure Inspection Manual (OSIM), and again in September 2021. The investigations identified the need for immediate maintenance items and long term recommendation to replace the structure.
- Ongoing erosion and sediment deposition is creating a restriction in the Nottawasaga River at the Bridge No. 9 location resulting in ice and debris jams causing flooding.

Municipal Class EA Process

- A municipality is required to conduct a Municipal Class Environmental Assessment before this type of infrastructure improvement project can proceed to construction. A Municipal Class Environmental Assessment follows an approved planning process designed to protect the environment and to ensure compliance with the Environmental Assessment Act.
- The purpose of the Environmental Assessment Act (EA Act) is to provide for “...the betterment of the people of the whole or any part of Ontario by providing for the protection, conservation and wise management in Ontario of the environment.” The term “environment” is broadly defined and includes the built, natural, socio-economic and cultural environments.
- The process requires the evaluation of potential solutions and design concepts so as to select a suitable approach that will address the problem/opportunity, but also keep impacts to a minimum.
- This project is classified as a Schedule ‘C’ in accordance with the Municipal Class Environmental Assessment (Oct. 2000, as amended 2007, 2011 & 2015) and requires completion of Phases 1 to 4 of the process.

Municipal Class EA Process



Existing Conditions

Various field studies have been completed to determine existing environmental conditions as well as to identify any potential impacts the alternative solutions pose to the environment.

- Physical Environment

- The existing Bridge No. 9 is a two-span continuous concrete T-beam bridge with a concrete deck and a concrete wearing surface.
- The deck is supported on three concrete beams cast integral with the deck. The beams are supported on concrete abutments and a central pier constructed normal to the road alignment.
- The structure is 52m long, with only a 6.1m wide platform between barriers. As a result, it currently operates as a single-lane structure, rendering it functionally deficient for the volume of traffic it services.
- The southbound roadway approach is quite steep and on a curve, so the sightlines do not meet the standard requirements for the posted speed limit.



Bridge No. 9 West Elevation View (2019)



5th Line Approach South of Bridge No. 9 (2019)

Existing Conditions

- Natural Environment

- Habitat-based biological assessments indicate that the study area provides potential and confirmed habitat for a variety of wildlife including endangered and threatened species. The Nottawasaga River represents direct habitat for a diverse range of fish species.
- The topography of the study area is generally steep, with the valley walls directly adjacent to the river being the steepest. One or more small drainage features within the study area drain run-off and groundwater seepage down these slopes toward the main river channel.
- A portion of the study area is designated as an Area of Natural and Scientific Interest (ANSI) by the Ministry of Northern Development, Mines, Natural Resources and Forestry. The ANSI designation associated with the study area represents a composite of various other significant natural heritage features and functions. The ANSI is recognized due to the unique attributes of the Nottawasaga River valley, including its forested slopes, natural linkage functions, unique wildlife habitats, and prominent groundwater emergence zone.

Existing Conditions

- Natural Environment (continued)
 - The pier slows the velocity of the water on the downstream side of the pier creating an area of deposition. This deposition has continued to accumulate over time creating a sizeable formation in the river, as the island extends for more than 55 m downstream from the bridge pier.
 - The quantity of woody debris in the channel leads to the conclusion that the river is actively eroding the riverbanks. Erosion is occurring at the toe of this slope, particularly on the downstream side of the river. On the other side of the road an exposed, unvegetated slope is also a concern. The other location is just downstream of the bridge where the slope has partially failed already.
 - Logjams are common at this location and are an erosion concern while also increasing the potential for upstream flooding.



Downstream of Bridge, June 2021 Riverstone Environmental



Extent of large log-jam, June 2021 Riverstone Environmental

Existing Conditions

- Cultural Environment

- The Nottawasaga River's main branch bisects the study area and therefore contributes to establishing archaeological potential.
- However, it must be noted that post-1950 developments have artificially altered much of the area surrounding the 5th Line road alignment and river crossing.
- Bridge No. 9 is typical of its construction time period and has some unique features such as a concrete open railing system. However, a cultural heritage assessment was completed and the structure was not deemed to have any cultural heritage value.

- Social and Economic Environment

- Under the Township of Essa's Official Plan, the land use for much of the study area is officially categorized as "Environmental – Significant Areas," except for a small segment in the north end, which is "Agricultural" (Township of Essa, 2003).
- Bridge No. 9 and the 5th Line provide a key transportation link between the communities of Angus, Baxter, and Alliston.
- Portions of the Nottawasaga River are a navigable waterway and used for recreational purposes such as kayaking, canoeing, and angling.

Alternative Solutions

As part of Phase 2 of the Class EA process, several alternative solutions have been developed to address the deficiencies identified with Bridge No. 9.

- ***Option 1 - “Do Nothing”***

The “Do-Nothing” option considers no improvements and/or modifications. This alternative does not address the problem/opportunity and is provided as a benchmark to gauge the potential impacts of the other options being considered.

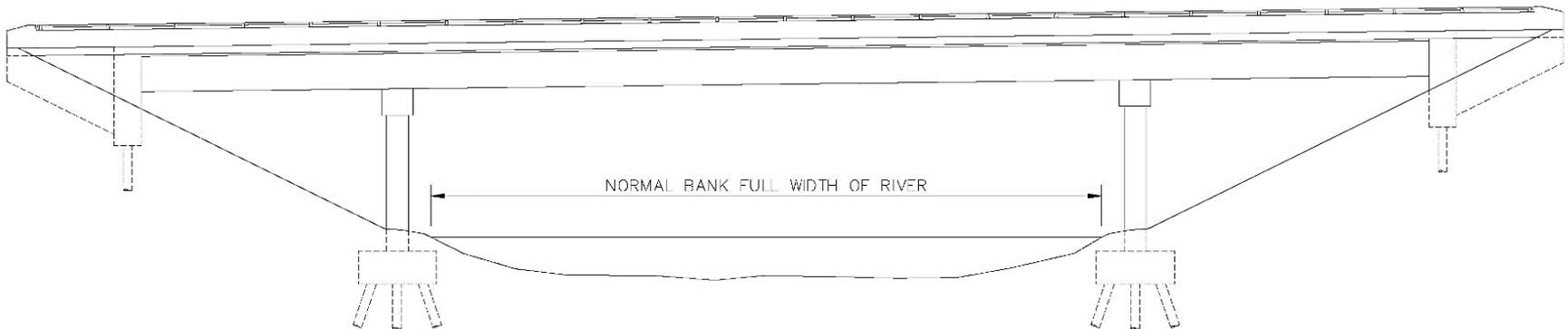
- ***Option 2 - Rehabilitate Existing Bridge***

This option involves rehabilitating the existing bridge structure in its current location. Some limited additional deck width could be achieved; however, due to the substructure design, it will not be possible to obtain two-lanes that meet current minimum design standards. As part of the rehabilitation, the existing barrier system and approach guiderail would be replaced to meet the requirements of the Roadside Design Manual (RDM). In addition, slope flattening and tree clearing within the road right-of way approaching the bridge (approximately 30m) in each direction would be completed to the extent possible in order to improve the sightlines.

Alternative Solutions

- ***Option 3 - Replace Bridge Structure in Current Location to Accommodate Two Lanes of Traffic***

This option involves replacing the bridge structure in its existing location. The new bridge would be of sufficient width to support two lanes of traffic and would meet all requirements of Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads, Canadian Highway Bridge Design Code (CHBDC) and RDM. The replacement would provide an opportunity to adjust the road profile and bridge elevation to improve the overall vertical alignment. The central pier would be eliminated and the new bridge would be three spans with piers set outside the bankful width. Erosion protection measures along the banks would also be reviewed along with removal of sediment deposition from the river to restore channel flow. In addition, slope flattening and vegetation removal would be considered to improve sightlines. (Drawing for illustration purposes only)



Alternative Solutions



- ***Option 4 - Replace Bridge on New Road Alignment to the West***
 - The existing bridge structure would be demolished and a new bridge constructed west of the existing location, remaining within the ROW. The new bridge would be of sufficient width to support two lanes of traffic and would meet all requirements of Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads, Canadian Highway Bridge Design Code (CHBDC) and RDM. As part of this option the road alignment on the 5th Line approaching the bridge from both directions (north and south) would be adjusted to 'straighten' the curves in the road.
 - Erosion protection measures along the banks would also be reviewed along with removal of sediment deposition from the river to restore channel flow.

Comment Period 1

Evaluation of Alternative Solutions

- Each of the alternatives were evaluated based on their potential impact to the study area environment (physical, natural, cultural, and socio-economic).
- The evaluation is presented in a table or matrix to provide a simplified, visual comparison.

Legend:

Positive	Positive Neutral	Neutral	Negative Neutral	Negative
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- Green represents the most preferred option, as it will address the key concerns, but create the least amount of environmental impact.
- Red is indicative of a least preferred option as it has a higher potential to impact the environment.
- A blank space indicates that the impact is considered neutral

Evaluation of Alternative Solutions

EVALUATION CRITERIA	OPT 1	OPT 2	OPT 3	OPT 4	DESCRIPTION OF IMPACTS
PHYSICAL ENVIRONMENT					
Addresses Structural Deficiencies	Red	Green	Green	Green	The existing structure has numerous structural deficiencies and Option 1 would do nothing to address this. Options 2, 3, and 4 could address all structural deficiencies.
Addresses Functional Deficiencies	Red	Orange	Green	Green	The existing structure is functionally deficient due to its limited width, vertical/horizontal alignment, and limited sightlines on each approach. Option 1 would do nothing to address this. Option 2 would provide minimal improvement. Options 3 and 4 would provide opportunity to address these functional deficiencies.
Impacts to Existing Utilities	Green	Orange	Orange	Red	There is existing aerial hydro and telecommunications along the corridor. There is also an existing sanitary forcemain on the bridge structure. Option 1 would have no impact on these utilities. Options 2 and 3 would only impact the sanitary forcemain during bridge construction works. Option 4 may require relocation of the hydro/telecommunications and would impact the sanitary forcemain.
NATURAL ENVIRONMENT					
Scientific Natural Heritage Features	White	Orange	Orange	Red	Options 2 and 3 would not be expected to adversely impact features and functions associated with the ANSI, as the valley landform would not require alteration. Temporary impacts may include construction disturbance to various wildlife habitat functions associated with the ANSI. Option 4 would require substantial grading of valley slopes and removal of forested cover within the ANSI, resulting in both permanent and long-term impacts at a site level.
Terrestrial Vegetation/Wildlife (Including SAR)	White	White	White	Red	Option 2 and 3 would not be expected to require substantial removals of trees within the ROW. Option 4 results in more substantial removal of forest cover. There is potential to impact SAR.
Fish Habitat (Including SAR)	Light Green	Orange	Orange	Orange	Options 2-4 have the potential to adversely impact fish habitat by creating obstruction within the channel, removing important cover, or releasing sediment and or/pollutants into the river. From an aquatic habitat perspective the current log jam is beneficial fish habitat.
River System and Bank Stability	Red	Orange	Green	Green	The existing bridge pier is causing the formation of the island, major logjams, and erosion along the upstream and downstream banks. Option 2 would not remove the central pier, however some bank protection measures could be explored. Option 3 and 4 design structure would eliminate the central pier and could include bank protection adjacent to the existing abutments to prevent scouring in the future.
Surface Water	White	Orange	Orange	Red	Options 2 and 3 may result in temporary construction disturbance to a small drainage feature conveying runoff. Option 4 would likely require re-alignment of this feature within the ROW. Removal of tree cover would result in decreased shading, and potentially increase water temperature prior to the feature entering the main river channel.

Evaluation of Alternative Solutions

EVALUATION CRITERIA	OPT 1	OPT 2	OPT 3	OPT 4	DESCRIPTION OF EFFECTS
NATURAL ENVIRONMENT					
Ground Water					Multiple small seeps were identified within the northeastern portion of the study area. Option 2 and 3 would not be expected to alter any factors influencing the presence of seeps within the study area. Option 4 proposes the road re-alignment toward the west, away from the identified seepage zone. Provided that no grading is proposed east of the existing 5 th Line alignment, no impacts to the seepage zone are expected under Options 2-4.
SOCIAL ENVIRONMENT					
Noise					Options 2, 3 and 4 would have temporary noise disturbances due to construction activity. There are 6 residential dwellings within the study area.
Archaeological					Parts of the study area have low or no longer retain archaeological potential due to steeply sloping terrain, permanently wet conditions or previous disturbance, portions in the north end will still require Stage 2 Investigation.
Cultural and Built Heritage					Bridge No. 9 was not determined to retain cultural heritage value following application of Regulation 9/06 of the Ontario Heritage Act.
Property Impacts					Option 2 and 3 may potentially result in minor property impacts due to vegetation clearing along the roadside. Option 4 would have property impacts associated with the new road alignment and property entrances.
Recreational Use					With Option 1 and 2 the formation of log jams will continue to occur, causing obstructions for recreational uses. The configuration of the new structures proposed under Option 3 and 4 would reduce the formation of log jams and provide open waterway for recreational uses.
ECONOMIC ENVIRONMENT					
Construction Costs					There is no construction cost associated with Option1. Construction costs under Option 2 and 3 could be considered comparable, whereas construction costs associated with Option 4 are estimated to be considerably higher.
Operating/Maintenance Costs					Maintenance of current structure will increase as the structure is over 70 years old. Option 1 has the highest cost due to the need for regular log jam removal and potential structure maintenance. Option 2 will similarly have ongoing maintenance for log jam removal. Options 3 and 4 should require less maintenance due to their revised configuration and new construction.

Preliminary Preferred Solution

- ***Option 3 - Replace Bridge Structure in Current Location to Accommodate Two Lanes of Traffic***

Given the results of the preliminary evaluation, it is recommended that Option 3 be selected as the Recommended Solution.

Next Steps

- All PIC material will be available on the Township of Essa's website at <https://www.essatownship.on.ca/government/publicnotices>
- The Project Team will receive comments for consideration until **December 13, 2021**. The project team will then select the Preferred Solution and the project will move into Phase 3 of the Class EA process.
- During Phase 3, alternative design concepts for the Preferred Solution will be identified and evaluated.
- A second Public Information Centre will be scheduled at a future date to present the alternative design concepts developed to implement the Preferred Solution.
- Advanced notification of the second Public Information Centre will be provided.

Comments

- We invite you to provide any comments in writing via email.
- All comments are to be submitted by **December 13, 2021** to one of the following members of the Project Team:

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Thank you for your attendance at this meeting!
We appreciate your participation.

MUNICIPAL FREEDOM OF INFORMATION & PROTECTION OF PRIVACY ACT

Comments and information regarding this project are being collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act for the purpose of meeting environmental assessment requirements. With the exception of personal information, all comments received will become part of the public record.