

Township of Essa | 5th Line Bridge (No. 9) Improvements

Schedule 'C' Municipal Class Environmental Assessment

Public Information Centre No. 2



Introductions

Tammy Kalimootoo, P. Eng., PMP Vice-President & Branch Manager

- Presenter
- Consultation Lead
- 21+ years of Experience



- Project Manager
- Technical Lead
- 28+ years of Experience





Township of Essa staff and members of Council are also in attendance.

Welcome

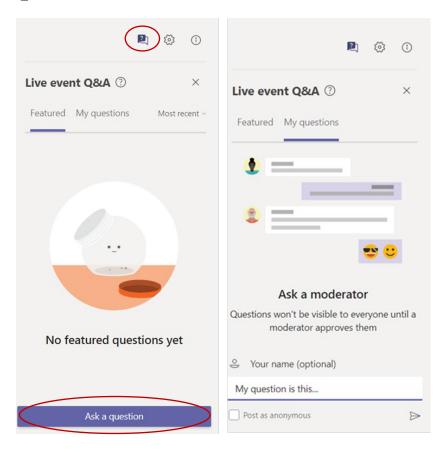
Thank you for your attendance and interest in this Municipal Class Environmental Assessment!

A few items to note:

- This presentation is being recorded.
- The presentation material, including the recording, will be made available after this event on the Township's website.
- There may be a 20-30 second video delay, so please be patient.

Your Input is Appreciated

- Cameras and microphones are deactivated, so the Presenter(s) cannot see or hear you.
- We invite you to provide questions or comments during the presentation.
- Look for the "?" icon.
- Select "Ask a Question".
- Type your name and question and hit send.
- The team will gather questions and will respond at the end of the presentation.



MUNICIPAL FREEDOM OF INFORMATION & PROTECTION OF PRIVACY ACT

Comments and information regarding this project are being collected for the purpose of meeting Environmental Assessment Act requirements, which includes the creation of a record that is available to the general public as described in the Municipal Freedom of Information and Protection of Privacy Act. Please note that all personal information included in a submission – such as name, address, telephone number and property location – will be collected, maintained, and may be disclosed for the purpose of transparency and consultation unless a request is made that personal information remain confidential.

Agenda

- 1. Study Area and Project Background
- 2. The Municipal Class Environmental Assessment Process
- 3. Preferred Solution
- 4. Alternative Design Concepts Considered
- 5. Evaluation of Alternative Design Concepts
- 6. Next Steps
- 7. Question & Comment Period

Study Area

- Bridge No. 9 is located in the Township of Essa, on the 5th Line, between the communities of Angus and Baxter.
- The 5th Line is a twolane collector road with an AADT of approximately 1,150 (2017).
- The bridge spans the Nottawasaga River, between 20th Sideroad and 25th Sideroad.



*Source: Google Maps



Study Area

- The bridge is located in a large meander of the river and within a deep valley.
- A large portion of the surrounding lands are considered to be an Area of Natural and Scientific Interest (ANSI).
- The study area, including the woodlands, valleylands, and the river provide potential habitat for a variety of wildlife and fish species, including endangered and threatened species.



*Source: Google Maps



Project Background

The existing structure is a two-span continuous concrete parabolic T-beam bridge with a concrete deck and a concrete wearing surface. It is estimated to have been constructed around 1950, making it over 70 years old.



Bridge No. 9 West Elevation View

Project Background

■ The travelled portion of the bridge is only 6.1 m wide, so it currently operates as a single-lane structure, with substandard sightlines on the approaches.



Project Background

 Ongoing erosion and sediment deposition is creating a restriction in the Nottawasaga River at the bridge location resulting in ice and debris jams causing flooding.



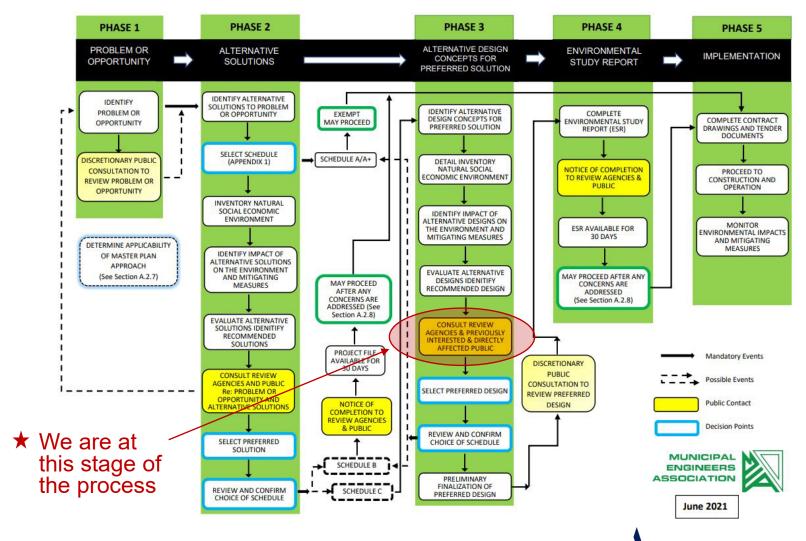
Large log-jam

- Recent inspections of Bridge No. 9 were completed, following the Ontario Structure Inspection Manual (OSIM), and identified maintenance needs as well as the need to replace the structure in the 6-10 year timeframe.
- The Township initiated a Municipal Class Environmental Assessment (Class EA) to examine potential improvements.

Municipal Class EA Process

- A municipality is required to conduct a Municipal Class EA before this type of infrastructure improvement project can proceed to construction. A Municipal Class EA 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 physical/built, natural, socio-economic and cultural environments.
- The process requires the identification and evaluation of potential solutions and design concepts in order to arrive at a suitable option that will address the problem/opportunity, but also keep environmental impacts to a minimum.
- This project is classified as a Schedule 'C' in accordance with the Municipal Class Environmental Assessment (last amended in 2023) and requires completion of Phases 1 to 4 of the process.

Municipal Class EA Process



Preferred Solution

- A Public Information Centre (PIC) was previously held during Phase 2 of the process in November of 2021.
- The alternative solutions considered included:
 - Option 1 Do Nothing
 - Option 2 Rehabilitate Existing Bridge
 - Option 3 Replace Bridge Structure in Current Location to Accommodate Two Lanes of Traffic
 - Option 4 Replace Bridge on New Road Alignment to the West
- After evaluation and consultation with various stakeholders and the public, Option 3 was selected as the Preferred Solution.

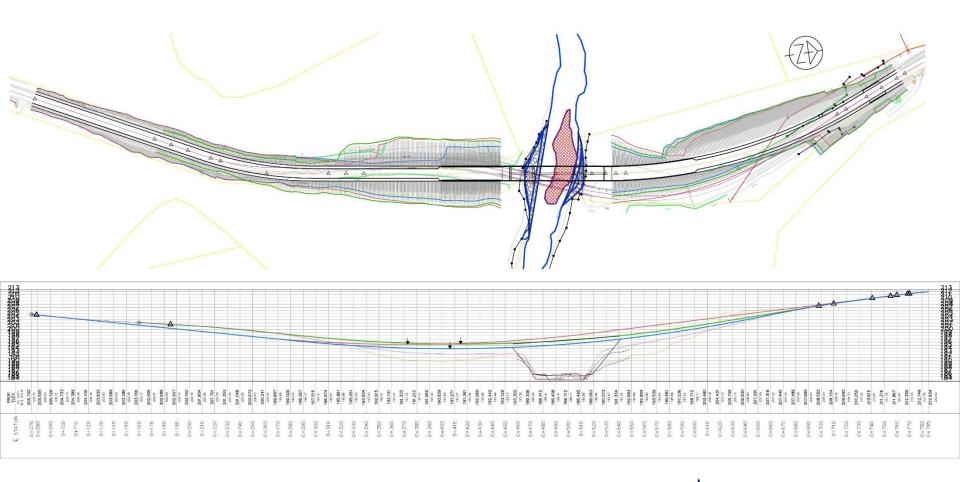
Alternative Design Concepts

- With the Preferred Solution established, a number of alternative design concepts have now been developed. The design concepts focus on addressing two critical factors: the vertical alignment of the road and the configuration of the bridge structure.
- Alternative Designs for Vertical Road Alignment:
 - Option 1 Lowest Vertical Alignment (Increase of +/- 2.2 m)
 - Option 2 Highest Vertical Alignment (Increase of +/- 4.7 m)
 - Option 3 Mid-Height Vertical Alignment (Increase of +/- 3.4 m)

*It should be noted that all options have a consistent horizontal road alignment and meet the minimum k value to provide the required sight distance.



Vertical Alignment Options



- Each of the alternatives were evaluated based on their potential impact to the study area environment (physical, natural, social, and economic).
- The evaluation is presented in a table or matrix to provide a simplified, visual comparison.
- Colours were used to depict the impacts
 - Green represents the most preferred option as it will create the least amount or positive impact.
 - Red is indicative of a least preferred option as it has a higher potential to have a negative impact.
 - A blank space indicates that the impact is considered neutral.

Least Preferred	Negative Neutral	Neutral	Positive Neutral	Most Preferred
LP	NN	N	PN	MP

Evaluation Criteria	Option 1	Option 2	Option 3	Description of Impacts
Physical Environm	ent			
Horizontal & Vertical Alignment Design Criteria	MP	МР	МР	Horizontal alignment is consistent for all options. All three options satisfy design and safety requirements.
Impacts to Existing Utilities and Infrastructure	NN	NN	NN	All three options will require relocation of both Bell and Hydro. The relocation of the utilities may provide an opportunity to implement upgrades to these systems, which may also benefit the general public in the area.
Design & Constructability	NN	LP	NN	 Option 1 requires slightly more road work (710 m) than Options 2 & 3 (625 m). It would require the least amount of imported fill as it has the lowest raise in grade at the location of the bridge and the least limits of disturbance. Option 2 requires the most amount of imported fill material and raises the elevation of the bridge a considerable amount (approximately 2.5 m more than Option 1), requiring taller pier construction and the potential for more down drag, impacting the bridge foundation design. It has the greatest limits of disturbance and it also moves the low point in the road further from the bridge requiring more curb and gutter for stormwater control. Option 3 follows the existing road profile as closely as possible south of the bridge and ties into existing sooner than the other options to the north. As a result, it require the least amount of excavation. However, it does raise the elevation of the bridge (approximately 1.2 m more than Option 1). It moves the low point in the road closer to the bridge requiring less curb and gutter construction for stormwater control.

Evaluation Criteria	Option	Option	Option	Description of Impacts
Natural Environme	•	2	3	
Areas of Natural and Scientific Interest	NN	LP	NN	All options will require tree clearing and grubbing north and south of the bridge, which will impact the feature. Minimizing the impact as well as mitigating the impact through restoration and naturalization will be needed. Option 1 provides the least impact in that it has the least area of disturbance whereas Option 2 has the largest area of disturbance and the most impact on tree clearing.
Terrestrial Vegetation/Wildlife (Including SAR)	NN	LP	NN	Similar to the ANSI, all options will require tree clearing and grubbing north and south of the bridge; however, trees and shrubs will be planted as part of the restoration. Option 1 provides the least impact as it has the least disturbance and the least amount of imported fill. Option 2 has the largest limit of disturbance and the most impact on tree clearing. A single butternut tree was found to the south of the bridge. All options may impact this tree and further analysis and mitigation will be required during detailed design.
Fish Habitat (Including SAR)	N	N	N	All options will require in-water work to remove the existing "island" of sediment that has formed south of the existing pier, which will cause a temporary, short-term impact. However, removal of the sediment also provides an opportunity for reconstruction of the channel bed and to provide improved habitat that will be to the ultimate benefit of fish and the watercourse in general. Removal of trees will reduce shading temporarily until restoration and naturalization is achieved.
River System and Bank Stability	NN	LP	NN	All options will require slope stabilization near the proposed abutments as well as armouring to minimize future erosion and scour. However, the more the road elevation is increased, the more slope stabilization and limits of disturbance will be required. Therefore, Option 1 has the least amount of impact with Option 2 having the most impact.
Surface Water	N	N	N	All of the options will be directing surface water from the road. All options will result in temporary construction disturbance to a small drainage feature conveying runoff. However, surface water will be controlled during construction operations and proper sediment control measures will be in place to ensure no foreign materials or contamination will enter the watercourse.
Ground Water	N	N	N	Multiple small seeps were identified within the northeastern portion of the study area. No grading is proposed east of the existing 5th Line alignment (north of the existing bridge) and therefore no impacts to the seepage zone are expected under any of the options.
Climate Change	N	N	N	All three options provide an alignment that allows for the smooth flow of traffic without the need for stopping to allow other users to pass (i.e. in the current single-lane configuration); thereby, nominally reducing emissions. All options will require tree clearing and grubbing north and south of the bridge; however, trees and shrubs will be planted as part of the restoration works. Although Option 1 requires a slightly longer length of road construction, it offers a better cut/fill balance with the least amount of imported fill for construction.

Evaluation Criteria	Option 1	Optior 2	Option 3	Description of Impacts
Cultural And Socia	Enviro	nment		
Noise	NN	NN	NN	All options will have similar temporary noise impacts from construction operations.
Archaeological	N	N	N	Based on the previous findings, parts of the study area have low or no longer retain archaeological potential due to steeply sloping terrain, permanently wet <u>conditions</u> or previous disturbance. Only small portions in the north end will require Stage 2 Archaeological Assessment. Each of the alignment options do not interfere with the previously indicated areas that would require a stage 2 archaeological assessment; therefore, there are no archaeological concerns.
Cultural and Built Heritage	N	N	N	There are <u>no</u> previously identified cultural and built heritage resources located within the vicinity of the work.
Property Impacts	NN	LP	NN	Each option will require property acquisition and may impact existing driveways. Option 1 will require the least amount of property acquisition and Option 2 requires the most property acquisition, with Option 3 being in the middle.
Recreational Use	PN	PN	PN	Each option will allow for a bridge to be constructed to meet the minimum navigational opening requirements for the Nottawasaga River. Removal of the existing "island" of sediment will improve the recreational use of the Nottawasaga River at this location. There may be temporary impacts to navigation during construction.
Construction Timing/Travel Delays/Detours	N	LP	NN	All three alignment options will require lengthy construction period and some road closures/detours. The lower the road elevation, the less time and materials required to complete the bridge construction; therefore, decreasing the overall time required to close the road and provide a detour, making Option 1 more attractive. Option 1 also has the least requirement for importing material as the cut and fill to the south of the bridge is nearly balanced and would only require moving material from one spot to another on site.

Evaluation Criteria	Optio 1	n Optio	n Option 3	Description of Impacts
Economic Environmen	nt			
Construction Costs	N	LP	NN	Each of the options will require considerable construction costs, with Option 1 being the least costly, Option 3 being the next, and Option 2 being the most expensive.
Operating/Maintenance Costs	N	LP	NN	Operation and maintenance costs will be reduced with all options. Option 1, having the lowest road elevation, may be less prone to side slope maintenance. Further, Option 1 has the least surface area, so the potential future maintenance and replacement costs may be lower.
Property Acquisition Costs	N	LP	NN	Option 2 requires the most amount of property, making it the most expensive. Option 1 requires the least amount of property and Option 3 is in the middle.

Vertical Alignment | Preferred

Based on the evaluation completed, Option 1 (lowest vertical road alignment) was selected as the Preferred Design Option as it:

- Meets the TAC, MTO, and CHDBC requirements;
- Has the smallest limit of disturbance, thereby reducing the required tree clearing and property impacts; and
- Has the lowest road construction costs.

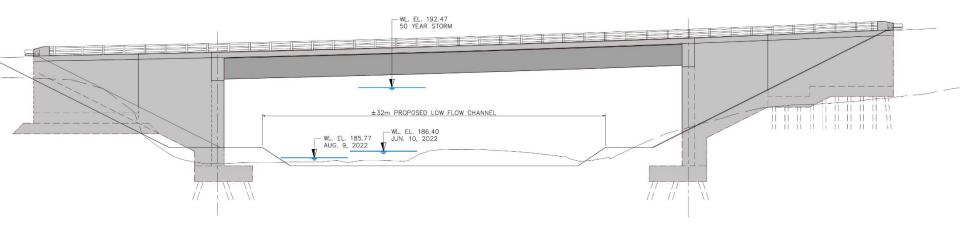
Alternative Design Concepts

Alternative Designs for Structure Configuration:

- Option A Single Span Structure
- Option B Two-Span Structure
- Option C Three-Span Structure

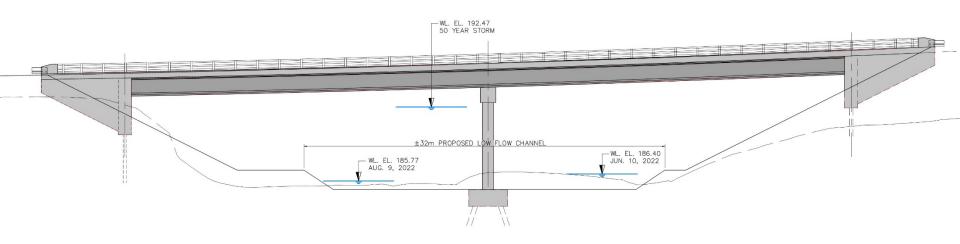
Structure Configuration | Option A

Single Span Structure



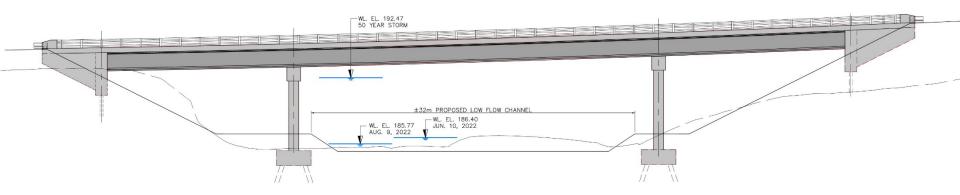
Structure Configuration | Option B

Two-Span Structure



Structure Configuration | Option C

Three-Span Structure



Evaluation Criteria

- Once again, each alternative was evaluated based on their potential impact to the study area environment (physical, natural, cultural, and socio-economic).
- Colours were again used to depict the impacts
 - Green represents the most preferred option as it will create the least amount or positive impact.
 - Red is indicative of a least preferred option as it has a higher potential to have a negative impact.
 - A blank space indicates that the impact is considered neutral.

Least Preferred	Negative Neutral	Neutral	Positive Neutral	Most Preferred
LP	NN	N	PN	MP

 Any criteria not applicable to the alternatives was generally considered neutral or not considered at all.

Structure Configuration Evaluation

Evaluation Criteria	Option A	Option B	Option C	Description of Impacts	
Physical Environment					
Design & Constructability	LP	NN	NN	Option A: with the longest single span, will require the largest girders and largest equipment for installation. The total number of piles under the abutments and retaining wall is the highest of all options. All options will require cofferdams and each have their own unique complexities with comparable levels of difficulty.	
Hydraulic Analysis	MP	MP	MP	All three options are able to convey the 50-year design storm while providing the required freeboard.	
Natural Environment					
Fish Habitat (Including SAR)	N	LP	N	Option B will have the pier built in the middle of the river, which will result in disturbance in the riverbed. This option also leads to the possibility of a sediment island and ice/log jams forming in the future as it is the same configuration as the existing structure. Option A & C will have the abutments and piers built on the riverbank, outside the bankful width rather than in the water, which will minimize impacts.	
River System and Bank Stability	PN	NN	MP	Option A & C, having the central pier eliminated and the new bridge abutments and piers set outside the <u>bankful</u> width as well as added scour and erosion protection measures along with removal of sediment deposition from the river to restore channel flow will increase the stability of the river system and riverbank. Option C, with additional spans on each end will provide larger flow area for the flood season. Additional mitigation features can also be added to the piers to assist with breakup of ice and logs. Option B, the same configuration as the existing bridge with the pier in the river, slows the velocity of the water on the downstream side of the pier creating an area of deposition. This deposition will continue to accumulate over time, leading to sediment island and log jams.	
Climate Change	NN	NN	PN	Options B & C will provide a larger flow area for major flooding events and will better allow for passing of more intense storms as a result of climate change. Option B, having the same configuration as existing poses a challenge for future sediment deposition and ice/log jams. Additional mitigation features can be added to the piers to assist with breakup of ice and logs. However, with Option C, having the piers set back from the normal water level is preferred.	

Structure Configuration Evaluation

Evaluation Criteria	Option A	Option B	Option C	Description of Impacts		
Cultural And Social En	nvironn	nent				
Noise	LP	NN	NN	Noise impacts will be temporary during construction. It is anticipated that the major source of construction noise will be from pile driving. Option A has the highest number of piles and will require the longest pile driving time. Option B has the least number of piles, with Option C in the middle.		
Recreational Use	MP	NN	MP	With Option B, there would be a pier in the middle of the channel and the potential for formation of sediment islands and log jams over time, causing obstructions and reduced water depths for recreational uses. Option A and C would provide an open waterway for recreational use.		
Economic Environmen	Economic Environment					
Construction Costs	LP	NN	NN	Construction costs under Option B are considered to be the lowest, with Option C being approx. \$0.6M more. Whereas construction costs associated with Option A are estimated to be considerably higher (+/-\$1.5 to 2M more).		
Operating/Maintenance Costs	PN	NN	PN	All options will reduce the operations and maintenance costs to the Township as the bridge will be new. Option C is anticipated to have the least operations and maintenance costs due to the integral abutment configuration. Over time, Option B is anticipated to have ongoing operations and maintenance cost for sediment and ice/log jam removal.		

Structure Configuration

Based on the evaluation completed, Option C (three-span structure) was selected as the Preferred Design Option as it:

- Eliminates the central pier and the potential for future issues with sediment deposition as well as ice/log jams;
- Provides a more open waterway for recreational use;
- Provides a larger flow area for major flooding events such as the regional event as well as future climate change impacts;
- Provides for smaller girders, making installation easier; and
- Has a lower construction cost compared to Option A.

Preliminary Preferred Design

- After evaluation, the selected Preferred Design Option is 1C, comprised of the lowest vertical road alignment and a three-span structure configuration.
- This is considered to be the <u>Preliminary</u> Preferred Design Option. The choice will be reviewed again following the receipt and consideration of comments and input from the agencies, First Nations, interested stakeholders, and the public.

Potential Impacts & Mitigation

Environment	Potential Impact or Concern	Mitigation or Future Commitment
General	Engagement and Consultation	 Continued coordination and engagement during design and construction with: Adjacent property owners regarding project schedule, property acquisition/grading easements, restoration. Indigenous communities, particularly in conjunction with the completion of any further archaeological assessments and field work. Utility service providers regarding relocation requirements. County of Simcoe, emergency services, and school boards.
	Permits and Approvals	 Consultation and securing of permits and approvals with the following agencies, as required, during detailed design and construction: Transport Canada (Navigation), DFO, MNRF, MECP, NVCA, Township of Essa (Road Occupancy)
	Monitoring	 Monitoring during construction and post-construction to ensure the project is constructed in accordance with the approved design and permits/approvals and that the environmental mitigation and effects are as anticipated.
Physical	Final Alignments and Grading	 The horizontal and vertical alignments will be fine tuned, as necessary, during detailed design. The extent of grading and limits of disturbance (and associated property acquisition) should be minimized during detailed design as much as possible.
	Hydraulics	 The final design must convey the 50-year storm event as a minimum. The hydraulic analysis will be updated to reflect the final design and for the purposes of obtaining permitting/approvals.
	Construction Staging and Traffic Management	 Construction staging and traffic management plans will be prepared during design and construction to ensure efficient operations and the safety of road users.
	Geotechnical Investigation and Management of Excess Soils	 A geotechnical investigation will be completed to assess existing soil conditions and support the foundation design for the replacement structure. Opportunities to place excess soil on the approach embankment side slopes to avoid transporting excess soil off site will be explored during detailed design. Management of excess soil will be completed in accordance with O. Reg. 406/19 and the MECP's document entitled "Rules for Soil Management and Excess Soil Quality Standards". All required investigations, analysis, planning, and reporting to meet the regulations will be completed.
	Utilities	 Coordination with Hydro and telecommunications will be completed during detailed design to ensure relocation of existing utilities to a location suitable for the proposed bridge replacement work.

Potential Impacts & Mitigation

Environment	Potential Impact or Concern	Mitigation or Future Commitment
Natural	Vegetation and Terrestrial Wildlife	 Limits of disturbance will be minimized to the extent possible, which will also minimize tree cutting. Tree preservation fencing may be incorporated into the design to ensure limits are adhered to. Tree cutting will be completed outside of the migratory birds and bat roosting windows. Netting of the existing bridge will be reviewed the ensure that nests are not developed on the bridge prior to demolition. Restoration/naturalization plans will be prepared and included as part of the design and construction of the project. Additional investigation will be completed to confirm that no significant bat roosting habitat is present. If found, mitigation such as bat roosting boxes may be incorporated into the design.
	Fish and Fish Habitat	 In-water works will only be completed during the permissible timing windows. Restoration plans will be prepared and implemented to improve fish habitat in consultation with DFO.
	Species at Risk	 Potential impacts to the single butternut tree will be reviewed as detailed design progresses. Additional investigations including a genetic assessment and/or a Butternut Health Assessment may be required. Pending the outcome, further mitigation, compensation, and authorizations may be required.
	Groundwater, Surface Water, and Source Water Protection	 Environmental protection plans will be prepared during design and construction to minimize risk from activities such as spills, bridge demolition, etc. Activities, including the maintenance of construction machinery, will be controlled to prevent the entry of petroleum products, debris, rubble, concrete or other deleterious substances into the natural environment. To minimize the potential for erosion and off-site transport of sediment into surface water features and the natural environment, the ESC design will be completed to meet NVCA guidelines and standards. At a minimum, ESC fencing will be installed along the limits of the construction area prior to the commencement of construction.

Potential Impacts & Mitigation

Environment	Potential Impact or Concern	Mitigation or Future Commitment		
Cultural and Social	Air Quality	 Impacts of construction activities on air quality are expected to be temporary in nature and will be mitigated through best practices. 		
	Climate Change	 Ensure hydraulic design is completed with consideration for increase in storm intensity, duration, and frequency related to climate change, as per Township standards. Ensure removal of the sediment island to prevent future ice and log jams. Incorporate vegetation into the restoration works to the extent possible to assist with stabilization, carbon sequestration, and provision of shade. 		
	Archaeological Resources	 The Stage 2 archaeological assessment will be completed by test pit and pedestrian survey in the locations identified in the Stage 1 report. Should it be determined during detailed design that the proposed work extends beyond the current Study Area, further Stage 1 archaeological assessment should be conducted to determine the archaeological potential of the surrounding lands. Should previously undocumented archaeological resources be discovered, the proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed archaeologist to carry out archaeological fieldwork, in compliance with sec. 48 (1) of the Ontario Heritage Act. 		
	Noise and Vibration	 Construction will be limited to the time periods allowed by the Township's Noise bylaw. If construction activities are required outside of these hours, the Contractor will seek exemptions directly from the municipality in advance. All equipment should be properly maintained to limit noise emissions. As such, all construction equipment should be operated with effective muffling devices that are in good working order. Preconstruction condition surveys as well as vibration monitoring will be included in the detailed design and construction plans, where necessary. 		
	Illegal Dumping and Site Conditions	 The contractor will be responsible for ensuring a secure project site to prevent illegal dumping as well as clean up of any garbage and debris. 		
Economic	Costs	 Continued effort will be required during detailed design and construction to minimize the economic impact of the project while ensuring all requirements are met. 		

Next Steps

- This PIC material will be available by visiting the Township of Essa's website at https://www.essatownship.on.ca/news-notices/.
- The Project Team will receive comments for consideration until December 31, 2023.
- Following the review and consideration of all comments received, the Project Team will finalize the Preferred Design selection. The Environment Study Report (ESR) will be updated to document the selection process and a Notice of Completion will be issued. The ESR will be made available for a 30-day public review and further commenting period.
- Once the 30-day public review period ends and assuming there are no objections, the Class EA process will be considered complete.

Comment Period

We invite you to provide any further comments in writing via email by **December 31, 2023** to one of the following members of the Project Team:

Michael Mikael Manager of Public Works/Deputy CAO Township of Essa

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Email: mmikael@essatownship.on.ca

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Ainley Group

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Email: brian.wickenheiser@ainleygroup.com

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

MUNICIPAL FREEDOM OF INFORMATION & PROTECTION OF PRIVACY ACT

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