APPENDIX A

CULTURAL HERITAGE EVALUATION REPORT/ HERITAGE IMPACT ASSESSMENT

B.M. Ross and Associates Ltd.

Cultural Heritage Evaluation Report/ Heritage Impact Assessment, Bear Creek Bridge County Road 22/Egremont Road. Lambton County, Ontario

Prepared by:

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November, 2018

Project Number: 60565115

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AECOM: 2015-04-13

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Executive Summary

AECOM Canada Ltd. (AECOM) was retained by B.M. Ross and Associates (B.M. Ross) on behalf of the County of Lambton to complete a Cultural Heritage Evaluation Report/Heritage Impact Assessment (CHER-HIA) as part of a Municipal Class Environmental Assessment (EA) for the Bear Creek Bridge, in the Village of Warwick, Ontario. The County of Lambton has initiated the Class EA process to consider options associated with the Bear Creek Bridge, located on County Road 22/Egremont Road at the east limits of the Village of Warwick (Figure 1 and Figure 2). Recent engineering inspections of the structure have identified significant deterioration with many of the bridge components. All reasonable alternatives are being considered as part of the Class EA process including repair of the existing bridge, replacement of the existing bridge in the same location, rehabilitation of the existing bridge, as well as a 'do nothing' alternative. This CHER-HIA was undertaken to evaluate the potential cultural heritage value or interest of the bridge structure, in order to assess the potential impacts that each alternative may have on the heritage value of the bridge, if identified.

This report was prepared according to the guidelines set out in the Ontario Ministry of Tourism, Culture, and Sport's (MTCS) *Ontario Heritage Toolkit: Heritage Resources in the Land Use Planning Process* document. In addition, the MTCS *Information Bulletin 3: Heritage Impact Assessments for Provincial Heritage Properties*, and the Ontario Ministry of Transportation's (MTO) *Ontario Heritage Bridge Guidelines* provided additional guidance in the assessment of impacts and identification of potential conservation options. For the purposes of this CHER-HIA, AECOM undertook the following tasks:

- Archival research completed at the Lambton County Archives and the University of Western Ontario;
- Preparation of a land use history of the Study Area based on a review of:
    - Primary and secondary resources;
    - Historic mapping and photography;
- A review of the Lambton County Official Plan, as well as the municipal, provincial, and federal registers including the Ontario Heritage Trust online database of buildings, museums, and easement properties, the Canadian Register of Historic Places, and the Parks Canada Directory of Federal Heritage Designations;
- A site investigation, undertaken on April 20, 2018 to document the existing conditions of the bridge structures and its associated landscape;
- Evaluation of the bridge structures and its landscape using the criteria outlined in *Ontario Regulation 9/06, Criteria for Determining Cultural Heritage Value or Interest*;
- Assessment of the proposed undertaking, and identifications of potential impacts and mitigation strategies.

Based on the Ontario Regulation 9/06 evaluation, the Bear Creek Bridge was determined to have design/physical and contextual value. The following Statement of Cultural Heritage Value was prepared for the bridge:

The Bear Creek Bridge is a single-span concrete bowstring arch bridge that carries County Road 22/Egremont Road over Bear Creek just east of the village of Warwick, in Lambton County. Designed and constructed in 1930 and 1931, the bridge design and style of construction was are representative of a short-lived type of structural design in the early/mid-20th century. Although popular in other parts of Ontario, the Bear Creek Bridge is one of the only concrete bowstring arches to be built in Lambton County.

The Class EA for the Bear Cree Bridge is evaluating alternatives for rehabilitation or replacement of the structure. As a result, seven conservation options and two mitigation options were considered as ways to consider the cultural heritage value of the bridge or mitigate impacts to the heritage attributes if replacement is identified as the preferred alternative.

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1. Introduction

1.1 Study Purpose

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1.2 Study Method

This report was prepared according to the guidelines set out in the Ontario Ministry of Tourism, Culture, and Sport's (MTCS) *Ontario Heritage Toolkit: Heritage Resources in the Land Use Planning Process* document. In addition, the MTCS *Information Bulletin 3: Heritage Impact Assessments for Provincial Heritage Properties*, and the Ontario Ministry of Transportation's (MTO) *Ontario Heritage Bridge Guidelines* provided additional guidance in the assessment of impacts and identification of potential conservation options. For the purposes of this CHER-HIA, AECOM undertook the following tasks:

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- Assessment of the proposed undertaking, and identifications of potential impacts and mitigation strategies.

1.3 Metric Measurements

Between 1971 and 1984 Canada adopted the metric system. All dimensions in this text are given in Imperial units, where they refer to the historic design of a structure. In general, the use of Imperial rather than Metric is preferred for describing historic structures. Engineered structures were often built to standard Imperial dimensions and distinctive patterns within such structures can be obscured by converting the original Imperial to Metric units. Unless there are historical issues (i.e. contract specifications), distances and other common measurements are given in Metric units.

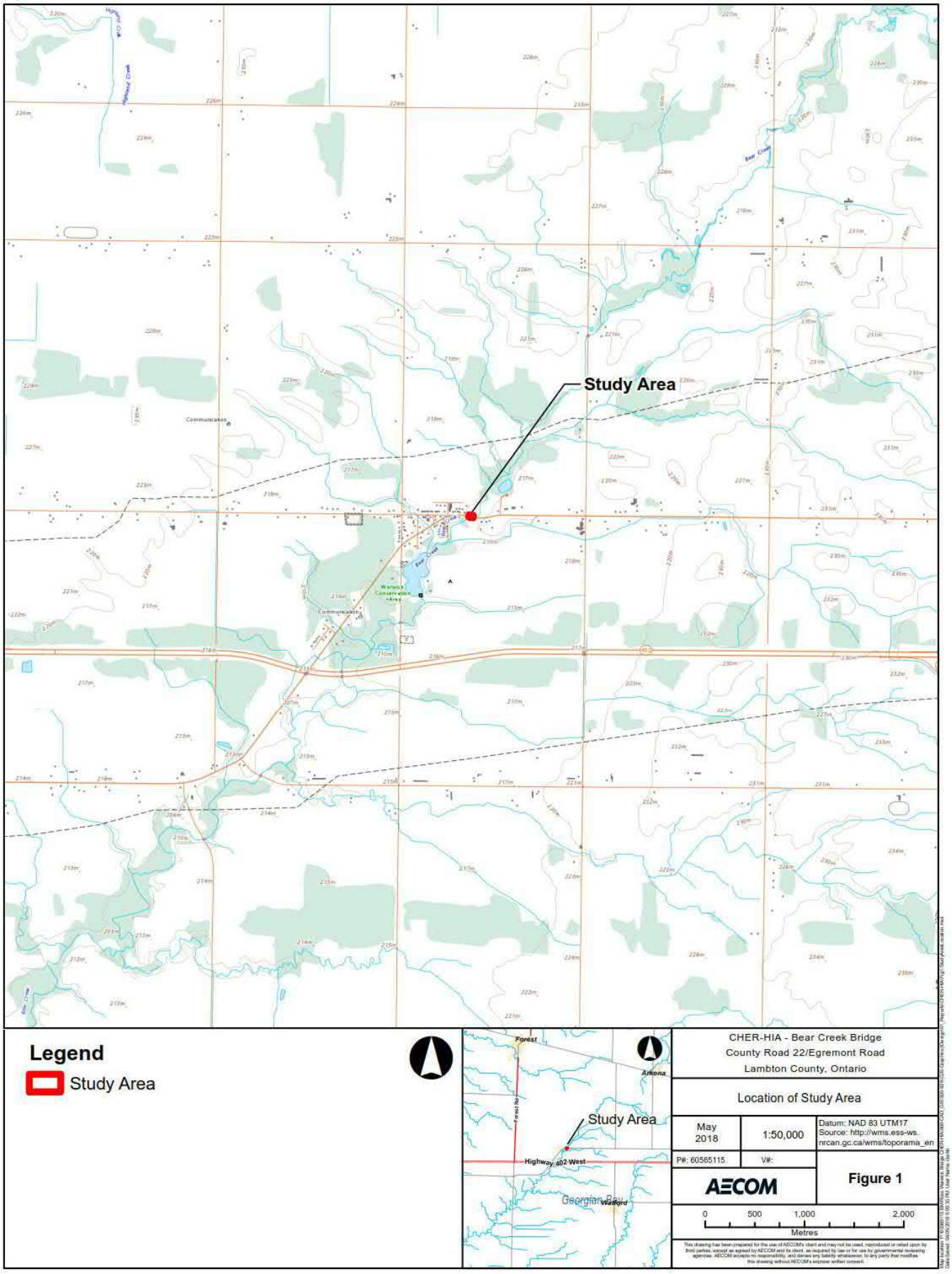

Figure 1: Location of Study Area

Figure 2: Study Area in Detail

2. Policy and Planning Framework

2.1 Ontario Environmental Assessment Act

This report has been produced to satisfy the cultural heritage reporting requirements typically undertaken as part of the Municipal Environmental Assessment process in Ontario. Pursuant to the *Environmental Assessment Act* (R.S.O. 1990, Chapter E.18), applicable infrastructure improvements and development projects are subject to appropriate studies to evaluate and assess the potential related impacts of a project on the social, economic, or cultural environment, i.e. the cultural heritage of an area. Infrastructure improvements projects have the potential to impact cultural heritage resources in various ways including, but not limited to:

- Loss or disruption of resources through removal or demolition;
- Disruption of resources by introducing physical, visual, audible, or atmospheric elements that are not in keeping with the resources and their contextual surroundings.

2.2 Additional Guidelines

The methods and analysis used in the cultural heritage resource assessment process addresses cultural heritage resources under various pieces of legislation and their supporting documentation:

- *Environmental Assessment Act* (R.S.O. 1990, Chapter E.18)
    - o *Guidelines for Preparing the Cultural Heritage Resource Component of Environmental Assessments* (MCC-MOE 1992)
    - o *Guidelines on the Man-Made Heritage Component of Environmental Assessments* (MCR-MOE 1981)
- *Planning Act* (R.S.O. 1990, Chapter P.13)
    - o *Heritage Resources in the Land Use Planning Process*, 2005 Provincial Policy Statement
- *Ontario Heritage Act* (R.S.O. 1990,Chapter O.18) and Ministry of Tourism, Culture, and Sport
    - o *Ontario Heritage Toolkit* (MCL 2006)

2.3 Lambton County Official Plan

The Official Plan for the County of Lambton (OP) is a policy document, adopted in accordance with the provisions of the *Planning Act*. It is intended to provide a general framework for the 11 municipalities within the County for land use, economic, natural heritage, social, and cultural decision-making within the County. Specific to the management of cultural heritage resources, the OP provides a series of objectives that encourage the identification, evaluation, and preservation of cultural heritage resources. The following policies provide a county planning context that addresses heritage conservation and its relation to the Bear Creek Bridge project:

2.2.10 *Local municipalities are encouraged to prepare and maintain comprehensive inventories of significant heritage resources, including significant built heritage and cultural heritage landscapes, as a basic tool for identifying and conserving those resources.*

2.2.16 *Where a proposed development will impact a cultural heritage resource, a heritage impact assessment will be required to guide mitigation of impacts to the resource. The County and local municipalities will ensure that cultural heritage resources are evaluated and conserved in public works projects, and where possible, restore, rehabilitate, improve, and maintain cultural heritage resources that they own.*

7.1.14 *The County and local municipalities should identify and protect historic transportation routes as heritage roads. As part of road maintenance and development including realignments and widenings, appropriate measures should be taken to mitigate negative impacts to heritage features of heritage roads.*

2.4 Township of Warwick Official Plan

The Township of Warwick's Official Plan, passed in 2010 sets out land use directions for long-term growth and development within the municipality. The following policy provides direction related to the evaluation of cultural heritage value and assessment of impacts when making development or infrastructure decisions:

1.1.1 *The Municipality will seek to conserve cultural heritage landscapes and built heritage resources when making development and infrastructure decisions with may affect those resources. As well, the Ontario Heritage Act may be utilized to conserve significant cultural heritage resources through the designation of individual properties or areas, and the designation of a group or groups of properties as Heritage Conservation Districts. Council may consider the establishment of a Heritage Advisory Board to consult on these issues related to cultural heritage resources and preservation.*

3. Historical Overview

3.1.1 Warwick Village and Township, Lambton County

The Bear Creek Bridge carries County Road 22/Egremont Road over Bear Creek in the community of Warwick, Ontario, a rural village currently within the Township of Warwick, in Lambton County. Historically, Warwick was an incorporated village in Lambton County, but was merged in 2001 with the Village of Watford to form the Township of Warwick.

Permanent European settlement into Warwick Township commenced primarily in the early and mid-19th century, as settlers began to access the interior of the township via the Egremont Road (See Section 3.1.2). Some of the earliest settlers into Warwick Township included James and Robert Hume and their families, entered into the Township in 1832, and settled on Lots 25 and 23, Concession 2, South of the Egremont Road (S.E.R), approximately eight kilometres, southwest of the existing bridge study area. The township was settled relatively quickly, and by the end of 1832, the population of the township had already grown to 852. The township would continue to grow steadily in the next decade, reaching a population of 1,235 by 1845 as settlers began to take up residence on the newly-surveyed lots.[1]

The hamlet of Warwick experienced a similar initial boom in growth, immediately following completion of the Crown Survey in 1832. In that year, Colonel Arthur Freer of the British Army was deeded Lot 11, Concession 1 N.E.R. in Warwick Township where he soon built a saw and flour mill along the creek on his lot. Just west, on Lot 10, Concession 1 S.E.R., a village site was laid out. The 200 acre lot was chosen to be a town site along the Egremont Road. Bear Creek ran through the lot and Peter Carroll, surveyor and engineer for the British government surveyed a traditional town plot with a centrally-located square surrounded by 16 square village lots and eight park lots.

Freer's sawmill evidently was not successful, however, another settler Thomas Hay set up a mill in 1842 just downstream on Bear Creek. Hay also built a blacksmith shop in Warwick village.[2] Much like the initial growth of the township, the small hamlet experienced immediate growth following its initial survey and town plot.

Prior to the arrival of railways through Lambton County, the Warwick village was described as the "most important point between Startford/London and Sarnia" being located along the Egremont Road. However, the construction and eventual opening of the Great Western Railway (GWR) through Watford, a few kilometres south of Warwick eventually slowed the immediate growth of Warwick village and its primary importance along the well-travelled route. Although still located along Egremont Road, the opening of a railway line just south of the road resulted in less traffic through the hamlet itself. By 1880, it was described in the *Illustrated Historical Atlas* as being of "less importance to than it was 25 years ago".[3] In 1880, the village had two stores, two wagon and blacksmith shops, two taverns, a steam and grist mill, and a town hall originally built in 1854. The estimated population at the time was 200. Warwick remained the only unincorporated village in the Township (Figure 3).

By the early-20th century, historic topographic mapping indicates that the village of Warwick continued to grow rather slowly at the intersection of Egremont Road and London Line, in Lambton County, however the village was continued to the intersection and was surrounded by an agricultural landscape. In comparison, Watford, to the south grew much more substantially (Figure 4, Figure 5, and Figure 6).

[1] *Warwick Township Book; Canadian Gazeteer, p204-205*
[2] *Note on naming of village/incorporation*
[3] *Illustrated Atlas*

Image 1: Warwick General Store, built c. 1909 and the McKenzie house at left. Both buildings are still in place today and are located just west of the Bear Creek Bridge (*The Township of Warwick: A Story Through Time*)

3.1.2 Egremont Road/Highway 7/County Road 22

The Bear Creek Bridge is located just outside of the existing Warwick village on County Road 22/Egremont Road, on the earliest roads constructed through Lambton County. The road was originally envisioned as a military road by Sir John Colborne, at the encouragement of Colonel Talbot. In 1828, Colborne, the Lieutenant Governor of Upper Canada concluded that the existing road network through what is now southwestern Ontario was not adequate in case of a military emergency. At the time, the Talbot Road and Dundas Street (now Highway 2) were the two main military roads through this portion of Upper Canada. Further, this portion of the province was set to become the focus of colonization efforts. Thus, beginning in 1831 and 1832, Peter Carroll, lead a survey through Warwick Township to build the Egremont Road – named after George O'Brien Wyndham, the 3rd Earl of Egremont.

Following its construction, the Egremont Road was much like most early roads in that they were of poor condition, mostly covered with the stumps of the trees that were cleared to make room for the road. Eventually as settlement began to increase along the road, gravel was hauled by farmers to grade the road, and ditches were dug to improve drainage.

Following the rise of motor vehicle usage in the 20th century construction of highways across Ontario greatly improved road quality as well as transportation networks through Warwick Township. In 1920, as part of the efforts by the Department of Highways (DHO) to create provincially-owned highways across the province, Egremont Road became designated as part of Highway 7 that would extend from Sarnia to Guelph, and eventually further east to Ottawa. The section between Sarnia and Guelph was the first of the sections to be designated as a provincial highway. The road remained under DHO (later MTO) ownership until 1997-1998 when the portions of the highway were downloaded to the respective municipalities including the County of Lambton, when it became known as County Road 22.

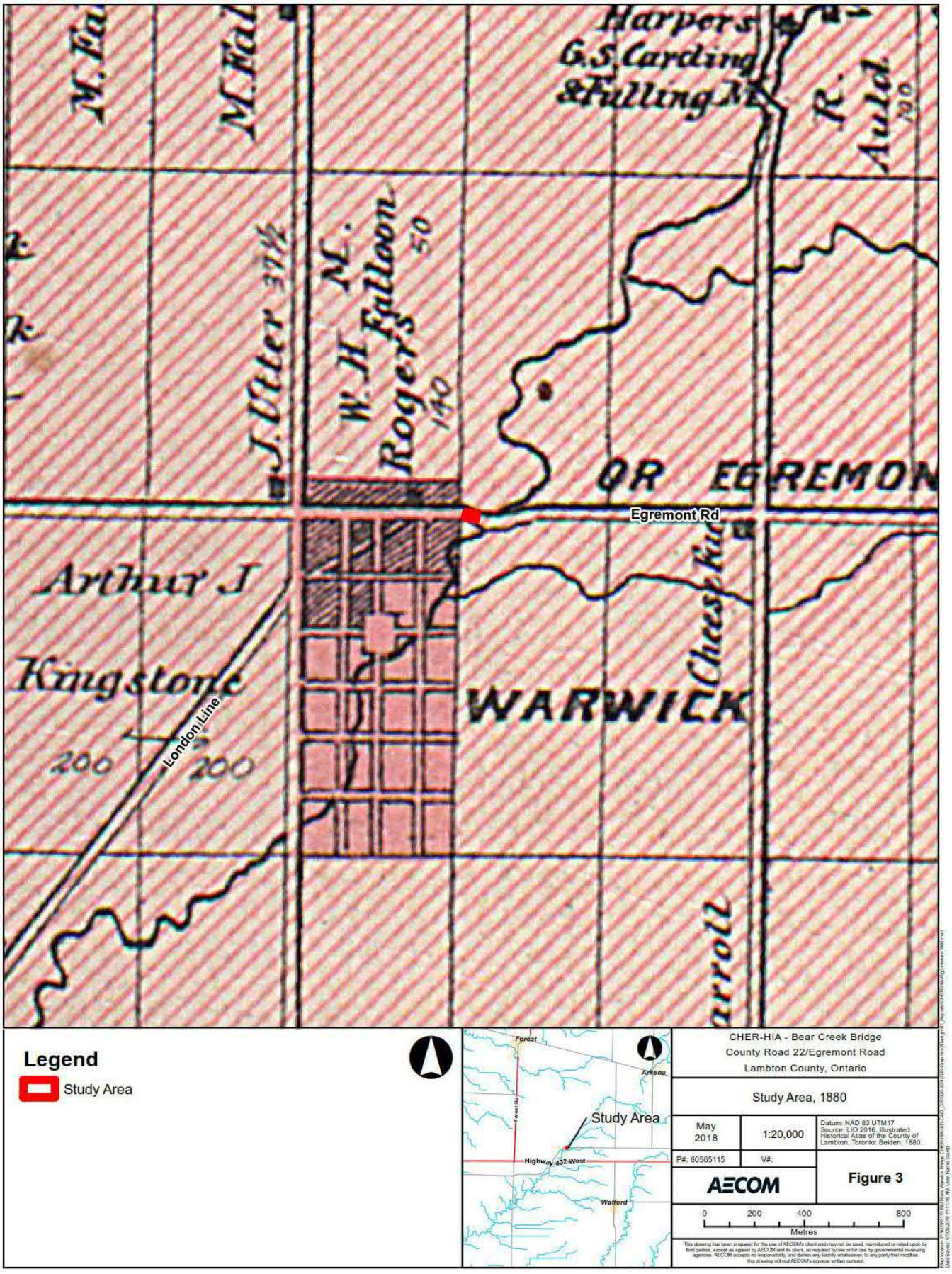

Figure 3: Study Area, 1880

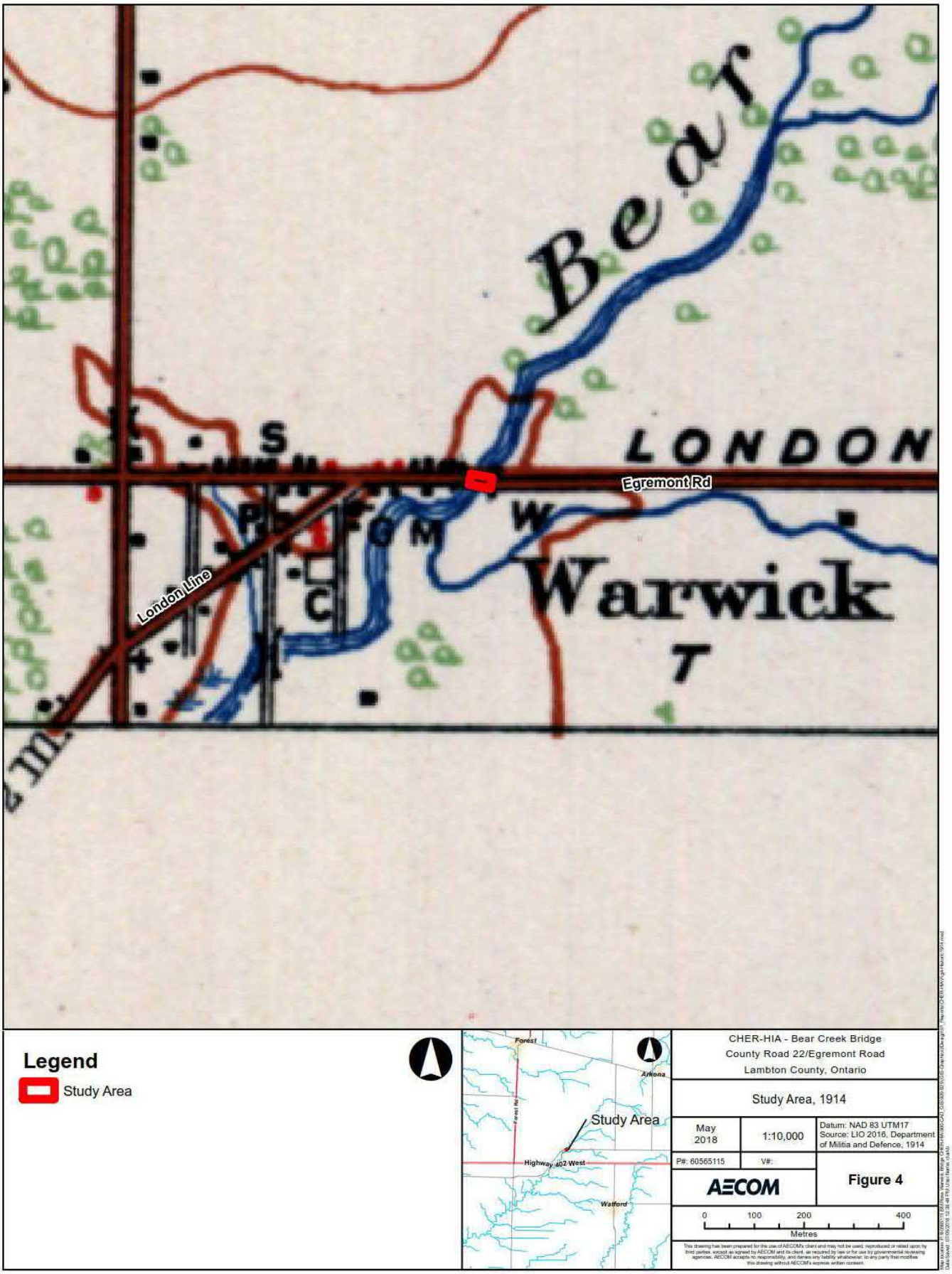

Figure 4: Study Area, 1914

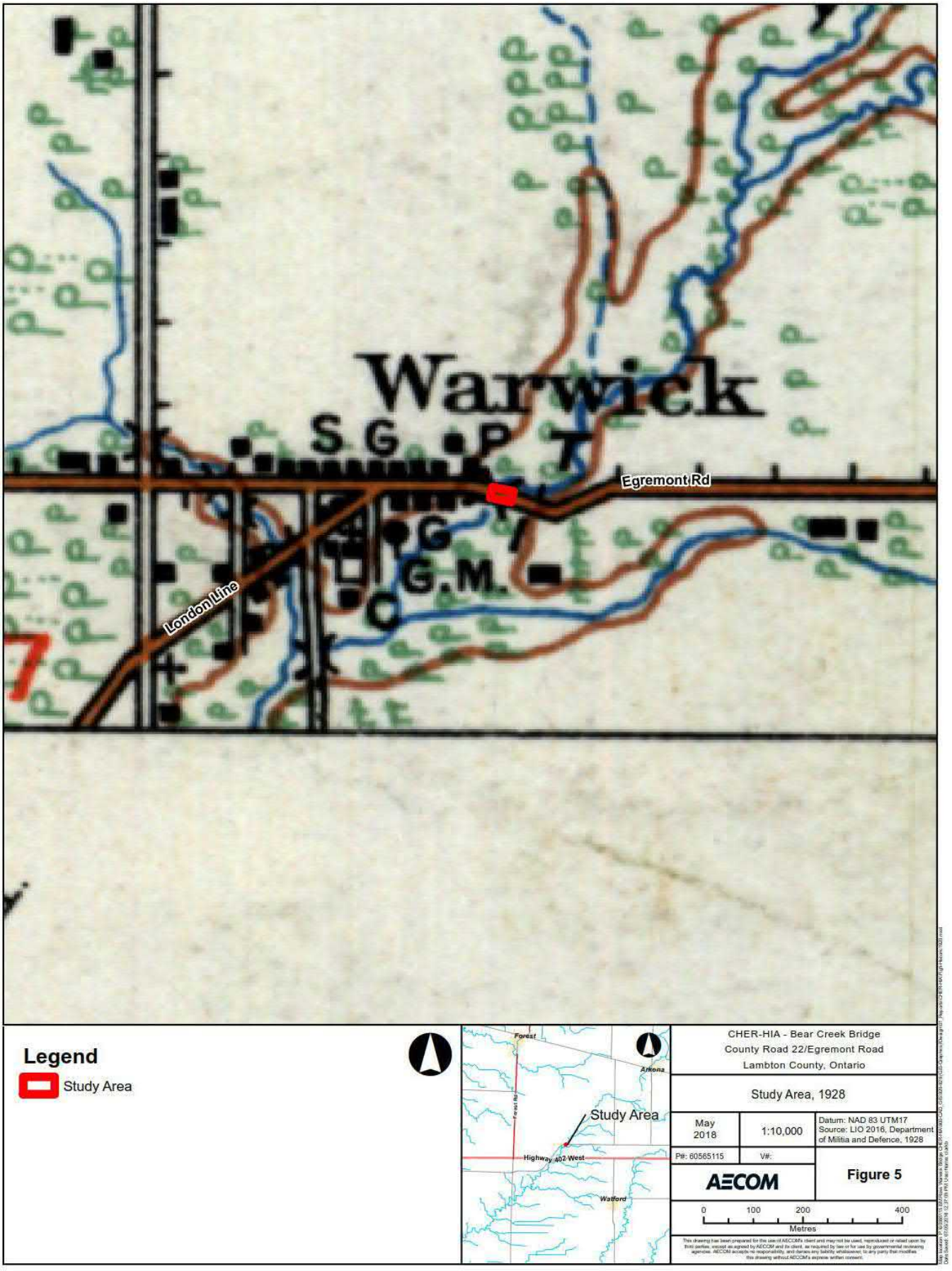

Figure 5: Study Area, 1928

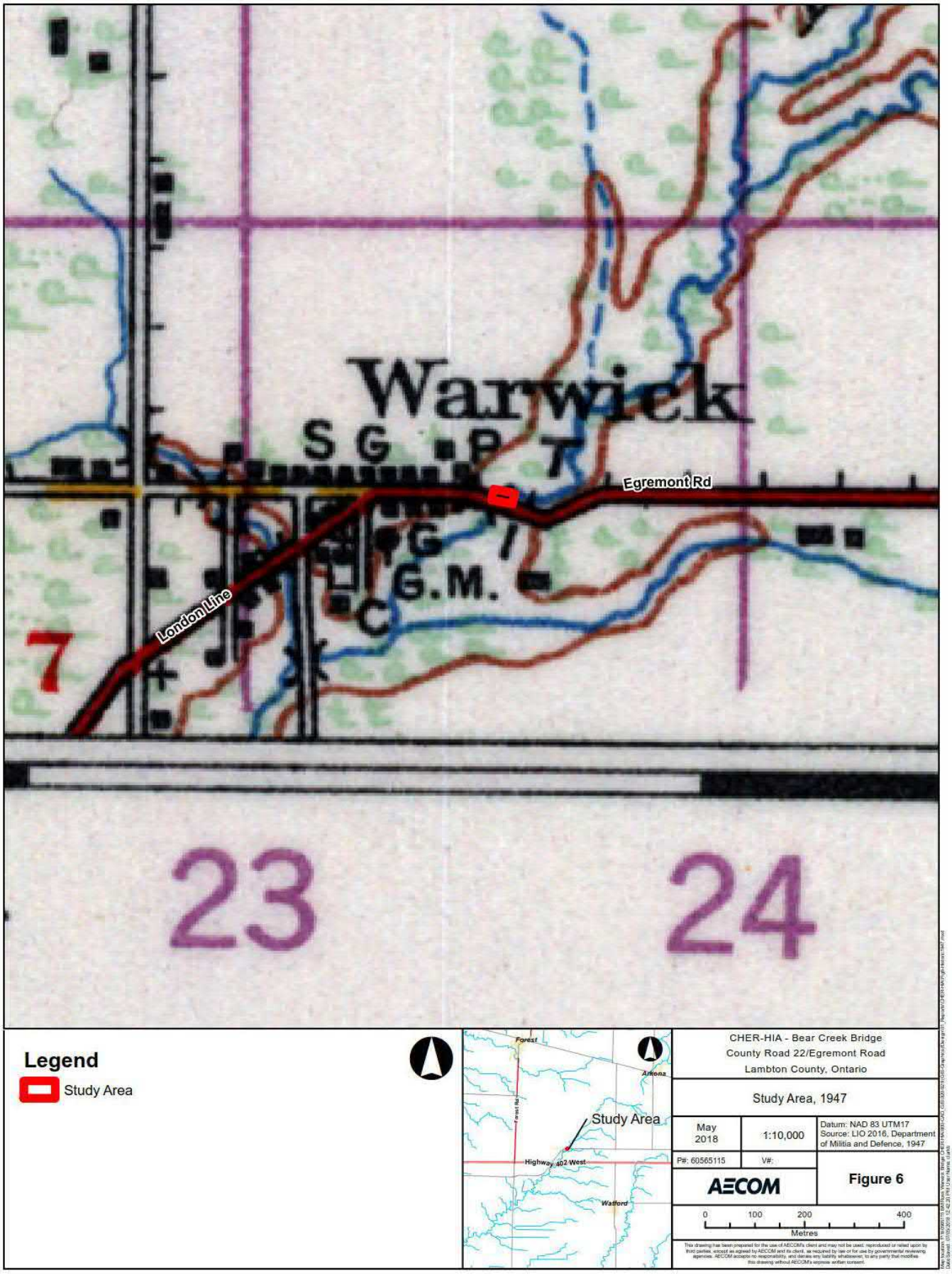

Figure 6: Study Area, 1947

3.1.3 Bridge Building Context

Most early road bridges were built and owned by a municipality such as a county, town or a township. Much more rarely, they were owned by the province. Matters pertaining to bridge ownership have been dictated by the *Ontario Municipal Act* since 1867. The construction and operation of bridges over water courses that formed boundaries between townships were always assumed by an upper level of government, such as a County.

Most 19th-century bridges in southern Ontario were built of timber. Short spans were beam structures; longer spans employed simple trusses, such as King and Queen Post trusses. A few iron truss bridges were built in the 1870s-1880s but were generally too costly to be widely used.

The economic value to communities of good roads, and by extension good bridges, was becoming evident. Nineteenth-century wooden bridges could not carry the weight of heavier wagon and street railway equipment coming into use. By the First World War, motor vehicles were becoming increasingly common and the provincial government began to provide grant programs and technical advice on bridge building. At the same time, counties began to create county-wide road networks by assuming the ownership of key township roads and bridges.

Inexpensive steel trusses came into use in the 1890s and the designs were commonly used into the 1930s. The Pratt truss and the Warren truss dominated the early-20th century, and were typically used for spans of up to 400 feet.[4]

In the early-20th century concrete became increasingly used to construct short-span bridges. One of the earliest forms was the solid spandrel concrete arch design that was inexpensive to build. This design consisted of solid concrete spandrel walls that held back the stone rubble and earth fill on the interior of the arch. The arch itself was constructed reinforcing steel bars. By the 1930s, concrete challenged steel as the primary bridge-building material of choice and various concrete bridges types have since been used for road bridge construction. Concrete and steel continues to be used in bridge construction into the 21st century.

3.2 Bear Creek Bridge History

It is unclear when the first bridge built over Bear Creek outside of Warwick village was constructed, however, prior to 1900 a timber-frame structure was in place. It is unclear when the timber bridge was built, however, it was repaired in 1899, and eventually replaced in 1903. Historic accounts suggest that the replacement bridge was also built of timber.

In 1913, a steel truss bridge was constructed to carry Egremont Road over Bear Creek. The bridge was built by the Petrolia Bridge Works and included heavy steel I beams and concrete deck. The structure included two concrete abutments. However, with the increased in motor vehicle traffic and the official designation of Egremont Road as Highway 7 in 1920, the steel truss bridge was short-lived and was replaced within 20 years.

The existing Bear Creek Bridge is a concrete bowstring arch bridge, constructed in 1931 by the Canada Paving Company of Windsor, Ontario. As is typical of provincially-owned bridges in the early/mid-20th century, the bridge was designed internally by the engineers at the DHO. Arthur Sedgwick, bridge engineer with the DHO signed the plans for the bridge (Appendix A). During construction of the bridge, a heavy crane which has been driving piles for the structure collapsed and crashed through the concrete deck of the previous structure. Evidently, the incident did not result in injury to any workers, however, it did slightly delay the opening of the structure. The bridge was resurfaced in 1983 and repaired in 2004. Despite repairs, the bridge's concrete bowstring arch design has remained for nearly 90 years.

[4] *T. Allan Comp and Donald Jackson, "Bridge Truss Types: A Guide to Dating and Identifying," in American Association for State and Local History, 1977; National Park Services, "Trusses: A Study by the Historic American Engineering Record, 1976.*

Image 2: An early timber bridge over Bear Creek at Warwick village (*The Township of Warwick: A Story Through Time*)

Image 3: View looking west in 1927, showing steel truss Bear Creek Bridge and General Store in Warwick on the far side of the bridge (*The Township of Warwick: A Story Through Time*)

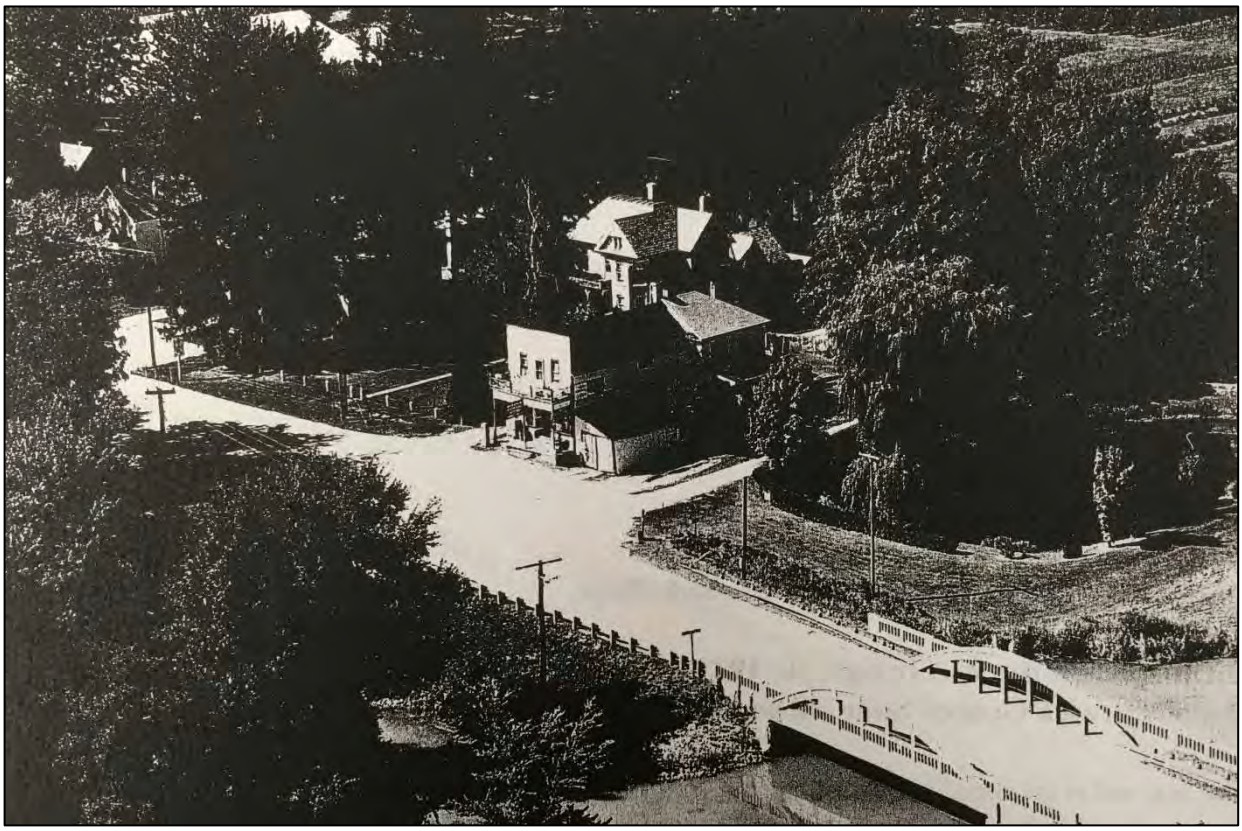

Image 4: Aerial view showing 1931 Bear Creek Bridge (bottom right) and Warwick General Store to the west (*Lambton County Archives*)

4. Site Description

4.1 Context

The Bear Creek Bridge is a single-span bowstring arch bridge, supported on concrete abutments. The structure carries County Road 22/Egremont Road over the Bear Creek Bridge, on the eastern edge of the village of Warwick, in Lambton County. The bridge's main design characteristics include the concrete bowstring arch that rises above the road level on the north and south sides of the structure (Image 5).

4.2 Cultural Landscape Context

The Bear Creek Bridge is located just east of the village of Warwick, a rural community in Lambton County. Today, the village is relatively small and consists of a few commercial businesses and some side roads where residential properties are located, mostly off of Egremont Road. The Warwick Conservation Area, operated by the St. Clair Region Conservation Authority is a 180 acre campsite with 181 campsites. Historically, the village functioned as a significant village along the well-travelled Egremont Road, one of the oldest roads in the County.

North and south of the bridge, Bear Creek flows through a relatively wide channel. Just beyond the bridge, on both the north and south sides however, the creek narrows significantly as its meanders through an agricultural landscape (Images 6 and 7).

To the west of the bridge, Egremont Road passes through the village of Warwick. Immediately to the west of the bridge is the former Warwick General Store, and the McKenzie House, both historic structures that have fronted onto Egremont Road for over 100 years. Just passed the bridge, County Road 22 turns into London Line and bends south towards Highway 402 where it continues south and west towards Reece's Corner. To the east of the bridge, County Road 22/Egremont Road extends eastwards through an agricultural landscape, running parallel with Highway 402 for several kilometres (Images 8 – 10).

4.3 Bridge Structure

Both approaches to the bridge are relatively level and generally consistent with the grading of the road at the bridge. At the bridge, the road curvature takes a slight deviation from the otherwise straight road, likely as a result of early surveying over the watercourse, or aligned to not be a skewed bridge crossing. East of the bridge, the road runs in a long straight manner. At the bridge, the road level is raised considerably above the ditching and floodplain levels below (Images 11 – 13).

The bridge structure consists of a single span concrete bowstring arch supported by concrete abutments. The concrete bowstring form was a short-lived bridge style that was used in early and mid-20th century bridge construction in Ontario, primarily in the Waterloo and Wellington areas. The Bridge Street Bridge and the Freeport Bridge both in Kitchener, Ontario are perhaps some of the most iconic of concrete bowstring bridges in southern Ontario. The style is most visually defined by a set of concrete arches that rise in a semi-circular form above the roadway, similar to a steel pony truss structure, only in a more rounded finish and of concrete materials (Image 14).

The Bear Creek Bridge has a span of approximately 65 feet from bearing to bearing. The overall length of the bridge, including the original concrete approach guard rails is approximately 104 feet. The distinctive concrete arch of the structure is formed with reinforcing bar and cast-in-place concrete to form a set of curved arches. Eight

vertical posts are located under the arch, connecting the arch to the deck. The faces of the arches are adorned with concrete panels that are sunken into the concrete to create a panelling effect for aesthetics (Images 15 – 19).

Solid concrete guardrails are also constructed on the north and south sides of the bridge. The guard rails are not original to the structure but were added as part of rehabilitation in 2004. The guard rails are designed to include a concrete panelling effect, similar in design to the recessed panels on the concrete arches and were designed to mimic the appearance of the original barriers, an open barrier system. On the south side of the bridge, the guard rails are constructed into the arch, while on the north side, the guard rail forms part of a pedestrian railing system adjacent to the sidewalk. As a result, the vertical posts under the arch on the north side of the bridge extend from the arch to the deck. The sidewalk is cantilevered away from the bridge. From the ditches and floodplains adjacent to the bridge, both the north and south sides of the bridge have smooth finishes and do not include the concrete panelling design seen from the road (Images 20 – 26).

Image 5: Bear Creek Bridge, looking west

Image 6: View looking north, showing Bear Creek immediately north of the bridge

Image 7: View looking south showing Bear Creek south of the bridge

Image 8: View looking west along County Road 22/Egremont Road towards Bear Creek Bridge

Image 9: Warwick General Store, located immediately west of the bridge

Image 10: View looking east towards Bear Creek Bridge

Image 11: View showing slight curvature of County Road 22/Egremont Road at the Bear Creek Bridge

Image 12: View looking west, showing Bear Creek Bridge and Warwick village in background

Image 13: View looking west showing ditching and flood plain on the south side of the bridge

Image 14: Freeport Bridge, Kitchener, Ontario, showing one of the most well-known concrete bowstring arch in southern Ontario (Google Images, 2018)

Image 15: Detail showing concrete west abutment of Bear Creek Bridge

Image 16: View showing concrete abutment, guardrail and earthworks on the east side of the bridge

Image 17: View looking across County Road 22/Egremont Road showing bowstring arch and concrete guardrail

Image 18: Detail showing concrete panelling of concrete arch

Image 19: View showing south arch

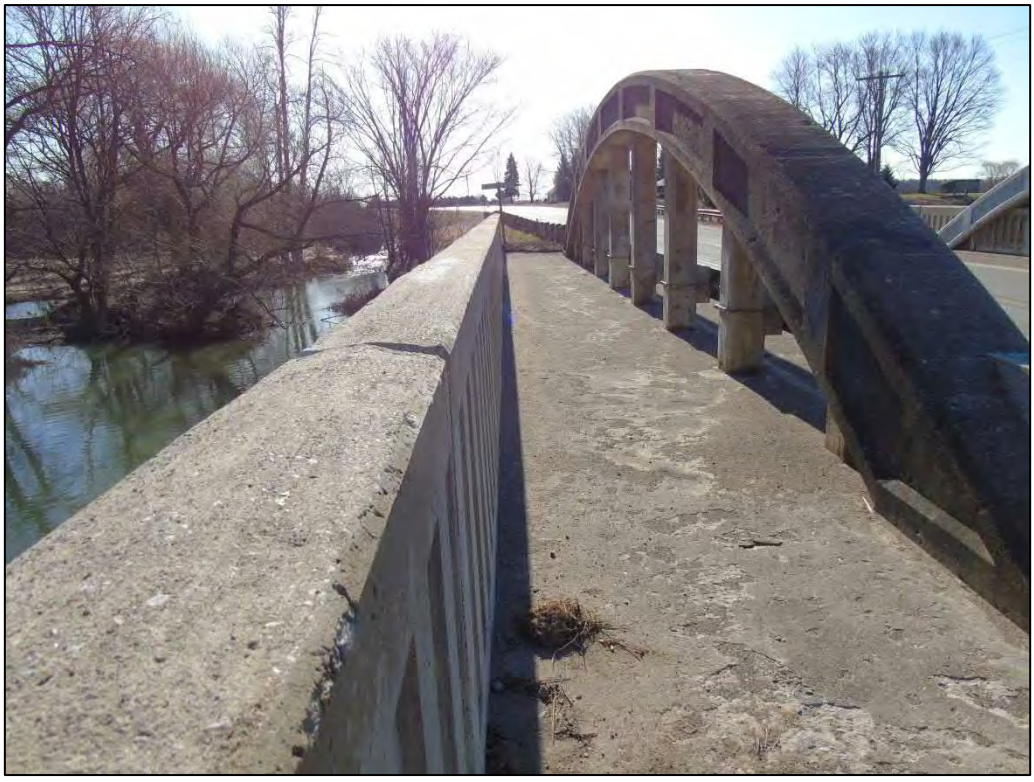

Image 20: Detail showing concrete guardrail and concrete sidewalk on north side of the bridge

Image 21: Detail of concrete guardrail on north side of the bridge

Image 22: View showing concrete guardrail on the south side of the bridge

Image 23: Detail of concrete panelling on guardrail

Image 24: View showing south side of the bridge showing un-textured concrete

Image 25: View showing north side of the bridge

Image 26: Detail showing concrete abutments and cantilevered sidewalk on north side of the bridge

5. Evaluation

5.1 Review of Existing Heritage Registers and Additional Information

As a part of the evaluation undertaken for this CHER/HIA, AECOM reviewed municipal, provincial, and federal heritage registers and inventories including:

- Lambton County Official Plan;
- Ontario Heritage Trust's online inventory of buildings, museums, and easement properties;
- *Canadian Register of Historic Places;* and
- *Parks Canada, Directory of Federal Heritage Designations.*
- Canadian Heritage Rivers System.

The Bear Creek Bridge is not currently listed on any of the above-noted registers, and is not listed or designated under the *Ontario Heritage Act*.

5.2 Ontario Regulation 9/06

Ontario Regulation 9/06 provides criteria for determining cultural heritage value or interest. If a property meets one or more of the following criteria it may be designated under Section 29, Part IV of the Ontario Heritage Act. The criteria for determining cultural heritage value under *Ontario Regulation 9/06* are outlined below:

1) The property has ***design or physical value*** because it:

- Is a rare, unique, representative or early example of a style, type, expression, material or construction method;
- Displays a high degree of craftsmanship or artistic merit; or
- Demonstrates a high degree of technical or scientific achievement.

2) The property has ***historic or associative value*** because it:

- Has direction associations with a theme, event, belief, person, activity, organization, or institution that is significant to a community;
- Yields, or has the potential to yield information that contributes to an understanding of a community or culture; or
- Demonstrates or reflects the work or ideas of an architect, artist, builder, designer, or theorist who is significant to a community.

3) The property has ***contextual value*** because it:

- Is important in defining, maintaining, or supporting the character of an area;
- Is physically, functionally, visually, or historically linked to its surroundings; or
- Is a landmark.

The application of the criteria for the evaluation of the Bear Creek Bridge is provided below in **Table 1**.

Table 1: Ontario Regulation 9/06 Evaluation for the Bear Creek Bridge

Criteria	Meets Criteria (Yes/No)	Rationale
1) The property has *design or physical value* because it:		
i) Is a rare, unique, representative or early example of a style, type, expression, material or construction method.	Yes	The Bear Creek Bridge is a representative example of an early/mid-20th century concrete bowstring arch bridge. Although various bowstring arch bridges can be found elsewhere in Ontario, the Bear Creek Bridge is a relatively rare example of a bridge of this style and design in Lambton County.
ii) Displays a high degree of craftsmanship or artistic merit.	No	Although a representative example of an increasingly rare style, the Bear Creek Bridge does not display a high degree of craftsmanship or artistic merit.
iii) Demonstrates a high degree of technical or scientific achievement.	No	The Bear Creek Bridge does not demonstrate a high degree or technical or scientific achievement. The bridge is a relatively typical example of a short-lived bridge design.
2) The property has *historic value or associate value* because it:		
i) Has direct associations with a theme, event, belief, person, activity, organization, or institution that is significant to a community.	No	The Bear Creek Bridge does not have any direct associations with a theme, event, belief, person, activity, organization, or institution that is significant to a community. The bridge was replaced as a part of the DHO's eventual upgrading of the provincial road network in Ontario.
ii) Yields, or has the potential to yield information that contributes to an understanding of a community or culture.	No	The Bear Creek Bridge does not yield, or have potential to yield information that contributes to an understanding of a community or culture.
iii) Demonstrates or reflects the work or ideas of an architect, artist, builder, designer, or theorist who is significant to a community.	No	The Bear Creek Bridge does not demonstrate or reflect the work, or ideas of an architect, builder, designer, or theorist who is significant to a community. Although the bridge drawings are signed by Arthur Sedgwick, a well-known engineer at DHO, it is most likely that the bridge was designed by a team of DHO engineers and the design was reviewed and approved by Sedgwick.
3) The property has *contextual value* because it:		
i) Is important in defining, maintaining or supporting the character of an area.	No	The Bear Creek Bridge is not important in defining, maintaining, or supporting the character of an area. Although it forms a key link in the transportation network through Warwick and Lambton County, this does not equate to the criteria in a way that demonstrates cultural heritage value or interest. Further, the bridge crossing itself may be considered to be of importance in defining transportation through

		Warwick, however the specific resource does not define or support the character of Warwick or Lambton County.
ii) Is physically, functionally, visually or historically linked to its surroundings.	Yes	The Bear Creek Bridge is physically, functionally, visually, and historically linked to its surroundings. During the late 19th/early 20th centuries, the need developed for stronger and more permanent bridges. Both the bridge location and the rebuilding of the structure over time is an important historic theme of the Egremont Road, one of the earliest roads to have been built through Lambton County.
iii) Is a landmark.	No	The Bear Creek Bridge is not considered to be a landmark.

5.2.1 Statement of Cultural Heritage Value

The Bear Creek Bridge is a single-span concrete bowstring arch bridge that carries County Road 22/Egremont Road over Bear Creek just east of the village of Warwick, in Lambton County. Designed and constructed in 1930 and 1931, the bridge design and style of construction was are representative of a short-lived type of structural design in the early/mid-20th century. Although popular in other parts of Ontario, the Bear Creek Bridge is one of the only concrete bowstring arches to be built in Lambton County.

5.2.2 Heritage Attributes

The following are the heritage attributes of the Bear Creek Bridge:

- Concrete bowstring arch design including;
  - Symmetrical arches on the north and south sides of the structure;
  - Concrete panelling set into the arch for aesthetic effects;
  - Vertical concrete posts under the bowstring arch;
  - Cantilevered concrete sidewalk.

6. Impact Assessment and Mitigation Options

6.1 Description of Purpose of Proposed Activity

The County of Lambton has initiated a Class Environmental Assessment process to consider options associated with the Bear Creek Bridge. Recent engineering inspections of the structure have identified significant deterioration with many of the bridge components. All reasonable alternatives will be considered in conjunction with the Class EA process including repair of the existing bridge, replacement of the existing bridge in the same location, rehabilitation of the existing bridge, and a 'do nothing' alternative.

6.2 Potential Conservation and Mitigation Options

The potential impacts of the proposed undertakings were considered in general according to MTCS' *Ontario Heritage Toolkit: Heritage Resources in the Land Use Planning process* and *Information Bulletin 3: Heritage Impact Assessments for Provincial Heritage Properties*. These documents identify potential impacts to consider when evaluating a site development or alteration.

For bridges of cultural heritage value that are subject to repair, rehabilitation, or proposed replacement, MTCS advises various conservation options or strategies be considered. The conservation options were developed as part of the Ministry of Transportation's *Ontario Heritage Bridge Guidelines for Provincially Owned Bridges* and include seven conservation options and two mitigation options to be considered when assessing alternatives for heritage bridges. The conservation options include:

1. Restoration of missing or deteriorated where physical or documentary evidence (e.g. photographs or drawings) can be used for their design;
2. Retention of existing bridge with no major modification undertaken;
3. Retention of existing bridge with sympathetic modifications;
4. Retention of existing bridge with sympathetically designed new structure in proximity;
5. Retention of existing bridge no longer in use for vehicular purposes but adapted for pedestrian walkways, cycle paths, scenic viewing, etc.;
6. Relocation of bridge to appropriate new site for continued use or adaptive re-use;
7. Retention of bridge as heritage monument for viewing purposes only;
8. Bridge removal and replacement with a sympathetically designed structure:
    a. Where possible, salvage of elements/members of bridge for incorporation into new structure or for future conservation work or displays;
    b. Undertake full recording and documentation of existing structure.

There is no, one, correct way to mitigate the adverse impacts of new construction on, or adjacent to heritage properties and structures. Strictly from the perspective of best practice for heritage conservation, the preferred option is one that conserves a property's cultural heritage value. The Provincial Policy Statement, 2014, identifies the requirement to conserve cultural heritage value, specifically in Section 2.6.1 stating "Significant built heritage resources and significant cultural heritage landscape shall be conserved."[5] Typically, this involves maintaining a heritage resource *in situ.* In reality, socio-economic, technical, and/or environmental site considerations may require some form of compromise and/or alternate means of heritage conservation.

[5] *Provincial Policy Statement, 2014.*

For the purposes of this HIA, the seven conservation options and the two mitigation options have been considered and annotated with input from B.M. Ross and Associates in order to consider the potential for each option in relation to the Class EA process for the Bear Creek Bridge. The conservation and mitigation options are discussed in Table 2 below.

Table 2: Conservation and Mitigation Options for Bear Creek Bridge

Conservation/Mitigation Option	Consideration for Bear Creek Bridge
1. Restoration of missing or deteriorated elements where physical or documentary evidence (e.g. photographs or drawings) can be used for their design.	Based on the current condition of the bridge, too many elements have deteriorated to complete a restoration of the structure. In the past, restoration of the bridge has been completed for deteriorating elements; however restoration is no longer feasible for this structure.
2. Retention of existing bridge with no major modification undertaken.	Retention of the existing bridge will not addresses the deficiencies of the existing structure.
3. Retention of existing bridge with sympathetic modification.	Retention of the existing bridge will not address the deficiencies of the existing structure.
4. Retention of existing bridge with sympathetically designed new structure in proximity.	Based on the existing bridge, this conservation option would not be feasible. The existing bridge occupies the preferred location for a new bridge and retention of the existing bridge would be in conflict with the location of a replacement.
5. Retention of existing bridge no longer in use for vehicular purposes but adapted for pedestrian walkways, cycle paths, scenic viewing, etc.	Not applicable. Vehicular traffic is the primary usage for this structure.
6. Relocation of bridge to appropriate new site for continued use or adaptive re-use.	Given the concrete materials and form of the bridge, relocation would not be feasible. Significant damage would be anticipated for a relocation of the structure.
7. Retention of bridge as heritage monument for viewing purposes only.	The existing location of the bridge would be in direct conflict with the location of a new structure. As a result, retention of the bridge as a monument would not be feasible.
8. a. Bridge removal and replacement with a sympathetically designed structure, and where possible, salvage of elements/members of bridge for incorporation into new structure or for future conservation work or displays.	Given the concrete materials and form of the bridge, elements or member of the existing bridge will likely not be feasible for salvage. Larger members would likely be too heavy and brittle to incorporate into a new design. Smaller elements are unlikely to successfully represent the heritage value of the existing bridge. A replacement structure could incorporate arches or inset concrete panelling as a way to resemble the cultural heritage value of the former bridge, if demolished.
8. b. Bridge removal and replacement with a sympathetically designed structure, and undertake full recording and documentation of structure if it is to be demolished.	Recording and documentation of the structure should be complete prior to demolition.

7. Recommendations

7.1 Preferred Option

As noted in Section 6.2, there is no, one, correct way to mitigate the adverse impacts of new construction on a heritage structure. From the perspective of best practice for heritage conservation, a rehabilitation alternative for the Bear Creek Bridge should be considered that relates to the conservation options identified in Table 2. This approach would minimize impacts to the cultural heritage value or interest identified in this report. If it is feasible, the rehabilitation of the Bear Creek Bridge should be considered. However, based on the analysis of the conservation options in Table 2, it is understood that rehabilitation may not be feasible for this structure.

If replacement is identified as the preferred option, consideration should be given to the incorporation of salvageable elements *or* design elements that can be incorporated into the design of the replacement structure in order to recognize or commemorate the identified cultural heritage value of the existing structure. Specifically for this structure, elements such as the arch component of the bowstring arch, or the concrete panelling could be incorporated into a new design as sympathetic design elements that could tie the replacement structure to the existing bridge.

7.2 Documentation

If it is determined through the Class EA that a rehabilitation option is not feasible for the Bear Creek Bridge, and the conservation options in Table 2 related to sympathetic modifications, or re-use are not feasible, the existing bridge should be photographically documented prior to demolition. This report, along with any additional photographic documentation should be deposited with municipal libraries or archives to create a public record of the bridge. Specifically, the following archives should be offered a copy of the report for archival purposes:

Lambton County Archives
787 Broadway Street
Box 3100
Wyoming, ON
N0N 1T0

7.3 Historic Transportation Route

According to the Lambton County OP, Policy 7.1.14 states, "*The County and local municipalities should identify and protect historic transportation routes as heritage roads. As part of road maintenance and development including realignments and widenings, appropriate measures should be taken to mitigate negative impacts to heritage features of heritage roads."* Although not directly related to the proposed bridge replacement, the County of Lambton should consider identifying County Road 22/Egremont Road as a historic transportation route, as encouraged in the County's Official Plan. Opportunities for commemorative measures such as signage or interpretive panels in rural communities like Warwick could provide useful and appropriate spaces for commemorating or identifying the historic transportation corridors and historic structures such as the Bear Creek Bridge, that were key built features along the transportation routes.

8. Bibliography

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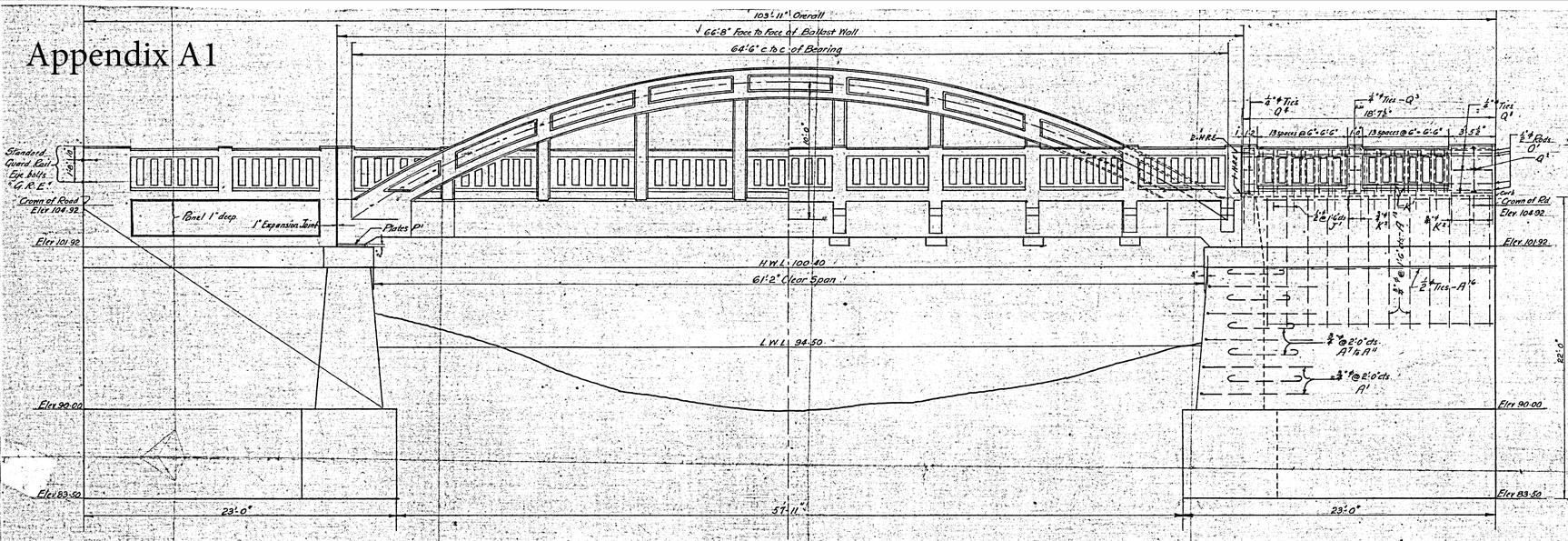
Appendix A

Proposed Bridge at Warwick Village, The King's Highway No. 7, 1931

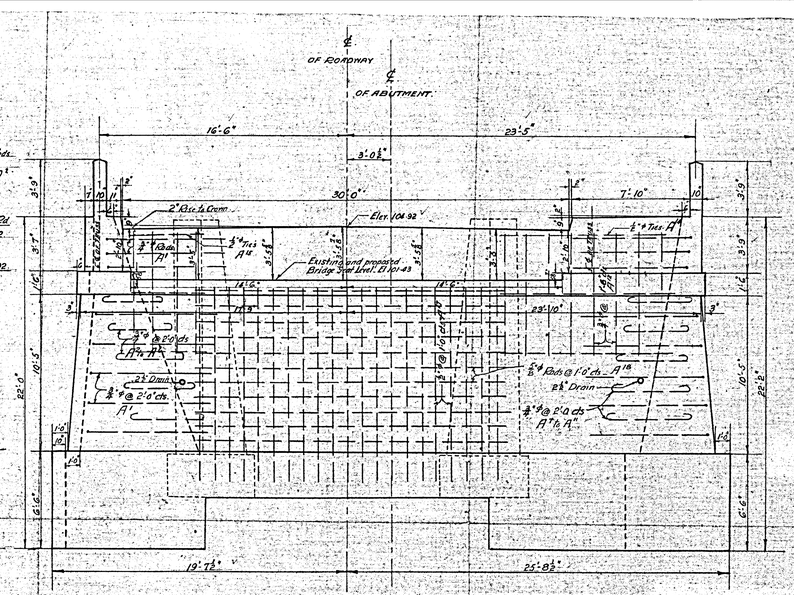
Appendix A1



HALF ELEVATION - S. SIDE

Scale ¼ in. = 1 ft.

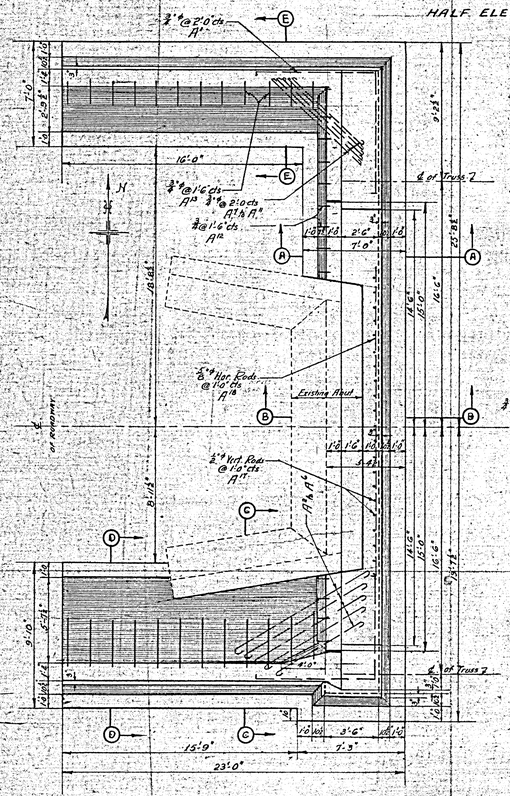
HALF ELEVATION - N. SIDE



ABUTMENT ELEVATION

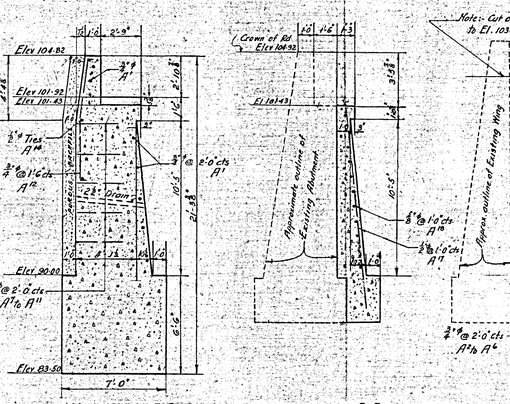
FRONT VIEW

Scale ¼ in = 1 ft.



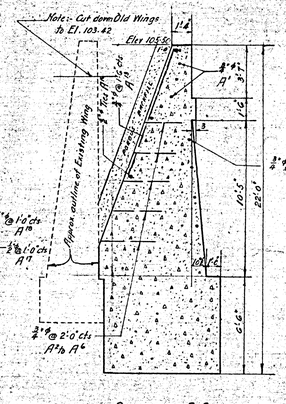
PLAN OF ABUTMENT

Scale ¼ in = 1 ft.

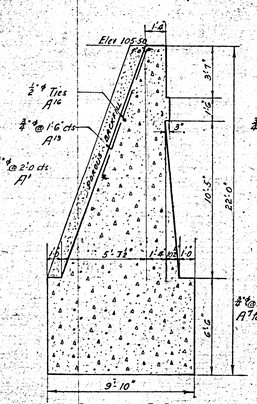


MAIN WALL ON A-A

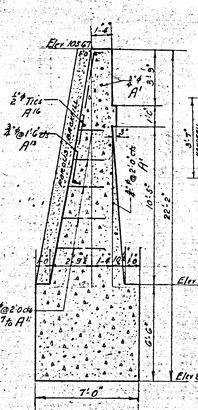
MAIN WALL ON B-B



S. WING ON C-C



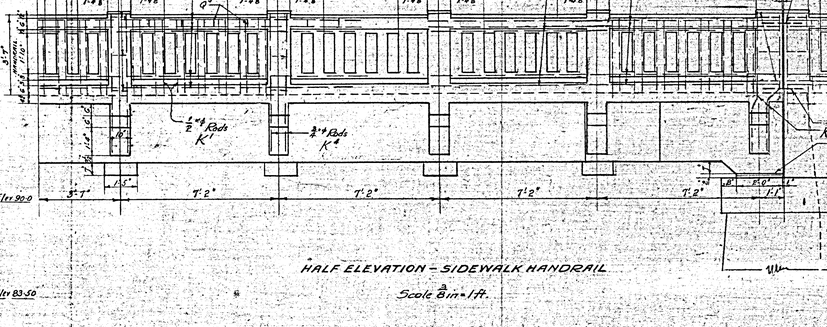
S. WING ON D-D



N. WING ON E-E

SECTIONS OF ABUTMENT

Scale ¼ in = 1 ft.

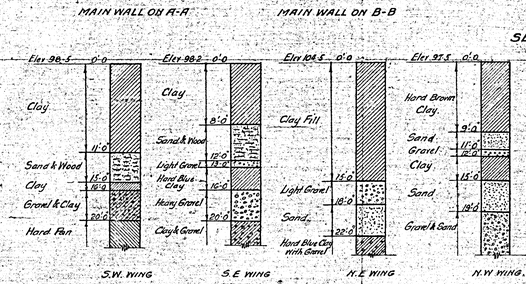


HALF ELEVATION - SIDEWALK HANDRAIL

Scale ⅛ in = 1 ft.

SECTION SHOWING BITUMINOUS JOINTING

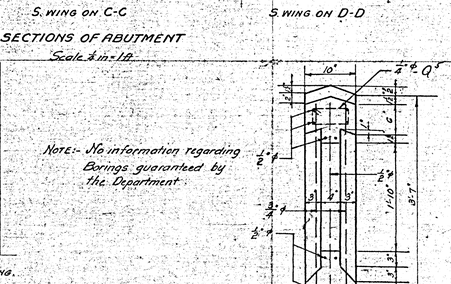
Scale 3 in = 1 ft.

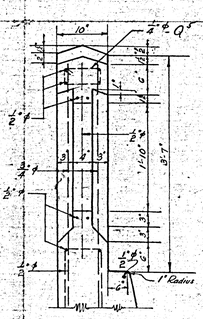


S.W. WING S.E. WING N.E. WING N.W. WING.

BORING DIAGRAMS

Note:- No information regarding Borings guaranteed by the Department.





SECTION OF HANDRAIL

Scale 1 in = 1 ft.

Note:-

To be built in accordance with D.P.H.O. "General Specifications for Concrete Highway Bridges 1920" with revisions and additions as per form No 9. 1930.

Revision June 23-1931:-

Addition of Marks for Reinforcing Steel in Substructure. Reduction of Crown of Roadway from 3" to 2", and alteration of heights of ballast wall above bridge seat. Widening of Curbs on Wings from 4" to 6". Panelling of Wing Walls above bridge seat.

Revision July 8-1931:-

Concrete Quantities.

QUANTITIES.

Concrete in Superstructure – 148·2 cu yds.

Concrete in Substructure – 487·0 cu yds.

Detailed by – H.E.H.

Traced by – H.E.H.

Checked by – [illegible]

SUBSTRUCTURE & HANDRAIL

CONTRACT 31-43

PROPOSED BRIDGE AT

WARWICK VILLAGE

LOT 11 CONC. I. TWP. WARWICK CO. LAMBTON

THE KINGS HIGHWAY No 7

SCALES AS SHOWN

APPROVED

Arthur G. Gilpatrick
BRIDGE ENGINEER

CHIEF ENGINEER

22-3-334

DEPUTY MINISTER

DEPARTMENT OF PUBLIC HIGHWAYS, ONTARIO

TORONTO. APRIL 18 1931. DRAWING No 217.1-1

PLAN OF LOWER CHORD AT END OF SPAN
Pour Arch Ribs to here with Beams, stringers & slab in one continous operation
HALF ELEVATION
Scale 3/8 in = 1 ft.
7" at expansion end
9" at fixed end
Sidewalk Side
Non-Sidewalk Side
SECTION OF ARCH RIB AND LOWER CHORD CONNECTIONS SHOWING STEEL
SECTION AT SIDEWALK BRACKET
DETAIL OF LOWER CHORD RODS
WITH TURNBUCKLE CONNECTIONS
UPPER ROW
SECOND ROW
THIRD ROW
LOWER ROW
SIDEWALK SIDE
NON-SIDEWALK SIDE
DETAIL OF ARCH RIB RODS
LOWER CHORD DIAGRAMS
SIDEWALK SIDE
NON-SIDEWALK SIDE
PART LONGITUDINAL SECTION ON ℄
Scale 3/4 in = 1 ft.
CROSS-SECTION
Scale 3/4 in = 1 ft.
7" Expansion End
9" Fixed End

Revision: July 4th 1931:-
Addition of Lower Chord Diagram - Non-Sidewalk.
do. Detail of Arch Rib Rods
do. Part Longitudinal Section on ℄
do. Marks for Reinforcing Steel.
Revision as to Crown of Roadway, depth of Curbs and thickness of Floor beams at ends.

Detailed by - W.E.H.
Traced by - W.E.H.
Checked by - L.L.

SUPERSTRUCTURE

CONTRACT 31-43
PROPOSED BRIDGE
AT
WARWICK VILLAGE
LOT 11. CONC. I TWP. WARWICK CO. LAMBTON
THE KINGS HIGHWAY No 7
SCALES AS SHOWN
APPROVED

Arthur Sedgwick
BRIDGE ENGINEER

CHIEF ENGINEER

DEPUTY MINISTER

DEPARTMENT OF PUBLIC HIGHWAYS, ONTARIO D
TORONTO. APRIL 16. 1931. DRAWING No 2170-2

Mark	Number of Rods	Size	Length	Remarks	Detail
A1	32	3/4"φ H	16'6"	Corner ties in Abutments.	
A2	2	3/4"φ H	12'8"	1 diagonally across SW & SE Corners of Abuts.	
A3	2	3/4"φ H	11'8"	do.	
A4	2	3/4"φ H	10'9"	do.	
A5	2	3/4"φ H	9'10"	do.	
A6	2	3/4"φ H	8'11"	do.	
A7	2	3/4"φ H	10'2"	1 diagonally across NE & NW corners of Abuts.	
A8	2	3/4"φ H	9'10"	do.	
A9	2	3/4"φ H	9'5"	do.	
A10	2	3/4"φ H	9'1"	do.	
A11	2	3/4"φ H	8'8"	do.	
A12	24	3/4"φ H	8'8"	Verticals in back of Main Wall @ 1'6" cts.	
A13	48	3/4"φ H	9'6"	Verticals in back of Wing Walls @ 1'6" cts.	
A14	6	1/2"φ H	11'6"	Horizontal ties in Main Wall. Section N of Old Abut for A12	Straight
A15	6	1/2"φ H	5'0"	do. Section S of Old Abut for A12	Straight
A16	12	1/2"φ H	17'0"	Horizontal ties in Wing Walls for A13	Straight
A17	42	1/2"φ H	13'0"	Verticals in Face Walls in front of Old Abuts at 1'0" cts.	Straight
A18	22	5/8"φ H	21'0"	Horizontals in Face Wall do at 1'0" cts.	Straight
B1	16	1 1/8"φ H	36'3"	Intermediate Floor beams 2 in each.	

Mark	Number of Rods	Size	Length	Remarks	Detail
B2	24	1 1/8"φ H	43'6"	In Intermediate Floor beams 3 in each	
B3	16	1 1/8"φ H	36'2"	do 2 in each	
B4	16	1 1/8"φ H	35'8"	do 2 in each	
B5	8	1 1/8"φ H	36'11"	do 1 in each	
B6	4	1 1/8"φ H	36'4"	In End Floor beams 2 in each	
B7	6	1 1/8"φ H	43'6"	do 3 in each	
B8	4	1 1/8"φ H	36'3"	do 2 in each	
B9	4	1 1/8"φ H	35'8"	do 2 in each	
B10	2	1 1/8"φ H	37'3"	do 1 in each	
C1	72	1/2"φ H	7'0 5/8"	In Intermediate Floor beams 9 in each	
C2	96	1/2"φ H	6'10 5/8"	do 12 in each	
C3	16	1/2"φ H	6'6 5/8"	do 2 in each	
C4	16	1/2"φ H	6'2 5/8"	do 2 in each	
C5	16	1/2"φ H	5'10 5/8"	do 2 in each	
C6	16	1/2"φ H	5'4 5/8"	do 2 in each	
C7	18	1/2"φ H	7'0 5/8"	In End Floor beams 9 in each	
C8	24	1/2"φ H	6'10 5/8"	do 12 in each	
C9	4	1/2"φ H	6'6 5/8"	do 2 in each	
C10	4	1/2"φ H	6'2 5/8"	do 2 in each	

Mark	Number of Rods	Size	Length	Remarks	Detail
C11	4	1/2"φ H	5'10 5/8"	In End Floor beams 2 in each	
C12	4	1/2"φ H	5'4 5/8"	do 2 in each	
D1	4	1"φ S	46'4"	In Lower Chord Sidewalk Side	R —
D2	4	1"φ S	19'5"	do	L —
D3	8	7/8"φ S	44'8"	In both Lower Chords 4 in each	R —
D4	8	7/8"φ S	21'1"	do 4 in each	L — R
D5	8	7/8"φ S	42'6"	do 4 in each	R — R
D6	8	7/8"φ S	23'3"	do 4 in each	L — R
D7	8	7/8"φ S	40'10"	do 4 in each	R — R
D8	8	7/8"φ S	24'11"	do 4 in each	L — R
D9	8	7/8"φ S	39'2"	do 4 in each	R — R
D10	8	7/8"φ S	26'7"	do 4 in each	L — R
D11	8	7/8"φ S	37'6"	do 4 in each	R — R
D12	8	7/8"φ S	28'3"	do 4 in each	L — R
D13	8	7/8"φ S	35'4"	do 4 in each	R — R

R: Right hand thread to be painted Red.
L: Left hand thread to be painted Green.

CONTRACT 31-43
TABLE OF REINFORCING STEEL
FOR BRIDGE AT
WARWICK VILLAGE.

BRIDGE ENGINEER.

DEPT. OF HIGHWAYS, ONT.
TORONTO, JUNE 16, 1931.

DRAWING No D.2170-3

Contract 31-43
Warwick Bridge
Part of Drawing No. D. 2170-3

TWP# 177-73-3/1

Mark	Number of Rods	Size & Grade	Length	Remarks	Detail
D¹⁴	8	7/8"φ S	30'-5"	In both Lower Chords 4 in each	L — R
D¹⁵	4	1"φ S	33'-8"	In Lower Chord Sidewalk Side	R — R
D¹⁶	4	1"φ S	32'-1"	do.	L — R
D¹⁷	4	3/4"φ S	46'-4"	In Lower Chord Non-Sidewalk Side	R — R
D¹⁸	4	3/4"φ S	19'-5"	do.	L — R
D¹⁹	4	3/4"φ S	33'-8"	do.	R — R
D²⁰	4	3/4"φ S	32'-1"	do.	L — R
D²¹	96	7/8"		Hexagonal Nuts fitted to 7/8"φ Rods in both Lower Chords	
D²²	16	1"		do. 1"φ Rods in Lower Chord Sidewalk Side	
D²³	16	3/4"		do. 3/4"φ Rods in Lower Chord Non-Sidewalk Side	
D²⁴	48	7/8"		Turnbuckles	Turnbuckles must develop the full tensile Strength of the rods with which they are intended to be used.
D²⁵	8	1"		do.	do.
D²⁶	8	3/4"φ		do.	do.
D²⁷	48	7/8"φ H	1'-0 1/2"	Ties in both Lower Chords for 7/8"φ Rods at each end	6"; 6 3/8"; 7/8" dia.
D²⁸	8	7/8"φ H	1'-1"	Ties in Lower Chord S-W side for 1"φ Rods at each end	6"; 7"; 1" dia.
D²⁹	8	7/8"φ H	1'-0 1/2"	Ties in Lower Chord Non S-W side for 3/4"φ Rods at each end	6"; 6 3/4"; 3/4" dia.
E¹	58	5/8"φ H	24'-2 3/4"	Longitudinal in Roadway Slab End & 2 outer Intermediate panels Alt with E³ @ 6 1/2" cts lapping 2'-1" with E³	℄ Ext F.B.; Int. F.B.; 23'-5"
E²	120	5/8"φ H	23'-8"	do. Alt with E¹ @ 6 1/2" cts top & bottom lapping 2'-1" with E⁴	23'-5"
E³	29	5/8"φ H	24'-1 3/4"	do. 3 Inner panels Alt with E⁴ @ 6 1/2" cts lapping 2'-1" with E¹	℄ Int. F.B; Int. F.B ℄; 23'-7"

Mark	Number of Rods	Size & Grade	Length	Remarks	Detail
E⁴	60	5/8"φ H	23'-7"	do. In 3 Inner panels Alt with E³ @ 6 1/2" cts top & bottom lapping 2'-1" with E²	Straight
E⁵	76	1/2"φ H	16'-9"	Transverse ties in Slab & Fl. beams 4 each for E¹ & E³ in Slab panels 4 each for Stirrups in Fl. beams lapping 1'-6" at centre	Straight
F¹	4	7/8"φ S	23'-11 1/8"	Verticals in Hangers	11'-9"
F²	4	7/8"φ S	23'-10 1/8"	do.	11'-8 1/2"
F³	4	7/8"φ S	22'-1 3/8"	do.	10'-10 1/8"
F⁴	4	7/8"φ S	21'-10 3/8"	do.	10'-8 5/8"
F⁵	4	7/8"φ S	18'-4 1/8"	do.	8'-11 1/2"
F⁶	4	7/8"φ S	17'-11 1/8"	do.	8'-9"
F⁷	4	7/8"φ S	12'-6 7/8"	do.	6'-0 7/8"
F⁸	4	7/8"φ S	11'-11 1/8"	do.	5'-9 3/8"
F⁹	56	1/4"φ S	3'-10 1/4"	Ties in hangers at 1'-0" cts.	6; 8 1/4"; 8 3/8" — Bend in field
F¹⁰	64	7/8"		Hexagonal Nuts below plates marked P²	
F¹¹	64	7/8"		Lock Nuts above plates marked P²	
G¹	5	7/8"φ H	18'-6"	In Arch Rib Sidewalk Side lap 6'-0"	15'-8"; 31°; 2'-0"; 10"
G²	5	7/8"φ H	29'-10"	do.	27'-0"; 31°; 2'-0"; 10"
G³	4	7/8"φ H	21'-6"	do.	21'-0"; 6"; 90°
G⁴	4	7/8"φ H	38'-0"	do.	37'-6"; 6"; 90°
G⁵	5	7/8"φ H	16'-0"	do.	15'-3"; 34°; 9"
G⁶	5	7/8"φ H	27'-0"	do.	26'-3"; 34°; 9"

Hanger detail: 7/8"; Dimensions given are to inside of bend; 5" Thread

Mark	Number of Rods	Size & Grade	Length	Remarks	Detail
G⁷	12	7/8"φ H	39'-0"	In Arch Rib Sidewalk Side lap 6'-0"	Straight
G⁸	3	3/4"φ H	18'-6"	In Arch Rib Non-Sidewalk Side lap 6'-0"	15'-8"; 31°; 2'-0"; 10"
G⁹	3	3/4"φ H	29'-10"	do.	27'-0"; 31°; 2'-0"; 10"
G¹⁰	4	3/4"φ H	21'-6"	do.	21'-0"; 6"; 90°
G¹¹	4	3/4"φ H	38'-0"	do.	37'-6"; 6"; 90°
G¹²	3	3/4"φ H	16'-0"	do.	15'-3"; 34°; 9"
G¹³	3	3/4"φ H	27'-0"	do.	26'-3"; 34°; 9"
G¹⁴	8	3/4"φ H	39'-0"	do.	Straight
H¹	136	1/4"φ S	9'-1"	In Arch Ribs both sides @ 1'-0" cts.	Bend in field
H²	68	1/4"φ S	5'-6"	do. both sides @ 2'-0" cts.	Bend in field
J¹	32	1/2"φ H	3'-7"	Bonding rods @ top of Wings @ 1'-6" cts. except in posts	7"; 1'-6"; 1'-6"
J²	30	1/2"φ H	3'-8"	Bonding rods in Curb on bridge Non-Sidewalk side @ 1'-6" cts. except in posts	7"; 1'-9"; Inner leg; Outer leg; 1'-4"
K¹	352	1/2"φ H	3'-2"	Verticals in Spindles	Straight
K²	56	3/4"φ H	6'-0"	Verticals in posts on Wings	Straight

CONTRACT 31-43

TABLE OF REINFORCING STEEL

FOR BRIDGE AT

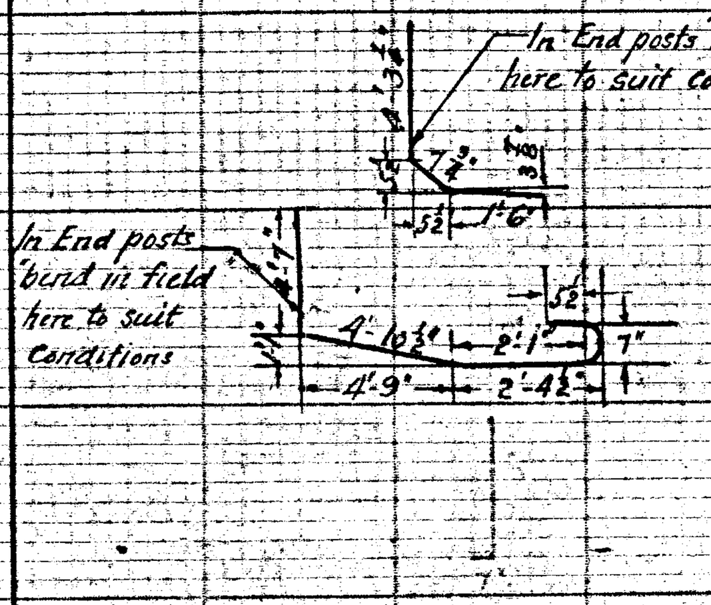
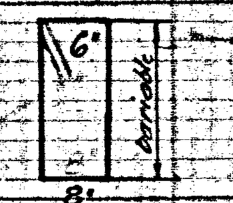
WARWICK VILLAGE

BRIDGE ENGINEER

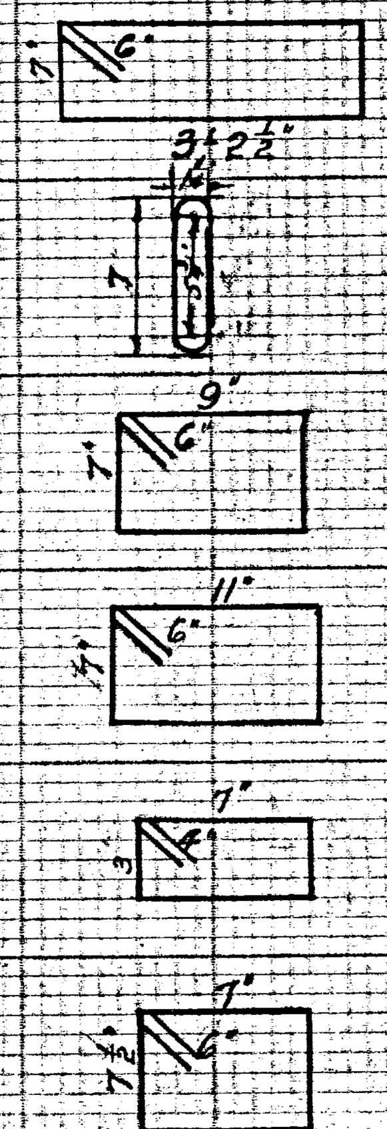
DEPT. OF HIGHWAYS ONT.
TORONTO JUNE 22 1931

D
DRAWING Nº 2110-A

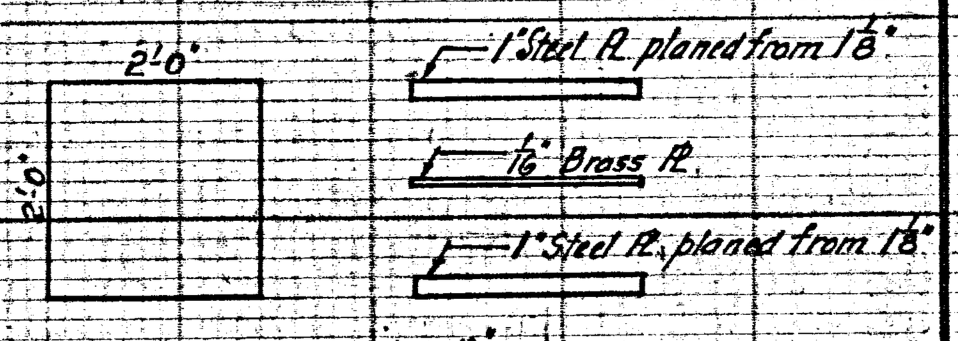
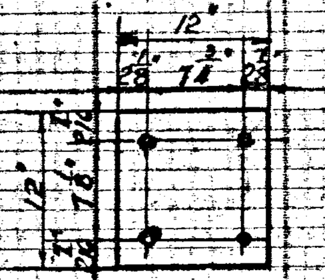
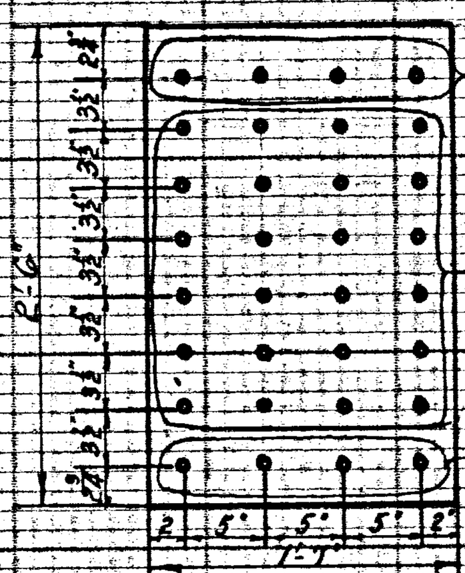
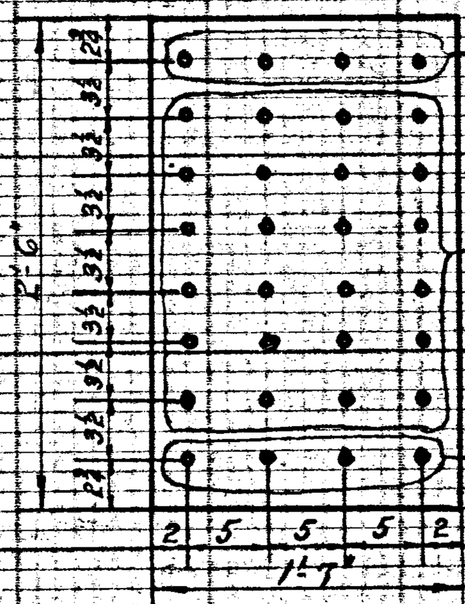
Tue# 177-73-4-A

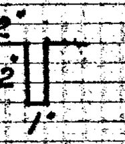
Mark	Number of Rods	Size & Grade	Length	Remarks	Detail
K^3	8	$\frac{3}{4}''\phi$ H	6'-8"	Verticals in End posts on bridge. Non-Sidewalk Side	Straight
K^4	20	$\frac{3}{4}''\phi$ H	6'-5"	In brackets & handrail posts. 2 in each. Outer rods. Sidewalk side	 In End posts bend in field here to suit conditions
K^5	20	$\frac{3}{4}''\phi$ H	12'-11"	do. 2 in each. Inner rods. Sidewalk side	In End posts bend in field here to suit conditions
L^1	32	$\frac{1}{2}''\phi$ H	23'-3"	Long[l] rods in S-W slab & Curbs. In 3 outer panels lapping 1'-8" with L^2	Straight
L^2	16	$\frac{1}{2}''\phi$ H	23'-2"	do. In 3 inner panels. lapping 1'-8" with L^1	Straight
M^1	30	$\frac{1}{4}''\phi$ S	7'-0"	Stirrups in brackets. 3 in each	 Bend in field
M^2	30	$\frac{1}{4}''\phi$ S	6'-0"	do. 3 in each	Same as above do.
N^1	34	$\frac{1}{2}''\phi$ H	8'-4"	Transverse Rods in Sidewalk Slab @ 2'-0" cts.	Straight
N^2	80	$\frac{1}{2}''\phi$ H	3'-0"	Over Intermediate brackets at $7\frac{1}{2}''$ cts. 10 in each.	Straight
N^3	20	$\frac{1}{2}''\phi$ H	3'-0"	Over End brackets at $7\frac{1}{2}''$ cts. 10 in each	
O^1	40	$\frac{1}{2}''\phi$ H	18'-4"	Long[l] in H-R on Wings	Straight
O^2	8	$\frac{1}{2}''\phi$ H	10'-1"	Long[l] in End panels in H-R. Non S W side.	do.
O^3	12	$\frac{1}{2}''\phi$ H	14'-9"	Long[l] in End & Outer Intermediate panels in H-R do.	do.
O^4	58	$\frac{1}{2}''\phi$ H	6'-0"	Long[l] in Intermediate panels in H-R do.	do.
O^5	60	$\frac{1}{2}''\phi$ H	4'-0"	Splices in H-R at hangers. do.	do.
O^6	20	$\frac{1}{2}''\phi$ H	8'-6"	Long[l] in H-R in End panels S-W side lapping 1'-0" with O^7	do.
O^7	70	$\frac{1}{2}''\phi$ H	8'-2"	Long[l] in H-R in Inter. panels. S-W side lapping 1'-0" at posts.	do.

Note :- H - Hard Grade Steel
S - Soft Grade Steel

Mark	Number of Rods	Size & Grade	Length	Remarks	Detail
Q^1	12	$\frac{1}{4}''\phi$ S	8'-7"	In End posts on Wings around Verticals "K^2" 3 in each	 Bend in field
Q^2	12	$\frac{1}{4}''\phi$ S	1'-6"	do. around Centre Vert. "K^2" 3 in each	do.
Q^3	36	$\frac{1}{4}''\phi$ S	3'-8"	In all 1'-0" posts on Wings and bridge 3 in each.	do.
Q^4	24	$\frac{1}{4}''\phi$ S	4'-0"	In all 1'-2" posts at Expansion Joints on Wings & bridge 3 in each	do.
Q^5	104	$\frac{1}{4}''\phi$ S	2'-4"	In cap of Handrail @ 1'-6" cts both sides except in posts 4 in each bay	do.
Q^6	36	$\frac{1}{4}''\phi$ S	3'-5"	In base of H-R @ 1'-6" cts. on bridge S-W side only. except in posts.	do.

PLATES

Mark	Number	Size	Remarks	Detail
P^1	2 sets		Plates under Lower Chords	 2'-0" × 2'-0"; 1" Steel Pl. planed from $1\frac{1}{8}''$; $\frac{1}{16}''$ Brass Pl.; 1" Steel Pl. planed from $1\frac{1}{8}''$
P^2	16	$12'' \times 12'' \times \frac{5}{8}''$	Plates at bottom of hangers	 4 - 1"ϕ holes.
P^3	2	$1'7'' \times 2'6'' \times \frac{5}{8}''$	Plates at Ends of Lower Chords Sidewalk Side	 4 - $1\frac{1}{8}''\phi$ holes; 24 - 1"ϕ holes; 4 - $1\frac{1}{8}''\phi$ holes.
P^4	2	$1'7'' \times 2'6'' \times \frac{5}{8}''$	Plates at Ends of Lower Chord Non-Sidewalk Side	 4 - $\frac{7}{8}''\phi$ holes; 24 - 1"ϕ holes; 4 - $\frac{7}{8}''\phi$ holes.

Mark	Number of Rods	Size & Grade	Length	Remarks	Detail
H-R-E	12			Handrail Expansion Joints 3 at each Joint	Supplied by Department
C.E.S.	26	#16 Gauge	6" x 9"	Copper Strips to retain bituminous jointing in Expansion Joint	 do. do.
G.R.E.	8			Standard Guard Rail Eye bolts.	do. Res[t]. Eng[r].
W.I.D.	10			3" W-I Drain pipes 5 on each side	do. do.

CONTRACT 31-43
TABLE OF REINFORCING STEEL
FOR BRIDGE AT
WARWICK VILLAGE

BRIDGE ENGINEER

DEPT. OF HIGHWAYS ONT.
TORONTO. JUNE 25 1931.

Detailed by WEA
Checked

D
DRAWING No 2170-3

Twp # 177-73-5 A/

APPENDIX B

BEAR CREEK WATERSHED
REPORT CARD

NRSI SPECIES AT RISK ASSESSMENT

Bear Creek Headwaters
Watershed Report Card 2013

This report card summarizes surface water quality and forest condition in the Bear Creek Headwaters watershed within the St. Clair Region Conservation Authority jurisdiction from 2001 to 2010. The summary is intended to provide citizens, community groups, municipalities, industries and agencies with information so they can take actions to protect or enhance the environmental features of the watershed. The ongoing monitoring will be reported on a five-year cycle which will help local people manage their local environment. This card uses the 2011 guidelines and updated grading system for Conservation Authority Watershed Report Cards. These new province-wide standards have a more stringent grading system and result in generally lower grades in the intensely developed regions of southwestern Ontario.

This report card is part of a larger report entitled the St. Clair Region Conservation Authority Watershed Report Card (2013) available at www.scrca.on.ca. Further information including methodology, comparisons with the other 13 St. Clair Region watersheds, regional maps and summary tables are also found in that document.

SURFACE WATER QUALITY

Steady **D**

Indicator	Bear Creek Headwaters		St. Clair Region	Provincial Guideline	Indicator Description
	2005	2010	2010		
Total Phosphorus (mg/L)	0.22	**0.22 F Steady**	0.13 D	0.03	*Phosphorus is found in products such as detergents, fertilizer and pesticides, and contributes to excess algae and low oxygen in streams and lakes.*
Bacteria (#*E. coli*/100mL)	147	**184 C Declining**	169 C	100 (recreational use)	*Fecal bacteria are found in human and animal (livestock/ wildlife) waste. Their presence in water indicates fecal contamination and is a strong indicator that other disease-causing organisms are in the watercourse.*
Benthic Score (FBI)	5.7	**5.7 C Steady**	5.9 D	None	*Benthic invertebrates are small animals without backbones that live in stream sediments. The Family Biotic Index (FBI) scores each taxa according to its pollution tolerance and ranges from 1 (healthy) to 10 (severely degraded).*

FOREST CONDITION

D

Indicators	Bear Creek Headwaters		St. Clair Region	Indicator Description
	2005	2010	2010	
Forest Cover %	11.8	**11.7 D**	11.4 D	*Forest Cover is the percentage of a watershed that is forested. Environment Canada recommends that 30% of a watershed should be forest and other natural cover to sustain native plants and animals.*
Forest Interior %	1.7	**1.8 F**	2.0 F	*Forest Interior is the core area inside a woodlot that some bird species need to breed successfully. The outer 100 m perimeter of a woodlot is prone to high predation, sun and wind damage, and alien species invasion.*
Forested Riparian Buffer %	No data	**23.6 D**	21.2 D	*Forested Riparian Buffer is the 30 m area that is forested on both sides of an open watercourse. Natural cover in this area aids in sediment and nutrient removal.*

The changes in forest condition percentages between the two time periods may reflect more accurate mapping, rather than an actual gain or loss of forest cover.

Forest Condition

D

The three forest condition indicators score a D, F and D, producing an overall grade of D. The forest condition recorded for this watershed are typical for the St. Clair Region, with poor forest cover, very poor forest interior and poor riparian buffer. The majority of the woodlands are less than 5 hectares in size. The percent forest cover (11.7%) is average for the St. Clair Region and too low for sustainability. The target for southern Ontario is 30% forest cover. The percent forest interior (1.8%) is low indicating that most woodlots are too narrow to support area sensitive species such as Scarlet Tanager and Ovenbird. The target for southern Ontario is 10% forest interior. The percentage of the riparian zone that is forested (23.6%) is higher than average in the St. Clair Region, though still less than half of the target of 50%.

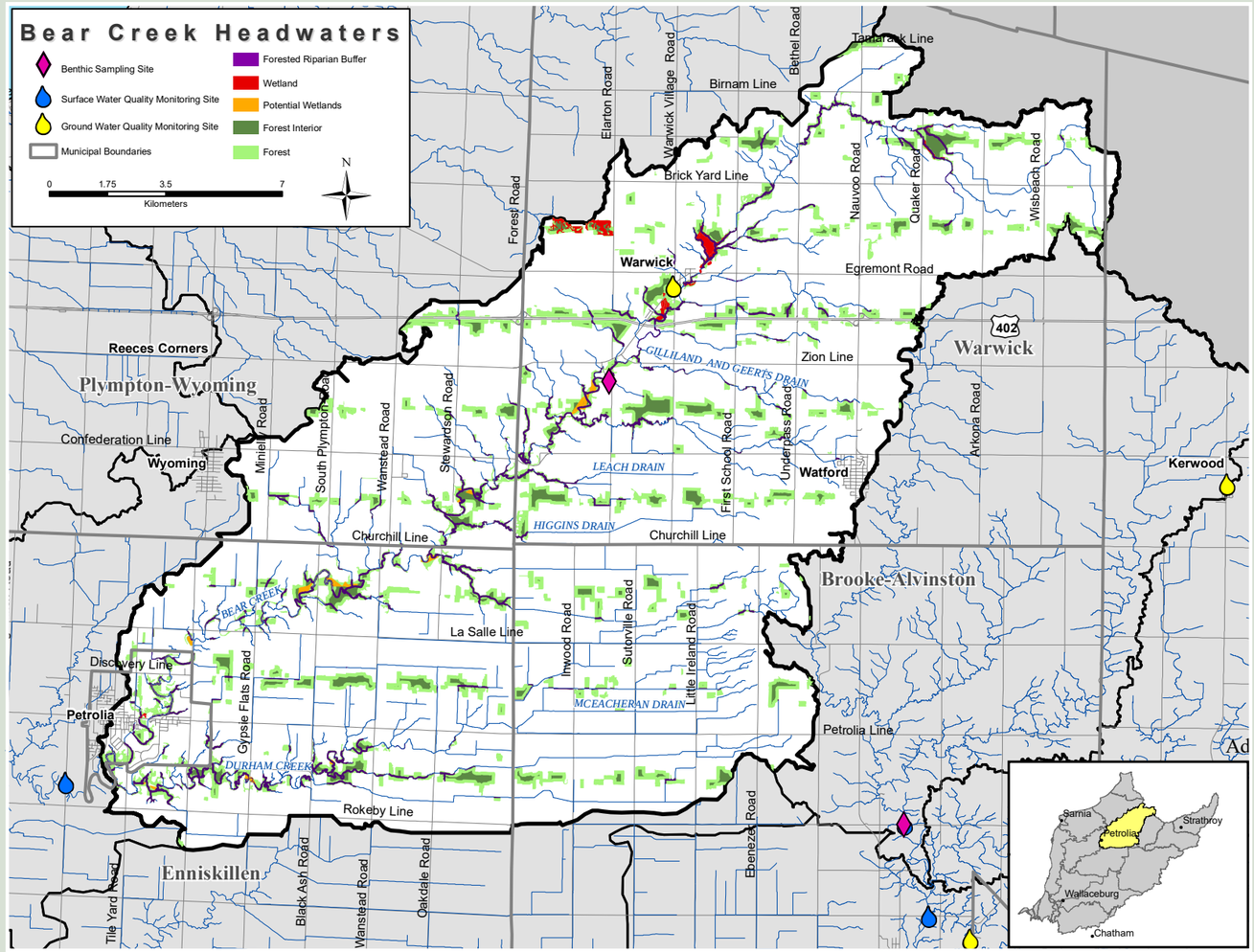
Although there have been tree-planting projects in this watershed, forests grow very slowly, and recent reforestation efforts are not likely to be visible in aerial photography. Young trees are not considered to be forests until the trees are at least 3 m tall and a canopy is developing. Forest loss from land use changes will be visible from above.

Local Solutions to Improve Forest Condition

- Increase forest interior by "bulking up" woodlots with a variety of native species to make the woodlots larger and rounder, to reduce the impact of extreme weather events on tree health
- Woodlot owners should prepare and follow Woodlot Management Plans
- Connect the woodlots at the back of farm properties into corridors, to improve wildlife habitat

Highlights Since 2005

- Private landowners completed 17 stewardship projects including wetland enhancement and extensive tree and shrub plantings
- Land developers in Petrolia donated significant stewardship funds to support tree planting for Glenview Estates conservation lands
- High school students and local residents helped plant native trees and shrubs on public lands in Petrolia



Surface Water Quality

D
Steady

The surface water quality indicators score F, C and C producing an overall grade for the Bear Creek Headwaters of D (using the provincial grading system). All three indicators have remained steady since the last report card.

Levels of phosphorus remained extremely elevated since 2005, at over seven times the Ministry of the Environment (MOE) guideline. This is the highest concentration of phosphorus recorded in the St. Clair Region watersheds.

Fecal bacteria have increased slightly since 2005, and continue to indicate ongoing contamination from human and animal waste.

Water quality based on benthic scores has been consistent since 2005. The score continues to be a C grade which is better than the St. Clair Region average.

Local Solutions to Improve Water Quality

- Implement Environmental Farm Plans, particularly for fertilizer and nutrient management, to reduce nutrient loss
- Fix faulty septic systems and establish a septic maintenance plan
- Develop and maintain streamside buffers along one side of all watercourses, especially municipal drains, to stabilize the banks

Impacts of Climate Change

- We can expect more severe weather: more storms with intense rainfall or snow; and more extended droughts.
- We can expect flooding conditions more often throughout the summer.
- Warmer temperatures will result in shifts in species diversity and will put pressure on species at risk.
- Less predictable weather increases the need to carry out stewardship projects and improved stormwater management to help protect watersheds.

Bear Creek Headwaters
Watershed Features

Area	379 km^2, 9.2% of the St. Clair Region watershed
Municipalities	Warwick (166 km^2), Enniskillen (89 km^2), Brooke-Alvinston (67 km^2), Plympton-Wyoming (47 km^2), Petrolia (10 km^2), Adelaide-Metcalfe (1 km^2)
First Nations	None
Physiography	70% bevelled till plain; 16% till moraine; 10% till plain (Undrumlinized); 4% sand plain
Soil Type	84% silt and clay; 5% loam; 5% silt and clay loam; 4% bottom land and beach; 2% sand loam
Streamflow	The mean annual flow is 2.91 cubic metres per second (cms) measured in Bear Creek just above Petrolia. From 2006-2010, annual flows varied widely, ranging from 1.89 to 5.30 cms. The previous period, from 2003-2005, flows were closer to the mean, with 2.25, 2.03 and 2.97 cms.
Precipitation	The average annual precipitation at Petrolia from 2002-2010 was 922 mm. From 2006-2010, levels were usually above this value, but ranged from 760 to 1131 mm. The previous period, from 2002-2005, was always lower than the mean, ranging from 773 to 942 mm.
Air Temperature	The average annual temperature at Petrolia is 8.9°C. From 2006 to 2010, average annual temperatures were close to the normal, ranging from 8.0-9.8°C. The previous period of record, 2002-2005, was similar with a range of 8.3 to 9.8°C.
Tileage	12% randomly tiled; 58% systematically tiled; 30% unknown drainage
Watercourse Length & Type	Total length: 685 km Watercourse type: 17% natural; 47% open municipal drain; 22% buried; 14% unclassified
Dams and Barriers	5 dams including public dams at Bridgeview C.A. and at Warwick C.A.
Sewage Treatment Plants	Watford sewage lagoons discharge treated effluent to a drain that enters Bear Creek north of Confederation Line. The Petrolia Wastewater Treatment Plant discharges treated effluent to Bear Creek at the downstream end of Petrolia, near the bottom of this watershed.
Fisheries Resources	30 fish species and 10 freshwater mussel species have been recorded. Game fish include Largemouth Bass.
Species at Risk	Plants: Butternut, Green Dragon, Kentucky Coffee-tree Birds: Bobolink, Loggerhead Shrike Fish: Blackstripe Topminnow, Spotted Sucker Mussels: Round Pigtoe
Stewardship Projects	17 stewardship projects were completed in this watershed from 2006 to 2010, including the planting of 8,830 trees and shrubs. Memorial Forest and Conservation Area tree planting from 1988 to 2012 includes an additional 4 projects (18,084 trees and shrubs).
Groundwater	The shallow unconfined aquifers associated with the Wyoming Moraine to the northwest and the Seaforth Moraine to the southeast provide groundwater for agricultural purposes. For the majority of the region, the deeper aquifer at the interface between the overburden and the bedrock, known as the Fresh Water Aquifer, is limited in quantity and has elevated chloride. Most of the residents are supplied by municipal piped water from intakes on Lake Huron.
Wetland Cover	97 ha (0.3% of the watershed) are identified as wetlands by MNR. An additional 53 ha (0.1% of the watershed) are identified by SCRCA as potential wetlands.

Woodlot Size

Size Category	Number of Woodlots	% of Woodlots	Total Woodland Area (ha)	% of Total Woodland Area	Largest Woodlot (ha)
<5 ha	168	49	336	8	137
5-10 ha	60	18	445	10	
10-30 ha	71	21	1,151	26	
>30 ha	43	13	2,504	56	
Total	**342**		**4,436**		

St. Clair Region Conservation Authority
205 Mill Pond Crescent, Strathroy ON N7G 3P9
E-mail: scrca@scrca.on.ca
Web site: www.scrca.on.ca
Phone (519) 245-3710

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

November 27, 2018 2126

Kelly Vader
BM Ross and Associates Ltd.
62 North Street
Goderich, ON N7A 2T4

Re: Egremont Road Bridge Replacement – Bear Creek
Species at Risk Habitat Assessment

Natural Resource Solutions Inc. (NRSI) was retained by BM Ross and Associates Ltd. to undertake a Species at Risk (SAR) habitat assessment associated with the proposed replacement of the existing Egremont Road Bridge over Bear Creek in Warwick Township. See Map 1 for the bridge and study area location.

Background information review and field surveys were completed to characterize the existing natural features and assess the presence of SAR habitat within the study area. Fisheries and Oceans Canada (DFO) indicated that there are no SAR mussel distribution records within the vicinity of the Egremont Bridge, although there is potential for Round Pigtoe (*Pleurobema sintoxia*), Rainbow (*Villosa iris*) and Salamander Mussel (*Simpsonaias ambigua*) to be present downstream of a large reservoir just south of Warwick Township (Pers. comm., A. Conway, Fisheries Protection Biologist, July 3, 2018). Based on Ministry of Natural Resources and Forestry (MNRF) SAR records, Round Pigtoe and Salamander Mussel have the potential to occur within the study area (MNRF 2017). As such, an aquatic habitat assessment was carried out that included a general assessment of suitable mussel habitat with a focus specifically on these three mussel SAR. Potential for terrestrial SAR habitat occurrence was also assessed as part of this study, including an investigation of Barn Swallow (*Hirundo rustica*) nesting under the existing bridge.

This report summarizes the methods and results of the SAR assessment undertaken for the study area. These results are discussed below in the context of Ontario's *Endangered Species Act* (ESA) and the federal *Species at Risk Act* (SARA), with anticipated next steps and requirements to meet MNRF and DFO policies for the protection of observed SAR and their habitats. Significant Wildlife Habitat (SWH) features identified through field studies have also been described and mapped. This memorandum identifies construction-related mitigation measures which are intended to minimize potential impacts to the identified significant features.

Study Area
For the purposes of this report, the study area encompasses the bridge location as well as those lands immediately upstream and downstream of the bridge (Map 1). It is understood that improvements to the east and west roadway approaches to the bridge will be maintained within the Egremont Road right-of-way (ROW) boundaries.

This SAR habitat assessment separates species and their habitats which occur within the ROW and have the greatest potential to be impacted from those which are adjacent to the ROW within the surrounding natural features.

The study area occurs to the north of the Warwick Conservation Area, which is part of a large, regionally significant natural area. The larger natural feature associated with the riparian corridor is designated as Natural Heritage area under Schedule C of the Warwick Official Plan (Township of Warwick 2010). This designation extends from the Conservation Area up to the south side of Egremont Road at the bridge location.

The proposed span of the new bridge is larger than the existing and it is expected that the new bridge abutments will extend into the creek, and that these will include underwater riprap slopes in front of the abutments. A small area of the Shallow Aquatic wetland habitat will be impacted by the footprint of the new abutments. Currently the full length of both abutments and a significant portion of the wingwalls are in contact with the creek. Impacts to upland areas will be restricted to the Cultural Meadow ditches where sediment and erosion control features will be installed at the toe of the embankment slopes and grading may occur on the slopes.

The study area is bisected by Bear Creek, which flows in a north to south direction beneath Egremont Road. This section of Bear Creek is considered to be in the headwaters of Lake St. Clair and is considered to be a warmwater watercourse with diverse range of fish and mussel species being recorded (St. Clair Region Conservation Authority Watershed Report Card 2013). A dam is present on Bear Creek within the Warwick Conservation Area downstream of the study area. This dam would present a barrier to fish passage and has also resulted in the large pond/reservoir being formed, which causes backwatering up to the Egremont Road Bridge.

Background Review and Species at Risk Screening

SAR include species identified by the Committee on the Status of Species at Risk in Ontario (COSSARO) as provincially Endangered or Threatened (MNRF 2018b). Species listed as Endangered or Threatened are protected by the ESA, which includes protection to their habitat. Herein, for the purposes of this report, Endangered and Threatened species are referred to as “regulated SAR”.

Species considered Special Concern are included in the definition of Species of Conservation Concern (SCC), which includes the following:

- species designated provincially as Special Concern,
- species that have been assigned a conservation status (S-Rank) of S1 to S3 or SH by the Natural Heritage Information Centre, and
- species that are designated federally as Threatened or Endangered by the Committee for the Status of Endangered Wildlife in Canada (COSEWIC) but not provincially by the COSSARO.

SAR are also those listed on the SARA (Government of Canada 2018). The species identified at Endangered and Threatened on Schedule 1 receive protection, including their habitat.

Habitat for SCC is considered Significant Wildlife Habitat (SWH) (OMNR 2010), which is afforded protection under the Provincial Policy Statement (OMMAH 2014) and various municipal natural heritage protection policies. Although SWH may not represent

constraints to road and bridge infrastructure improvements that are subject to Class Environmental Assessments (as these activities are exempt), this information is presented to inform the bridge replacement plan so as to avoid, or otherwise mitigate impacts to known SWH to the extent feasible.

Background information sources were reviewed to identify records of provincially and federally significant species known from the study area vicinity. These information sources included the following:

- MNRF Natural Heritage Information Centre database (MNRF 2018a);
- Ontario Breeding Bird Atlas (BSC et al. 2008);
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2018);
- Atlas of the Mammals of Ontario (Dobbyn 1994);
- Ontario Butterfly Atlas (MacNaughton et al. 2018); and,
- Fisheries and Oceans Canada SAR Distribution Mapping (DFO 2017)

An information request was submitted to the DFO on June 20, 2018, and to the MNRF Aylmer District office on September 5, 2018 for existing regulated SAR records, fisheries data, and other background natural heritage information for the study area and surrounding vicinity. A response was received from the DFO on July 7, 2018 and from the MNRF on September 5, 2018. Information received from these responses was considered with other background information in screening potential for regulated SAR occurrence.

Based on background information review, a comprehensive list of regulated SAR and SCC known from the study area, (including a SAR list for the whole of Warwick Township), was compiled (Appendix I). Based on this list, 5 plant species, 11 bird species, 5 herpetofauna species, 4 mammal species, and 2 mussel regulated SAR were identified as having occurrence records in the study area or greater Township of Warwick. Appendix I also lists SCC known from or observed within the study area vicinity, the habitats of which are considered SWH (OMNR 2010).

A preliminary screening exercise was conducted for these species to identify which species have suitable habitat within the study area. This involved cross-referencing the preferred habitat for reported regulated SAR (OMNR 2000) against habitats known to occur in the study area. This was completed to ensure that the potential presence of all regulated SAR within the study area was adequately assessed.

Of the regulated SAR (provincial and federal) with known occurrence records in the study area vicinity, the following species were determined to have suitable habitat *within the ROW development footprint zone* based on preliminary screening:

- Barn Swallow (*Hirundo rustica*)
- Blanding's Turtle (*Emydoidea blandingii*)
- Snapping Turtle (*Chelydra serpentina serpentina*)
- Little Brown Myotis (*Myotis lucifugus*)
- Northern Myotis (*Myotis septentrionalis*)
- Eastern Small-footed Myotis (*Myotis leibii*)
- Salamander Mussel (*Simpsonaias ambigua*)
- Round Pigtoe (*Pleurobema sintoxia*)
- Rainbow (*Villosa iris*)
- Butternut (*Juglans cinerea*)

Green Dragon (*Arisaema dracontium*) was determined to have suitable habitat within the study area but not within the ROW development footprint zone.

Field Methodology
A single site visit was completed on July 17, 2018 to characterize the existing natural features and habitats and to verify the presence or absence of SAR and their habitats within the study area. The following survey methodologies were undertaken during the site visit:

- Vegetation community descriptions and mapping using Ecological Land Classification (ELC) methods for Southern Ontario (Lee *et al.* 1998), including a comprehensive inventory of vascular flora species within and adjacent to the ROW at the bridge location.
- A single breeding bird area search survey was conducted within the development area and adjacent habitats. The highest level of breeding evidence was recorded for each observed species based on breeding evidence codes provided in BSC (2001).
- Nest searches of the bridge structure for the presence of Barn Swallow or other nesting species.
- Area search for snakes in appropriate habitat and potential hibernaculum features;
- Cavity tree assessment to determine presence of potential bat SAR habitat;
- Incidental observations of mammals, amphibians, butterflies and odonates (dragonflies/damselflies) observed on-site.
- Aquatic habitat assessment of Bear Creek extending approximately 50m upstream and 50m downstream of Egremont Road, using visual observations, wetted cross-section measurements and mapping of habitat features such as riffles, pools and in-stream cover features. The aquatic habitat assessment included a general assessment of suitable mussel habitat with a focus on regulated SAR. Any mussel shells found along the shoreline were identified. A long-handled scoop with 7mm mesh was used within deeper areas to determine substrates.

Results of Field Studies
Terrestrial Investigations

<u>Vegetation Communities and Provincially Significant Species</u>
The study area is dominated by a single vegetation community, Reed-canary Grass Graminoid Mineral Meadow Marsh Type (MAM2-2), both north and south of the Egremont Road ROW (Map 2). This community was observed to be dominated by Reed-canary Grass (*Phalaris arundinacea*) with small amounts of American Stinging Nettle (*Urtica dioica*), Giant Ragweed (*Artemisia trifida*) and Dame's Rocket (*Hesperis matronalis*). This community contains scattered Canada Elderberry (*Sambucus canadensis*) with Green Ash (*Fraxinus pensylvanica*), Crack Willow (*Salix fragilis*) and American Elm (*Ulmus americana*) limited to the watercourse edge. The banks of the roadway are cultural meadow and are dominated by non-native cool season grasses.

At the bridge crossing, an area of Water Lily – Bullhead Lily Floating-leaved Shallow Aquatic Type (SAF1-1) is present and extends approximately 30m to the north and south of the bridge. This open water community contains species such as Yellow Pond-lily

(*Nuphar lutea*), Eurasian Water Milfoil (*Myriophyllum spicatum*), Broad-leaved Arrowhead (*Sagittaria latifolia*) and Common Spikerush (*Eleocharis palustris*). Fluctuations in water levels have created mud flats at the periphery of this community and along the edges of the watercourse which support a high diversity of wetland plant species.

A small oxbow feature is present to the north of the road and is characterized as Mineral Deciduous Swamp Ecosite (SWD4). This feature is dominated by Crack Willow and was assessed from the roadside.

Approximately 40m south of the bridge, an area of Bur Oak Mineral Deciduous Swamp Type (SWD1-2) is present and extends southward toward the Conservation Area. The canopy of mature Bur Oak (*Quercus macrocarpa*), Black Walnut (*Juglans nigra*) and Silver Maple (*Acer saccharinum*) has an open understorey with American Black Curant (*Ribes americanum*), Silky Dogwood (*Cornus amomum*) and Riverbank Grape (*Vitis riparia*) present in the shrub layer. The groundcover includes swaths of Fringed Loosestrife (*Lysimachia ciliata*), False Nettle (*Boehmeria cylindrica*) and Virginia Wildrye (*Elymus virginicus*). Species such as Cardinal Flower (*Lobelia cardinalis*) and the provincially rare Green Dragon (*Arisaema dracontium*) are present in the wet swales throughout this community.

A total of 75 species of vascular flora were inventoried within the study area. No regulated SAR were observed; however, one SCC, Green Dragon was documented from the study area to the south of the bridge. No provincially significant plant species were inventoried within the road ROW.

Green Dragon is designated a species of Special Concern in Ontario (MNRF 2018a). Consequently, it is considered a SCC, the habitat of which is considered SWH (OMNR 2010). Approximately 30 Green Dragon plants were observed in depressional slough areas within the Bur Oak swamp community south of the road ROW (with additional plants likely present further south), as shown on Map 2. All individuals were located outside of the proposed ROW construction footprint.

Wildlife and Habitat

A total of 15 bird species was recorded during the breeding bird survey. Of these, 12 species showed evidence of breeding within the study area, such as adults carrying food, maintenance of breeding territories, and singing males.

One regulated bird SAR, Barn Swallow (*Hirundo rustica*), was documented within the study area. A total of 5 active Barn Swallow nests were observed on the underside of the Egremont Road Bridge during the field investigation. NRSI biologists observed as many as 9 individuals flying to and from the nests, some carrying food and with young observed in the nests. NRSI biologists also observed a Northern Rough-winged Swallow (*Stelgidopteryx serripennis*) flying to and from a nest under the Egremont Road Bridge. Although this species is not a SAR or SCC it has protection under the *Migratory Birds Convention Act* (MBCA) (Environment Canada 2016a).

Incidental wildlife observed during the survey included Midland Painted Turtle (*Chrysemys picta*), Muskrat (*Ondatra zibethicus*), Ebony Jewelwing (*Calopteryx maculata*), Raccoon (*Procyon lotor*) tracks and Green Frog (*Lithobates clamitans*) vocalizations. A Monarch (*Danaus plexippus*) was observed nectaring on Swamp

Milkweed (*Asclepias incarnata*) at the edge of the watercourse. While Monarch is considered significant both provincially and federally, the bridge replacement would not have an impact on this species or the availability of Milkweed which acts as a larval host plant.

No cavity trees or trees with exfoliating bark which could provide bat roosting habitat or cavity nesting bird habitat were documented within the study area ROW. One Green Ash and one American Elm snag are present within the ROW but do not provide suitable cavities or exfoliating bark. No terrestrial crayfish chimneys were observed within the ROW or within adjacent marsh and field areas.

The shallow aquatic marsh which extends to the north and south of the bridge is likely to provide anuran breeding habitat (between April and June). Although this area is part of the watercourse, the shallow backwater areas at the fringe of this feature are likely to provide suitable conditions for toad and frog breeding.

Aquatic Investigations

One NRSI biologist conducted an aquatic habitat assessment on Bear Creek from 50m upstream to 50m downstream of the Egremont Road crossing on July 17, 2018. It had rained within the general area the previous day, but the rain amount did not influence the turbidity of the site, as Bear Creek is already a turbid system due to its clay substrates. At 0845hrs, the water temperature and air temperature were 23.9°C and 25.5°C, respectively. The dissolved oxygen was 6.6mg/L and 81%, pH was 8.62, total dissolved solids was 305 parts per million (ppm), and conductivity was 0.61ms/cm. Using a turbidity tube the visible depth was 15cm and it was difficult to see the bottom at most depths.

See Appendix II for an aquatic habitat photolog of the study area.

Bear Creek upstream of the bridge flows in an east to west direction roughly paralleling Egremont Road before taking a sharp turn toward a southerly direction under the bridge. Where it runs along the north side of Egremont Road it has a narrow riparian zone and there is evidence of livestock use of the creek. The floodplain extends to the north of the channel and the road bank limits the floodplain to the south (along Egremont Road). The channel as it runs alongside the road is defined and ranged in width of 2.8 to 3.9m and was primarily shaded with deciduous trees and shrubs on both banks. There was limited flow within the channel during the assessment, although there was evidence of high flows (debris up along the banks and within trees/shrubs). The substrates within the defined channel were gravel, silt, muck and detritus, changing to softer substrates closer to the bridge. Immediately upstream of the bridge, Bear Creek is wide with very limited flow and is mapped as a wetland feature (SAF1-1, Map 2) due to the backwatered area, limited flow, and heavy aquatic vegetation. The wetted width upstream of the bridge was 19.2m with depths ranging from 0.6 to greater than 1.1m. The substrates were soft, comprising of clay, muck, detritus, and silt and being difficult to walk through within the centre of the channel. Lesser Duckweed (*Lemna minor)*, Eurasian Water Milfoil, and Yellow Pond Lily was present within the wider section of Bear Creek immediately upstream of the bridge. An abundance of young-of-year fish were also observed within the backwatered area. No mussel shells or live mussels were observed upstream of the road.

A drainage ditch exists along the northwest side of Egremont Road that conveys roadside runoff to Bear Creek. This channel was densely lined with willows, cattail and other small shrubs and grasses. A man-made pond is also present to the north of Egremont Road. This pond has an overflow outlet to Bear Creek.

Under the bridge along the west abutment the substrates were comprised primarily of sand and gravel. Remnants of a previous wood bridge structure were observed along both abutments. The substrates along the east abutment were comprised primarily of muck and sand, with a firmer substrate underneath. Depths under the bridge varied from 0.6m to 0.9m and the depths were greatest in the centre at the downstream side of the bridge. Due to the clay base and agricultural runoff inputs, the water keeps a turbid, brown colour throughout the year. Substrates were scooped throughout the area under the bridge and no mussel shells or live specimens were found.

Downstream of the bridge Bear Creek continues in a southerly direction, occurring as a shallow embayment immediately south of the bridge. Rip-rap is present along the west and east banks for a small distance downstream of the bridge. There is evidence of high flows and water levels along the banks, shown through eroded banks. Substrates within the wetland feature downstream of the bridge were comprised of gravel, rip-rap/boulders, detritus, and muck. Silt, sand, and gravel were present in the shallow bay area to the south of the bridge. The adjacent lands had a moderate slope and the natural vegetation extended 20-30m from the banks. The floodplain downstream also extended greater than 10m and contained a high density of shrubs, grasses, and herbs. In-stream habitat for fish is provided through pools, backwater, woody debris, vegetation, and limited cobble. A large number of Common Carp (*Cyprinus carpio*) were observed downstream of the bridge gulping at the surface where there was a large amount of Yellow Pond Lily. Utilizing the long-handled scoop both live and fresh shells of White Heelsplitter (*Lasmigona complanata*) and Giant Floater (*Pyganodon grandis*), as well as a Fatmucket (*Lampsilis siliquoidea*) shell, were found within the wetland area immediately downstream of the bridge. The creek channel becomes defined and the width decreases downstream of the wetland feature (SAF1-1) as it meanders to the southwest through a Meadow Mineral Marsh (MAM2-2, Map 2). It is anticipated that the large reservoir and dam has caused backwatering effect up to the bridge location, which has created preferred habitat for Common Carp. An additional live juvenile Giant Floater was observed within the defined channel of Bear Creek. The substrates within the channel are similar to those upstream and are comprised of gravel, sand, muck, and clay. Woody debris is also abundant within the channel.

<u>Mussel Regulated SAR/SCC Habitat</u>

Mussels require specific habitat, as well as fish hosts to undertake their various life stages. Based on the background information provided by MNRF it is expected that the SAR records are from downstream of the reservoir/Warwick dam. The Round Pigtoe and Salamander Mussel are both listed as Endangered federally and provincially (Government of Canada 2018, MNRF 2018). Rainbow is listed as Endangered federally and Special Concern provincially (Government of Canada 2018, MNRF 2018).

Round Pigtoe have been found in a wide range of habitats, from small rivers in areas of moderate flow with gravel, cobble and boulder substrates to larger rivers in mud, sand and gravel at varying depths (DFO 2016). Their fish hosts include Spotfin Shiner (*Cyprinella spiloptera*), Northern Redbelly Dace (*Phoxinus eos*), Bluntnose Minnow

(*Pimephales notatus*), Bluegill (*Lepomis macrochirus*) and Central Stoneroller (*Campostoma anomalum*).

The Salamander Mussel has a habitat preference of watercourses with soft substrates and swift currents and are often found burrowed in sand or silt under large rocks in shallow areas, on gravel bars, or in mud. Its host is the Mudpuppy (*Necturus maculosus*), an aquatic salamander (MNRF 2018).

Rainbow has a habitat preference of mainly small streams to small rivers in coarse sand or gravel substrates in or near riffles and along edges of emergent vegetation in moderate to strong current (MNRF 2018). Their fish hosts are also known to include Striped Shiner (*Luxilus chrysocephalus*), Smallmouth Bass (*Micropterus dolomieu*), Largemouth Bass (*Micropterus salmoides*), Green Sunfish (Lepomis cyanellus), Greenside Darter (*Etheostoma blennioides*), Rainbow Darter (*Etheostoma caeruleum*), and Yellow Perch (*Perca flavescens*) (MNRF 2018).

The majority of the aquatic habitat assessed at Bear Creek within the ROW has the potential to provide at least one of the different life stages for the regulated SAR Round Pigtoe and Rainbow. This is based on the potential for their fish hosts to occur within the study area reach of Bear Creek. As the Round Pigtoe has a wide range of habitats it can utilize; the substrates within the ROW could provide habitat, although the limited flows make it unlikely. The habitat preference for Rainbow is absent within the Bear Creek ROW due to the limited flows and soft substrates and if the fish hosts were to be present within the ROW the habitat would still not be conducive to the mussel SAR surviving. It is unlikely that Bear Creek provides potential for any of the different life stages for the Salamander Mussel due to the low probability of Mudpuppy being present, as well as the lack of swift current and large rocks within the watercourse. No live specimens or shells (relict or fresh) of the regulated SAR mussels were observed within the bridge crossing vicinity.

Although no live specimens or shells were observed during the assessment, this does not preclude them from being present within the river due to the potential presence of fish hosts. However, as stated above, if the mussels (glochidial) were to drop off their fish hosts within the substrates under the ROW/bridge, the habitat would not be conducive to their survival.

Summary of Potential and Confirmed Species at Risk Habitat

The following is a summary of confirmed and potential SAR habitats within the study area based on the results of background information review and site investigations. In order to help inform the potential for regulated SAR habitat impacts associated with the proposed bridge replacement activities, this summary specifies habitat occurrence within the anticipated ROW construction zone, and habitats that are adjacent but entirely outside of the road ROW.

Habitat Within Study Area ROW

<u>Confirmed Habitat</u>

Based on the results of background information review and field studies, the following ESA-regulated SAR is considered to have confirmed habitat within the study area ROW, as shown on Map 2:

- Barn Swallow (nesting habitat)

Because the proposed undertaking will not negatively impact ESA-protected Barn Swallow foraging habitat, which comprises suitable open habitats within 200m of the nest site, Barn Swallow foraging habitat has not been included on Map 2.

Potential Habitat

The following regulated SAR are considered to have potential habitat within the Bear Creek crossing of the study area ROW:

- Blanding's Turtle (*Category 2 habitat*)

Several SAR mussels were determined unlikely to be present within the study area ROW due to the limited flow and soft substrates within this section of Bear Creek. As such, the potential habitat for Round Pigtoe has not been included on Map 2.

Potential Blanding's Turtle habitat was identified within the study area within the wetland to the immediate north and south of the Egremont Road bridge. Blanding's Turtles use a wide range of wetland and surrounding upland habitats to support their various life-stage processes (Environment Canada 2016b, OMNR 2000). This species is known to occur within Warwich Township (MNRF 2017), but is not indicated in the 10km by 10km square of the Ontario Reptile and Amphibian Atlas which overlaps the study area (Ontario Nature 2018).

The MNRF has defined general habitat for the species according to a 3-level categorical system:

- Category 1: Nest or overwintering site and surrounding 30m
- Category 2: The wetland complex that extends up to 2km from an occurrence, and the area within 30m around those wetlands
- Category 3: Area within 30m-250m around suitable wetlands identified as Category 2 habitat, within 2km of an occurrence (MNRF undated).

Category 1 habitat is considered the most sensitive to site alteration, while Category 3 habitat is considered the most tolerant of site alteration. Blanding's Turtle nesting sites are not known from the vicinity of the study area. However, taking a conservative approach, it has been assumed that the wetlands within the study area may be within 2km of a potential nesting site and has therefore been considered potential Category 2 habitat. All wetlands identified on Map 2 and 30m of surrounding terrestrial lands, including the road ROW, would therefore be considered potential Category 2 habitat.

It is reiterated that no Blanding's Turtles were observed within the study area on July 17, 2018, and there are no records for the Reptile and Amphibian Atlas square which overlaps the study area.

Additional Species Habitats Outside the ROW

Confirmed Habitat

Habitat of additional regulated SAR, in addition to those listed above, was not identified adjacent to the ROW.

Potential Habitat

Habitat outside of the ROW may exist for regulated mussel SAR as the substrates and flow are more conducive to mussel survival. No SAR mussel shells were observed during the field investigation. As the proposed undertaking should use erosion and control measures, such as turbidity curtains, no impacts are expected to SAR mussels and the potential habitat is not shown on Map 2.

Summary of Confirmed Significant Wildlife Habitat

It is understood that SWH may not represent constraints to road and bridge infrastructure improvements that are subject to Class Environmental Assessments. However, effort should be made to avoid, or otherwise mitigate impacts to known SWH to the extent feasible.

Habitat Within the Study Area ROW

The shallow marsh which extends to the north and south of the road is considered candidate SWH for anuran breeding. While unlikely to fulfill the requirements to confirm SWH which requires at least 20 calling anurans recorded during an anuran survey (MNRF 2015), these surveys were not carried out and the SWH type can therefore not be ruled out. Through the implementation and maintenance of mitigation measures during bridge construction (e.g., proper erosion and sediment controls, avoiding work during night-time hours, emergency response plan, containment system to capture any debris that may fall in the water) impacts to anuran breeding within this area of shallow aquatic marsh can be avoided.

Habitat Outside of the Study Area ROW

One SWH type was confirmed to occur within the study area outside of the ROW:

- Habitat for the SCC Green Dragon

As shown on Map 2, the habitat for this species occurs entirely outside of the ROW construction limits. Provided construction activities are restricted to the proposed development limits identified on Map 2, direct impacts to adjacent SWH for Green Dragon are not anticipated.

Conclusions and Recommendations

NRSI biologists completed a desktop- and field-based assessment of regulated SAR habitats that occur within and adjacent to the anticipated construction footprint associated with the planned replacement of the Egremont Road Bridge. This assessment confirmed that Bear Creek at the bridge crossing location does not provide suitable flow or habitat for the SAR Round Pigtoe, Salamander Mussel, and Rainbow to survive even if their fish hosts are present. Further MNRF consultation may be required to confirm the NRSI conclusion that sufficient suitable habitat for SAR mussels is absent within the ROW.

As the work being proposed will involve a full bridge replacement, appropriate agency approvals or reviews from the St. Clair Region Conservation Authority, MNRF and DFO may be required. An assessment of potential impacts to fish and fish habitat associated with the bridge reconstruction undertaking, following DFO guidelines, will also need to be completed to determine if a formal request for review is required. Based on the anticipated construction footprint and habitat to be impacted, it is unlikely that a *Fisheries*

Act Authorization will be required, as long as the appropriate mitigation measures are followed. No in-water work is permitted from March 15 to July 15 of any given year due to the potential presence of spring-spawning fish within Bear Creek.

Impacts to existing Barn Swallow nesting habitat is anticipated to be temporary as the new bridge structure will continue to provide appropriate nesting locations. It is therefore recommended that bridge construction work occur outside of the general bird breeding period of April 1-August 31 (in addition to the aquatic timing window) to avoid impacts to nesting Barn Swallows. This timing window is also recommended to avoid impacts to other migratory bird nesting on the bridge (i.e., Northern Rough-winged Swallow) to avoid contravention of the federal MBCA (Environment Canada 2016a).

If any part of the proposed works are to be carried out during the Barn Swallow active season, in accordance with Ontario Regulation 242/08 subsection 23.5, efforts must be made to ensure that Barn Swallows are excluded from any part of the structure that is the object of the activity by doing the following prior to the active season:

- Any existing (inactive) Barn Swallow nests that may be impacted by the activity should be removed, and
- Tarps or netting should be installed, or other measures should be implemented to prevent Barn Swallows from accessing the structure that is the object of the activity.

Where bridge replacement work within this timing window cannot be avoided, a nest search of the bridge should be completed by a qualified biologist to search for the presence of active nests prior to construction initiation. During construction, any identified active nests would require protection until all young have fledged, or as otherwise determined by the Canadian Wildlife Service. If a nest search confirms the presence of nesting Barn Swallows, and impacts to Barn Swallow nesting habitat between the period of April 1-August 31 cannot be avoided (e.g., removal of the existing bridge structure that provides the habitat), measures must be taken to avoid contravention of the ESA. Section 23.5 of Ontario Regulation 242/08 lists measures which, if implemented, may avoid the requirement for a permit under the ESA where impacts to Barn Swallows or their habitat will occur. These include the following primary measures for Barn Swallow impact avoidance, minimization or mitigation:

- any activities associated with the bridge reconstruction that would harm or harass Barn Swallows while nesting must be avoided until the end of the Barn Swallow active period
- Barn Swallow nesting habitat compensation measures will be required in accordance with Ontario Regulation 242/08, and in conjunction with MNRF guidance. A temporary Barn Swallow nesting structure must be installed within 1km of the bridge location and meet the following other requirements:
    - Be within 200m of an area that provides suitable foraging conditions for Barn Swallows;
    - Provide horizontal ledges or rough vertical surfaces with a sheltered overhang;
    - Provide surface areas suitable for nest attachment at a height that minimizes disturbances to Barn Swallows and in a location that minimizes predation;
    - Allow Barn Swallows to freely enter and exit nests;

- Provide suitable area to accommodate appropriate spacing between nests; and
- Be structurally sound and capable of providing habitat for Barn Swallows on a long-term basis.

The Barn Swallow nesting habitat should be monitored for three years for use by Barn Swallows during the active season of each year and information on the number, description and location of new nests and estimation of the number of Barn Swallows using the structure should be recorded.

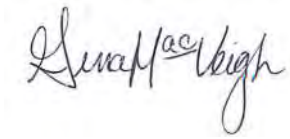
The study area also represents potential Category 2 Blanding's Turtle habitat. MNRF consultation is required to confirm whether a technical memo, or additional actions, are require to address the presence of this potential habitat adjacent to the construction zone. Given the footprint of the existing and proposed bridge abutments, it is unlikely that further studies pertaining to Blanding's Turtle are required.

Significant habitats outside of the ROW are not expected to be directly impacted by the proposed bridge replacement works. However, construction-stage measures should be taken to avoid impact to provincially significant Green Dragon plants that are known to occur downstream of the construction zone (e.g. sediment and erosion control measures). Impacts to potential SAR mussels outside of the ROW should be avoidable through implementation of erosion and sediment control measures, such as using a turbidity curtain around in-water work areas and working in low-flow conditions.

SWH has also been described and mapped within the study area to inform the assessment of significant habitat and potential constraints to the undertaking. No direct impacts to SWH are anticipated as a result of the proposed undertaking.

This information has been provided to inform BM Ross of confirmed and potential regulated SAR habitat constraints that may be imposed on the proposed activities to replace the Egremont Road Bridge. Please contact the undersigned for any questions or for further information.

Sincerely,
Natural Resource Solutions Inc.



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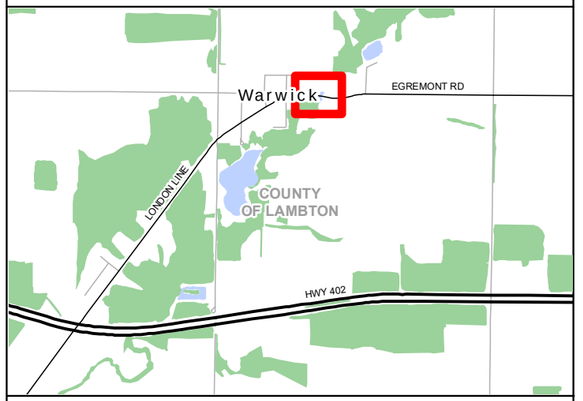
MAPS

Map 1

Bear Creek Bridge SAR Screening

Study Area



Legend

- Study Area
- Provincially Significant Wetland (PSW)
- Wooded Area

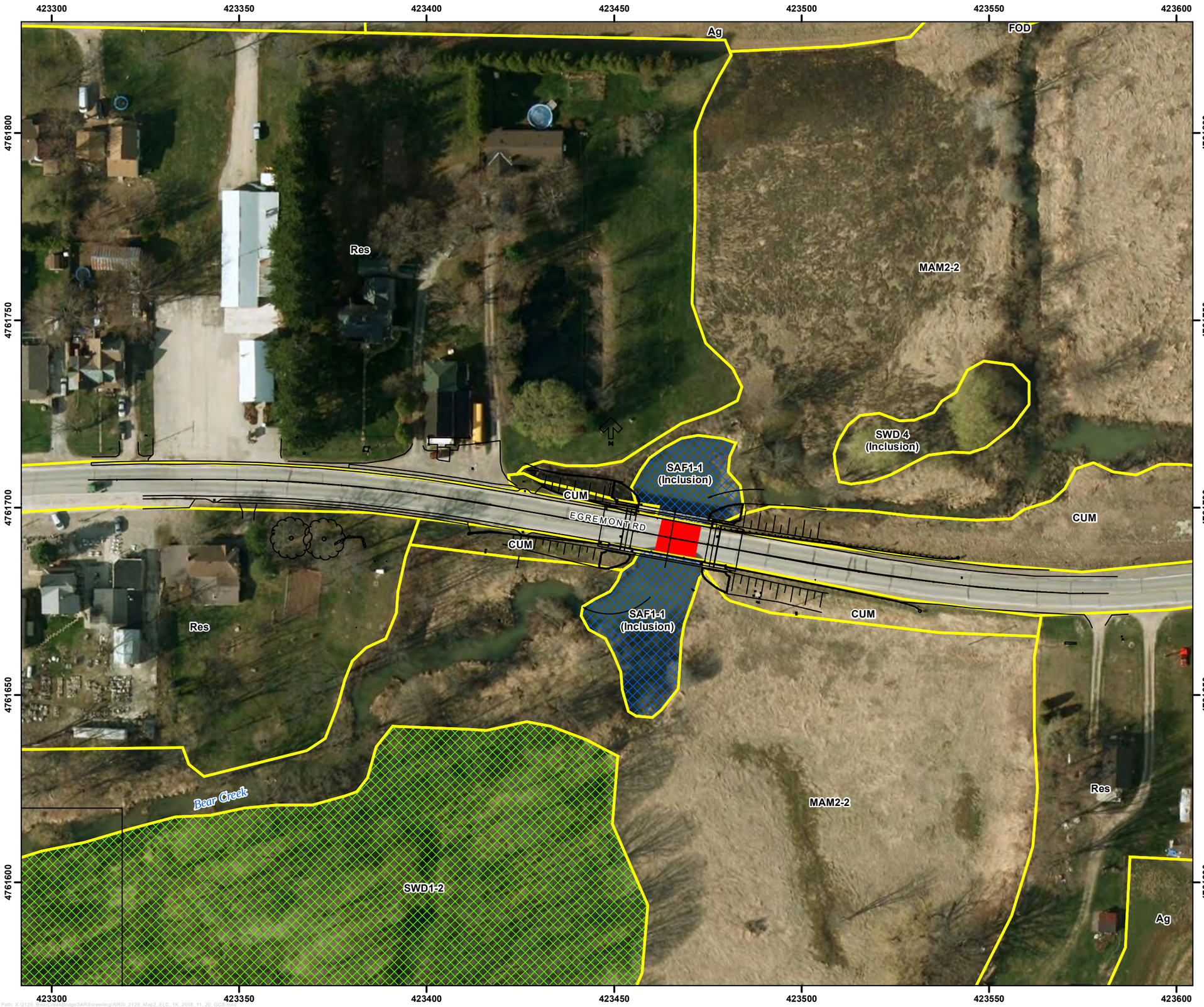
NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2126
Date: October 17, 2018

NAD83 - UTM Zone 17
Size: 11x17"
1:1,000

N

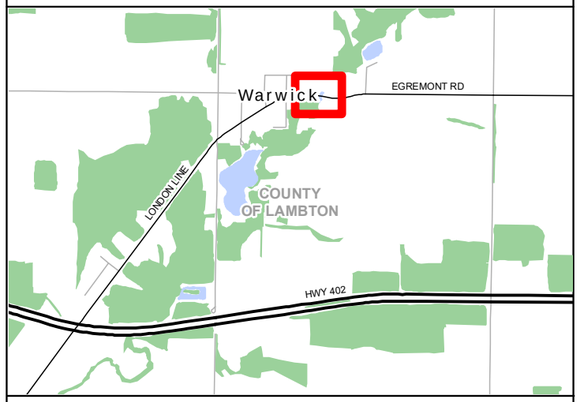
0 20 40 60 Metres



Map 2

Bear Creek Bridge SAR Screening

Vegetation Communities



Legend

- Ecological Land Classification (ELC)
- Proposed Developmet

Species at Risk Habitat

- Barn Swallow Nesting Habitat (Confirmed)

Significant Wildlife Habitat

- Amphibian Breeding Habitat - Wetland (Candidate)
- Green Dragon Habitat (Confirmed)

(Ag) Agriculture

(CUM) Cultural Meadow

(FOD) Deciduous Forest

(MAM2-2) Reed-canary Grass Mineral Meadow Marsh Type

(Res) Residential

(SAF1-1) Water Lily - Bullhead Lily Floating-leaved Shallow Aquatic Type

(SWD1-2) Bur Oak Mineral Deciduous Swamp Type

(SWD4) Mineral Deciduous Swamp Ecosite

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2126
Date: November 20, 2018

NAD83 - UTM Zone 17
Size: 11x17"
1:1,000

0 20 40 60 Metres

N

APPENDIX I

Species at Risk and Species of Conservation Concern Habitat Screening

Scientific Name	Common Name	S-RANK[1]	ESA/ COSSARO[2]	COSEWIC[3]	SARA	Background Source	Habitat Preference[4]	Suitable Habitats within Subject Property	Carried Forward?	Rationale
Birds										
Chaetura pelagica	Chimney Swift	S4B, S4N	THR	T	Schedule 1	BSC et al. 2008, MNRF 2017	Commonly found in urban areas near buildings; nests in hollow trees, crevices of rock cliffs, chimneys; highly gregarious; feeds over open water.	No	No	Suitable habitat for the species is not present within the study area.
Ixobrychus exilis	Least Bittern	S4B	THR	T	Schedule 1	MNRF 2017	Deep marshes, swamps, bogs; marshy borders of lakes, ponds, streams, ditches; dense emergent vegetation of cattail, bulrush, sedge; nests in cattails; intolerant of loss of habitat and human disturbance.	No	No	Suitable habitat for the species is not present within the study area.
Tyto alba	Barn Owl	S1	END	E	Schedule 1	MNRF 2017	Open areas such as fields, agricultural lands with scattered woodlots, buildings and/or orchards; grasslands, sedge meadows, marshes; snow-cover limits ability to catch prey; species has intolerance to severe cold; nests in hollow trees and live trees >46 cm dbh; also nests in barns, abandoned buildings.	No	No	Suitable habitat for the species is not present within the study area.
Contopus virens	Eastern Wood-pewee	S4B	SC	SC		BSC et al. 2008, MNRF 2017	Lives in the mid-canopy layer of forest clearings and edges of deciduous and mixed forests. It is most abundant in intermediate-age mature forest stands with little understory vegetation.	No	No	Suitable habitat for the species is not present within the study area.
Empidonax virescens	Acadian Flycatcher	S2S3B	END	E	Schedule 1	MNRF 2017	Mature, shady, deciduous forests; heavily wooded ravines; creek bottoms or river swamps; availability of good quality habitat is limiting factor; needs at least 30 ha of forest.	No	No	Suitable habitat for the species is not present within the study area.
Riparia riparia	Bank Swallow	S4B	THR	T		BSC et al. 2008, MNRF 2017	Sand, clay or gravel river banks or steep riverbank cliffs; lakeshore bluffs of easily crumbled sand or gravel; gravel pits, road-cuts, grassland or cultivated fields that are close to water; nesting sites are limiting factor for species presence.	No	No	Suitable habitat for the species is not present within the study area.
Hirundo rustica	Barn Swallow	S4B	THR	T		BSC et al. 2008, MNRF 2017, NRSI 2018	Farmlands or rural areas; cliffs, caves, rock niches; buildings or other man-made structures for nesting; open country near body of water.	Yes	Yes	Inidividuals were observed nesting beneath the bridge and foraging above the watercourse and adjacent marshes and fields.
Protonotaria citrea	Prothonotary Warbler	S1B	END	E	Schedule 1	MNRF 2017	Area sensitive species preferring 100 ha of flooded or swampy woodlands with standing or flowing water and more than 25% canopy cover with numerous stumps and snags; stream borders or flooded bottomlands; soft, dead trees with dbh >10 cm; Carolinian species.	No	No	Suitable habitat for the species is not present within the study area.
Icteria virens	Yellow-breasted Chat	S2B	END	E	Schedule 1	MNRF 2017	Thickets, tall tangles of shrubbery beside streams, ponds; overgrown bushy clearings with deciduous thickets; nests above ground in bush, vines etc.	No	No	Suitable habitat for the species is not present within the study area.
Dolichonyx oryzivorus	Bobolink	S4B	THR	T	No Schedule	BSC et al. 2008, MNRF 2017	Large, open expansive grasslands with dense ground cover; hayfields, meadows or fallow fields; marshes; requires tracts of grassland >50 ha.	No	No	Suitable habitat for the species is not present within the study area.
Sturnella magna	Eastern Meadowlark	S4B	THR	T	No Schedule	BSC et al. 2008, MNRF 2017	Open, grassy meadows, farmland, pastures, hayfields or grasslands with elevated singing perches; cultivated land and weedy areas with trees; old orchards with adjacent, open grassy areas >10 ha in size.	No	No	Suitable habitat for the species is not present within the study area.
Setophaga cerulea	Cerulean Warbler	S3B	THR	E	Schedule 1	MNRF 2017	Mature deciduous woodland of Great Lakes- St. Lawrence and Carolinian forests, sometimes coniferous; swamps or bottomlands with large trees; area sensitive species needing extensive areas of forest (>100 ha).	No	No	Suitable habitat for the species is not present within the study area.

Scientific Name	Common Name	S-RANK[1]	ESA/ COSSARO[2]	COSEWIC[3]	SARA	Background Source	Habitat Preference[4]	Suitable Habitats within Subject Property	Carried Forward?	Rationale
Herpetofauna										
Chelydra serpentina serpentina	Common Snapping Turtle	S3	SC	SC	Schedule 1	Ontario Nature 2018, MNRF 2018	Permanent or semi-permanent fresh water; marshes, swamps or bogs; rivers and streams with soft muddybanks or bottoms. The species often uses soft soil or clean dry sand on south-facing slopes for nest sites and may nest at some distance from water.	Yes	Yes	Areas of graminoid marsh adjacent to bridge may provide suitable habitat.
Emydoidea blandingii	Blanding's Turtle (Great Lakes/St Lawrence population)	S3	THR	T	Schedule 1	MNRF 2017	Shallow water marshes, bogs, ponds or swamps, or coves in larger lakes with soft muddy bottoms and aquatic vegetation; basks on logs, stumps or banks; surrounding natural habitat is important in summer as they frequently move from aquatic habitat to terrestrial habitats; hibernates in bogs; not readily observed.	Yes	Yes	Areas of graminoid marsh adjacent to bridge may provide suitable habitat. There are no records of this species within the 10 x 10km square overlapping the study area (Ontario Nature 2018).
Clemmys guttata	Spotted Turtle	S3	END	E	Schedule 1	MNRF 2017	Unpolluted, shallow bodies of water such as streams, ponds, wet meadows, marshes or swamps with aquatic vegetation, logs or clumps of vegetation for basking; nest is dug near water in fine-textured soil (e.g. sand) or moss; vulnerable to factors affecting water quality, vegetation composition and structure; average home range size 3.7 ha.	Yes	No	Although areas of graminoid marsh adjacent to bridge may provide suitable habitat, there are no records of this species within the 10 x 10km square overlapping the study area (Ontario Nature 2018).
Pantherophis gloydi pop. 2	Eastern Foxsnake (*Carolinian population*)	S2	END	E	Schedule 1	MNRF 2017	Eastern Foxsnakes in the Carolinian population are usually found in old fields, marshes, along hedgerows, drainage canals and shorelines. Females lay their eggs in rotting logs, manure or compost piles, which naturally incubate the eggs until they hatch.	No	No	Suitable habitat for the species is not present within the study area. There are no records of this species within the 10 x 10km square overlapping the study area (Ontario Nature 2018).
Heterodon platirhinos	Eastern Hog-nosed Snake	S3	THR	T	Schedule 1	MNRF 2017	The Eastern Hog-nosed Snake specializes in hunting and eating toads, and usually only occurs where toads can be found. Eastern Hog-nosed Snakes prefer sandy, well-drained habitats such as beaches and dry forests where they can lay their eggs and hibernate. They use their up-turned snout to dig burrows below the frost line in the sand where eggs are deposited.	No	No	Suitable habitat for the species is not present within the study area.
Regina septemvittata	Queensnake	S2	END	E	Schedule 1	MNRF 2017	The Queensnake is an aquatic species that is seldom found more than a few metres from the water. It prefers rivers, streams and lakes with clear water, rocky or gravel bottoms, lots of places to hide, and an abundance of crayfish. Queensnakes will often hibernate in groups with other snakes, amphibians and even crayfish. Suitable hibernation sites (called hibernacula) include abutments of old bridges and crevices in bedrock.	No	No	Suitable habitat for the species is not present within the study area. There are no records of this species within the 10 x 10km square overlapping the study area (Ontario Nature 2018).

Scientific Name	Common Name	S-RANK[1]	ESA/ COSSARO[2]	COSEWIC[3]	SARA	Background Source	Habitat Preference[4]	Suitable Habitats within Subject Property	Carried Forward?	Rationale
Mammals										
Myotis lucifungus	Little Brown Myotis	S5	END	E	Schedule 1	MNRF 2017	Uses caves, quarries, tunnels, hollow trees or buildings for roosting; winters in humid caves; maternity sites in dark warm areas such as attics and barns; feeds primarily in wetlands, forest edges	No	No	Suitable cavity trees are not present within the right-of way.
Myotis leibii	Eastern Small-footed Myotis	S2S3	END			MNRF 2017	Will roost in a variety of habitats, including in or under rocks, in rock outcrops, in buildings, under bridges, or in caves, mines, or hollow trees. Hibernates in caves or abandoned mines.	No	No	It is unlikely thqat this species would roost beneath the Bear Creek bridge.
Myotis septentrionalis	Northern Myotis	S3?	END	E	Schedule 1	MNRF 2017	Hibernates during winter in mines or caves; during summer males roost alone and females form maternity colonies of up to 60 adults; roosts in houses, man-made structures but prefers hollow trees or under loose bark; hunts within forest, below canopy	No	No	Suitable cavity trees are not present within the right-of way.
Taxidea taxus jacksoni	American Badger	S2	END	E	Schedule 1	MNRF 2017	In Ontario, badgers are found in a variety of habitats, such as tall grass prairie, sand barrens and farmland. These habitats provide badgers with small prey, including groundhogs, rabbits and small rodents. Since badgers are primarily nocturnal and quite wary of people, they are not readily observed.	No	No	Suitable habitat for the species is not present within the study area.

Scientific Name	Common Name	S-RANK[1]	ESA/ COSSARO[2]	COSEWIC[3]	SARA	Background Source	Habitat Preference[4]	Suitable Habitats within Subject Property	Carried Forward?	Rationale
Freshwater Mussels										
Pleurobema sintoxia	Round Pigtoe	S1	END	E	Schedule 1	MNRF 2017	The Round Pigtoe can live in a wide range of habitats, from small rivers in areas of moderate flow with gravel, cobble and boulder substrates (bottoms) to larger rivers in mud, sand and gravel at varying depths. Its breeding season lasts from early May to late July and the larvae (glochidia) are released before winter. Like most other freshwater mussels, the glochidia are parasitic on fishes— the glochidia attach to the gills of a host fish (Spotfin Shiner (Cyprinella spiloptera), Northern Redbelly Dace (Phoxinus eos), Bluntnose Minnow (Pimephales notatus), Bluegill (Lepomis macrochirus) and Central Stoneroller (Campostoma anomalum).) until they reach their juvenile, free-living stage and drop off into the substrate below.	No	No	Suitable habitat for the species is not present within the study area.
Simpsonaias ambigua	Salamander Mussel	S1	END	E	Schedule 1	MNRF 2017	Restricted to a 50 km reach of the East Sydenham River, where it appears to be reproducing. This mussel, historically also found in 14 American states, has been lost from 60 per cent of formerly occupied rivers and streams in the United States. The Salamander Mussel is most often found burrowed in sand or silt under large, flat rocks in shallow areas with swift currents, although it can also be found in mud or on gravel bars. Habitat is dependent on areas that meet nesting and sheltering requirements of its larval host, the Mudpuppy salamander. Here, the glochidia (the mussel's larvae) are released and infest the gills of the Mudpuppy.	No	No	Suitable habitat for the species is not present within the study area.
Villosa iris	Rainbow	S2S3	SC	SC	Schedule 1	MNRF 2017	The Rainbow mussel prefers small to medium-sized rivers with a moderate to strong current and sand, rocky, or gravel bottoms. It is found in or near riffle areas and along the edges of vegetation in water less than one metre deep. The Rainbow mussel uses a variety of fish hosts in Ontario, including Striped shiner, Smallmouth bass, Largemouth bass, Green sunfish, Greenside darter, Rainbow darter, and Yellow perch.	No	No	Suitable habitat for the species is not present within the study area.

Scientific Name	Common Name	S-RANK[1]	ESA/ COSSARO[2]	COSEWIC[3]	SARA	Background Source	Habitat Preference[4]	Suitable Habitats within Subject Property	Carried Forward?	Rationale
Plants										
Crataegus lumaria	Round-leaved Hawthorn	S2				MNRF 2018	Brushy areas and fallow pastures.	No	No	Suitable habitat for the species is not present within the study area.
Panax quinquefolius	Ginseng	S3	END	E	Schedule 1	MNRF 2017	In Ontario, American Ginseng typically grows in rich, moist, but well-drained, and relatively mature, deciduous woods dominated by Sugar Maple (Acer saccharum), White Ash (Fraxinus americana) and American Basswood (Tilia americana). It usually grows in deep, nutrient rich soil over limestone or marble bedrock.	No	No	Suitable habitat for the species is not present within the study area.
Cornus florida	Eastern Flowering Dogwood	S2?	END	E	Schedule 1	MNRF 2017	Eastern Flowering Dogwood grows under taller trees in mid-age to mature deciduous or mixed forests. It most commonly grows on floodplains, slopes, bluffs and in ravines, and is also sometimes found along roadsides and fencerows.	No	No	Suitable habitat for the species is not present within the study area.
Castanea dentata	American Chestnut	S2	END	E	Schedule 1	MNRF 2017	Moist to well drained forests on sand, occasionally heavy soils.	No	No	Suitable habitat for the species is not present within the study area.
Juglans cinerea	Butternut	S2?	END	E	Schedule 1	MNRF 2017	In Ontario, Butternut usually grows alone or in small groups in deciduous forests. It prefers moist, well-drained soil and is often found along streams. It is also found on well-drained gravel sites and rarely on dry rocky soil. This species does not tolerate shade, and often grows in sunny openings and near forest edges.	Yes	No	Suitable habitat for the species is present within the study area but no trees were observed.
Hydrastis canadensis	Golden Seal	S2	THR	T	Schedule 1	MNRF 2017	Damp, deciduous woods, often on clay soil.	No	No	Suitable habitat for the species is not present within the study area.
Arisaema dracontium	Green Dragon	S3	SC	SC	Schedule 3	NRSI 2018	Wet bottomlands along rivers and creeks.	Yes	Yes	Green Dragon was observed outside of the right-of-way, to the south of the bridge.

[1]MNRF 2018a, [2]MNRF 2018b, [3]COSEWIC 2018, [4]OMNR 2000

APPENDIX II
Aquatic Habitat Assessment Photo Log

Upstream of Bear Creek Bridge

Photo 1: Upstream of Bridge

Photo 2: Upstream side facing south towards bridge (west side)

Photo 3: Upstream side facing south towards bridge (east side)

Photo 4: Upstream side of bridge facing north

Photo 5: Upstream side of bridge facing north east (along the north side of road)

Photo 6: Facing upstream of Bear Creek channel

Photo 7: Facing upstream along Bear Creek (facing east)

Photo 8: Rip rap along bank of Bear Creek channel

Photo 9: Overflow pipe from the Pond

Photo 10: Roadside drainage ditch along north side of Road

Downstream of Bear Creek Bridge

Photo 11: Downstream view (facing south) from bridge

Photo 12: Substrates under the bridge

Photo 13: Substrates

Photo 14: Bridge (downstream side facing east)

Photo 15: Culvert to the west of bridge

Photo 16: Live White Heelspitter

Photo 17: Facing downstream into the back area

Photo 18: Live Giant Floater

Photo 19: Dead Fatmucket

Photo 20: Pond lily and shallow back bay

Photo 21: High water and erosion along bank

Photo 22: Downstream view within channel downstream of bridge

Photo 23: Nest cups under the bridge

APPENDIX C

ONTARIO STRUCTURAL INSPECTION MANUAL REPORT

APPENDIX A3

Bear Creek
OSIM Inspection Report

Lambton County Site No: 22-3-334
October 2016

MTO Site Number: 14-073

County Site Number: 22-3-334

Inventory Data:

Structure Name:	Bear Creek		
Main Hwy/Road #:	22 On	Crossing Type:	Watercourse
Hwy/Road Name:	Egremont Road		
Structure Location:		Heritage Designation:	Unknown
Latitude:	43.0042	Longitude:	-81.9391
Owner(s):	County	Ownership:	1 (%)
Region:	NE	Road Class:	RAU
District:	Group 2	Posted Speed:	50
County:	Lambton County	No. of Lanes:	2
Township:	Township of Warwick	AADT:	1541 2013
Structure Type:	Concrete Bowstring Arch	% Trucks:	
Total Deck Length:	20.32 (m)	Watercourse:	Bear Creek
Overall Str. Width:	12.6 (m)	Navigability:	Unknown
Total Deck Area:	256.03 (sq.m)	Min. Vertical Clearance:	(m)
Roadway Width:	9.14 (m)	Min. Horizontal Clearance:	(m)
Skew Angle:	0 (°)	Special Routes:	
No. of Spans:	1	Detour Length Around County:	(km)
Span Lengths:	18.64 (m)	Detour Length Around Local:	(km)
		Direction of Structure:	E/W
		Fill on Structure:	(m)

Historical Data:

Year Built:	1931	Year of Last Major Rehab:	2003
Last OSIM Inspection:	2014-08-27	Last Evaluation:	
Last Enhanced OSIM Inspection:		Current Load Limit:	
Last Condition Survey:		Load Limit By-Law #:	
Last Underwater Inspection:		By-Law Expiry Date:	
Enhanced Access Equipment:			

MTO Site Number: 14-073

County Site Number: 22-3-334

Field Inspection Information:

Date of Inspection:	2016-10-11	**Type of Inspection:**	OSIM
Inspector:	K. Graham	**Others in Party:**	
Company:	R. Dobbin Engineering Inc.		
Access Equipment Used:	digital camera, measuring tape		
Weather:	Partly Cloudy		
Temperature:	16		

Additional Investigation Required:	**Priority**		
	None	**Normal**	**Urgent**
Material Condition Survey			
Detailed Deck Condition Survey:	Y		
Non-Destructive Delamination Survey of Asphalt-Covered Deck:	Y		
Concrete Substructure Condition Survey:	Y		
Detailed Coating Condition Survey:	Y		
Detailed Timber Investigation:	Y		
Post-Tensioned Strand Investigation:	Y		
Underwater Investigation:	Y		
Fatigue Investigation:	Y		
Seismic Investigation:	Y		
Structure Evaluation:	Y		
Monitoring			
Monitoring of Deformations, Settlements and Movements:	Y		
Monitoring Crack Widths:	Y		

Investigation Notes:

Overall Structure Notes:

Recommended Work on Structure:	Minor Rehab
Timing of Recommended Work:	1 to 5 years
Overall Comments:	Repair spalling and delaminations throughout structure. Maintenance work is required.
Date of Next Inspection:	Two Years
Bridge Condition Index (BCI):	62.11

MTO Site Number: 14-073

County Site Number: 22-3-334

Rehabilitation History:

Year	Description
2004	Structure Rehabilitation - scarify deck (30 mm), repair columns, arches, verticals, repair deck top and curbs, replace deck drains (4), replace concrete barrier walls, concrete overlay (70 mm avg.), waterproof, pave 2 lifts, joint seals (BM Ross/Theo V).
1983	Structure Rahabilitation - patch deck top, repair west expansion joint and ballast wall, 2" concrete overlay with expansion joints, flexicell, waterproof, and pave deck (80 mm) (MTO/Unknown Contractor). Performed under MTO Contract No. 83-18.
1931	Bridge Placement - DHO under Contract 31-43.

MTO Site Number: 14-073

County Site Number: 22-3-334

Scheduled Improvements:

Regional Priority Number	Programmed Work Year	Nature of Program Work

MTO Site Number: 14-073

County Site Number: 22-3-334

Appraisal Indicies:

	Priority	Comments
Fatigue:		
Seismic:		
Scour:		
Flood:		
Geometrics:		
Barrier:		
Curb:		
Load Capacity:		

MTO Site Number: 14-073

County Site Number: 22-3-334

Element Group:	Abutments	**Length:**	(m)
Element Name:	Abutment Walls	**Width:**	12.60 (m)
Location:	0	**Height:**	1.50 (m)
Material:	Cast-in-place concrete	**Count:**	2.0
Element type:	Conventional closed	**Total Quantity:**	38.0
Environment:	Benign	**Not Inspected:**	No
Protection System:			

Condition Data:	Units	Exec.	Good	Fair	Poor
	sq. m	0.0	30.0	8.0	0.0

Approximate Costings:

Performance Deficiencies: 00 None

Maintenance Needs: 00 None

Recommended Work:

Comments:

Isolated light cracking and spalling

MTO Site Number: 14-073

County Site Number: 22-3-334

Element Group:	Abutments	**Length:**	(m)
Element Name:	Ballast Walls	**Width:**	12.60 (m)
Location:	0	**Height:**	1.00 (m)
Material:	Cast-in-place concrete	**Count:**	2.0
Element type:		**Total Quantity:**	0.0
Environment:	Benign	**Not Inspected:**	Yes
Protection System:			

Condition Data:	Units	Exec.	Good	Fair	Poor
		0.0	0.0	0.0	0.0

Approximate Costings:

Performance Deficiencies: 00 None

Maintenance Needs: 00 None

Recommended Work:

Comments:

MTO Site Number: 14-073

County Site Number: 22-3-334

Element Group:	Abutments	**Length:**	5.60 (m)
Element Name:	Wingwalls	**Width:**	(m)
Location:	0	**Height:**	2.00 (m)
Material:	Cast-in-place concrete	**Count:**	4.0
Element type:	Reinforced Concrete	**Total Quantity:**	45.0
Environment:	Moderate	**Not Inspected:**	No
Protection System:			

Condition Data:	Units	Exec.	Good	Fair	Poor
	sq. m	0.0	23.0	22.0	0.0

Approximate Costings:

Performance Deficiencies: 00 None

Maintenance Needs: 00 None

Recommended Work:

Comments:

Crack/cold joint no bond at tie in with repair at SW corner

MTO Site Number: 14-073

County Site Number: 22-3-334

Element Group:	Approaches	**Length:**	(m)
Element Name:	Drainage System - Approaches	**Width:**	(m)
Location:	0	**Height:**	(m)
Material:		**Count:**	2.0
Element type:		**Total Quantity:**	2.0
Environment:	Severe	**Not Inspected:**	No
Protection System:			

Condition Data:	Units	Exec.	Good	Fair	Poor
	Each	0.0	0.0	2.0	0.0

Approximate Costings:

Performance Deficiencies: 00 None

Maintenance Needs: 00 None

Recommended Work:

Comments:

MTO Site Number: 14-073

County Site Number: 22-3-334

Element Group:	Barriers	**Length:**	31.10 (m)
Element Name:	Barrier / Parapet Walls	**Width:**	(m)
Location:	Interior	**Height:**	1.10 (m)
Material:	Concrete	**Count:**	2.0
Element type:	Wall	**Total Quantity:**	62.0
Environment:	Severe	**Not Inspected:**	No
Protection System:			

Condition Data:	Units	Exec.	Good	Fair	Poor
	sq. m	0.0	62.0	0.0	0.0

Approximate Costings:

Performance Deficiencies: 00 None

Maintenance Needs: 00 None

Recommended Work:

Comments:

Repaired but poor finish, especially along to edge. Light cracking throughout

MTO Site Number: 14-073

County Site Number: 22-3-334

Element Group:	Trusses / Arches	**Length:**	20.50 (m)
Element Name:	Top Chords	**Width:**	0.60 (m)
Location:	0	**Height:**	0.60 (m)
Material:	Cast-in-place concrete	**Count:**	2.0
Element type:		**Total Quantity:**	98.0
Environment:	Moderate	**Not Inspected:**	No
Protection System:			

Condition Data:	Units	Exec.	Good	Fair	Poor
	sq. m	0.0	49.0	49.0	0.0

Approximate Costings:

Performance Deficiencies: 00 None

Maintenance Needs: 00 None

Recommended Work: 1-5 years

Repair spalling during next rehabilitation

Comments:

Repaired. Cracking on underside of S. arch near mid-span, Multiple cracks and spalling on N arch

MTO Site Number: 14-073

County Site Number: 22-3-334

Element Group:	Trusses / Arches	**Length:**	0.30 (m)
Element Name:	Verticals / Diagonals	**Width:**	0.30 (m)
Location:	0	**Height:**	1.80 (m)
Material:	Cast-in-place concrete	**Count:**	14.0
Element type:		**Total Quantity:**	30.0
Environment:	Moderate	**Not Inspected:**	No
Protection System:			

Condition Data:	Units	Exec.	Good	Fair	Poor
	sq. m	0.0	15.0	15.0	0.0

Approximate Costings:

Performance Deficiencies: 00 None

Maintenance Needs: 00 None

Recommended Work: 1-5 years

Repair concrete during next rehabilitation

Comments:

Cracks in N columns, cracking & spalling at base of columns throughout.

MTO Site Number: 14-073

County Site Number: 22-3-334

Element Group:	Beams (MLE's)	**Length:**	12.60 (m)
Element Name:	Floor Beams - Concrete	**Width:**	0.40 (m)
Location:	0	**Height:**	0.60 (m)
Material:	Cast-in-place concrete	**Count:**	10.0
Element type:		**Total Quantity:**	202.0
Environment:	Moderate	**Not Inspected:**	No
Protection System:			

Condition Data:	Units	Exec.	Good	Fair	Poor
	sq. m	0.0	195.0	2.0	5.0

Approximate Costings:

Performance Deficiencies: 00 None

Maintenance Needs: 00 None

Recommended Work: 1-5 years

Repair during next rehabilitation

Comments:

Severe spalling on floor beam at east abutment. Medium to wide cracking on underside of floor beam at west abutment.

MTO Site Number: 14-073

County Site Number: 22-3-334

Element Group:	Beams (MLE's)	**Length:**	2.00 (m)
Element Name:	Girders - Concrete	**Width:**	0.40 (m)
Location:	End	**Height:**	0.80 (m)
Material:	Cast-in-place concrete	**Count:**	2.0
Element type:		**Total Quantity:**	8.0
Environment:	Moderate	**Not Inspected:**	No
Protection System:			

Condition Data:	Units	Exec.	Good	Fair	Poor
	sq. m	0.0	4.0	4.0	0.0

Approximate Costings:

Performance Deficiencies: 00 None

Maintenance Needs: 00 None

Recommended Work:

Comments:

MTO Site Number: 14-073

County Site Number: 22-3-334

Element Group:	Decks	**Length:**	20.50 (m)
Element Name:	Deck Top - Thin Slab	**Width:**	12.60 (m)
Location:	0	**Height:**	0.20 (m)
Material:	Cast-in-place concrete	**Count:**	
Element type:	On supports composite	**Total Quantity:**	0.0
Environment:	Moderate	**Not Inspected:**	Yes
Protection System:			

Condition Data:	Units	Exec.	Good	Fair	Poor
		0.0	0.0	0.0	0.0

Approximate Costings:

Performance Deficiencies: 00 None

Maintenance Needs: 00 None

Recommended Work:

Comments:

MTO Site Number: 14-073

County Site Number: 22-3-334

Element Group:	Decks	**Length:**	(m)
Element Name:	Drainage System - Deck	**Width:**	(m)
Location:	0	**Height:**	(m)
Material:		**Count:**	
Element type:		**Total Quantity:**	4.0
Environment:	Moderate	**Not Inspected:**	No
Protection System:			

Condition Data:	Units	Exec.	Good	Fair	Poor
	Each	0.0	0.0	0.0	4.0
Approximate Costings:					

Performance Deficiencies: 00 None

Maintenance Needs: 00 None

Recommended Work:

Comments:

New deck drains have been cut in, caused concrete to break out and expose rebar, which has medium corrosion.

MTO Site Number: 14-073

County Site Number: 22-3-334

Element Group:	Decks	**Length:**	2.00 (m)
Element Name:	Soffit - Thin Slab	**Width:**	12.60 (m)
Location:	End	**Height:**	(m)
Material:	Cast-in-place concrete	**Count:**	
Element type:		**Total Quantity:**	25.0
Environment:	Moderate	**Not Inspected:**	No
Protection System:			

Condition Data:	Units	Exec.	Good	Fair	Poor
	sq. m	0.0	23.0	1.0	1.0

Approximate Costings:

Performance Deficiencies: 00 None

Maintenance Needs: 00 None

Recommended Work: 1-5 years

Repair during next rehabilitation

Comments:

Minor spalls with exposed rebar

MTO Site Number: 14-073

County Site Number: 22-3-334

Element Group:	Decks	**Length:**	18.50 (m)
Element Name:	Soffit - Thin Slab	**Width:**	6.40 (m)
Location:	Exterior	**Height:**	(m)
Material:	Cast-in-place concrete	**Count:**	
Element type:		**Total Quantity:**	118.0
Environment:	Moderate	**Not Inspected:**	No
Protection System:			

Condition Data:	Units	Exec.	Good	Fair	Poor
	sq. m	0.0	0.0	71.0	47.0

Approximate Costings:

Performance Deficiencies: 00 None

Maintenance Needs: 00 None

Recommended Work: 1-5 years

Repair spalls & delaminatins during next rehabilitation

Comments:

Extensive exposed rebar in cantilevered section on north side. Spalling with exposed rebar at new deck drains.

MTO Site Number: 14-073

County Site Number: 22-3-334

Element Group:	Decks	**Length:**	18.50 (m)
Element Name:	Soffit - Thin Slab	**Width:**	6.60 (m)
Location:	Interior	**Height:**	(m)
Material:	Cast-in-place concrete	**Count:**	
Element type:		**Total Quantity:**	122.0
Environment:	Benign	**Not Inspected:**	No
Protection System:			

Condition Data:	Units	Exec.	Good	Fair	Poor
	sq. m	0.0	120.0	2.0	0.0

Approximate Costings:

Performance Deficiencies: 00 None

Maintenance Needs: 00 None

Recommended Work: 1-5 years

Repair during next rehabilitation

Comments:

Isolated narrow cracking, light scaling/spalling

MTO Site Number: 14-073

County Site Number: 22-3-334

Element Group:	Decks	**Length:**	20.50 (m)
Element Name:	Wearing Surface - Deck	**Width:**	9.30 (m)
Location:	0	**Height:**	0.09 (m)
Material:	Asphalt	**Count:**	
Element type:		**Total Quantity:**	191.0
Environment:	Severe	**Not Inspected:**	No
Protection System:			

Condition Data:	Units	Exec.	Good	Fair	Poor
	sq. m	0.0	191.0	0.0	0.0

Approximate Costings:

Performance Deficiencies: 00 None

Maintenance Needs: 00 None

Recommended Work:

Comments:

Cracks in asphalt have been sealed

MTO Site Number: 14-073

County Site Number: 22-3-334

Element Group:	Embankments & Streams	**Length:**	(m)
Element Name:	Embankments	**Width:**	(m)
Location:	0	**Height:**	(m)
Material:		**Count:**	1.0
Element type:		**Total Quantity:**	1.0
Environment:		**Not Inspected:**	No
Protection System:			

Condition Data:	Units	Exec.	Good	Fair	Poor
	Each	0.0	1.0	0.0	0.0

Approximate Costings:

Performance Deficiencies: 00 None

Maintenance Needs: 00 None

Recommended Work:

Comments:

MTO Site Number: 14-073

County Site Number: 22-3-334

Element Group:	Embankments & Streams	**Length:**	(m)
Element Name:	Streams and Waterways	**Width:**	(m)
Location:	0	**Height:**	(m)
Material:		**Count:**	1.0
Element type:		**Total Quantity:**	1.0
Environment:		**Not Inspected:**	No
Protection System:			

Condition Data:	Units	Exec.	Good	Fair	Poor	
	Each	0.0	1.0	0.0	0.0	
			Approximate Costings:			

Performance Deficiencies: 00 None

Maintenance Needs: 00 None

Recommended Work:

Comments:

MTO Site Number: 14-073

County Site Number: 22-3-334

Element Group:	Foundations	**Length:**	(m)
Element Name:	Foundation (below ground level)	**Width:**	(m)
Location:	0	**Height:**	(m)
Material:	Cast-in-place concrete	**Count:**	1.0
Element type:	Spread	**Total Quantity:**	0.0
Environment:		**Not Inspected:**	Yes
Protection System:			

Condition Data:	Units	Exec.	Good	Fair	Poor
		0.0	0.0	0.0	0.0

Approximate Costings:

Performance Deficiencies: 00 None

Maintenance Needs: 00 None

Recommended Work:

Comments:

MTO Site Number: 14-073

County Site Number: 22-3-334

Element Group:	Joints	**Length:**	12.60 (m)
Element Name:	Seals / Sealents	**Width:**	(m)
Location:	0	**Height:**	(m)
Material:		**Count:**	2.0
Element type:	Paved Over	**Total Quantity:**	0.0
Environment:	Severe	**Not Inspected:**	Yes
Protection System:			

Condition Data:	Units	Exec.	Good	Fair	Poor
		0.0	0.0	0.0	0.0

Approximate Costings:

Performance Deficiencies: 00 None

Maintenance Needs: 00 None

Recommended Work:

Comments:

Joints paved over. Asphalt sealant is still in good condition.

MTO Site Number: 14-073

County Site Number: 22-3-334

Element Group:	Sidewalks / Curbs	**Length:**	20.50 (m)
Element Name:	Sidewalks and Medians	**Width:**	2.30 (m)
Location:	0	**Height:**	0.50 (m)
Material:	Cast-in-place concrete	**Count:**	1.0
Element type:		**Total Quantity:**	57.0
Environment:	Severe	**Not Inspected:**	No
Protection System:			

Condition Data:	Units	Exec.	Good	Fair	Poor
	sq. m	0.0	0.0	56.0	1.0

Approximate Costings:

Performance Deficiencies: 00 None

Maintenance Needs: 00 None

Recommended Work:

Comments:

Repaired but still some medium spalling on N. side

MTO Site Number: 14-073

County Site Number: 22-3-334

Element Group:	Approaches	**Length:**	6.00 (m)
Element Name:	Curb and Gutters	**Width:**	0.50 (m)
Location:	0	**Height:**	0.15 (m)
Material:	Cast-in-place concrete	**Count:**	3.0
Element type:		**Total Quantity:**	12.0
Environment:	Severe	**Not Inspected:**	No
Protection System:			

Condition Data:	Units	Exec.	Good	Fair	Poor
	sq. m	0.0	4.0	8.0	0.0

Approximate Costings:

Performance Deficiencies: 00 None

Maintenance Needs: 00 None

Recommended Work:

Comments:

MTO Site Number: 14-073

County Site Number: 22-3-334

Element Group:	Approaches	**Length:**	6.00 (m)
Element Name:	Wearing Surface - Approaches	**Width:**	9.30 (m)
Location:	0	**Height:**	(m)
Material:	Asphalt	**Count:**	2.0
Element type:		**Total Quantity:**	112.0
Environment:	Severe	**Not Inspected:**	No
Protection System:			

Condition Data:	Units	Exec.	Good	Fair	Poor
	sq. m	0.0	107.0	5.0	0.0

Approximate Costings:

Performance Deficiencies: 00 None

Maintenance Needs:	2 year	15 Rout and Seal

Sawcut behind ballast walls, rout & seal cracks.

Recommended Work:

Comments:

Centreline and transverse cracks have previously been routed & sealed, new cracks forming. Asphalt not sawcut at back of ballast wall-cracks forming. Settlement with ponding water in all 4 quadrants.

MTO Site Number: 14-073

County Site Number: 22-3-334

Element Group:	Barriers	**Length:**	31.10 (m)
Element Name:	Barrier / Parapet Walls	**Width:**	(m)
Location:	Exterior	**Height:**	1.10 (m)
Material:	Cast-in-place concrete	**Count:**	2.0
Element type:	Parapet Wall with No Rail	**Total Quantity:**	62.0
Environment:	Moderate	**Not Inspected:**	No
Protection System:			

Condition Data:	Units	Exec.	Good	Fair	Poor
	sq. m	0.0	62.0	0.0	0.0

Approximate Costings:

Performance Deficiencies: 00 None

Maintenance Needs: 00 None

Recommended Work:

Comments:

MTO Site Number: 14-073

County Site Number: 22-3-334

Element Group:	Beams (MLE's)	**Length:**	17.50 (m)
Element Name:	Girders - Concrete	**Width:**	0.40 (m)
Location:	Middle	**Height:**	0.80 (m)
Material:	Cast-in-place concrete	**Count:**	2.0
Element type:		**Total Quantity:**	70.0
Environment:	Moderate	**Not Inspected:**	No
Protection System:			

Condition Data:	Units	Exec.	Good	Fair	Poor
	sq. m	0.0	35.0	34.5	0.5

Approximate Costings:

Performance Deficiencies: 00 None

Maintenance Needs: 00 None

Recommended Work: 1-5 years

Repair during next rehabilitation

Comments:

Medium to wide cracking on underside of south girder - mid span

Facing west

Profile

Soffit

Spall with exposed rebar

Spall with exposed rebar

Severe spall with exposed rebar - east floor beam

Spall with exposed rebar

Spall with exposed rebar

Spall on north arch

Spall on north arch

APPENDIX D

CONSULTATION

COUNTY OF LAMBTON

CLASS ENVIRONMENTAL ASSESSMENT FOR THE BEAR CREEK BRIDGE (VILLAGE OF WARWICK)

NOTICE OF STUDY COMMENCEMENT

THE PROJECT:

The County of Lambton has initiated a Class Environmental Assessment (Class EA) process to consider options associated with the Bear Creek Bridge which is located on County Road 22 (Egremont Road) at the east limits of the Village of Warwick (as shown on the accompanying key plan). Recent engineering inspections of the structure have identified significant deterioration with many of the bridge components. All reasonable alternatives will be considered in conjunction with the Class EA process including: 1) Repair of the existing bridge, 2) Replacement of the existing bridge in the same location, 3) Rehabilitation of the existing bridge or 4) Do nothing.

THE ENVIRONMENTAL SCREENING PROCESS:

The planning for this project is following the planning process established for Schedule B activities under the Municipal Class Environmental Assessment (Class EA) document. Schedule B projects are approved subject to the completion of a screening process. The purpose of the screening process is to identify any potential environmental impacts associated with the proposal and to plan for appropriate mitigation of any impacts. The process includes consultation with the public, local municipalities, First Nation communities, stakeholders and review agencies. This notice is being issued to advise of the start of study investigations. There will be additional opportunities for public input and involvement as the study progresses.

PUBLIC INVOLVEMENT:

Public input and comments are invited for incorporation into the planning and design of this project and will be received until **February 16, 2018**, at the address listed below. Any comments collected in conjunction with the study, will be maintained on file for use during the project and may be included in project documentation. With the exception of personal information, all comments will become part of the public record. For further information on this project, or to review the Municipal Class EA process, please contact the project engineers:

B.M. Ross and Associates Ltd.: 2695 Hamilton Road, Box 400, Brights Grove, Ontario, N0N 1C0. Telephone: 1-519-908-9564. Fax: 1-519-524-4403. Kelly Vader, Environmental Planner (e-mail: kvader@bmross.net).

Glen Millar, P. Eng
County of Lambton

This Notice issued January 10, 2018.

B. M. ROSS AND ASSOCIATES LIMITED
Engineers and Planners
2695 Hamilton Rd, Box 400, Brights Grove, ON N0M 1C0
p. (519) 908-9564 • f. (519) 524-4403
www.bmross.net

File No. BR1279

January 8, 2018

Adjacent Property Owner

RE: County of Lambton
Class Environmental Assessment for the Bear Creek Bridge
(Village of Warwick)

The County of Lambton has initiated a Class Environmental Assessment (Class EA) process to consider options associated with the Bear Creek Bridge which is located on County Road 22 (Egremont Road) at the east limits of the Village of Warwick (as shown on the accompanying key plan). Recent engineering inspections of the structure have identified significant deterioration with many of the bridge components. All reasonable alternatives will be considered in conjunction with the Class EA process including: 1) Repair of the existing bridge, 2) Rehabilitation of the existing bridge, 3) Replacement of the existing bridge in the same location or 4) Do nothing.

The planning for this project is following the planning process established for Schedule B activities under the Municipal Class Environmental Assessment (Class EA) document. Schedule B projects are approved subject to the completion of a screening process. The purpose of the screening process is to identify any potential environmental impacts associated with the proposal and to plan for appropriate mitigation of any impacts. The process includes consultation with the public, local municipalities, First Nation communities, stakeholders and review agencies. This notice is being issued to advise of the start of study investigations. There will be additional opportunities for public input and involvement as the study progresses.

As a property owner located in the vicinity of the project, you have been identified as possibly having an interest in the project and we are soliciting your input. This letter is advising of the start of study investigations. A public information meeting will be held later in the process to update residents on study progress and to receive additional input. Please forward any initial comments to our office by February 16, 2018. As the project proceeds, additional information will be made available and can be accessed at www.bmross.net under the PIC tab. If you have any questions or require further information, please contact the undersigned at 519-908-9564 or e-mail kvader@bmross.net.

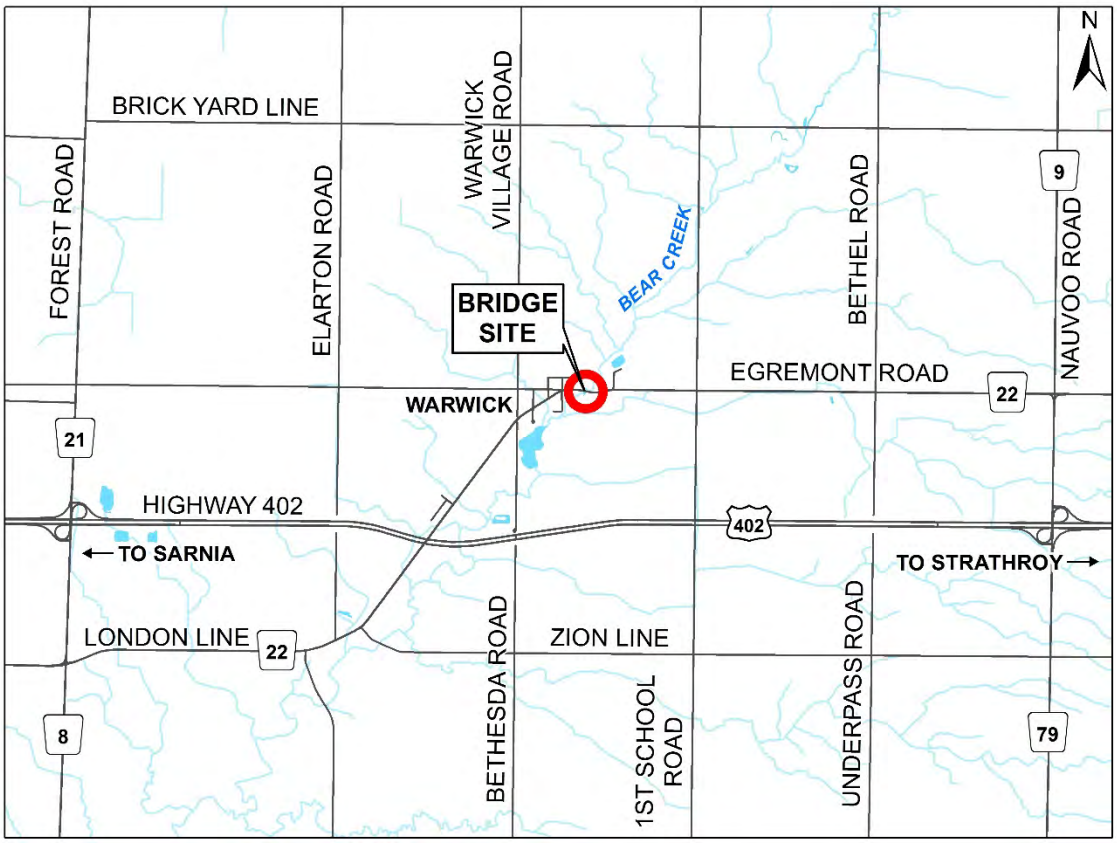
Yours very truly

B. M. ROSS AND ASSOCIATES LIMITED

Per _____
Kelly Vader, RPP, MCIP
Environmental Planner

Encl.
cc. Glen Millar, P. Eng., County of Lambton

Project Key Plan:



View of south face of bridge ↓

B. M. ROSS AND ASSOCIATES LIMITED
Engineers and Planners
2695 Hamilton Road, P.O. Box 400
Brights Grove, ON N0N 1C0
p. (519) 908-9564 • f. (519) 524-4403
www.bmross.net

File No. BR1279

January 8, 2018

Agency
(See attached list)

RE: County of Lambton (Village of Warwick)
Class Environmental Assessment for the Bear Creek Bridge

The County of Lambton has initiated a Class Environmental Assessment (Class EA) process to consider options associated with the Bear Creek Bridge which is located on County Road 22 (Egremont Road) at the east limit of the Village of Warwick (as shown on the accompanying key plan). Recent engineering inspections of the structure have identified significant deterioration with many of the bridge components. All reasonable alternatives will be considered in conjunction with the Class EA process including: 1) Repair of the existing bridge, 2) Rehabilitation of the existing bridge, 3) Replacement of the existing bridge in the same location or 4) Do nothing.

The planning for this project is following the planning process established for Schedule B activities under the Municipal Class Environmental Assessment (Class EA) document. Schedule B projects are approved subject to the completion of a screening process. The purpose of the screening process is to identify any potential environmental impacts associated with the proposal and to plan for appropriate mitigation of any impacts. The process includes consultation with the public, local municipalities, First Nation communities, stakeholders and review agencies. This notice is being issued to advise of the start of study investigations. There will be additional opportunities for input and involvement as the study progresses.

Your organization has been identified as possibly having an interest in the project and the County of Lambton is soliciting your input. Please forward your response to our office by February 16, 2018. As the project proceeds, additional information will be made available and can be accessed at www.bmross.net under the PIC tab. If you have any questions or require further information, please contact the undersigned at 519-908-9564 or e-mail kvader@bmross.net.

Yours very truly

B. M. ROSS AND ASSOCIATES LIMITED

Per _____
Kelly Vader, RPP, MCIP
Environmental Planner

KV:hv
Encl.

cc. Glen Millar, P. Eng., County of Lambton

COUNTY OF LAMBTON

MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT
FOR THE BEAR CREEK BRIDGE (WARWICK)

REVIEW AGENCY CIRCULATION LIST

REVIEW AGENCY	INVOLVEMENT
Ministry of the Environment and Climate Change (London) - EA Coordinator	Mandatory Contact
Ministry of Natural Resources and Forestry (Aylmer)	Potential Impact on Natural Features
Ministry of Tourism, Culture and Sport (Toronto)	Potential Impact to Heritage Features
Ministry of Transportation (London)	General Information
Lambton County - Administration Department - Planning & Development Department - Public Works Department - Emergency Services Department	Proponent
St. Clair Region Conservation Authority	Potential Impact on Natural Features
Township of Warwick	Affected Municipality
Township of Adelaide-Metcalfe	Adjacent Municipality
Town of Plympton-Wyoming	Adjacent Municipality
Department of Fisheries and Oceans (DFO)	Aquatic Species at Risk
Lambton Kent District School Board	Transportation Information
St. Clair Catholic School Board	Transportation Information

COUNTY OF LAMBTON

MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT
FOR THE BEAR CREEK BRIDGE (WARWICK)

REVIEW AGENCY CIRCULATION LIST

Warwick Fire Department (via email) Fire Chief: Brad Goodhill warwickfire@warwicktownship.ca	Emergency Access
Watford Fire Department (via email) Fire Chief: Rick Sitlington watfordfire@warwicktownship.ca	Emergency Access
OPP Petrolia Detachment 4224 Oil Heritage Rd, Petrolia, ON N0N 1R0	Emergency Access
Lambton Area Water Supply System 1215 1M2, Fort St, Point Edward, ON N7V Attention: Susan McFarlane	Watermain Impacts

B. M. ROSS AND ASSOCIATES LIMITED
Engineers and Planners
2695 Hamilton Road, P.O. Box 400
Brights Grove, ON N0N 1C0
p. (519) 908-9564 • f. (519) 524-4403
www.bmross.net

File No. BR1279

January 8, 2018

'First Nation Community'

RE: County of Lambton (Village of Warwick)
Class Environmental Assessment for the Bear Creek Bridge

The County of Lambton has initiated a Class Environmental Assessment (Class EA) process to consider options associated with the Bear Creek Bridge which is located on County Road 22 (Egremont Road) at the east limit of the Village of Warwick (as shown on the accompanying key plan). Recent engineering inspections of the structure have identified significant deterioration with many of the bridge components. All reasonable alternatives will be considered in conjunction with the Class EA process including: 1) Replacement of the existing bridge in the same location, 2) Repair of the existing bridge, 3) Rehabilitation of the existing bridge or 4) Do nothing.

The planning for this project is following the planning process established for Schedule B activities under the Municipal Class Environmental Assessment (Class EA) document. Schedule B projects are approved subject to the completion of a screening process. The purpose of the screening process is to identify any potential environmental impacts associated with the proposal and to plan for appropriate mitigation of any impacts. The process includes consultation with the public, local municipalities, First Nation communities, stakeholders and review agencies. This notice is being issued to advise of the start of study investigations. There will be additional opportunities for input and involvement as the study progresses.

Your community has been identified as possibly having an interest in this project. For your convenience, a response form is enclosed along with a self-addressed stamped envelope. Please complete and return the form by February 16, 2018. As the project proceeds, additional information will be made available and can be accessed at www.bmross.net under the PIC tab. If you have any questions on this matter or require further information, please contact the undersigned at 519-908-9564 or by e-mail at kvader@bmross.net.

Yours very truly

B. M. ROSS AND ASSOCIATES LIMITED

Per _____
Kelly Vader, RPP, MCIP
Environmental Planner

KV:hv
Encl.
cc. Glen Millar, P. Eng., County of Lambton

Z:\BR1279-Lambton_Cty-Bear_Creek_Bridge_Warwick\Projects\Class EA\Screening Report\Appendices\Consultation Appendix\BR1279-18Jan08-Aboriginal Let.docx

Response Form

Project Name: ___Bear Creek Bridge Project_____

Project Description: __Class Environmental Assessment to consider options for the Bear Creek Bridge including replacement with new bridge or rehabilitation of the existing structure._____

Project Location: ___Village of Warwick, Warwick Township_____

(Key Plan of Project Location attached)

Please Detach and Return in Envelope Provided

Name of Aboriginal Community: _____

Please check appropriate box

☐ **Please send additional information on this project**

☐ **We would like to meet with representatives of this project.**

☐ **We have no concerns with this project and do not wish to be consulted further**

COUNTY OF LAMBTON

CLASS ENVIRONMENTAL ASSESSMENT
FOR THE BEAR CREEK BRIDGE (WARWICK)

ABORIGINAL CIRCULATION LIST: BR1279

Aamjiwnaang First Nation
Chief Joanne Rogers
Aamjiwnaang Administration Office
978 Tashmoo Ave.
Sarnia, ON N7T 7H5

Chippewas of the Thames First Nation
Chief Myeengun Henry
320 Chippewa Road
Muncey, ON N0L 1Y0

Oneida Nation of the Thames
Chief Randall Phillips
2212 Elm Ave
Southwold, ON N0L 2G0

Munsee-Delaware Nation
Chief Roger Thomas
RR#1
Muncey, ON N0L 1Y0

Bkejwanong Territory (Walpole Island)
Chief Daniel Miskokomon
117 Tahgahoning Road, R.R. #3
Wallaceburg, ON N8A 4K9

Historic Saugeen Métis
204 High Street, Box 1492
Southampton, ON N0H 2L0

Métis Nation of Ontario
500 Old St. Patrick St., Unit 3
Ottawa, ON K1N 9G4

Chippewas of Kettle and Stony Point First Nation
Chief Thomas Bressette
Kettle & Stony Point Band Office
6247 Indian Lane
Kettle & Stony Point First Nation, ON N0N 1J1

Kelly Vader

From: Lands and Resources Consultation Coordinator <saugeenmetisadmin@bmts.com>
Sent: January 17, 2018 11:03 AM
To: Kelly Vader
Subject: Request for Comments - Village of Warwick, Lambton County - Class Environmental Assessment for Bear Creek Bridge

Your File: BR1279
Our File: Beyond Geographical Area

Good Morning Kelly,

The Historic Saugeen Metis (HSM) Lands, Resources, and Consultation Department has reviewed the relevant documents and has determined that the proposed development is beyond the geographical area of our traditional Metis territory.

We therefore have no concerns with this project and do not wish to be consulted further.

I trust this may be helpful.

Regards,

George Govier

Co-ordinator Lands, Resources, and Consultation

Historic Saugeen Metis
204 High Street
Southampton, Ontario
N0H 2L0
Direct Line (519) 483-4001
Fax (519) 483-4002
Email saugeenmetisadmin@bmts.com

Ministry of the Environment and Climate Change

733 Exeter Road
London ON N6E 1L3
Tel': 519 873-5000
Fax: 519 873-5020

Ministère de l'Environnement et de l'Action en matière de changement climatique

733, rue Exeter
London ON N6E 1L3
Tél.: 519 873-5000
Fax: 519 873-5020

Ontario

January 19, 2018

789 Broadway Street, Box 3000
Wyoming Ontario
N0N 1T0

Attention: Glen Millar

Re: Class EA for the Bear Creek Bridge

Dear Glen Millar:

This letter acknowledges this ministry's receipt of the Notice of Commencement for the above noted project.

It is this ministry's understanding that the County of Lambton is initiating a Class EA process to assess options for potential repair or replacement of the Break Creek Bridge.

As you know, the Class Environmental Assessment (Class EA) planning process includes consultation with interested stakeholders, evaluation of alternatives, assessment of the effects of the proposed works and identification of measures to mitigate any adverse impacts. In addition to consultation with public agencies and the general public, consultation with Aboriginal communities is required.

Aboriginal Consultation

The Crown has a legal duty to consult Aboriginal communities when it has knowledge, real or constructive, of the existence or potential existence of an Aboriginal or treaty right and contemplates conduct that may adversely impact that right. Before authorizing this project, the Crown must ensure that its duty to consult has been fulfilled, where such a duty is triggered. Although the duty to consult with Aboriginal peoples is a duty of the Crown, the Crown may delegate procedural aspects of this duty to project proponents while retaining oversight of the consultation process.

Your proposed project may have the potential to affect Aboriginal or treaty rights protected under Section 35 of Canada's *Constitution Act* 1982. Where the Crown's duty to consult is triggered in relation to your proposed project**, the MOECC is delegating the procedural aspects of rights-based consultation to you through this letter.** The Crown intends to rely on the delegated consultation process in discharging its duty to consult and maintains the right to participate in the consultation process as it sees fit.

Based on information you have provided to date and the Crown`s preliminary assessment you are required to consult with the following communities who have been identified as potentially affected by your proposed project:

Nation	Contact Information
Aamjiwnaang First Nation	Aamjiwnaang First Nation 978 Tashmoo Ave. Sarnia, ON N7T 7H5 519-336-8410 Chief Joanne Rogers chief@aamjiwnaang.ca Other Contacts: Sharilyn Johnston, Environment Coordinator sjohnston@aamjiwnaang.ca Christine Rogers, Enviroment Worker crogers@aamjiwnaang.ca (same mailing address for all)
Bkejwanong Territory (Walpole Island First Nation)	Bkejwanong Territory 117 Tahgahoning Road R.R.#3 Wallaceburg, ON N8K 4K9 519-627-1481 Chief Dan Miskokomon drskoke@wifn.org Other Contacts: Dean Jacobs, Consultation Manager Walpole Island Heritage Centre 2185 River Road R.R.#3 Wallaceburg, ON N8K 4K9 519-627-1475 dean.jacobs@wifn.org and Janet Macbeth, Project Review Coordinator janet.macbeth@wifn.org
Chippewas of Kettle and Stony Point First Nation	Chippewas of Kettle and Stony Point First Nation 6247 Indian Lane, R.R.#2 Forest, ON N0N 1J1 519-786-2125 Chief Tom Bressette thomas.bressette@kettlepoint.org Other Contact: Valerie George Consultation Coordinator valerie.george@kettlepoint.org
Chippewas of the Thames First Nation	Chippewas of the Thames First Nation 320 Chippewa Rd., Muncey, ON N0L 1Y0 519-289-5555 Chief Myeengun Henry myeengun@cottfn.com Other Contacts: Kelly Riley, Acting Director - Lands & Environment kriley@cottfn.com 519-289-2662 ext. 209 Rochelle Smith, Consultation Coordinator rsmith@cottfn.com 519-289-2662 ext 213
Oneida Nation of the Thames ONYOTA'A:KA	Oneida Nation of the Thames 2212 Elm Ave. Southwold, ON N0L 2G0 519-652-3244 Chief Randall Phillips randall.phillips@oneida.on.ca Other Contact: Political Chief Assistant: Catherine Cornelius catherine.cornelius@oneida.on.ca

Steps that you may need to take in relation to Aboriginal consultation for your proposed project are outlined in the "Code of Practice for Consultation in Ontario's Environmental Assessment Process" which can be found at the following link:

https://www.ontario.ca/document/consultation-ontarios-environmental-assessment-process

Additional information related to Ontario's Environmental Assessment Act is available online at: www.ontario.ca/environmentalassessments.

You must contact the Director of Environmental Approvals Branch under the following circumstances subsequent to initial discussions with the communities identified by MOECC:

- aboriginal or treaty rights impacts are identified to you by the communities;
- you have reason to believe that your proposed project may adversely affect an aboriginal or treaty right;
- consultation has reached an impasse;
- a Part II Order request or elevation request is expected.

The Director of the Environmental Approvals Branch can be notified either by email with the subject line "Potential Duty to Consult" to EAASIBgen@ontario.ca or by mail or fax at the address provided below:

Email:	EAASIBGen@ontario.ca Subject: Potential Duty to Consult
Fax:	416-314-8452
Address:	Environmental Approvals Branch 135 St. Clair Avenue West, 1st Floor Toronto, ON, M4V 1P5

The MOECC will then assess the extent of any Crown duty to consult for the circumstances and will consider whether additional steps should be taken, including what role you will be asked to play in them.

Source Water Protection

As per the recent amendments to the Municipal Engineers Association (MEA) Class Environmental Assessment parent document approved October 2015, proponents undertaking a Municipal Class EA project must identify early in the process whether a project is occurring within a source water protection vulnerable area. This must be clearly documented in a Project File report or ESR. If the project is occurring in a vulnerable area, then there may be policies in the local Source Protection Plan (SPP) that need to be addressed (requirements under the Clean Water Act). The proponent should contact and consult with the appropriate Conservation Authority/Source Protection Authority (CA/SPA) to discuss potential considerations and policies in the SPP that apply to the project.

Please include a section in the report on Source Water Protection. Specifically, it should discuss whether or not the project is located in a vulnerable area or changes or creates new vulnerable areas, and provide applicable details about the area. If located in a vulnerable area, proponents should document whether any project activities are a prescribed drinking water threat and thus pose a risk to drinking water (this should be consulted on with the appropriate CA/SPA). Where an activity poses a risk to drinking water, the proponent must document and discuss in the Project File Report/ESR how the project adheres to or has regard to applicable policies in the local SPP. If creating or changing a vulnerable area, proponents should document whether any existing uses or activities may potentially be affected by the implementation of source protection policies. This section should then be used to inform and should be reflected in other sections of the report, such as the identification of net positive/ negative effects of alternatives, mitigation measures, evaluation of alternatives etc. As a note, even if the project activities in a vulnerable area are deemed not to be a drinking water risk, there may be other policies that apply and so consultation with the local CA/SPA is important.

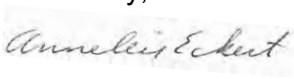
Conclusion

Thank you for the opportunity to comment on this project. Please keep this office fully informed of the status of this project as it proceeds through the Class EA process.

Please send all future correspondence with respect to this project to my attention, as I am this ministry's one window contact for this project: Anneleis Eckert, Regional Environmental Planner / Regional EA Coordinator at the address below; email address: anneleis.eckert@ontario.ca; telephone number: 519-873-5115.

A draft copy of the Environmental Study Report should be forwarded to my attention prior to the filing of the final report, allowing a minimum of 30 days for the ministry's technical reviewers to provide comments. Please also forward the Notice of Completion and final ESR to me when completed. Thank you in advance.

Yours truly,



Anneleis Eckert
Regional Environmental Planner / Regional EA Coordinator
Ministry of Environment and Climate Change
733 Exeter Road
London ON, N6E 1L3
519 873-5115

cc: Kelly Vader, Environmental Planner, B.M. Ross and Associates
Mike Moroney, District Manager, MOECC Sarnia/Windsor District
Maryjane Corda, Area Supervisor, MOECC Sarnia Area Office
Scott Abernethy, Surface Water Group Leader, MOECC Southwest Region
Marc Bechard, Supervisor, MOECC Safe Drinking Water Branch, Sarnia

Kelly Vader

From: MNRF Ayl Planners (MNRF) <MNRF.Ayl.Planners@ontario.ca>
Sent: January 22, 2018 11:53 AM
To: kvader@bmross.net
Subject: MNRF Comments: Bear Creek Bridge - Class EA
Attachments: 2017-04_SAR Screening Process_Technical Bulletin.pdf; 2017-05_SAR Reference Material Memo_AylmerDistrict.pdf; 2017-05_SAR Ref Guide Warwick.pdf

Ministry of Natural Resources and Forestry

615 John Street
North
Aylmer, ON N5H 2S8
Tel: 519-773-9241
Fax: 519-773-9014

Ministère des Richesses naturelles et des Forêts

615, rue John Nord
Aylmer ON N5H 2S8
Tél: 519-773-9241
Téléc: 519-773-9014

Ontario

January 22, 2018

Kelly Vader, Environmental Planner
B. M. Ross and Associates Limited
2695 Hamilton Road, P.O. Box 400
Brights Grove, ON N0N 1C0

Subject: Bear Creek Bridge – Class Environmental Assessment

Dear Ms. Vader,

Ministry of Natural Resources and Forestry (MNRF) Aylmer District received the notice of Class Environmental Assessment for the Bear Bridge Creek on January 11, 2018. Thank for you for circulating this notice to our office, however, **please note that we have not completed a screening of natural heritage (including species at risk) or other resource values for the project at this time**. Please also note that it is your responsibility to be aware of and comply with all relevant federal or provincial legislation, municipal by-laws or other agency approvals.

This response provides information to guide you in identifying and assessing natural features and resources as required by applicable policies and legislation, and engaging with MNRF Aylmer District for advice as needed.

Natural Heritage & Endangered Species Act

- Please refer to the attached *Species at Risk Reference Guide* for a list of threatened and endangered species that may occur in your area to further inform an initial background information review for your project. Also attached is Aylmer District's *Species at Risk Reference Material Memo* intended to introduce and explain the reference guide that is attached

- Please refer to Aylmer District's *Species at Risk Screening Process Technical Bulletin* (attached) for information about the process for seeking *Endangered Species Act 2007* advice, including the information required and where to submit a request.

Petroleum Wells & Oil, Gas and Salt Resource Act

There may be petroleum wells within the proposed project area. Please consult the Ontario Oil, Gas and Salt Resources Library website (www.ogsrlibrary.com) for the best known data on any wells recorded by MNRF. Please reference the 'Definitions and Terminology Guide' listed in the publications on the Library website in order to better understand the well information available. Any oil and gas wells in your project area are regulated by the *Oil, Gas and Salt Resource Act*, and the supporting regulations and operating standards. If any unanticipated wells are encountered during development of the project, or if the proponent has questions regarding petroleum operations, the proponent should contact the Petroleum Operations Section at 519-873-4634.

Public Lands Act & Lakes and Rivers Improvement Act

Some Municipal projects may be subject to the provisions of the *Public Lands Act* or *Lakes and Rivers Improvement Act*. Please review the information on MNRF's web pages provided below regarding when an approval is required or not. Please note that many of the authorizations issued under the *Lakes and Rivers Improvement Act* are administered by the local Conservation Authority.

- For more information about the *Public Lands Act*: https://www.ontario.ca/page/crown-land-work-permits
- For more information about the *Lakes and Rivers Improvement Act*: https://www.ontario.ca/document/lakes-and-rivers-improvement-act-administrative-guide

After reviewing the information provided, if you have not identified any of MNRF's interests stated above, there is no need to circulate any subsequent notices to our office. If you have any questions or concerns, please feel free to contact me.

Sincerely,

Laura Warner
Planning Intern
Ministry of Natural Resources and Forestry, Aylmer District
615 John St. N. Aylmer, ON, N5H 2S8
E-mail: MNRF.Ayl.Planners@ontario.ca

Township of Warwick

Municipal Species at Risk Reference Guide

Birds

Acadian Flycatcher

Endangered

Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information	Timing Windows	Survey Protocol
Occupies a broad spectrum of deciduous and mixed woodlands of variable size across its breeding range. Refer to the Provincial Recovery Strategy (2016).	Migratory bird that may be present in Ontario from April through September.	Follow Breeding Bird Survey Protocol as applicable, conducting three rounds of surveys during the breeding window.
https://www.ontario.ca/page/acadian-flycatcher		http://www.ec.gc.ca/reom-mbs/default.asp?lang

Bank Swallow

Threatened

Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information	Timing Windows	Survey Protocol
Bank swallows nest in burrows in natural and human-made settings where there are exposed and inclined areas of erodable substrate like silt or sand, such as banks of rivers and lakes, roadsides, aggregate pits, and stock-piled materials. Refer to the Provincial Recovery Strategy (2016) and contact ESA.Aylmer@Ontario.ca for the General Habitat Description (not yet available online).	Migratory bird most commonly seen in Ontario from April through September.	Survey for burrows in potential habitat features and identify habitat according to the species general habitat description. Follow Breeding Bird Survey Protocol to assess habitat occupancy, conducting three rounds of surveys during the breeding window.
https://www.ontario.ca/page/bank-swallow		http://www.ec.gc.ca/reom-mbs/default.asp?lang

Barn Owl

Endangered

Species Protection ☑ Regulated Habitat Protection ☑ General Habitat Protection ☐

Habitat Information	Timing Windows	Survey Protocol
Barn Owls are known to nest in both natural structures (e.g. hollows in trees or banks) and human-made structures (e.g. nest boxes, barns and other shelters with access). Refer to the Provincial Recovery Strategy (2010) and Ontario Regulation 242/08.	May be present year-round. Egg dates recorded in Ontario have occurred from March through October.	No standardized species protocol available; contact ESA.Aylmer@Ontario.ca to request specific advice on conducting adequate surveys for your project.

https://www.ontario.ca/page/barn-owl

Barn Swallow

Threatened

Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information	Timing Windows	Survey Protocol
Barn Swallow nests in Ontario are commonly situated inside or outside of buildings and other man-made shelters, under bridges and piers and in road culverts. Refer to the Provincial Recovery Strategy (2014) and the General Habitat Description.	Migratory bird most commonly seen in Ontario from April through September.	Survey structures for the presence of nest cups. Identify habitat according to the species general habitat description.

https://www.ontario.ca/page/barn-swallow http://www.ec.gc.ca/reom-mbs/default.asp?lang

Bobolink

Threatened

Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information	Timing Windows	Survey Protocol
Nests in grassland-like habitats typically greater than 2 hectares, such as hayfield, pasture, alfalfa, winter wheat, old/overgrown fields, prairie, savannah, and meadow or meadow marsh. Refer to the Provincial Recovery Strategy (for Bobolink and Eastern Meadowlark; 2013).	Migratory bird most commonly seen in Ontario from May to September.	Contact ESA.Aylmer@ontario.ca to obtain a copy of the MNRF draft Bobolink breeding survey protocol (2011).

https://www.ontario.ca/page/bobolink

Cerulean Warbler

Threatened Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information	Timing Windows	Survey Protocol
Typically occur in mature deciduous woodlands. Has been found breeding in tracts as small as 10 hectares in Ontario. Refer to COSEWIC Assessment and Status Report (2010).	Migratory bird most commonly seen in Ontario from May to August.	Follow Breeding Bird Survey Protocol as applicable, conducting three rounds of surveys during the breeding window.
https://www.ontario.ca/page/cerulean-warbler		http://www.ec.gc.ca/reom-mbs/default.asp?lang

Chimney Swift

Threatened Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information	Timing Windows	Survey Protocol
They typically nest and roost in chimneys and other man-made structures. Can also nest in hollow trees or tree cavities. Refer to COSEWIC Assessment and Status Report (2007) and the General Habitat Description.	Migratory bird most commonly seen in Ontario from mid-April to mid-October.	Follow the Ontario Swift Watch Protocol by Bird Studies Canada (2015). Identify habitat according to the general habitat description.
https://www.ontario.ca/page/chimney-swift		http://www.bsc-eoc.org/volunteer/ai/resources/

Eastern Meadowlark

Threatened Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information	Timing Windows	Survey Protocol
Breed primarily in grassland-like habitats, such as pastures and hayfields (including alfalfa), meadow and meadow marsh, old/overgrown fields, prairie, savannah, weedy borders of croplands, roadsides, orchards, gold courses, and other open areas, typically greater than 3 hectares. Refer to the Provincial Recovery Strategy (for Bobolink and Eastern Meadowlark; 2013).	Migratory bird most commonly seen in Ontario from March through October.	Contact ESA.Aylmer@ontario.ca to obtain a copy of the MNRF draft Eastern Meadowlark breeding survey protocol (2013) .
https://www.ontario.ca/page/eastern-meadowlark		

Least Bittern

Threatened

Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information	Timing Windows	Survey Protocol
Found in marshes, often where vegetation cover is interspersed with areas of open water. They can be found in smaller isolated marshes though most known occurrences are in larger wetlands. Refer to the Provincial Recovery Strategy (2016).	Migratory bird most commonly seen in Ontario from May through September.	Follow the National Least Bittern Survey Protocol, CWS Technical Report Series no. 519 (2011). Contact ESA.Aylmer@ontario.ca for more information if needed.
https://www.ontario.ca/page/least-bittern		http://ec.gc.ca/Publications/default.asp?lang=E

Prothonotary Warbler

Endangered

Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information	Timing Windows	Survey Protocol
Key features are presence of water near wooded area with suitable cavity nest sites or nest boxes. Nests usually occur near large bodies of standing or slow-moving water, such as seasonally flooded forest, swamps, rivers, streams, ponds, or lakes. Refer to the Provincial Recovery Strategy (2012).	Migratory bird most commonly seen in Ontario from May through August.	Follow Breeding Bird Survey Protocol as applicable, conducting three rounds of surveys during the breeding window.
https://www.ontario.ca/page/prothonotary-warbler		

Yellow-breasted Chat

Endangered

Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information	Timing Windows	Survey Protocol
A wide variety of early-successional habitats are used (i.e., dense, low deciduous or coniferous vegetation), including early shrubby regrowth on abandoned agricultural fields, power-line corridors, clear-cuts, fencerows, forest edges and openings, and areas near streams, ponds and swamps. Refer to the COSEWIC Assessment and Status report (virens subspecies; 2012).	Migratory bird most commonly seen in Ontario from May through August.	Follow Breeding Bird Survey Protocol as applicable, conducting three rounds of surveys during the breeding window.

https://www.ontario.ca/page/yellow-breasted-chat

Herbaceous

American Ginseng

Endangered

Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information	Timing Windows	Survey Protocol
American Ginseng typically grows in rich, moist, but well-drained, and relatively mature, deciduous woods dominated by Sugar Maple, White Ash and American Basswood. It usually grows in deep, nutrient rich soil over limestone or marble bedrock. Refer to the general habitat description (2013) and the federal recovery strategy (2015).	American Ginseng plants are typically found from May to late September. Refer to protocol for details.	Draft Site Occupancy Survey Protocol for American Ginseng in Ontario (2013) - contact MNRF Aylmer District for more information.

https://www.ontario.ca/page/american-ginseng

http://ibis.geog.ubc.ca/biodiversity/eflora/Protoc

Goldenseal

Threatened

Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information

Grows in rich, moist semi-open to closed areas of deciduous forests. Found at periodically flooded upland sites and in moist lowlands near floodplains. Associated with Red Oak, Sugar Maple, Hawthorns, Shagbark Hickory, Ironwood and Basswood. Typically grows in disturbed areas where trees have fallen, or next to recreational paths or woodland edges. Prefers sandy loam, loam soils or clay soils depending on whether it is growing in an upland or lowland area. Refer to the provincial recovery strategy (2016).

https://www.ontario.ca/page/goldenseal

Timing Windows

Flowers April - May; fruit ripens July-August.

Survey Protocol

No standardized species protocol available; contact ESA.Aylmer@Ontario.ca to request specific advice on conducting adequate surveys for your project.

Mammals

American Badger (Southwestern Ontario population)

Endangered

Species Protection ☑ Regulated Habitat Protection ☑ General Habitat Protection ☐

Habitat Information

Badgers are found in a variety of habitats, such as tall grass prairie, sand barrens, meadows, grasslands, ravines, hedgerows, forest edges, and farmland. Refer to the provincial recovery strategy (2010) and Ontario Regulation 242/08.

https://www.ontario.ca/page/american-badger

Timing Windows

Present all year-round, semi-dormant over winter.

Survey Protocol

No standardized species protocol available; contact ESA.Aylmer@Ontario.ca to request specific advice on conducting adequate surveys for your project.

Eastern Small-footed Myotis

Endangered Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information	Timing Windows	Survey Protocol
Will roost in a variety of habitats changing day to day, including in trees or under tree bark, under rocks or in rock outcrops, in buildings, under bridges, etc. Over-winter in caves and abandoned mines.	Typically over-winter from about October to April.	No standardized species protocol available; contact ESA.Aylmer@Ontario.ca to request specific advice on conducting adequate surveys for your project.

https://www.ontario.ca/page/eastern-small-footed-bat

Little Brown Myotis (formerly little brown bat)

Endangered Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information	Timing Windows	Survey Protocol
Roost habitat may include human structures such as houses, bridges, and barns, or natural features such as rock crevices and forests. May over-winter in buildings, caves, or mines. Refer to the draft federal recovery strategy (2015).	They feed at night and are most active in the two or three hours after sunset. Typically over-winter from about October to April.	No standardized species protocol available; contact ESA.Aylmer@Ontario.ca to request specific advice on conducting adequate surveys for your project.

https://www.ontario.ca/page/little-brown-bat

Northern Myotis (formerly Northern Long-eared Bat)

Endangered Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information	Timing Windows	Survey Protocol
Roosts in tree cavities, under tree bark, in natural and artificial crevices such as rock outcrops and roof shingles. Over-winters in caves and mines. Refer to the draft federal recovery strategy (2015).	Typically over-winter from about October to April.	No standardized species protocol available; contact ESA.Aylmer@Ontario.ca to request specific advice on conducting adequate surveys for your project.

https://www.ontario.ca/page/northern-long-eared-bat

Molluscs

Round Pigtoe

Endangered Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information

In small rivers, this species can be found in areas of moderate flow on substrates of gravel, cobble and boulder. In larger rivers, it is found in mud, sand and gravel at varying depths. Known fish hosts: Bluegill, Spotfin shiner, Bluntnose minnow, and Northern redbelly dace.

Timing Windows

Contact DFO.

Survey Protocol

Please reference: Mackie, G, T.J Morris, and D Ming. "Protocol for the Detection and Relocation of Freshwater Mussel Species at Risk in Ontario Great Lakes Area (OGLA)." Fisheries and Oceans Canada. (2008).

https://www.ontario.ca/page/round-pigtoe

Salamander Mussel

Endangered Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information

Found in streams that support the Mudpuppy, an aquatic salamander. Waterbodies with soft substrates and swift current.

Timing Windows

Contact DFO.

Survey Protocol

Please reference: Mackie, G, T.J Morris, and D Ming. "Protocol for the Detection and Relocation of Freshwater Mussel Species at Risk in Ontario Great Lakes Area (OGLA)." Fisheries and Oceans Canada. (2008).

https://www.ontario.ca/page/salamander-mussel

Snakes

Eastern Foxsnake (Carolinian population)

Endangered

Species Protection ☑ Regulated Habitat Protection ☑ General Habitat Protection ☐

Habitat Information	Timing Windows	Survey Protocol
Generally use old fields, prairie, savannah, shorelines, wetlands, rock barrens, dunes, hedgerows, drains and canals, as well as anthropogenic features such as old foundations, bridges, and wells. Refer to the provincial recovery strategy (2010), Ontario Regulation 242/08, and the habitat protection summary (2012).	Egress from over-wintering sites usually occurs from April to mid May, mating occurs from late May to mid June, egg-laying occurs from late June to mid-July, and hatching occurs from late August to early October. Ingress to over-wintering sites usually occurs in September and October.	Survey Protocol for Ontario's Species at Risk Snakes (December 2016) - contact ESA.Aylmer@Ontario.ca for more information

https://www.ontario.ca/page/eastern-foxsnake

Eastern Hog-nosed Snake

Threatened

Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information	Timing Windows	Survey Protocol
Generally use sandy beaches and dunes, wetlands, forests, forest edges, and meadows. Refer to the provincial recovery strategy (2011).	Emergence in April. Mating occurs in spring and late summer. Eggs are laid in June and July. Hatching occurs between late August and mid September.	Survey Protocol for Ontario's Species at Risk Snakes (December 2016) - contact ESA.Aylmer@Ontario.ca for more information

https://www.ontario.ca/page/eastern-hog-nosed-snake

Queensnake

Endangered

Species Protection ☑ Regulated Habitat Protection ☑ General Habitat Protection ☐

Habitat Information	Timing Windows	Survey Protocol
Queensnake is an aquatic species that is seldom found far from water. Prefers rivers and riverbanks, streams, and lakes, with the presence of crayfish. Over-wintering sites include abutments of old bridges and crevices in bedrock. Refer to the provincial recovery strategy (2011), Ontario Regulation 242/08, and the habitat protection summary (2013).	Emerges from over-wintering beginning mid April; Mating in May and September; Young born between July and September; Returns to over-wintering site early to mid October	Contact ESA.Aylmer@Ontario.ca for the Survey Protocol for Queensnake (August 2015).

https://www.ontario.ca/page/queensnake

Trees

American Chestnut

Endangered

Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information	Timing Windows	Survey Protocol
In Ontario, it is only found in the Carolinian Zone between Lake Erie and Lake Huron. American Chestnut grows alongside Red Oak, Black Cherry, Sugar Maple, American Beech and other deciduous tree species. Refer to the provincial recovery strategy (2012).	Trees typically flower in late May to early July. Nuts mature by mid-October.	No standardized species protocol available; contact ESA.Aylmer@Ontario.ca to request specific advice on conducting adequate surveys for your project.

https://www.ontario.ca/page/american-chestnut-species-risk

Butternut

Endangered

Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information	Timing Windows	Survey Protocol
Butternut usually grows alone or in small groups in forests and woodlands. It prefers moist, well-drained soil and is also found on well-drained gravel sites. This species does not do well in the shade, and often grows in sunny openings and near forest edges. Refer to the provincial recovery strategy (2013).	Flowers from April to June. Fruits reach maturity during the month of September or October in the year of pollination and usually remain on the tree until after leaf fall.	A certified butternut health assessor must assess Butternut trees. Contact ESA.Aylmer@Ontario.ca for more information.

https://www.ontario.ca/page/butternut-species-risk

Eastern Flowering Dogwood

Endangered

Species Protection ☑ Regulated Habitat Protection ☑ General Habitat Protection ☐

Habitat Information	Timing Windows	Survey Protocol
Grows in deciduous or mixed forests, open woodlands, forest edges, floodplains, slopes, bluffs, ravines, roadsides, hedgerows, and along drains. Refer to the provincial recovery strategy (2010) and Ontario Regulation 242/08.	Flowering occurs from mid-May to early June, as the leaves begin to develop. The fruits mature in August and September.	No standardized species protocol available; contact ESA.Aylmer@Ontario.ca to request specific advice on conducting adequate surveys for your project.

https://www.ontario.ca/page/eastern-flowering-dogwood-species-riskhttps://www

Turtles

Blanding's Turtle

Threatened

Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information

Blanding's Turtle lives in shallow water, usually in large wetlands and shallow lakes with lots of water plants. May travel long distances from nearest waterbody, usually while searching for mates or traveling to nesting or overwintering sites. Hibernate in the mud at the bottom of permanent water bodies from late October until the end of April. Refer to the general habitat description (2013) and the draft federal recovery strategy (2016).

https://www.ontario.ca/page/blandings-turtle

Timing Windows

Mating prior to and right after overwintering, typically in April to early May, and from the end of August to end of October. Eggs are laid in from late May to early July, with hatchlings emerging in throughout September and October. Overwinter from October to April.

Survey Protocol

Survey Protocol for Blanding's Turtle (Emydoidea blandingii) in Ontario (August 2015) - contact MNRF Aylmer District for more information.

Spotted Turtle

Endangered

Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information

Semi-aquatic preferring ponds, marshes, bogs and even ditches with slow-moving, unpolluted water and abundant supply of aquatic vegetation. Other aquatic habitat can include vernal pools, seeps, sloughs, creeks, stormwater ponds, sheltered edges of bays, channels and drainage ditches. Strong preference for marsh meadows as well. Nests will be found in well-drained, sunny locations that are bare or have sparse vegetation. Hibernates in wetlands or seasonally wet areas associated with structures including overhanging banks, hummocks, tree roots, or aquatic animal burrows. Refer to the draft federal recovery strategy (2016) for more information.

https://www.ontario.ca/page/spotted-turtle

Timing Windows

Overwinters in underwater hibernacula for 7 to 8 months of the year, from mid-September/October to mid-late April. Basks in April. Mates begins in early spring as soon as ice/snow melt and can occur from late May through to early July.

Survey Protocol

Survey Protocol for Spotted Turtle (Clemmys guttata) in Ontario (August 2015) - contact MNRF Aylmer District for more information.

ONTARIO MINISTRY of NATURAL RESOURCES and FORESTRY | AYLMER DISTRICT OFFICE
615 John Street N. Aylmer ON, N5H 2S8 esa.aylmer@ontario.ca

This report was produced May, 2017

Please refer to the associated Municipal Species at Risk Reference Material Memo for instructions on how to use this guide.

The Committee on the Status of Species at Risk in Ontario (COSSARO) meets regularly to evaluate new species for listing and/or re-evaluate species already on the SARO List. As a result, species designations may change, which could in turn change the protection they receive under the ESA and whether proposed projects may have adverse effects on SAR. Habitat protection provisions for a species may also change if a species-specific habitat regulation comes into effect, or as new general habitat guidance is developed based on the best available information. Additionally, the province has not been comprehensively surveyed and MNRF data relies on observers to report sightings. As such, the absence of an occurrence does not indicate the absence of SAR species or habitat, and new occurrence information may affect whether a proposed project may contravene the ESA.

Ministry of Natural Resources and Forestry

615 John Street North
Aylmer, ON N5H 2S8
Tel: 519-773-9241
Fax: 519-773-9014

Ministère des Richesses naturelles et des Forêts

615, rue John Nord
Aylmer ON N5H 2S8
Tél: 519-773-9241
Téléc: 519-773-9014

May 2017

Re: Aylmer District Species at Risk Reference Material for Species and Habitat Information

The Ministry of Natural Resources and Forestry (**MNRF**) has created reference material for species at risk (**SAR**) specific to each municipality in Aylmer District. This document is intended to introduce and explain the reference material that is attached.

Intended use of the reference material

- The reference material is targeted towards landowners, municipalities, consultants, and developers in Aylmer District.
- The material is meant to provide awareness of endangered and threatened SAR that have potential to occur in a specific municipality, along with brief descriptions of typical habitat and general survey recommendations for each SAR species.
- It is MNRF's expectation that consultants and their proponents will refer to the reference material prior to completing SAR field assessments, since it outlines MNRF-approved survey protocols that should be followed in order to work towards MNRF Aylmer District's expectations for ensuring due diligence under the *Endangered Species Act, 2007* (**ESA**).
- The material is not meant to replace species and/or habitat surveys conducted by a qualified biologist, but help scope the field assessments.
- If you are intending to conduct a project that has known occurrences of SAR or a high likelihood of SAR in the area, MNRF (ESA.Aylmer@ontario.ca) should be contacted early in the process; see our attached SAR Screening Process Technical Bulletin outlining how to submit a screening request.
- During the SAR screening process, MNRF can provide site-specific information regarding:
    - likelihood of SAR species and/or habitat occurring;
    - whether a qualified professional should be retained for field assessments;
    - SAR survey methodologies to demonstrate due diligence under the ESA; and,
    - options to avoid contravening the ESA or ways to acquire approval, if required.

General information and disclaimers

- The Species at Risk in Ontario (**SARO**) List is prescribed by Ontario Regulation 230/08 issued under the ESA. The ESA provides protection for endangered and threatened species listed on the SARO List, and their habitats. The ESA is a law of General Application that is binding on everyone (e.g. landowners, corporations, municipal and provincial governments) in the province of Ontario and applies to both private and public lands.
- Please note that the province has not been comprehensively surveyed and MNRF data relies on observers to report sightings. As such, the absence of a species from the municipal list does not guarantee the absence of SAR species or habitat in the specific municipality.

- It is important to note that the reference material may be updated annually but MNRF's guidance on SAR occurrences and field assessments can change throughout the year as policies, regulations, survey protocols, SAR data, and other SAR documents are finalized.

Species and habitat information

The Committee on the Status of Species at Risk in Ontario (COSSARO) meets regularly to evaluate species for listing and/or re-evaluate species already listed. As a result, species designations may change that could in turn change the level of protection they receive under the ESA. Additionally, habitat protection provisions for a species may change over time.

- Detailed information on all species on the SARO List can be found on the MNRF website
- Ontario Regulation (O. Reg.) 242/08 should be consulted for a complete and current list of SAR habitat regulations.
- MNRF (ESA.Aylmer@ontario.ca) should be contacted for guidance on identifying habitat for species that do not have habitat regulations, general habitat descriptions, or recovery strategies available.
    - Aylmer District recommends consulting federal recovery strategies if provincial ones are not available (http://www.registrelep-sararegistry.gc.ca/sar/recovery/recovery_e.cfm)

Conducting adequate surveys

- SAR surveys must be undertaken by a qualified professional who has experience with the target species and/or habitat.
- MNRF approvals or authorizations (e.g. permit under clause 17(2)(b) of the ESA or registry under O. Reg. 242/08, authorization under the *Fish and Wildlife Conservation Act*, and an approved animal care protocol) may be required to conduct SAR surveys.
- MNRF has finalized survey protocols for some SAR species, which are specified in the reference material, and these protocols can be obtained from Aylmer District upon request.
- It is strongly recommended that Aylmer District be consulted prior to conducting species surveys to confirm if surveys are necessary to determine if a project may contravene the ESA, and that surveys are conducted using appropriate methods and effort.

Additional information sources

The reference material was populated using Natural Heritage Information Centre (NHIC) data and additional information available to MNRF Aylmer District. There are additional sources of SAR information, including for species of special concern and provincially rare species that both receive consideration under the Provincial Policy Statement (2014), such as:

- Your local Conservation Authority
- Land Information Ontario
- Ontario Make a Natural Heritage Map tool
- Fisheries and Oceans Canada
- Breeding Birds of Ontario
- eBird
- Ontario Reptile and Amphibian Atlas

NEWS LOCAL

Study will determine what to do with bridge built in 1931

By Melissa Schilz, Postmedia Network
Tuesday, January 23, 2018 1:40:44 EST PM

Bear Creek Bridge, located on Egremont Road, was built in 1931.It will be undergoing an environmental assessment after an inspection found parts of the bridge deteriorating. (Photo courtesy of the County of Lambton)

Bear Creek Bridge located on Egremont Road in the Village of Warwick is set to undergo an environmental assessment after engineering inspections found deterioration with some bridge components.

Built in 1931 by the Department of Public Highways Ontario, the concrete bowstring arch bridge spans 18.64 meters over Bear Creek and consist of two lanes for traffic.

Glen Millar, Manager of Public Works, said the county inherited that road and bridge from the province

in 1997.

“We do regular inspections on all of our structures, and we’ve noted the deterioration of that structure,” he said.

There are four options to be considered following the assessment – to repair the existing bridge, replace the bridge entirely, rehabilitation of the existing bridge, or leave as is.

Millar said there is nothing emergent about these repairs, and no danger is posed to those using the bridge now. Being a well-traveled county road, the bridge carries an average of 1600 vehicles a day.

“There is nothing safety critical at this point,” he said. “We’re really at the front end of the project, it’s just to kick off notice at this point.”

Millar said at this time they are unsure of an exact cost in rehabilitating or replacing the structure, but should have a better idea following their study. He noted that they are expecting to complete the assessment and get approvals over the course of 2018, with plans for works in 2019.

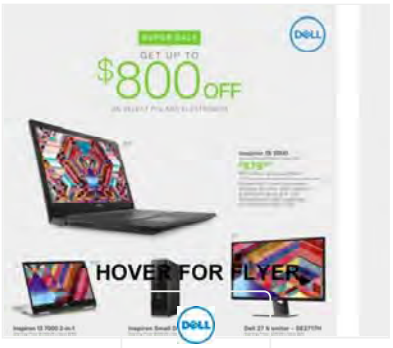
The environmental screening process will determine any impacts that the proposal could have, and how to mitigate those impacts. Consultation will be held with the public, First Nations communities, local municipalities, stakeholder and review agencies.

“We’re trying to get the word out about the project,” he said. “As we get some of our studies back in, there will public information with findings and options as we move forward.”

Public input and comments regarding the planning and design of the project are welcome. Millar said citizens can reach out to the project engineers until Feb. 16, by contacting B.M Ross and Associates Ltd. at 519-908-9564 or emailing Environmental Planner Kelly Vader at kvader@bmross.net.

mschilz@postmedia.com

This Week's Flyers



Kelly Vader

From: Sarah Hodgkiss <shodgkiss@scrca.on.ca>
Sent: February 6, 2018 3:15 PM
To: Kelly Vader
Subject: Class EA for the Bear Creek Bridge

Hi Kelly,

We received the notices re: the class EA for the Bear Creek Bridge, both as a neighbouring landowner and commenting authority. As I'm sure you are aware, our Warwick Conservation Area is south of the bridge, and the bridge is entirely within our regulated area. The bridge is within the adjacent lands of the significant woodland on our property, and is in the adjacent lands of the Provincially Significant Wetland along Bear Creek to the north.

I understand that you have received hydrology and hydraulic information from Girish Sankar.

We don't have any further concerns at this stage, but appreciate being kept informed as the project moves forward.

Please let me know if you need any additional information from us.

Thanks

Sarah

Sarah Hodgkiss

St. Clair Region Conservation Authority
Planning Ecologist

(519) 245-3710 ext. 234
shodgkiss@scrca.on.ca

205 Mill Pond Cresc.
Strathroy ON N7G 3P9

Ministry of Tourism, Culture and Sport

Heritage Program Unit
Programs and Services Branch
401 Bay Street, Suite 1700
Toronto ON M7A 0A7
Tel: 416 314 7133
Fax: 416 212 1802

Ministère du Tourisme, de la Culture et du Sport

Unité des programmes patrimoine
Direction des programmes et des services
401, rue Bay, Bureau 1700
Toronto ON M7A 0A7
Tél: 416 314 7133
Téléc: 416 212 1802

Ontario

February 16, 2017 (EMAIL ONLY) this is for MEA's

Kelly Vander
B.M. Ross and Associates Limited
2695 Hamilton Road, P.O. Box 400
Brigths Grove, ON N0N 1C0
E: bmross.net

RE: MTCS file #: 0008308
Proponent: County of Lambton
Subject: Notice of Commencement
Class Environmetal Assessment for the Bear Creek Bridge
Location: Village of Warwick, County of Lambton, Ontario

Dear Ms. Vander:

Thank you for providing the Ministry of Tourism, Culture and Sport (MTCS) with the Notice of Commencement for your project. MTCS's interest in this EA project relates to its mandate of conserving Ontario's cultural heritage, which includes:

- Archaeological resources, including land-based and marine;
- Built heritage resources, including bridges and monuments; and,
- Cultural heritage landscapes.

While some cultural heritage resources may have already been formally identified, others may be identified through screening and evaluation. Aboriginal communities may have knowledge that can contribute to the identification of cultural heritage resources, and we suggest that any engagement with Aboriginal communities includes a discussion about known or potential cultural heritage resources that are of value to these communities. Municipal Heritage Committees, historical societies and other local heritage organizations may also have knowledge that contributes to the identification of cultural heritage resources.

Municipal Heritage Bridges Cultural, Heritage & Archaeological Resources Assessment Checklist

Under the EA process, the proponent is required to determine a project's potential impact on cultural heritage resources. The Municipal Engineers Association provides screening criteria for work on bridges that falls under the Municipal Class EA with a *checklist* and *background material* available online, developed in coordination with MTCS.

Part A – Municipal Class EA Activity Selection

Please use the *checklist* and *background material* to determine the Municipal Class EA schedule (A, A+, B or C) for the project. Completing the remainder of this checklist determines what technical heritage studies may be required.

Part B - Cultural Heritage Assessment

If Part B of the checklist determines that the bridge or study area warrants preparation of a Cultural Heritage Evaluation Report (CHER), and undertaking of a Heritage Impact Assessment, our Ministry's *Info Sheet #5: Heritage Impact Assessments and Conservation Plans* outlines the scope of HIAs. CHERs and HIAs are to be prepared by qualified consultants. Please send HIAs to MTCS for review, and make copies available to local organizations or individuals who have expressed an interest in cultural heritage.

Part C – Heritage Assessment

If Part C of the checklist determines that the CHER has identified heritage features on the project and recommends that a Heritage Impact Assessment (HIA) be undertaken, our Ministry's *Info Sheet #5: Heritage Impact Assessments and Conservation Plans* outlines the scope of HIAs. CHERs and HIAs are to be prepared by qualified consultants. Please send HIAs to MTCS for review, and make copies available to local organizations or individuals who have expressed an interest in cultural heritage.

Part D – Archaeological Resources Assessment

If Part D of the checklist establishes that an archaeological assessment is required, it is to be conducted by an archaeologist licenced under the *Ontario Heritage Act* (*OHA*), who is responsible for submitting the report directly to MTCS for review. MTCS archaeological sites data are available at *archaeology@ontario.ca*.

After completing the checklist, please update MTCS on the project Class EA schedule and whether any technical heritage studies will be completed for the project. Please provide all technical heritage studies to MTCS before issuing a Notice of Completion of work on-site.

Environmental Assessment Reporting
All technical heritage studies and their recommendations are to be addressed and incorporated into EA projects. If your screening has identified no known or potential cultural heritage resources, or no impacts to these resources, please include the completed checklists and supporting documentation in the EA report or file.

Thank-you for consulting MTCS on this project: please continue to do so through the EA process, and contact me for any questions or clarification.

Sincerely,

Brooke Herczeg
Heritage Planner
Brooke.Herczeg@ontario.ca

Municipal Heritage Bridges
Cultural, Heritage and Archaeological
Resources Assessment Checklist
Revised April 11, 2014

This checklist was prepared in March 2013 by the Municipal Engineers Association to assist with determining the requirements to comply with the Municipal Class Environmental Assessment. View all 4 parts of the module on Structures Over 40 Years at www.municipalclassea.ca to assist with completing the checklist.

Project Name: Bear Creek Bridge Replacement

Location: County Road 22 in the community of Warwick

Municipality: Township of Warwick, County of Lambton

Project Engineer: Andrew Ross, P. Eng.

Checklist completed by: Kelly Vader, RPP, MCIP

Date: June 22, 2017

NOTE: Complete all sections of Checklist. Both Cultural Heritage and Archaeological Sections must be satisfied before proceeding.

Part A - Municipal Class EA Activity Selection

Description	Yes	No
Will the proposed project involve or result in construction of new water crossings? This includes ferry docks.	☐ Schedule B or C	☒ Next
Will the proposed project involve or result in construction of new grade separation?	☐ Schedule B or C	☒ Next
Will the proposed project involve or result in construction of new underpasses or overpasses for pedestrian recreational or agricultural use?	☐ Schedule B or C	☒ Next
Will the proposed project involve or result in construction of new interchanges between any two roadways, including a grade separation and ramps to connect the two roadways?	☐ Schedule B or C	☒ Next

Description	Yes	No
Will the proposed project involve or result in reconstruction of a water crossing where the structure is less than 40 years old and the reconstructed facility will be for the same purpose, use, capacity and at the same location? (Capacity refers to either hydraulic or road capacity.) This include ferry docks.	☐ Schedule A+	☒ Next
Will the proposed project involve or result in reconstruction of a water crossing, where the reconstructed facility will not be for the same purpose, use, capacity or at the same location? (Capacity refers to either hydraulic or road capacity). This includes ferry docks.	☐ Schedule B or C	☒ Next
Will the proposed project involve or result in reconstruction or alteration of a structure or the grading adjacent to it when the structure is over 40 years old where the proposed work will alter the basic structural system, overall configuration or appearance of the structure?	☒ Next	☐ Assess Archaeological Resources

Part B - Cultural Heritage Assessment

Description	Yes	No
Does the proposed project involve a bridge construction in or after 1956?	☐ Next	☒ Prepare CHER Undertake HIA
Does the project involve one of these four bridge types?	☐ Rigid frame Next ☐ Precast with Concrete Deck Next ☐ Culvert or Simple Span Next ☐ Steel Beam/ Concrete Deck Next	☐ Prepare CHER Undertake HIA

Description	Yes	No
Does the bridge or study area contain a parcel of land that is subject of a covenant or agreement between the owner of the property and a conservation body or level of government?	□ Prepare CHER Undertake HIA	□ Next
Does the bridge or study area contain a parcel of land that is listed on a register or inventory of heritage properties maintained by the municipality?	□ Prepare CHER Undertake HIA	□ Next
Does the bridge or study area contain a parcel of land that is designated under Part IV of the Ontario Heritage Act?	□ Prepare CHER Undertake HIA	□ Next
Does the bridge or study area contain a parcel of land that is subject to a notice of intention to designate issued by a municipality?	□ Prepare CHER Undertake HIA	□ Next
Does the bridge or study area contain a parcel of land that is located within a designated Heritage Conservation District?	□ Prepare CHER Undertake HIA	□ Next
Does the bridge or study area contain a parcel of land that is subject to a Heritage Conservation District study area by-law?	□ Prepare CHER Undertake HIA	□ Next
Does the bridge or study area contain a parcel of land that is included in the Ministry of Tourism, Culture and Sport's list of provincial heritage properties?	□ Prepare CHER Undertake HIA	□ Next
Does the bridge or study area contain a parcel of land that is part of a National Historic Site?	□ Prepare CHER Undertake HIA	□ Next
Does the bridge or study area contain a parcel of land that is part of a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site?	□ Prepare CHER Undertake HIA	□ Next

Description	Yes	No
Does the bridge or study area contain a parcel of land that is designated under the Heritage Railway Station Protection Act?	☐ Prepare CHER Undertake HIA	☐ Next
Does the bridge or study area contain a parcel of land that is identified as a Federal Heritage Building by the Federal Heritage Building Review Office (FHBRO)	☐ Prepare CHER Undertake HIA	☐ Next
Does the bridge or study area contain a parcel of land that is the subject of a municipal, provincial or federal commemorative or interpretive plaque that speaks to the Historical significance of the bridge?	☐ Prepare CHER Undertake HIA	☐ Next
Does the bridge or study area contain a parcel of land that is in a Canadian Heritage River watershed?	☐ Prepare CHER Undertake HIA	☐ Next
Will the project impact any structures or sites (not bridges) that are over forty years old, or are important to defining the character of the area or that are considered a landmark in the local community?	☐ Prepare CHER Undertake HIA	☐ Next
Is the bridge or study area adjacent to a known burial site and/or cemetery?	☐ Prepare CHER Undertake HIA	☐ Next
Is the bridge considered a landmark or have a special association with a community, person or historical event in the local community?	☐ Prepare CHER Undertake HIA	☐ Next
Does the bridge or study area contain or is it part of a cultural heritage landscape?	☐ Prepare Cher Undertake HIA	☐ Assess Archaeological Resources

PART C - HERITAGE ASSESSMENT

Description	Yes	No
Does the Cultural Heritage Evaluation Report identify any Heritage Features on the project?	☐ Undertake HIA	☐ Part D - Archaeological Resources
Does the Heritage Impact Assessment determine that the proposed project will impact any of the Heritage Features that have been identified?	☐ Schedule B or C	☐ Part D - Archaeological Resources

PART D - ARCHAEOLOGICAL RESOURCES ASSESSMENT

Description	Yes	No
Will any activity, related to the project, result in land impacts/significant ground disturbance?	☐ Next	☐ Schedule A - proceed
Have all areas, to be impacted by ground disturbing activities, been subjected to recent extensive and intensive disturbances and to depths greater than the depths of the proposed activities?	☐ Schedule A - proceed	☐ Next
Has an archaeological assessment previously been carried out that includes all of the areas to be impacted by this project?	☐ Next	☐ Archaeological Assessment
Does the report on that previous archaeological assessment recommend that no further archaeological assessment is required within the limits of the project for which that assessment was undertaken, and has a letter been issued by the Ministry of Tourism, Culture and Sport stating that the report has been entered into the Ontario Public Register of Archaeological Reports?	☐ Schedule A - proceed	☐ Obtain satisfaction letter - proceed

** Include Documentation Summary in Project File**

AAMJIWNAANG FIRST NATION

978 Tashmoo Ave.
Sarnia, Ontario N7T 7H5
Ph.: 519-336-8410
Fax: 519-336-0382

March 21, 2018

Our File # 2018-0002

B.M. ROSS AND ASSOCIATES LIMITED
Engineers and Planners
62 North Street
Goderich, ON N7A 2T4

Attention: Kelly Vader, RPP, MCIP
Environmental Planner

Re: County of Lambton (Village of Warwick)
Class Environmental Assessment for the Bear Creek Bridge
File No. BR 1279

Dear Kelly Vader:

We are writing to follow-up with the information that you recently provided regarding the above noted project dated January 8, 2018. The information was recorded into our consultation log and recently discussed at the Aamjiwnaang First Nation's Environment Committee on March 6, 2018 for their review and consideration.

After review of information provided, Aamjiwnaang First Nation (AFN) has concerns with road mortalities during construction and would like to know your plans to reduce/mitigate impacts on wildlife? AFN requests that any habitat areas that have been disturbed or removed as a result of the project be restored, where possible. Any wildlife corridors that are disturbed due to the project, be restored after completion of the project. Also, AFN is interested in any archeological studies in the project area. AFN request that we have our Archeological and Species at Risk Monitors on site during assessments studies and construction. In addition, as part of the rebuilding after improvements, AFN would like to have native plant species re-planted or planted in another significant area near the project area.

As the First Peoples of this territory, we are intimately connected to our lands, water and resources. We have an inherent and sacred responsibility to manage and protect our lands and resources. Our existing Aboriginal and treaty rights, our perspectives, interests and obligations of stewardship must inform the development of any proposed project, which may potentially impact these rights. Our First Nation must be involved in the decision-making processes at an early stage in the project and be fully informed throughout.

AAMJIWNAANG FIRST NATION

978 Tashmoo Ave.
Sarnia, Ontario N7T 7H5
Ph.: 519-336-8410
Fax: 519-336-0382

To promote consistency and timely responses, please forward any and all relevant information pertaining to this project to:

Chief Joanne Rogers
Aamjiwnaang First Nation
978 Tashmoo Avenue
Sarnia, Ontario, N7T 7H5
Office: (519) 336-8410

Sharilyn Johnston
Environmental Coordinator
Aamjiwnaang First Nation
978 Tashmoo Avenue
Sarnia, Ontario, N7T 7H5
Office: (519) 336-8410
Email: sjohnston@aamjiwnaang.ca

Information sharing between the proponent and our community is critical to making informed decisions. However, this review process must not in any way be interpreted as satisfying the Crown's constitutional duty to consult and accommodate Aamjiwnaang First Nation. As the Supreme Court set out in *Haida Nation*, the Crown may delegate procedural elements of its duty to consult, however, "the ultimate legal responsibility for consultation and accommodation rests with the Crown and the Crown alone."

Aamjiwnaang First Nation is committed to facilitating a flexible, clear, and reasonable process for reviewing information in relation to the proposed project and will participate fully in responding to the information provided. This letter does not abrogate or derogate Aamjiwnaang First Nation's continuing ability to assert and exercise its Aboriginal Rights and Title to all parts for its Reserve and Traditional Territory.

Sincerely,

Christine James
Aamjiwnaang Consultation Worker
Aamjiwnaang First Nation

Kelly Vader

From: Jenny.SEO@HydroOne.com
Sent: March 22, 2018 2:22 PM
To: kvader@bmross.net
Cc: enza.cancilla@HydroOne.com; SecondaryLandUse@HydroOne.com
Subject: County of Lambton Bear Creek Bridge - EA - Not impact
Attachments: County of Lambton - Class Environmental Assessment.pdf; BR1279-General_Location_Plan.jpg; BearCreek1.jpg

Dear Kelly Vader,

In our initial review, we can confirm that there are no Hydro One Transmission (above 115 kV) Facilities in the subject area. Please note there may also be Hydro One Distribution facilities in your study area (ie. Distribution wires operating below 115 kV). In order to cover off the impact to all Hydro One assets, please also forward your EA to the following email address:

Enza Cancilla, Hydro One Real Estate Management
185 Clegg Road, Markham L6G 1B7
Phone: (416) 345-5892
Enza.Cancilla@HydroOne.com

Please be advised that this is only a preliminary assessment based on current information. No further consultation with Hydro One Networks Inc. is required if no changes are made to the current information.

If you have any further questions or concerns, please feel free to contact me.

Regards,

Thanks,
Jenny

Jenny SEO
Network Management Officer, Secondary Land Use

Hydro One Networks Inc.
483 Bay St. | North Tower | 13th Floor
Toronto, ON | M5G 2P5

Tel: 416.345.5676
Email: Jenny.Seo@Hydroone.com

www.HydroOne.com

On behalf of

Secondary Land Use
Strategy & Integrated Planning
Hydro One Networks

Kelly Vader

From: Tyson.Monk@HydroOne.com
Sent: April 13, 2018 8:30 AM
To: kvader@bmross.net
Cc: John.Findlay@HydroOne.com
Subject: FW: Bear Creek Bridge - County of Lambton, Community of Warwick
Attachments: County of Lambton Bear Creek Bridge - EA - Not impact.eml; BR1279-18Jan08-Adjacent Property Let.pdf

Please see information below.

Let me know if you need anything else

TYSON MONK
Lines Customer Support Clerk
BE1 ~ Beachville Operations
DISTRIBUTION LINES WORK MANAGEMENT
1-800-957-7756 ~ Ext 3321
tyson.monk@hydroone.com

From: FINDLAY John
Sent: Friday, April 13, 2018 8:20 AM
To: MONK Tyson
Cc: CANCILLA Enza; HENDRIKSEN Gerry
Subject: FW: Bear Creek Bridge - County of Lambton, Community of Warwick

Tyson please forward following information back to requestor at BM Ross.

- There is a HONI 3-phase 4.8/8.32kV pole line running parallel with bridge/roadway approx. 8m south of the south face of this bridge. Constructor needs to follow OHSA "limits of approach" when working in vicinity of Powerlines.
- There is a HONI 1-phase 4.8kV line which crosses roadway from S. side to N. side approx. 5m west of the end of concrete railings on west side of this bridge. Constructor needs to follow OHSA "limits of approach" when working in vicinity of Powerlines.

John Findlay
Supervising Tech. – Lambton Ops.
Hydro One Design Services
519-331-0584

From: MONK Tyson
Sent: Wednesday, March 28, 2018 10:48 AM
To: FINDLAY John
Subject: FW: Bear Creek Bridge - County of Lambton, Community of Warwick

IS THERE ANYTHING WE NEED TO DO HERE?

Kelly Vader

From: Christine James <cjames@aamjiwnaang.ca>
Sent: April 3, 2018 10:10 AM
To: Kelly Vader
Subject: RE: Bear Creek Bridge

Hi Kelly, Sorry for the delayed response I have been out of the office since March 22nd.
It is a standard response our committee often sends along with any bridge construction. I will have to confirm with the committee, however, I believe the concern would be mitigated with the closure of the road, and this would satisfy concern. Typically the concern is that there is an affected water body and that could potentially displace aquatic habitat. Our next Environment Committee meeting is April 10, 2018 – I will request for clarification and let you know whether or not the concern is satisfied by the closure of the road.

Sincerely,

Christine James
Environment Consultation Worker
Aamjiwnaang First Nation
978 Tashmoo Avenue
Sarnia, ON N7T7H5
Phone: 519-336-8410 ext 222
cjames@aamjiwnaang.ca
www.aamjiwnaangenvironment.ca
www.facebook.com/AamjiwnaangEnvironment

From: Kelly Vader <kvader@bmross.net>
Sent: March-23-18 11:01 AM
To: Christine James <cjames@aamjiwnaang.ca>
Cc: Sharilyn Johnston <sjohnston@aamjiwnaang.ca>
Subject: RE: Bear Creek Bridge

Hi Christine:

Thanks again for the input. I wondered if I could ask for clarification on one of the comments contained in your correspondence. We received a similar comment on another bridge project and I wasn't sure how to address the concern.

This is in regards to concerns regarding road mortalities during construction. For both of the projects where this comment arose, the crossings will be closed to traffic during the construction period, so I would anticipate that road mortalities would actually be reduced during the construction period? Are you concerned with increased traffic on

detour routes? Is there a standard form of mitigation that you would like to see implemented? I'm just unsure how to address this concern and am certainly open to suggestions on how you want this concern addressed.

Kelly Vader, MCIP, RPP
B. M. Ross and Associates Limited
Engineers and Planners
62 North Street
Goderich, ON N7A 2T4

Ph: (519) 524-2641
Fax: (519) 524-4403
kvader@bmross.net
www.bmross.net

From: Christine James [mailto:cjames@aamjiwnaang.ca]
Sent: March 21, 2018 2:05 PM
To: 'kvader@bmross.net' <kvader@bmross.net>
Subject: Bear Creek Bridge

Hi Kelly,
In the interest of time I have attached the Aamjiwnaang environment committee's response to this email. I see that you requested comments prior to March 16, 2018, however several environment committee meetings were post-poned in early 2018 and this is my first chance to respond to your consultation request. The committee is requesting for specific mitigations during construction and for Aamjiwnaang archeology monitors to attend for any archeology work. The original letter will be mailed out tomorrow.

Sincerely,

Christine James
Environment Consultation Worker
Aamjiwnaang First Nation
978 Tashmoo Avenue
Sarnia, ON N7T7H5
Phone: 519-336-8410 ext 222
cjames@aamjiwnaang.ca
www.aamjiwnaangenvironment.ca
www.facebook.com/AamjiwnaangEnvironment

B. M. ROSS AND ASSOCIATES LIMITED
Engineers and Planners
2695 Hamilton Rd. Box 400, Brights Grove, N0M 1CO
p. (519) 908-9564 • f. (519) 524-4403
www.bmross.net

File No. BR1279

July 18, 2018

<Adjacent property owners>

RE: Class Environmental Assessment for The Bear Creek Bridge (Village of Warwick) Public Open House Notice – Municipality of Lambton Shores

The County of Lambton initiated a Class Environmental Assessment (Class EA) process in January 2018 to consider options associated with the Bear Creek Bridge which is located on County Road 22 (Egremont Road) at the east limits of the Village of Warwick (as shown on the accompanying key plan). Recent engineering investigations have identified deterioration with key structural components of the bridge, which need to be remediated to ensure the safety of the traveling public. All reasonable alternatives are being considered in conjunction with the Class EA process. A description of the alternatives that were included in the assessment are described below.

1) Repair of the existing bridge
2) Replacement of the existing bridge in the same location
3) Rehabilitation of the existing bridge
4) Do nothing

PUBLIC INFORMATION CENTRE:

A Public Open House has been scheduled to advise stakeholders of the current status of the project and to receive additional input from interested parties before finalizing the plans. Representatives of the Municipality and the Project Engineers will be in attendance. Details of the meeting are included below:

Date: **Saturday, July 28, 2018**
Time: **10 am- 12 pm**
Location: **Warwick Community Centre, 7074 Egremont Rd, Warwick**

As a property owner situated in the vicinity of the crossing you were previously identified as possibly having an interest in this project. If you are unable to attend the meeting, but would

still want to review the information, the presentation material can be forwarded for your information. Following the Public Open House, comments will be received until August 31, 2018.

Please contact the undersigned directly if you have any questions or want to receive the presentation material.

Yours very truly

B. M. ROSS AND ASSOCIATES LIMITED

Per _____
Kelly Vader, RPP, MCIP
Environmental Planner

KV:es
Encl.
cc. Glen Millar, P. Eng, Country of Lambton

B. M. ROSS AND ASSOCIATES LIMITED
Engineers and Planners
2695 Hamilton Road, P.O. Box 400
Brights Grove, ON N0N 1C0
p. (519) 908-9564 • f. (519) 524-4403
www.bmross.net

File No. BR1279

July 10, 2018

<Agency>

RE: Class Environmental Assessment for Bear Creek Bridge
County of Lambton – Project Update

The County of Lambton initiated a Class Environmental Assessment (Class EA) process in January 2018 to consider options associated with the Bear Creek Bridge which is located on County Road 22 (Egremont Road) at the east limits of the Village of Warwick (as shown on the accompanying key plan). Recent engineering investigations identified deterioration with key structural components of the bridge, which need to be remediated to ensure the safety of the traveling public. A range of alternatives were considered as part of the Class EA process including:

1) Repair of the existing bridge
2) Rehabilitation of the existing bridge
3) Replacement of the existing bridge in the same location
4) Do nothing

Following a detailed review of the various alternatives and the advantages and disadvantages associated with each, the County of Lambton has now identified a preliminary preferred alternative for the Bear Creek crossing. The proposed alternative will require complete replacement of the crossing and construction of a new bridge in the same location. The new bridge cross section will consist of two 3.5m traffic lanes and 2.15m side clearances for a total width of 11.3m. The current deck width at the crossing is 9.144m.

Public Open House:

A Public Open House has been scheduled to advise stakeholders of the current status of the project and to receive additional input from interested parties before finalizing the plans. Representatives from the County of Lambton and the Project Engineers will be in attendance. Details of the meeting are included below:

Date: **Saturday, July 28, 2018**
Time: **10 a.m.- 12 p.m.**
Location: **Warwick Community Centre, 7074 Egremont Rd, Warwick**

Your agency was identified as possibly having an interest in this project. If you are unable to attend the meeting but would still want to review the Open House information, the presentation material can be forwarded for your information. Following the Public Open House, comments will be received until August 31, 2018.

Please contact the undersigned directly if you have any questions or want to receive the presentation material.

Yours very truly

B. M. ROSS AND ASSOCIATES LIMITED

Per _____
Kelly Vader, RPP, MCIP
Environmental Planner

KV:hv
Encl.

cc. Glen Millar, Country of Lambton

COUNTY OF LAMBTON

MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT
FOR THE BEAR CREEK BRIDGE (WARWICK)

REVIEW AGENCY CIRCULATION LIST: Project Update Letter

REVIEW AGENCY	INVOLVEMENT
Ministry of the Environment and Climate Change (London) - EA Coordinator	Mandatory Contact
Ministry of Natural Resources and Forestry (Aylmer)	Potential Impact on Natural Features
Ministry of Tourism, Culture and Sport (Toronto)	Potential Impact to Heritage Features
Ministry of Transportation (London)	General Information
Lambton County - Administration Department - Planning & Development Department - Public Works Department - Emergency Services Department	Proponent
St. Clair Region Conservation Authority	Potential Impact on Natural Features
Township of Warwick	Affected Municipality
Township of Adelaide-Metcalfe	Adjacent Municipality
Town of Plympton-Wyoming	Adjacent Municipality
Department of Fisheries and Oceans (DFO)	Aquatic Species at Risk
Lambton Kent District School Board	Transportation Information
St. Clair Catholic School Board	Transportation Information
Warwick Fire Department (via email) Fire Chief: Brad Goodhill warwickfire@warwicktownship.ca	Emergency Access
Watford Fire Department (via email) Fire Chief: Rick Sitlington watfordfire@warwicktownship.ca	Emergency Access
OPP Petrolia Detachment 4224 Oil Heritage Rd, Petrolia, ON N0N 1R0	Emergency Access
Lambton Area Water Supply System 1215 1M2, Fort St, Point Edward, ON N7V Attention: Susan McFarlane	Watermain Impacts

B. M. ROSS AND ASSOCIATES LIMITED
Engineers and Planners
2695 Hamilton Rd. Box 400, Brights Grove, N0M 1CO
p. (519) 908-9564 • f. (519) 524-4403
www.bmross.net

File No. BR1279

July 10, 2018

<First Nations>

RE: Class Environmental Assessment for Bear Creek Bridge
County of Lambton – Project Update

The County of Lambton initiated a Class Environmental Assessment (Class EA) process in January 2018 to consider options associated with the Bear Creek Bridge which is located on County Road 22 (Egremont Road) at the east limits of the Village of Warwick (as shown on the accompanying key plan). Recent engineering investigations identified deterioration with key structural components of the bridge, which need to be remediated to ensure the safety of the traveling public. A range of alternatives were considered as part of the Class EA process including:

1) Repair of the existing bridge
2) Rehabilitation of the existing bridge
3) Replacement of the existing bridge in the same location
4) Do nothing

Following a detailed review of the various alternatives and the advantages and disadvantages associated with each, the County of Lambton has now identified a preliminary preferred alternative for the Bear Creek crossing. The proposed alternative will require complete replacement of the crossing and construction of a new bridge in the same location. The new bridge cross section will consist of two 3.5m traffic lanes and 2.15m side clearances for a total width of 11.3m. The current deck width at the crossing is 9.144m.

Public Open House:

A Public Open House has been scheduled to advise stakeholders of the current status of the project and to receive additional input from interested parties before finalizing the plans. Representatives from the County of Lambton and the Project Engineers will be in attendance. Details of the meeting are included below:

Date: **Saturday, July 28, 2018**
Time: **10 am- 12 pm**
Location: **Warwick Community Centre,**
7074 Egremont Rd, Warwick

Your community was identified as possibly having an interest in this project. If you are unable to attend the meeting, but would still want to review the information, the presentation material can be forwarded for your information. Following the Public Open House, comments will be received until **August 31, 2018.**

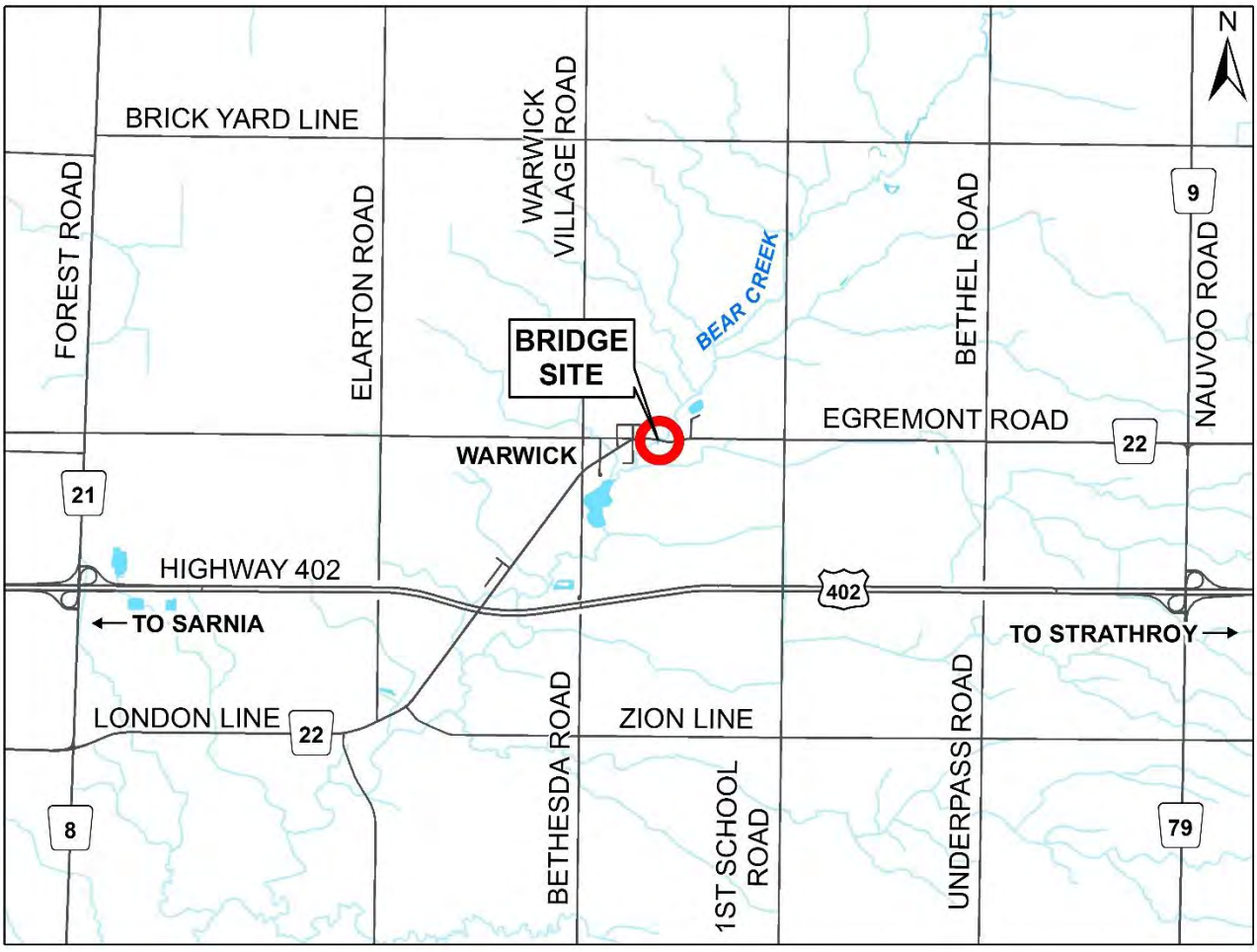
Please contact the undersigned directly if you have any questions or want to receive the presentation material.

Yours very truly

B. M. ROSS AND ASSOCIATES LIMITED

Per _____
Kelly Vader, RPP, MCIP
Environmental Planner

KV:hv
Encl.
cc. Glen Millar, Country of Lambton



COUNTY OF LAMBTON

CLASS ENVIRONMENTAL ASSESSMENT
FOR THE BEAR CREEK BRIDGE (WARWICK)

ABORIGINAL CIRCULATION LIST: Project Update Letter

Aamjiwnaang First Nation
Chief Joanne Rogers
Aamjiwnaang Administration Office
978 Tashmoo Ave.
Sarnia, ON N7T 7H5

Chippewas of the Thames First Nation
Chief Myeengun Henry
320 Chippewa Road
Muncey, ON N0L 1Y0

Oneida Nation of the Thames
Chief Randall Phillips
2212 Elm Ave
Southwold, ON N0L 2G0

Munsee-Delaware Nation
Chief Roger Thomas
RR#1
Muncey, ON N0L 1Y0

Bkejwanong Territory (Walpole Island)
Chief Daniel Miskokomon
117 Tahgahoning Road, R.R. #3
Wallaceburg, ON N8A 4K9

Métis Nation of Ontario
500 Old St. Patrick St., Unit 3
Ottawa, ON K1N 9G4

Chippewas of Kettle and Stony Point First Nation
Chief Thomas Bressette
Kettle & Stony Point Band Office
6247 Indian Lane
Kettle & Stony Point First Nation, ON N0N 1J1

Kelly Vader

From: Herczeg, Brooke (MTCS) <Brooke.Herczeg@ontario.ca>
Sent: July 18, 2018 11:39 AM
To: Kelly Vader
Subject: Bear Creek Bridge - County of Lambton

Hi Kelly,

I realize that the PIC session is scheduled for July 28th but would you send the information shared at this meeting to MTCS after the meeting? We would like to review and provide comments. MTCS would also like some information on the status of the MEA Bridge Checklist.

Thank you in advance,
Brooke

Brooke Herczeg MPL
Heritage Planner
Heritage Program | Programs and Services Branch | Ministry of Tourism, Culture and Sport
401 Bay Street Suite 1700 Toronto ON M7A 0A7
Tel. 416.314.7133| email: Brooke.Herczeg@ontario.ca

COUNTY OF LAMBTON

CLASS ENVIRONMENTAL ASSESSMENT FOR THE BEAR CREEK BRIDGE (VILLAGE OF WARWICK)

NOTICE OF PUBLIC OPEN HOUSE

THE PROJECT:

The County of Lambton initiated a Class Environmental Assessment (Class EA) process in January 2018 to consider options associated with the Bear Creek Bridge which is located on County Road 22 (Egremont Road) at the east limits of the Village of Warwick (as shown on the accompanying key plan). Recent engineering investigations have identified deterioration with key structural components of the bridge, which need to be remediated to ensure the safety of the traveling public. Since initiating the review, a range of alternatives have been investigated including: 1) Repair of the existing bridge, 2) Rehabilitation of the existing bridge, 3) Replacement of the existing bridge in the same location, or 4) Do nothing.

CLASS EA PROCESS:

The planning for this project is following the planning process established for Schedule B activities under the Municipal Class Environmental Assessment (Class EA) document. Schedule B projects are approved subject to the completion of a screening process. The purpose of the screening process is to identify any potential environmental impacts associated with the proposal and to plan for appropriate mitigation of any impacts. The process includes consultation with the public, local municipalities, First Nation communities, stakeholders and review agencies. This notice is being issued to advise of a Public Information Meeting being held to provide residents with information on study investigation.

PUBLIC INVOLVEMENT:

Public consultation is a key component of this study. A **Public Open House** has therefore been scheduled to update residents and project stakeholders on the status of study investigations and to receive input from interested parties on the Preliminary Preferred Alternatives identified for the Bear Creek Bridge crossing. Details of the public Information Centre are as followed:

Date:	**Saturday July 28, 2018**
Time:	**10 am – 12 pm**
Location:	**Warwick Community Centre, 7074 Egremont Rd, Warwick**

Following the meeting, input into the Class EA will be accepted until **August 31, 2018**. Comments collected in conjunction with this Class EA Schedule 'B' process will be maintained on file for use during the project and may be included in project documentation. With the exception of personal information, all comments will become part of the public record. For further information on this project, or to review the Class EA process, please contact the project engineers: B.M. Ross and Associates Ltd.: 2695 Hamilton Road, Box 400, Brights Grove, Ontario, N0N 1C0. Telephone: 1-519-908-9564. Fax: 1-519-524-4403. Kelly Vader, Environmental Planner (e-mail: kvader@bmross.net).

Glen Millar, P. Eng
County of Lambton

This Notice issued July 18, 2018

RECEIVED
AUG 0 2 2018

CHIPPEWAS OF THE THAMES FIRST NATION

July 25, 2018

Kelly Vader, MCIP, RPP
Environmental Planner
B.M. Ross and Associates Limited
2695 Hamilton Road, P.O Box 400
Brights Grove, ON N0M 1C0

RE: Class EA for Bear Creek Bridge
County of Lambton

Ms. Vader,

We have received information concerning the abovementioned project, dated July 10, 2018. The proposed work will be conducted within the Big Bear Creek Additions to Reserve (ATR) land selection area, as well as Chippewas of the Thames First Nation (COTTFN) Traditional territory.

At this time, with the information that has been provided to us, we have minimal concern with this project. As well, we request that a copy of the information presented at the PIC on July 28, 2018 and a copy of the Class EA upon completion. However, if there are any substantive changes to this project, we ask that you keep us informed. As well, if there is an Archaeological Assessment conducted, we require notification and the opportunity to actively participate by sending First Nation monitors on behalf of this First Nation.

We look forward to continuing this open line of communication. To implement meaningful consultation, COTTFN has developed its own protocol — a document and a process that will guide positive working relationships. We would be happy to meet with you to review COTTFN's Consultation Protocol.

Please do not hesitate to contact me if you need further clarification of this letter.

Sincerely,

Rochelle Smith
Consultation Coordinator
Chippewa of the Thames First Nation
(519) 289-5555 Ext. 252
rsmith@cottfn.com

COUNTY OF LAMBTON

BEAR CREEK BRIDGE

WELCOME

PUBLIC OPEN HOUSE

JULY 28th, 2018

COUNTY OF LAMBTON

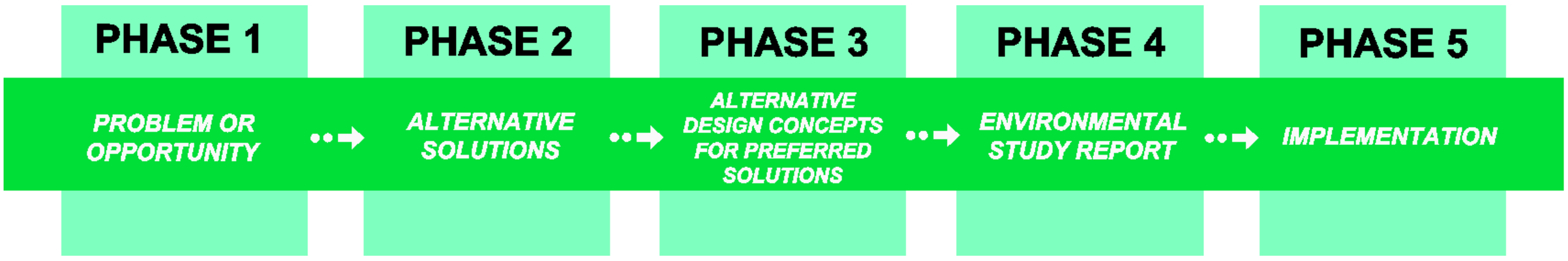
BMROSS engineering better communities

MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

SUMMARY OF CLASS EA PROCESS:

- PLANNING AND DESIGN PROCESS FOR MUNICIPAL WATER, WASTEWATER, AND ROAD PROJECTS
- CONDUCTED TO EVALUATE THE POTENTIAL IMPACTS OF THE PROJECT ON THE NATURAL, CULTURAL, SOCIAL, ECONOMIC, AND BUILT ENVIRONMENTS

STUDY PHASES:



SCOPE OF THIS STUDY:

- RECONSTRUCTION OR ALTERATION OF A STRUCTURE OR THE GRADING ADJACENT TO IT WHEN THE STRUCTURE IS OVER 40 YEARS OLD, WHICH AFTER APPROPRIATE EVALUATION IS FOUND TO HAVE CULTURAL HERITAGE VALUE (Determination of cultural heritage value will be in accordance with a screening checklist developed with the Ministry of Tourism and Culture (MTC) and posted on the MEA website).
  - SCHEDULE B PROJECTS APPROVED SUBJECT TO COMPLETION OF PHASES 1 AND 2 OF THE CLASS EA PROCESS
- GENERAL STUDY COMPONENTS:
  - DEFINE PROBLEM / OPPORTUNITY;
  - IDENTIFICATION OF ALTERNATIVE SOLUTIONS;
  - CONSULTATION WITH THE PUBLIC / REVIEW AGENCIES;
  - SELECTION OF A PREFERRED ALTERNATIVE;
  - EVALUATION OF ALTERNATIVES / IMPACT MITIGATION;
  - PREPARATION OF ENVIRONMENTAL SCREENING REPORT ; AND
  - FINAL PUBLIC NOTIFICATION.

CLASS EA ALTERNATIVES

ALTERNATIVE 1: REPLACEMENT

- REPLACE WITH NEW CONCRETE BEAM BRIDGE
- RECONSTRUCT ROAD APPROACHES TO MATCH

ALTERNATIVE 2: REHABILITATION

- BASED ON THE CURRENT CONDITION OF THE BRIDGE, TOO MANY KEY STRUCTURAL ELEMENTS HAVE DETERIORATED TO COMPLETE A REHABILITATION OF THE STRUCTURE

ALTERNATIVE 3: REPAIR

- PREVIOUS REPAIRS HAVE ADDRESSED DETERIORATION WHICH IS TYPICAL FOR THIS TYPE OF STRUCTURE
- GIVEN THE AGE OF THE CROSSING AND DETERIORATION OF KEY STRUCTURAL ELEMENTS, REPAIRS ARE NO LONGER FEASIBLE FOR THIS STRUCTURE

ALTERNATIVE 4: DO NOTHING

- RETENTION OF THE EXISTING BRIDGE WILL NOT ADDRESS THE DEFICIENCIES OF THE EXISTING STRUCTURE

COUNTY OF LAMBTON

BMROSS engineering better communities

EVALUATION OF BRIDGE ALTERNATIVES

PURPOSE:

- SYSTEMATICALLY EVALUATE THE IMPACT OF IMPLEMENTING EACH OF THE ALTERNATIVES ON VARIOUS COMPONENTS OF THE ENVIRONMENT (SOCIAL/CULTURAL/ENVIRONMENTAL/ ECONOMIC AND TECHNICAL).
- MITIGATION MEASURES WILL BE IDENTIFIED TO MINIMIZE THE POTENTIAL IMPACTS OF IMPLEMENTATION

KEY CONSIDERATIONS:

- INPUT FROM CONSULTATION PROGRAM (LOCAL RESIDENTS, REVIEW AGENCIES, STAKEHOLDERS, ABORIGINAL)
- HABITAT DISRUPTION/ REMOVAL
- IMPACT ON EXISTING RESIDENTS
- TRANSPORTATION CONCERNS
- RECREATIONAL IMPACTS
- AGRICULTURAL COMMUNITY AND BUSINESS OWNERS
- CULTURAL HERITAGE
- CAPITAL AND OPERATIONAL COSTS

COUNTY OF LAMBTON

BMROSS engineering better communities

SUMMARY OF THE CLASS EA SCHEDULE B PROCESS

DEFINE PROBLEM OR OPPORTUNITY

↓

IDENTIFY ALTERNATIVE SOLUTIONS

↓

INVENTORY THE ENVIRONMENTAL SETTING

↓

IDENTIFY IMPACT OF ALTERNATIVE SOLUTIONS AND MITIGATING MEASURES

↓

CONSULT WITH PUBLIC AND REVIEW AGENCIES TO IDENTIFY ISSUES OF CONCERN

↓

EVALUATE ALTERNATIVE SOLUTIONS

↓

DOCUMENT STUDY FINDINGS AND PRESENT EVALUATIONS TO COUNTY COUNCIL

↓

COUNTY COUNCIL SELECTS PREFERRED ALTERNATIVE

WHERE WE ARE TODAY

↓

PREPARE PROJECT FILE AND PUBLISH NOTICE OF COMPLETION

↓

ADDRESS OUTSTANDING CONCERNS

↓

FINALIZE PROJECT FILE AND PROCEED TO DESIGN PHASE

BEAR CREEK BRIDGE

- SINGLE SPAN CONCRETE BOWSTRING ARCH BRIDGE
- CONSTRUCTED IN 1930 & 1931
- ONLY ONE OF THIS STYLE REMAINING IN LAMBTON COUNTY

DEFICIENCIES:

- CRACKING ON UNDERSIDE OF SOUTH ARCH NEAR MID-SPAN
- MULTIPLE CRACKS AND SPALLING ON NORTH ARCH
- SPALLING WITH EXPOSED REBAR ON UNDERSIDE OF DECK
- CRACKING AND SPALLING AT BASE OF COLUMNS THROUGHOUT
- SEVERE SPALLING ON FLOOR BEAMS AT EAST ABUTMENT
- MEDIUM TO WIDE CRACKING ON UNDERSIDE OF FLOOR BEAM AT WEST ABUTMENT

EXPOSED REBAR

SPALLING ON NORTH ARCH

CULTURAL HERITAGE EVALUATION

PURPOSE:

- TO EVALUATE WHETHER THE STRUCTURE REPRESENTS A BUILT HERITAGE RESOURCE OR IS PART OF A CULTURAL HERITAGE LANDSCAPE OF CULTURAL HERITAGE VALUE.
- TO IDENTIFY THE POTENTIAL IMPACTS OF THE PROPOSED UNDERTAKING ON THE STRUCTURE, AND RECOMMEND APPROPRIATE MITIGATION STRATEGIES.

METHODOLOGY:

- THE REPORT WAS PREPARED ACCORDING TO GUIDELINES IN THE ONTARIO MINISTRY OF TOURISM, CULTURE, AND SPORT'S *ONTARIO HERITAGE TOOLKIT*.
- THE FOLLOWING TASKS WERE UNDERTAKEN:

1. PREPARATION OF LAND USE HISTORY OF THE AREA.
2. A REVIEW OF THE LAMBTON COUNTY OFFICIAL PLAN, THE ONTARIO HERITAGE TRUST PROPERTIES DATABASE AND THE CANADIAN REGISTER OF HISTORIC PLACES.
3. A SITE INVESTIGATION, TO DOCUMENT THE EXISTING CONDITIONS OF THE BRIDGE AND STUDY AREA.
4. EVALUATION OF THE BRIDGE STRUCTURE AND LANDSCAPE, USING *ONTARIO REGULATION 9/06, CRITERIA FOR DETERMINING CULTURAL HERITAGE VALUE OR INTEREST.*
5. EVALUATION OF THE PROPOSED UNDERTAKING, POTENTIAL IMPACTS AND POTENTIAL MITIGATION OPTIONS.

CULTURAL HERITAGE EVALUATION

RESULTS:

- THE STRUCTURE WAS DETERMINED TO HAVE CULTURAL HERITAGE VALUE DUE TO THE FOLLOWING:
  - REPRESENTATIVE EXAMPLE OF AN EARLY/MID 20TH CENTURY BOWSTRING ARCH BRIDGE, A RELATIVELY RARE EXAMPLE OF THIS STYLE IN LAMBTON COUNTY
  - BEAR CREEK BRIDGE IS PHYSICALLY, FUNCTIONALLY, VISUALLY, AND HISTORICALLY LINKED TO ITS SURROUNDINGS. LINKED TO EARLY DEVELOPMENT IN THE AREA AND THE EGREMONT ROAD, AN EARLY TRANSPORTATION CORRIDOR IN LAMBTON COUNTY

CHARACTER-DEFINING HERITAGE ATTRIBUTES:

- CONCRETE BOWSTRING ARCH DESIGN:
  - SYMMETRICAL ARCHES ON THE NORTH AND SOUTH SIDE
  - CONCRETE PANELLING SET INTO THE ARCHES
  - VERTICAL CONCRETE POSTS UNDER THE BOWSTRING ARCHES
  - CONCRETE GUARDRAILS WITH INSET CONCRETE PANELS (CIRCA 2004)
  - CANTILEVERED CONCRETE SIDEWALK

VIEW SHOWING SYMMETRICAL ARCHES AND CONCRETE SIDEWALK

VIEW SHOWING CONCRETE PANELING SET INTO ARCHES

CULTURAL HERITAGE EVALUATION

OPTIONS TO ADDRESS IMPACTS:

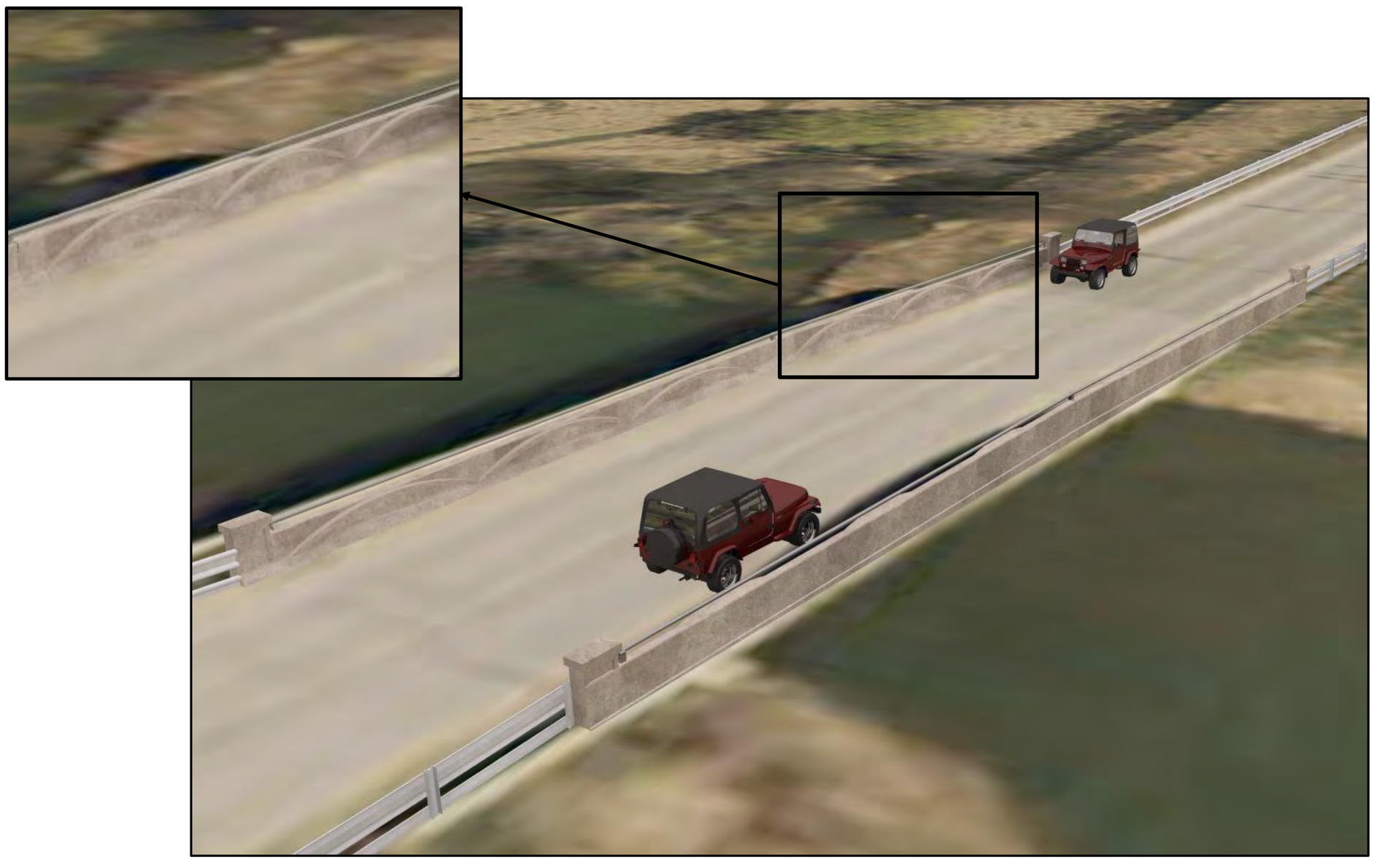
- THREE OPTIONS HAVE BEEN IDENTIFIED TO ADDRESS IMPACTS:

1) CONSERVATION PLAQUE ERECTED AT FIRE HALL DETAILING BRIDGE HISTORY AND SIGNIFICANT CULTURAL FEATURES

SAMPLE OF PLAQUE SIMILAR TO WHAT IS PROPOSED FOR BEAR CREEK BRIDGE

2) REPLICATION OF SYMMETRICAL ARCHES

3) ARCH SHAPE INSET INTO BRIDGE PANELS



PROJECT TIMELINES

JANUARY 2018 - PROJECT INITIATED

JANUARY 2018 – INITIAL CONSULTATION EFFORTS

- CORRESPONDENCE SENT TO:
  - ADJACENT PROPERTY OWNERS
  - ABORIGINAL COMMUNITIES
  - PROVINCIAL AND FEDERAL REVIEW AGENCIES

JANUARY 2018- NOTICE OF STUDY COMMENCEMENT

- NOTICE PLACED IN NEWSPAPERS FOR TWO CONSECUTIVE WEEKS

MAY 2018-CULTURAL HERITAGE EVALUATION REPORT

- REQUIRED BY MINISTRY OF TOURISM CULTURAL AND SPORT, DUE TO THE AGE OF THE CROSSING (> 40 YEARS)
- ASSESSMENT COMPLETED BY AECOM USING MINISTRY GUIDELINES

JULY 2018 – SPECIES AT RISK (SAR) ASSESSMENT

- HABITAT AT THE BRIDGE SITE EVALUATED FOR PRESENCE OF SAR

JULY 2018 - PUBLIC OPEN HOUSE

- OBTAIN INPUT FROM RESIDENTS ON THE CLASS EA ALTERNATIVES
- PRESENT RESULTS OF ON-SITE INVESTIGATIONS

FALL/WINTER 2018 - FINALIZE CLASS EA

- NOTICE OF COMPLETION PUBLISHED IN LOCAL PAPER
- SCREENING REPORT AVAILABLE FOR PUBLIC REVIEW

SPRING 2019 – INITIATE CONSTRUCTION

- ROAD CLOSED TO TRAFFIC IN JULY WITH DETOUR ROUTES IDENTIFIED
- CONSTRUCTION TO BE COMPLETED BY DECEMBER 15, 2019

SPECIES AT RISK

- AN EVALUATION FOR THE PRESENCE OF SIGNIFICANT SPECIES AND THEIR ASSOCIATED HABITATS HAS BEEN INCORPORATED INTO THE PROJECT PLANNING PROCESS
- PROTECTION FOR SPECIES AT RISK (SAR) AND THEIR ASSOCIATED HABITATS IS GOVERNED BY FEDERAL AND PROVINCIAL LEGISLATION
- BASED ON INPUT FROM THE MINISTRY OF NATURAL RESOURCES AND FORESTRY, A NUMBER OF SPECIES AT RISK ARE POTENTIALLY LOCATED WITHIN THE STUDY AREA:
- THE TABLE BELOW SUMMARIZES THE SPECIES AT RISK THAT ARE POTENTIALLY PRESENT WITHIN THE TOWNSHIP OF WARWICK AND THEREFORE THE PROJECT AREA:

SAR SPECIES	STATUS	HABITAT POTENTIAL?	CONFIRMED JULY 17, 2018
ACADIAN FLYCATCHER	ENDANGER	NO	
BARN OWL	ENDANGERED	YES	NO
BARN SWALLOW	THREATENED	YES	YES
BOBOLINK	THREATENED	YES	NO
CERULEAN WARBLER	THREATENED	NO	
CHIMNEY SWIFT	THREATENED	NO	
EASTERN MEADOWLARK	THREATENED	YES	NO
LEAST BITTERN	THREATENED	YES	NO
PROTHONOTARY WARBLER	ENDANGERED	NO	
YELLOW-BREASTED CHAT	ENDANGERED	NO	
AMERICAN GINSENG	ENDANGERED	NO	
GOLDENSEAL	THREATENED	YES	NO
AMERICAN BADGER	ENDANGERED	NO	
EASTERN SMALL-FOOTED MYOTIS	ENDANGERED	YES	NO
LITTLE BROWN MYOTIS	ENDANGERED	YES	NO
NORTHERN MYOTIS	ENDANGERED	YES	NO
ROUND PIGTOE	ENDANGERED	YES	NO
SALAMANDER MUSSEL	ENDANGERED	YES	NO
EASTERN FOXSNAKE	ENDANGERED	YES	NO
EASTERN HOG-NOSED SNAKE	THREATENED	NO	
QUEENSNAKE	ENDANGERED	NO	
AMERICAN CHESTNUT	ENDANGERED	NO	
BUTTERNUT	ENDANGERED	NO	
EASTERN FLOWERING DOGWOOD	ENDANGERED	NO	
BLANDING'S TURTLE	THREATENED	YES	NO
SPOTTED TURTLE	ENDANGERED	YES	NO

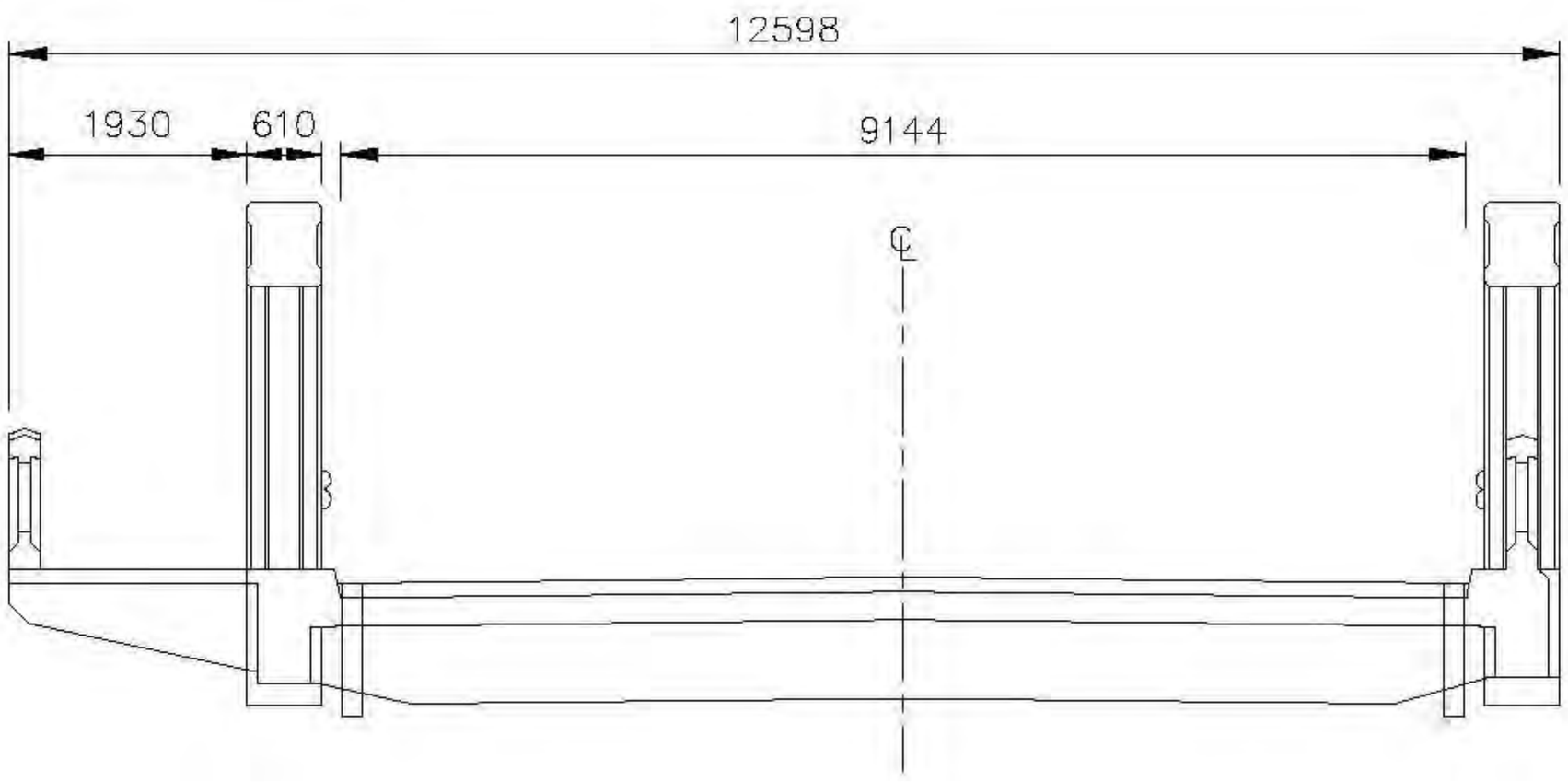
CONSULTATION

- THE TABLE BELOW OUTLINES THE FEEDBACK FROM REVIEW AGENCIES, ABORIGINAL COMMUNITIES, AND ADJACENT PROPERTY OWNERS RECEIVED, TO DATE:

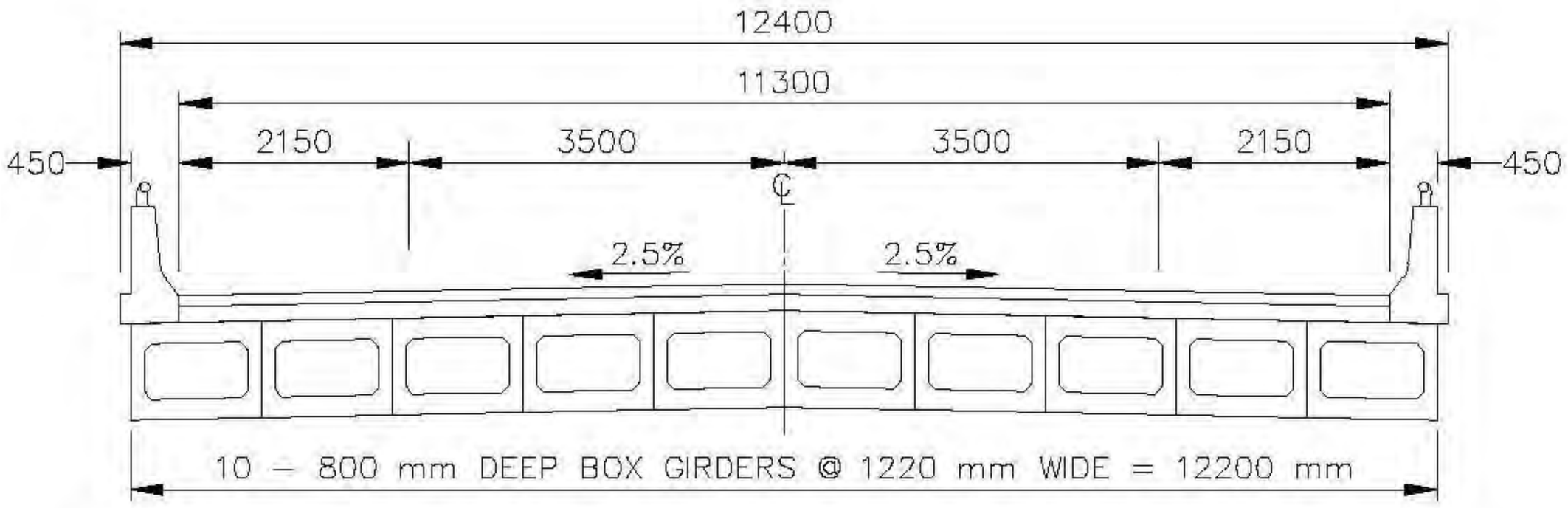
NAME	COMMENTS
HISTORIC SAUGEEN METIS (HSM)	• PROJECT IS LOCATED OUTSIDE OF THEIR TRADITIONAL TERRITORY • NO CONCERNS
AAMJIWNAANG FIRST NATION (AFN)	• CONCERNED WITH ROAD MORTALITIES AND WOULD LIKE TO KNOW THE PLANS TO REDUCE/MITIGATE IMPACTS ON WILDLIFE • ANY HABITAT AREAS THAT HAVE BEEN DISTURBED OR REMOVED BE RESTORED, WHERE POSSIBLE • INTERESTED IN ARCHEOLOGICAL AND SPECIES AT RISK STUDIES. ASKED THAT MONITORS BE ON SITE DURING COMPLETION OF STUDIES
MINISTRY OF ENVIRONMENT AND CLIMATE CHANGE (MOECC)	• ENSURE CONSULTATION WITH FIRST NATION AND METIS • PROJECT MUST HAVE CONSIDERATION FOR SOURCE WATER PROTECTION POLICIES AND CONSIDER IMPACTS ASSOCIATED WITH CLIMATE CHANGE
MINISTRY OF NATURAL RESOURCES AND FORESTRY (MNRF)	• ADVISED THAT THERE MAY BE PETROLEUM WELLS IN THE VICINITY • REFERRED TO THE PUBLIC LANDS ACT AND LAKES AND RIVERS IMPROVEMENT ACTS, PROJECT MAY BE AFFECTED • NOTED SPECIES AT RISK POTENTIALLY PRESENT AT THE BRIDGE SITE
ST. CLAIR REGION CONSERVATION AUTHORITY	• STUDY AREA REGULATED BY SCRCA UNDER ONTARIO REGULATION 171/06 • ADVISED THAT THE BRIDGE IS LOCATED WITHIN ADJACENT LANDS TO A SIGNIFICANT WOODLAND AND PROVINCIALLY SIGNIFICANT WETLAND
WARWICK FIRE DEPARTMENT	• CONCERNED WITH DELAYS TO THEIR EMERGENCY RESPONSE TIMES • MOST FIRE CALLS OCCUR IN THE WINTER AND ARE RELATED TO HIGHWAY ACCIDENTS ON 402. HAVING DIRECT ACCESS TO THE 402 WOULD HELP
WARWICK GAS & VARIETY	• CONCERNED WITH HOW BRIDGE CLOSURE COULD IMPACT BUSINESS • DEPENDS ON THROUGH TRAFFIC FOR BUSINESS • TOURIST TRAFFIC IN THE SUMMER IS A MAJOR SOURCE OF INCOME • IMPACTS TO RESPONSE TIME FOR THE FIRE DEPARTMENT
HYDRO ONE NETWORKS	• A HONI 3-PHASE 4.8/8.32kV POLE LINE IS LOCATED PARALLEL TO BRIDGE/ ROADWAY APPROX. 8m SOUTH OF SOUTH FACE OF BRIDGE • A HONI 1-PHASE 4.8kV LINE CROSSES ROAD FROM S. SIDE TO N. SIDE APPROX. 5m WEST OF CONCRETE RAILING ON WEST SIDE OF BRIDGE

PREFERRED ALTERNATIVE

- REPLACEMENT OF THE EXISTING CROSSING WITH A NEW BRIDGE IN THE SAME LOCATION, HAS BEEN IDENTIFIED AS THE PRELIMINARY PREFERRED ALTERNATIVE BY THE COUNTY



Existing Deck Section – 9.144m wide deck



Proposed Deck Section – 11.3m wide deck

BMROSS engineering better communities

COUNTY OF LAMBTON
CLASS EA FOR THE BEAR CREEK BRIDGE
PROPOSED DETOUR ROUTE
EGREMONT ROAD - 200m EAST OF LONDON LINE

DATE	PROJECT No.
JULY 2018	BR1279
SCALE	FIGURE No.
1 : 27 000	1

SOUTH SIDE OF BRIDGE

UNDERSIDE OF BRIDGE FACING EAST

ABUTMENTS ON NORTH SIDE OF BRIDGE

SPALL WITH EXPOSED REBAR
CLIFF SWALLOW NESTS

EAST FLOOR BEAM

VIEW LOOKING SOUTH EAST

GUARDRAIL ON NORTH SIDE OF BRIDGE

VIEW SHOWING SOUTH ARCH

CONCRETE SIDEWALK ON NORTH SIDE

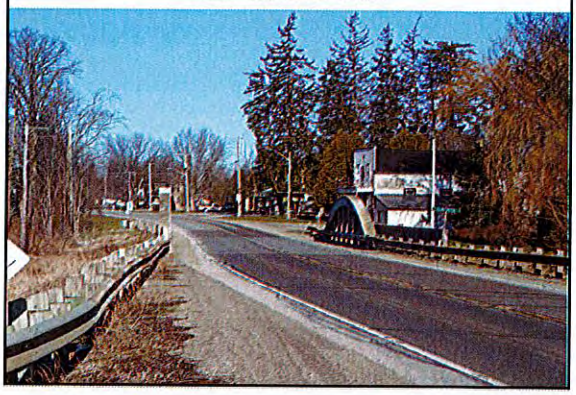
VIEW FACING EAST

SPALLING ON NORTH ARCH

VIEW FACING WEST

NORTH SIDE OF BRIDGE

VIEW FACING WEST

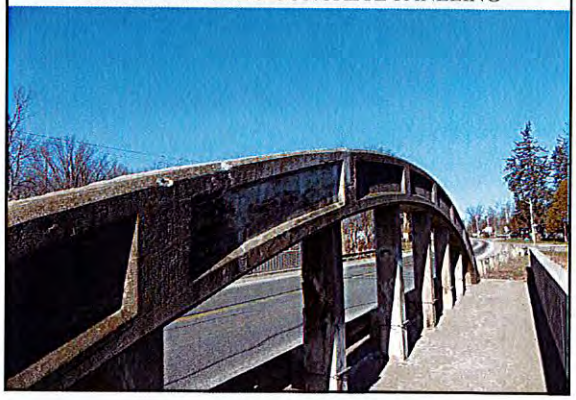


VIEW LOOKING NORTH AT BEAR CREEK

VIEW LOOKING EAST
SHOWING BOWSTRING ARCH

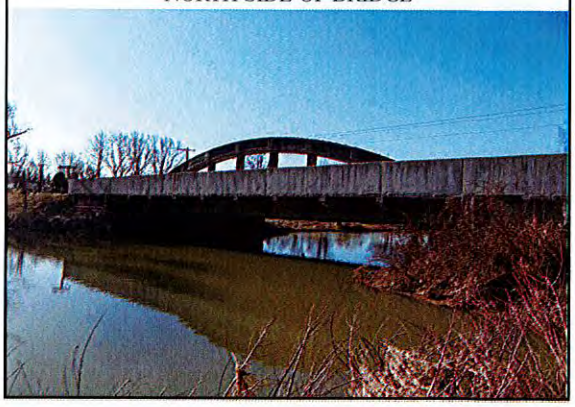
VIEW LOOKING SOUTH AT BEAR CREEK

DETAIL SHOWING CONCRETE PANELING

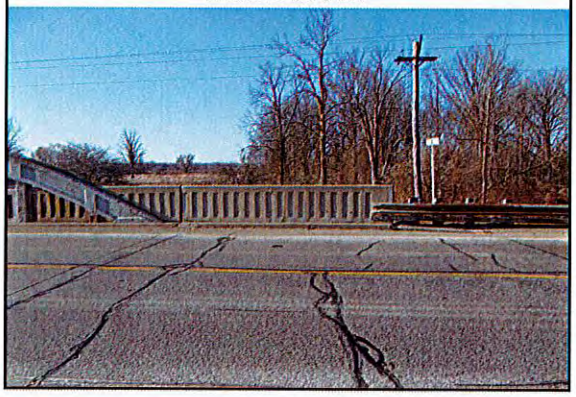


FACING EAST

NORTH SIDE OF BRIDGE

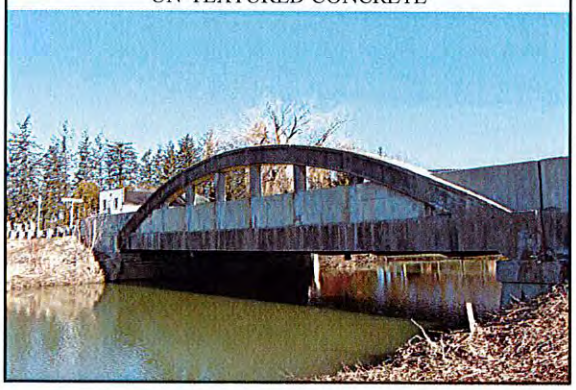


FACING SOUTH



NORTH SIDE OF BRIDGE

SOUTH SIDE OF BRIDGE SHOWING
UN-TEXTURED CONCRETE



VIEW FACING EAST

CONCRETE WEST ABUTMENT

B. M. ROSS AND ASSOCIATES LIMITED
Engineers and Planners
62 North Street, Goderich, ON N7A 2T4
p. (519) 524-2641 • f. (519) 524-4403
www.bmross.net

File No. BR1279

COUNTY OF LAMBTON

CLASS EA FOR REPLACEMENT OF THE BEAR CREEK BRIDGE (COMMUNITY OF WARWICK)

PUBLIC MEETING NOTES

Details: Saturday July 28, 2018
Warwick Community Centre

Open House: 10:00 am - 12:00 pm

In Attendance:

Matt Deline, Manager, Public Works Glen Millar, Public Works, Jason Cole, General Manager, Infrastructure and Development	)	Lambton County
Andrew Ross Kelly Vader	))	B.M. Ross and Associates (BMROSS)

Members of the public: 15 ±

10:00 am - 12:00 pm - Open House Component

Public Arrival

- Members of the public signed in upon arrival.
- Poster boards were on display for the public to view *(attached)*
- Photos of the bridge site were presented via a power point slide show
- Representatives of BMROSS and the County made themselves available to answer questions from the public as they viewed the presentation material.

10:00 am – 12:00 pm– Questions

Questions asked by members of the public as they viewed the presentation material are summarized below.

Summary of Questions and Answers

Q. A resident asked when the work was expected to begin.
A. The final bridge design will be completed during the fall/winter of 2018 so that the project can be tendered early in the New Year. Construction would begin in July of 2019 and be completed by December of 2019.

Q. A resident asked how long the construction would take.
A. Replacement of a bridge of this size typically takes 4-6 months to complete.

Q. How much will it cost to replace?
A. A final cost estimate has not yet been determined.

Q. A resident asked why the road can't be kept open during construction.
A. Due to the alignment of Bear Creek and the pond downstream of the crossing, a temporary crossing would be very difficult and costly to construct. The potential environmental impacts would also increase significantly.

Q. Concerns were expressed by many residents about impacts to response times for the Warwick Fire Department.
A. It was noted that the Department has agreements with adjacent Fire Halls to assist during response calls. This should help to address any increases in response times. The County is also pursuing an option to open an emergency access entrance onto the 402 during the construction period.

Q. Several residents expressed concerns about the bridge replacement impacting the ability of volunteer fire fighters to respond to emergency calls.
A. It was noted that, although the official detour route is 24 km in length, a local route over gravel-surfaced roads could be used by volunteer fire fighters, which is only 9 km in length.

C. Several members of the public in attendance commented that they preferred the replication of the historic arches on the bridge, rather than the etched panels, if it wasn't too costly. Some would like the vertical columns replicated as well.

Q. A resident asked if there would be accommodation for bicycle traffic included in the design of the new bridge.
A. It was explained that a dedicated bike lane would not be provided on the bridge, however the new bridge will be more than 2 metres wider than the current bridge, which will be significantly safer for cyclists and pedestrians.

Should there be any errors or omissions to these meeting notes, please notify the undersigned.

Meeting Notes Prepared by
B. M. ROSS AND ASSOCIATES LIMITED

Kelly Vader, Environmental Planner

KV:hv
Distribution
Glen Millar, County of Lambton
Matt Deline, County of Lambton
Jason Cole, County of Lambton
Kelly Vader, BMROSS
Andrew Ross, BMROSS

Kelly Vader

From: Glen Millar <glen.millar@county-lambton.on.ca>
Sent: October 15, 2018 12:06 PM
To: Kelly Vader (kvader@bmross.net)
Cc: 'Andy Ross'; Matt Deline
Subject: FW: Municipal Class EA - Bear Creek Bridge (Warwick Village)
Attachments: BR1279-General_Location_Plan_Reduced.pdf; BR1279_DetourRoute_number1.pdf; County - MTO Emergency Access - 2009.pdf

Kelly,

See below response from the MTO.

Let me know if you require anything further at this time.

Cheers,

Glen

From: Mentley, Ryan (MTO) [mailto:Ryan.Mentley@ontario.ca]
Sent: Monday, October 15, 2018 11:50 AM
To: Glen Millar
Subject: FW: Municipal Class EA - Bear Creek Bridge (Warwick Village)

Hi Glen,

MTO has reviewed your request to use Highway 402 from Forest Road to Nauvoo Road as a detour route to accommodate the proposed bridge work. The County will be permitted to use Highway 402 as a detour route via Encroachment Permit and upon an approved detour plan.

MTO may have Minor Capital work in the area next year but can't confirm the date or location due to the schedule not being prepared at this time. The County will have to coordinate their work with any contractor that may be working in the area, a condition that will be put in the permit.

A temporary access from Warwick Village Road onto Highway 402 will not be permitted.

I have attached a link below to MTO's application process. An Encroachment Permit will be require for the proposed work. .

Permit Application : https://www.hcms.mto.gov.on.ca/
Corridor Policies : www.mto.gov.on.ca/english/engineering/management/corridor/index.html

Let me know if you have any questions.

Regards,

Ryan Mentley
Corridor Management Officer
Highway Corridor Management Section
Ministry of Transportation

659 Exeter Rd, London ON, N6E 1L3
Tel: (519) 873-4543
Fax: (519) 873-4228
Ryan.Mentley@Ontario.ca

Highway Corridor Management

From: Balasa, Christopher (MTO)
Sent: August 22, 2018 11:04 AM
To: Mentley, Ryan (MTO) <Ryan.Mentley@ontario.ca>; Glen Millar <glen.millar@county-lambton.on.ca>
Cc: Matt Deline <Matt.Deline@county-lambton.on.ca>; Jason Cole <jason.cole@county-lambton.on.ca>; Kelly Vader (kvader@bmross.net) <kvader@bmross.net>; Keith, Andrew (MTO) <Andrew.Keith@ontario.ca>; Costa, Christine (MTO) <Christine.Costa@ontario.ca>; Boparai, Jasan (MTO) <Jasan.Boparai@ontario.ca>
Subject: FW: Municipal Class EA - Bear Creek Bridge (Warwick Village)

Morning Glen – forwarding your email to Ryan Mentley from our Corridor Management section and copied our maintenance folks as well; Ryan will work with you on your request below.

Christopher

From: Glen Millar [mailto:glen.millar@county-lambton.on.ca]
Sent: July 30, 2018 10:07 AM
To: Balasa, Christopher (MTO) <Christopher.Balasa@ontario.ca>
Cc: Matt Deline <Matt.Deline@county-lambton.on.ca>; Jason Cole <jason.cole@county-lambton.on.ca>; Kelly Vader (kvader@bmross.net) <kvader@bmross.net>
Subject: Municipal Class EA - Bear Creek Bridge (Warwick Village)

Christopher,

Hope all is well. Just following up from a message I left a couple of weeks back. Not sure who within the Ministry to direct these questions to, so hoping you can assist.

The County of Lambton is currently completing an EA for the Bear Creek Bridge which is located on County Road 22 (Egremont Road) at the east end of Warwick Village (see attached Location Plan). The Bridge was built by the Department of Public Highways in 1931 and the road and the bridge were downloaded from the MTO to the County in 1997. Although we are still working through the EA, it appears that the replacement of the bridge is the preferred alternative.

Given the nature of the structure, concrete bowstring arch, it is not feasible to phase construction and the replacement will require the full closure of the road and a detour of traffic for 4-5 months. Although we are contemplating a number of detour routes, the preferred route utilizes County and Ministry roads (see attached), as opposed to Warwick Township roads that were not necessarily built to carry larger volumes of traffic. I am assuming the use of the section of Kings Highway 402 from Forest Road to Nauvoo Road as part of the detour will require an encroachment permit from the MTO. Please confirm that corridor control is the proper contact.

Provided everything falls in place (EA, design, approval, budget, etc.), we expect to commence the structure replacement next summer. As such, we want to ensure the MTO doesn't having any conflicting projects in the area during the replacement. Can you provide the proper contact within the Ministry?

Lastly, the Warwick Township Fire Department has provided comment as part of the EA and one of their concerns pertains to their increased fire response times to the east of the bridge during the road closure given their fire hall is

located just west of the bridge. As such, Warwick has requested that we provide emergency access to the 402 via Warwick Village Road during the length of the road closure. As you may recall , this would be similar to the access provided by the MTO/County when the interchange to the east (402 @ County Road 79 Nauvoo Road) was being reconstructed back in 2009 (see attached plan). Can you direct me to the appropriate staff to discuss emergency access to the 402 from the south end of Warwick Village Road?

Thanks in advance. Would be happy to discuss further.

Glen Millar, P.Eng.
Public Works Department
County of Lambton
(519) 845-0801 Ext. 5311

Kelly Vader

To: Jenna Allain (allainj@thamesriver.on.ca)
Subject: Lambton County Bridge replacement - Warwick
Attachments: BR1279-Fig2.5-Source_Water_Protection.pdf; BR1279-General_Location_Plan.jpg

Hi Jenna:

Thanks for talking with me earlier. I have attached a general location plan of the project site as well as our mapping showing vulnerable areas that will be included as a figure in our Class EA report.

As I mentioned, there are no sewer pipes in the vicinity of the project and the Bear Creek channel will be isolated during removal of the existing bridge and construction of the new one. Construction mitigation measures will be outlined in the report such as refueling away from the channel, sediment and erosion control measures, and having a spill kit on hand in case of accidents.

Let me know if there are any additional recommendations that should be included.

Thanks,

Kelly Vader, MCIP, RPP
B. M. Ross and Associates Limited
Engineers and Planners
62 North Street
Goderich, ON N7A 2T4

Ph: (519) 524-2641
Fax: (519) 524-4403
kvader@bmross.net
www.bmross.net

Kelly Vader

From: Jenna Allain <allainj@thamesriver.on.ca>
Sent: November 13, 2018 9:41 AM
To: Kelly Vader
Subject: Re: Lambton County Bridge replacement - Warwick

Hi Kelly,

Thanks for your call and email. As we discussed, the EA report should identify that the project is located in a Highly Vulnerable Aquifer, which you have already done. You can mention that you consulted with me, and that no significant, moderate or low drinking water threats are identified in association with the project. The construction mitigation measures which you are outlining in the report look good to me.

Jenna

Jenna Allain, M.Sc.
Source Protection Coordinator
Thames-Sydenham and Region Drinking Water Source Protection
DRINKING WATER SOURCE PROTECTION
RISK MANAGEMENT SERVICES
Working together to protect drinking water sources
allainj@thamesriver.on.ca | www.sourcewaterprotection.on.ca
519.451.2800 Ext. 223
Upper Thames River Conservation Authority
1424 Clarke Road London, Ontario, N5V 5B9
DRINKING WATER SOURCE PROTECTION
RISK MANAGEMENT SERVICES
Working together to protect drinking water sources

>>> Kelly Vader <kvader@bmross.net> 11/12/2018 3:06 PM >>>
Hi Jenna:

Thanks for talking with me earlier. I have attached a general location plan of the project site as well as our mapping showing vulnerable areas that will be included as a figure in our Class EA report.

As I mentioned, there are no sewer pipes in the vicinity of the project and the Bear Creek channel will be isolated during removal of the existing bridge and construction of the new one. Construction mitigation measures will be outlined in the report such as refueling away from the channel, sediment and erosion control measures, and having a spill kit on hand in case of accidents.

Let me know if there are any additional recommendations that should be included.

Thanks,

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