



**Oxford Road 16 Improvements
From Kintore to Zorra 31st Line
Class Environmental Assessment**

**Environmental Study
Report**

**Oxford County
21 Reeve St., P.O. Box 1614
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Executive Summary

Introduction

Oxford County Public Works conducted an Environmental Assessment in accordance with the Ontario Environmental Assessment Act (EA Act) to determine the impacts of Road Improvement on part of Oxford Road 16.

The Environmental Assessment of part of Oxford Road 16 Improvements was conducted in accordance with 'Schedule C' of the Municipal Engineers Association Municipal Class Environmental Assessment process dated October 2000, as amended in 2007 & 2011.

The Municipal Class Environmental Assessment (Municipal Class EA) is one of the Class EAs planning and design process approved by the Minister of the Environment and Climate Change (MOECC).

Study Area

Oxford Road 16 has been identified as an East-West transportation corridor across the County, in conjunction with Oxford Road 6 and Oxford Road 8. The focus of this study has been on 5.8 kilometres of part of Oxford Road 16 from the eastern limit of Kintore to Zorra 31st Line. Other sections of Oxford Road 16 were previously resurfaced to 8.7 metres wide pavement. Oxford Road 6 and Oxford Road 8 are all constructed to County Standards for this class of road.

Public, First Nations and Agency Consultation

Consultation with the Public, Property Owners, First Nations, Agencies and Stakeholders was carried out in accordance with Schedule C of the Municipal Class EA.

Notice of Study Commencement and Public Consultation Centre No. 1 was published twice in the local newspaper and mailed out to Property Owners, First Nations, Businesses, Stakeholders and Agencies in November 2014. The first Public Consultation Centre was held on November 27, 2014 to give the Public an opportunity to review the study scope and provide input.

Notice of Public Consultation Centre No. 2 was published twice in the local newspaper and mailed out to Property Owners, First Nations, Businesses, Stakeholders and Agencies in January 2016. The second Public Consultation Centre was held on January 26, 2016 to give the Public an opportunity to review and provide input on the Alternative Solutions and the preferred Solution.

Notices were sent directly to First Nations within 100 kilometres of Oxford County. Copies of the responses/comments are included in Appendices E and F.

Notice of Study Completion will be published twice in the local newspaper and mailed out to Property Owners, First Nations, Businesses, Stakeholders and Agencies after County Council has accepted the Environmental Study Report (ESR). The ESR will be placed on public record for a minimum of 30 calendar days for review by the Public, First Nations, Stakeholders and Agencies.

Phase 1 of Municipal Class EA – Problem/Opportunity Statement

Based on the review of background information, technical studies and input from the Public, the problem statement was developed:

There is a need for improved roadway and traffic operations throughout Oxford Road 16 corridor in order to improve safety for all road users;

Corridor improvements are required in order to satisfy the goals and objectives of the Transportation Master Plan as well as provide a safe access for all road users.

Phase 2 of Municipal Class EA – Alternative Solutions and Selection of Preferred Solution

In order to address the Problem Statement, alternative solutions, including ‘Do Nothing’, were identified and the impacts on the environment were evaluated. Based on the evaluations, the Preferred Solution is to: Reconstruct road to a wider two-lane rural cross section, including realignments and drainage improvements.

Phase 3 of Municipal Class EA – Alternative Design Concepts for the Preferred Solution

After evaluating the alternative designs, the recommended design is to provide a 2 lane road with 3.35 metres travel lanes, 1 metre paved shoulder and 2 metres gravel shoulders. The existing pavement will be pulverized with underlying granular materials in-place to a depth of 300 millimetres (mm), excavate and widen the gravel shoulders, widen bridge structures, replace culverts, ditching, gravelling, grading and pave with 100 mm of new asphalt, topsoil and seed/mulch/sod. Improve sight line at the intersection of Oxford Road 16 and Zorra 29th Line.

Estimated Capital Construction Cost of the Preferred Solution is \$5,000,000 including property acquisitions and utility relocations.

Improvements to one Municipal drain and the Ross Award Drain 1919 are required in order to provide additional outlets required to properly drain the road and adjacent lands. The County of Oxford has submitted a petition for improved drainage in these areas pursuant to Section 4-1(c) of the Drainage Act RSO 1990.

Phasing of Preferred Solution

Depending on budgets, the road improvements may be completed in three phases as follows:

- Replacement of the drainage structure (bridge) at McCall-McCorquodale drain and Road improvement between Zorra 31st Line and Zorra 29th Line;
- Road improvement from east limit of Kintore to Zorra 25th Line; and
- Road improvement from Zorra 25th Line to Zorra 29th Line.

Potential Impacts of Preferred Solution on the Environment

Disruptions to traffic during construction: Sign and maintain detour routes if the road is closed;

Limited or no access to properties during construction: Advise property owners if there will be limited or no access to properties before access is closed;

Removal of natural features, such as, vegetation and trees: Restore disturbed areas and plant new trees in accordance with municipal Tree policy;

Removal of archaeological resources: Carry out Stage 1 or Stage 2 Archeological assessment as required to identify and protect archaeological resources;

Relocation of utilities: Electrical power may be interrupted to homes and businesses when the properties are to be connected to the new power lines. The utility company should provide power outage notices to the affected properties.

Dewatering during culvert installation and extension and/or replacement of other drainage structures: Filter pumped water before discharging into the ditches and creeks.

Phase 4 of Municipal Class EA – Environmental Study Report (ESR)

This Environmental Study Report (ESR) documents the Class Environmental process undertaken through Phases 1, 2 and 3. Following County Council approval, the ESR will be placed on public record for at least 30 calendar days for review by the public, First Nations, stakeholders and review agencies.

Phase 5 of Municipal Class EA – Implementation

Subject to comments received, the County of Oxford plans to proceed with the design and construction of the preferred solution.

Consideration of Climate Change

Climate change, mitigations and adaptations have been considered for this project. Drainage and drainage structures were reviewed. Recommendation was made to improve the pavement width to accommodate Active Transportation as per the County Cycling Strategy.

Additional Work

Additional work required to be completed before construction include but are not limited to the following:

Property acquisitions;

Detailed design of the road improvements;

Relocation of utilities that are in conflicts with the proposed roadwork;

Two Municipal Drain petitions have been filed for drainage improvements;

Extension or replacements of two (2) large drainage structures under the County Bridge Program.

Extend the current 60 km/h speed zone eastward beyond the current location at the east end of Kintore.

Install advance 'TRUCKS TURNING' signs to warn drivers of trucks slowing down to turn onto Zorra 31st Line.

Monitoring

The following items shall be monitored:

Erosion and sediment control measures during construction and for a period of one (1) year after construction;

Growth of vegetation and trees for a period of one (1) year after construction.

1.0 Introduction

1.1 Background

Oxford County commenced a Municipal Class Environmental Assessment (Class EA) in November 2014 to identify opportunities for roadway improvements on Oxford Road 16 from the east limit of Kintore to Zorra 31st Line.

This Class EA is being undertaken based on the recommendation of the *County of Oxford – 2010 Road Needs Study*, which identified the need for improvements for this section of Oxford Road 16. The 2010 Road Needs Study recommended ‘reconstruction’ for the 1 to 5 year needs.

1.2 Study Area

The location and extent of the Study Area are shown on Figures 1(a) and 1(b). The focus of this study has been on part of Oxford Road 16 from the eastern limit of Kintore to Zorra 31st Line, which is about 5.8 kilometres in length.

Figure 1(a): Study Area



Figure 1(b): Study Area Showing the East-West Connections with Road 6 and Road 8



1.3 Existing Roadway Cross Section

Oxford Road 16 is a two-lane bituminous surfaced road with rural cross section. Drainage is by open ditches and culverts which outlets into existing creek crossings and municipal drains.

The Right-of-Way (ROW) for the study area from the east limit of Kintore to Zorra 31st Line varies from 20.1 to 30 metres and the width of the bituminous surface varies from 6.8 to 7.0 metres. Other parts of the road west of Kintore and east of Zorra 31st Line have a 30 metre ROW. The parts to the east and west were resurfaced to obtain an 8.7 metre asphalt width.

1.4 The Ontario Environmental Assessment Act (Ontario EA Act)

The Ontario EA Act came into force in 1976. The purpose of the EA Act as defined in the Act is to provide for: “the betterment of the people of the whole or any part of Ontario by providing for the protection, conservation and wise management in Ontario of the environment”. Environment is applied in a broad sense and includes the Natural, Social, Cultural, Built and Economic environments.

Under the EA Act, projects must undergo environmental assessments before implementations. The different ways to comply with the EA Act are as follows:

- ask the Minister of the Environment and Climate Change for exemption;
- conduct an Individual Environmental Assessment;
- conduct a Class Environmental Assessment (Class EA).

Municipal Road, Water, Wastewater and sometimes Transit projects follow the Municipal Class Environmental Assessment Planning and Design Process. The Municipal Class Environmental Assessment (Municipal Class EA) is one of the Class EAs planning and design process approved by the Minister, and when followed will meet the requirements of the Ontario EA Act.

1.5 Municipal Class Environmental Assessment Planning and Process

Projects in the Municipal Class EA are classified according to schedules in the Municipal Engineers Association (MEA) **Municipal Class Environmental Assessment** document (October 2000, as amended in 2007 and 2011):

Schedule A:

- Generally includes normal or emergency operational and maintenance activities.
- The environmental effects of these activities are usually minimal and, therefore, these projects are pre-approved.

Schedule A+:

- As part of the 2007 amendments, Schedule A+ was introduced. The purpose of Schedule A+ is to ensure some type of public notification prior to project implementation for certain projects that are pre-approved.

Schedule B:

- Generally includes improvements and minor expansion to existing facilities.
- There is the potential for some adverse environmental impacts and therefore the proponent is required to proceed through a screening process including consultation with those who may be affected.

Schedule C:

- Generally includes the construction of new facilities and major expansions to existing facilities.
- There is potential for significant environmental effects and these projects must proceed through the environmental assessment planning process outlined in the Municipal Class EA document.

1.6 Study Process

The steps undertaken for this study are described below:

- Phase 1 – Identify the problem or opportunity:
 - Distribute a notice of study commencement.
- Phase 2 – Identify alternative solutions to address the problem:
 - Inventory the natural, social, and economic environments.
 - Identify impact of alternative solutions on the environment.
 - Evaluate alternative solutions.
 - Undertake a Public Consultation Centre (PCC) to present information to-date and the preferred solution.
 - Select preferred solution and confirm Schedule of project: A, A+, B or C.
- Phase 3 – Identify alternative design concepts for preferred solution
 - Detail inventory of natural, social and economic environment
 - Identify impact of alternative designs on environment and mitigating measures
 - Evaluate alternative designs, identify preferred design
 - Undertake a Public Consultation Centre (PCC) to present information to-date and the preferred design.
 - Select preferred design
 - Preliminary finalization of preferred design
- Phase 4 – Environmental Study Report (ESR)
 - Complete ESR
 - ESR is placed on Public Record for public review after Council acceptance
 - Notice of completion to review agencies, First Nations, the public and MOECC
 - Opportunity to ask Minister within 30 days of notification for a Part II Order

- Phase 5 – Implementation
 - Complete contract drawings and tender documents
 - Proceed to construction and operation
 - Monitor for environmental provisions and commitments

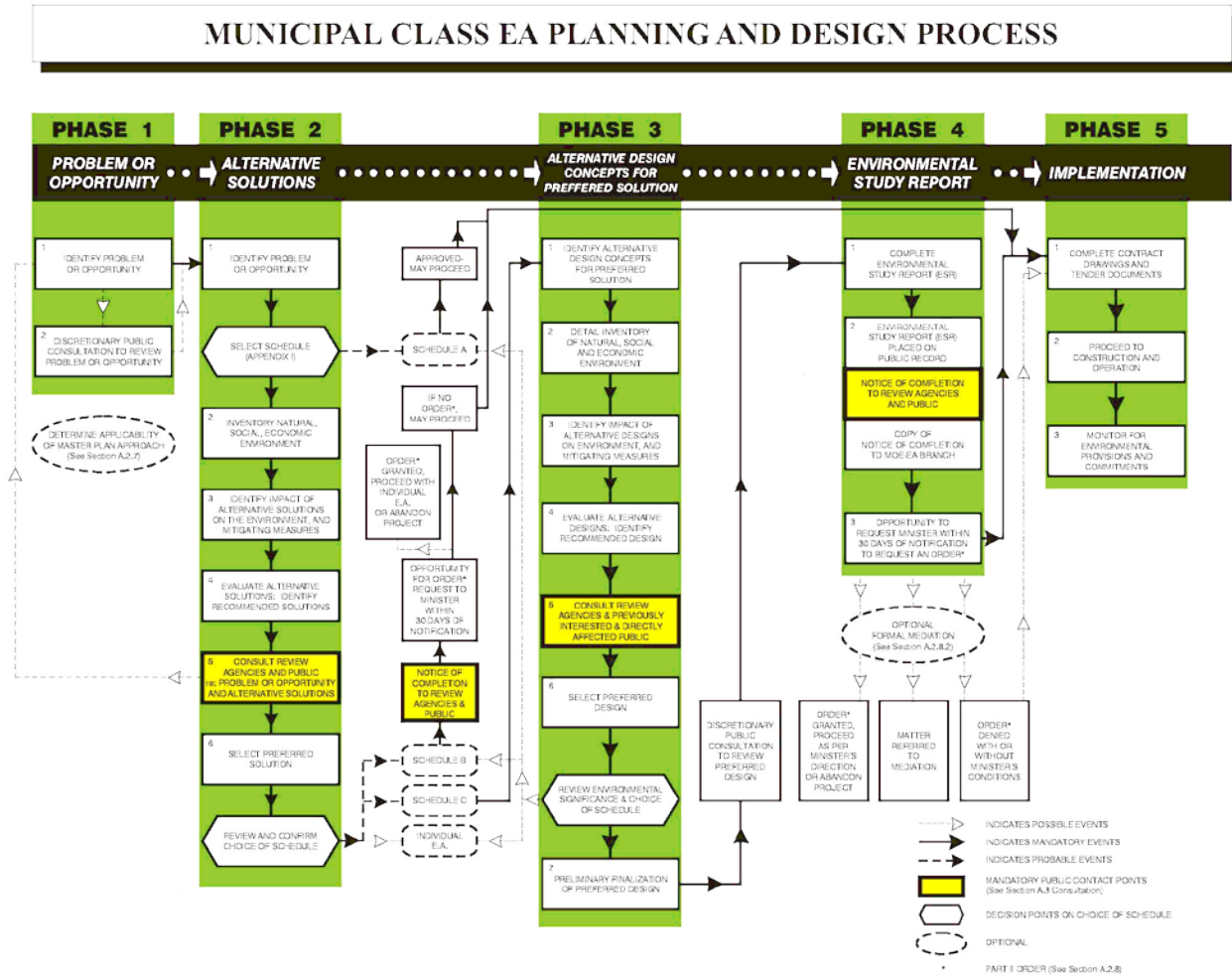
1.7 Selection of Project Schedule

In Appendix 1 of the Municipal Class EA Planning and Design Process, it states that road reconstruction or widening projects, with the addition of lane(s) or re-location of road(s), are either a Schedule B or Schedule C projects. Furthermore, projects that have an estimated value less than \$2.4 million are assigned as Schedule B projects. Projects that have an estimated value greater than \$2.4 million are assigned as Schedule C projects.

This project has been identified as a Schedule C Class EA as the improvements on part of Oxford Road 16 may require horizontal and vertical re-alignments and it is estimated to be over \$2.4 million. Schedule C projects have potential for adverse environment impact(s); therefore, a public consultation is required to provide an opportunity for the Public, Review Agencies, First Nations and Stakeholders to provide their inputs. This study has been carried out in accordance with the Schedule C of the Municipal Class EA process.

The documentation for a Schedule C project consists of an Environmental Study Report (ESR) which is presented in this document. The placement of the ESR for public review completes the planning and preliminary design stages of the project. The ESR is available for public review a minimum of thirty (30) calendar days from the date of publication of the Notice of Completion.

Figure 2: Municipal Class EA Planning and Design Process



1.8 Preferred Solution

The following improvements have been recommended in the Class EA for part of Oxford Road 16:

- Maintain a two-lane rural road cross section but widen the existing lane widths to improve safety and reduce maintenance;
- Widen granular shoulders to allow a recovery zone and emergency stopping;
- Increase sight lines and stopping distances;
- Improve drainage.

1.9 Appeal Process

If after reviewing the Environmental Study Report (ESR), you have questions or concerns, please follow this procedure:

- 1) Contact the following County staff to discuss your questions/concerns:

Dadean Assam, P.Eng.
Manager of Construction
Oxford County
21 Reeve Street, PO Box 1614
Woodstock ON N4S 7Y3
Tel: 519-539-9800 ext 3117
Fax: 519-421-4711
Email: dassam@oxfordcounty.ca

- 2) Arrange a meeting with the above if you have significant concerns that may require more detailed explanation;
- 3) If you raise major concerns, the County will attempt to negotiate a resolution of the issues. A mutually acceptable time period for this negotiation will be set. If the issues remain unresolved, you may request the Minister of the Environment and Climate Change, by order, to require the County to comply with Part II of the Environmental Assessment Act before proceeding with the project. Requests must be submitted in writing to the Minister of the Environment and Climate Change at the following address within the 30-calendar day review period:

The Minister/Ministry of Environment and Climate Change
77 Wellesley St. West, 11th Floor
Toronto, Ontario M7A 2T5
Fax: 416-314-8452

A copy of the letter to the MOECC must also be sent to the attention of Mr. Robert Walton, P.Eng., Director of Public Works (to the County address provided above).

1.10 Project Team

According to the EA Act, the Proponent means “a person who **carries out or proposes to carry** out an undertaking, or is the owner or person having charge, **management or control of an** undertaking”.

The proponent is Oxford County, c/o Public Works Department. The project team members were:

- Robert Walton, P.Eng., Director of Public Works;
- Dadean Assam, P.Eng., Manager of Construction;
- Melissa Abercrombie, P.Eng., Manager of Roads and Facilities;
- Frank Gross, C.Tech., Supervisor of Engineering Services.

1.11 Public & Agency Consultations

Public and agency consultation ensure that all stakeholders are given the opportunity to provide input to the project in a meaningful way. The goal of the consultation program is to have stakeholders help the project team by providing input into the definition of problems/opportunities, identification and evaluation of alternative solutions, and the selection of the preferred solution. The project team consisted of Oxford County staff.

The project team sought the involvement of residents/public, stakeholders, review agencies and First Nations by circulating newspaper advertisements, notices and notifications of upcoming Public Consultation Centers (PCCs). General notification points are summarized in Table 1.

Table 1: Study Notifications

Notification	Delivery Method	Date
Notice of Commencement and Public Consultation Centre #1	Newspaper Advertisements in Oxford Review	November 6 & 20, 2014
	Hand Delivery to Residents	November 4, 2014
	Mail-out to First Nations, Review Agencies and Property Owners	November 4, 2014
Notice of Public Consultation Centre #2	Newspaper Advertisements in Oxford Review	January 7 & 14, 2016
	Hand Delivery to Residents	January 6, 2016
	Mail-out to First Nations, Review Agencies and Property Owners	January 6, 2016
Notice of Public Consultation Centre #3	Newspaper Advertisements in Oxford Review	October 20 & 27, 2016
	Mail-out to First Nations, Review Agencies and Property Owners	Week of October 17, 2016

Presentation to Township of Zorra Council		November 15, 2016
Class EA Acceptance by Oxford County Council	Council Report No.:	December 14, 2016
Notice of Study Completion	Newspaper Advertisements in Oxford Review	
	Mail-out to First Nations, Review Agencies and Property Owners	

A number of agencies were contacted for the purpose of study notification, meeting notification and general information exchanged. The contact lists of First Nations and agencies are included in Appendix A. Due to privacy issues, the contact information of property owners are not included in this report.

By providing the public, review agencies and First Nations the opportunity to identify their concerns, the project team was able to respond to the specific issues and comments.

2. Phase 1 of Class EA - Problem or Opportunity

2.1 Collision Report

Police collision records from 2006 to 2014 were reviewed. A total of thirty five (35) collisions were reported to the Police. Twenty (20) collisions were single vehicle accidents due to loss of control of vehicle. Eight (8) were with animals and seven (7) involved two vehicles.

2.2 Archaeological and Built Heritage Assessments

The County retained AMICK Consultants Ltd. to carry out Stage 1 archaeological assessment of the study area. Some archaeological potential exist on the undisturbed portions of the existing right of way.

Stage 2 Archaeological Assessment is recommended to be completed if road work will be done on the undisturbed areas of the right of way.

A Built Heritage Assessment Checklist has been completed as required by Ministry of Tourism, Culture and Sport (MTCS). There were no built heritage resources identified along this portion of Oxford Road 16.

The complete Archaeological and Heritage Reports are included in Appendix B.

2.3 Drainage and Drain Outlets

There are five municipal drains (Henderson Drain, Borland Drain, Roefs Drain, McCall-McCorquodale Drain and the Ross Award Drain) and one creek crossing (Nissouri Creek), all flowing from north to south.

There are drainage ditches on both sides of the road that drains into the culverts, municipal drains, private drain and the creek.

The County of Oxford has identified road drainage/flooding in the areas of the Borland Drain crossing and the Ross Award Drain. The County requested a meeting with the Township of Zorra and the landowners on the drains to discuss possible improvements. This meeting occurred on September 30, 2016. The Township of Zorra is the municipality responsible for drainage under the sphere of influence under the Municipal Act, RSO 2001.

A petition signed by the Director of Public Works for the County has been submitted pursuant to Section 4-1 (c) of the Drainage Act, RSO 1990 for drainage improvements.

The County is concerned about the capacity of the Ross Award Drain which is apparently 100 years old. The Borland Drain has rock weir constructed by the landowner downstream of the road which causes flooding.

2.4 Natural Environment

The County retained Natural Resource Solutions Inc. (NRSI) to assess the natural environment of the study area.

Nine (9) Species at Risk (SAR) and eleven (11) Species of Conservation Concern (SCC) were identified as "having records from within the vicinity (within 10 km) of the study area.

No Significant Wildlife Habitats (SWH) were confirmed within the study area.

Significant Woodlands are associated with the McCal-McCorquodale Drain and the Nissouri Creek.

Significant Valleyland features are associated with the Pearson & Cuskey Drain, McCall-McCorquodale Drain, and Nissouri Creek floodplains.

Fish habitat is present in Pearson & Cuskey Drtain, McCall-McCorquodale Drain and Nissouri Creek.

The complete Natural Environment screening report by Natural Resource Solutions Inc. (NRSI) is included in Appendix C.

2.5 Geotechnical

Oxford County retained EXP Services Inc. to perform geotechnical investigation to determine the subsurface conditions at the project site and provide recommendations for the pavement design.

The boreholes were carried out to a sampling depth of 2.0 metres. The existing road consists of 75 mm to 225 mm of asphalt, 300 mm to 700 mm of granular materials and sandy silt below. The geotechnical report can be found in Appendix D.

2.6 Traffic and Traffic Volumes

Traffic Volume

The Average Daily Traffic (ADT) from the traffic count in 2012/2013 was 2,483 vehicles per day. The traffic counts were done in the Fall and Spring times. Heavy Trucks (trucks) were not counted separately but are included in this count. It is common to assume 12% truck traffic. Assuming 1.5% increase in vehicle traffic per year, the traffic volume in 20 years is estimated to be 3,344 vehicles per day.

Trucks Turning

Comments were received from the public that at Zorra 31st Line, commercial trucks turning onto Zorra 31st Line need to slow down (brake) to make the turns safely. At times, vehicles following the commercial trucks may not realize this maneuver and will brake suddenly, creating a situation that may lead to loss of vehicle control and/or collision. Installation of advance warning signs, such as, 'TRUCKS TURNING' will warn drivers of trucks slowing down to turn onto Zorra 31st Line. This can be implemented under Roads Operation and Maintenance program.

Reduce Speed

Requests were received to extend the current 60 km/h speed zone eastward beyond the current location at the east end of Kintore. Implementation of this request will require a Report to County Council and a by-law for a change in 'Speed Zone'. This can also be implemented under Roads Operation and Maintenance program. No horizontal realignment will be done in this area.

2.7 Socio-Economic Environment – Roadway & Adjacent Land Use

Oxford Road 16 is an east-west rural arterial roadway under the jurisdiction of Oxford County.

Except in the Village of Kintore, the roadway currently operates with a posted speed of 80 km/h.

Adjacent land use within the study area can be characterized as rural agriculture and rural residential development.

2.8 Classes of Soils

The Agriculture and Agri-Food Canada (Government of Canada) classified soils as Class 1 to Class 7.

Class 1: Soils in this Class 1 have no significant limitations in use for crops.

Class 2: Soils in this Class 2 have moderate limitations that restrict the range of crops or require moderate conservation practices.

2.9 Utilities

Oxford County is aware of the following utilities that will be impacted by the proposed work:

- Hydro One (electricity supply)
- Bell Canada (telephone and internet service), partly overhead and partly buried.
- Natural gas at the east end of Kintore.

2.10 Problem Statement

After completing a review of relevant background information and reviewing the technical studies and traffic operations, the problem statement can be identified as follows:

There is a need for improved roadway and traffic operations throughout the Oxford Road 16 corridor in order to improve safety for road users travelling along the roadway.

Corridor improvements are required in order to satisfy the goals and objectives of the Transportation Master Plan, as well as provide a safe access for all road users.

3. Phase 2 of Class EA - Alternative Solutions

3.1 Opportunity for Improvement

A number of alternatives were considered in order to improve future operating conditions of the corridor while concurrently improving geometrics, drainage, and safety.

3.2 Alternative Solutions

- 1) **Do Nothing:** Status quo with no improvements to corridor operations. This alternative is used as a “benchmark” in which all other alternatives are compared. This alternative does not address the identified issues along the corridor.
Estimated Capital Construction cost = \$0
- 2) **Rehabilitate existing road and maintain existing road width and alignments:** This alternative consists of removal of the existing asphalt from the road down to the granular base and placement of two layers of new asphalt, or recycle the existing asphalt and overlay with new asphalt.
Estimated Capital Construction cost = \$3,500,000.
- 3) **Reconstruct and maintain existing road width and alignments:** This alternative consists of removal of existing asphalt and granular material to native soil and rebuilding the roadway with new granular materials and asphalt.
Estimated Capital Construction cost = \$3,900,000
- 4) **Reconstruct road to a wider 2 lane rural cross-section, including re-alignments and drainage improvements:** This alternative consists of widening the existing travelled lane widths and gravel shoulders. Realigning the horizontal and vertical curves

where required. Improve drainage and improve sight line at the intersection of Oxford Road 16 and Zorra 29th Line.

Estimated Capital Construction cost = \$5,000,000, including property acquisitions and utility relocations.

3.3 **Evaluation of Alternative Solutions**

In order to evaluate the alternatives, evaluation criteria which reflects the study goals and objectives was developed. The evaluation criteria are summarized as follows:

- **Transportation Environment** – impact on traffic operations, ability to improve safety for all roadway users, and ability to maintain adequate local access;
- **Social Environment** – land requirements, and impact to adjacent residential and agriculture properties;
- **Natural Environment** – removal/disturbance to vegetation, storm water/drainage and noise impacts;
- **Cost** – construction and maintenance costs.

The reasoned argument evaluation method has been used in order to select a preferred alternative by highlighting the differences in net impacts associated with the various alternative solutions and in determining the advantages and disadvantages of those impacts. The evaluation has been based on feasibility, constructability, conformity to County policies and comments and concerns received during public consultation.

The evaluation of the alternatives is summarized in Table 2.

Table 2: Evaluation of Alternative Solutions

Evaluation Criteria and Sub-Factors		Alternative Solutions			
		Alternative 1: Do Nothing	Alternative 2: Rehabilitate Existing Road Surface	Alternative 3: Reconstruct Road with no Alignment and Drainage Improvements	Alternative 4: Reconstruct Road with New Cross-Section including Alignment and Drainage Improvements
Transportation Environment	Traffic Operations				
	Safety				
	Road Geometry				
Social Environment	Impact to Rural Residential Properties				
	Impact to Rural Agricultural Properties				
Natural Environment	Impact to Vegetation/Trees				
	Stormwater/ Drainage				
	Noise Impacts				
Cost	Construction	\$0	\$3,500,000	\$3,900,000	\$5,000,000
	Maintenance				
Summary					

Range Indicator



3.4 Selection of Preferred Solution

Based on the preliminary evaluation of the alternative solutions, and keeping in context with the study goals and objectives, it was concluded that **Alternative 4 - Reconstruct Road to a new 2 lane rural cross section with wider pavement, including realignment and drainage improvements** as the preferred alternative based on the following rationale:

- The ability to achieve improved sightlines, improved stopping distance, improved driving cross-section, along the length of the corridor;
- The ability to provide improved drainage along the roadway and prevent negative impacts on adjacent agriculture and residential lands.
- Although this is the highest cost option evaluated, the proposed construction is in keeping with the existing cross section of other parts of Oxford Road 16 to the east and west of the study area.

3.5 Review and Confirmation of Class EA Schedule

Based on the criteria used to evaluate and select the Preferred Solution, the status of this Class EA was confirmed to be Schedule C.

3.6 Recommendation of Preferred Solution

A report to County Council will recommend Alternative 4 to **improve Oxford Road 16 within the study area with a 2-lane rural cross-section with wider pavement widths, including realignments where required and drainage improvements**. This alternative consists of increasing the width of the paved road, adding wider granular shoulders, realigning vertical and horizontal curves, and installing adequate drainage along the roadway. For the preferred solution, some utilities (hydro poles, natural gas mains and telephone cables) will be relocated.

4. Phase 3 of Class EA - Alternative Design Concepts for the Preferred Solution

4.1 Phasing of Construction

Depending on budgets, the road improvements may be completed in three phases as follows:

- Replacement of the drainage structure (bridge) at McCall-McCorquodale drain and Road improvement between Zorra 31st Line and Zorra 29th Line;
- Road improvement from east limit of Kintore to Zorra 25th Line, and
- Road improvement from Zorra 25th Line to Zorra 29th Line.

4.2 Proposed New Road Cross Section

- Two - 3.35 metre wide paved travel lanes;
- Two - 1.0 metre wide paved shoulders;
- Two - 2.0 metre wide gravel shoulders; drainage ditches on both sides with side slopes of 2 horizontal to 1 vertical or flatter.

4.3 **Potential Impacts of the Preferred Solution**

Transportation Environment: During construction, the road will be closed during excavation for structure replacement. Detours will be signed and communicated to the Public.

Proposed construction detour routes are shown on Figures 3(a), (b) and 4.

Economic Environment: There are farm lands adjacent to the road. During construction, local access will be maintained for access to the farmlands, except when work is directly in front of the entrance.

Cultural Environment: Stage 1 Archaeological Report recommended that Stage 2 Archaeological Assessment be carried out on areas where deep excavations have not been previously done. Road widening on acquired properties, such as, farmlands may require Stage 1 and Stage 2 Archaeological Assessments.

Social Environment: The adjacent lands are mostly residential and agriculture properties. Local access to these properties will be maintained during construction. During construction, noise from construction equipment may be noticeable and the hours of construction will be according to Municipal by-law. Dust will be created when vehicles travel on unpaved (gravel) surfaces. Calcium and water should be used to control dust.

For 2012/2013 traffic volume of 2,483 vehicles per day and assuming 1.5% annual increase in traffic, noise impacts due to potential increase in traffic will be minimal.

Natural Environment: Potential impacts on the Terrestrial environment include removal of roadside vegetation and trees. Vegetation will be removed for wider road platform. Disturbed areas should be seeded, sodded or mulched as soon as possible.

Potential impacts on surface water include silt and sedimentation from construction activities. Install, inspect and maintain silt fence, straw bale during construction to mitigate silt migration to surface water. Disturbed areas should be seeded, sodded or mulched as soon as possible.

Utilities: Relocation of hydro poles and Bell cables will be required. There is no natural gas within the study area, but the natural gas company was circulated with the notice of study commencement and Public Consultation Centers.

Drainage: With a wider pavement, the drainage structures will be extended or replaced if they are near the end of their useful life. Where required, new drainage ditches will be constructed for improved drainage. The wider pavement will result in more surface runoff. However, ditches should be lined with vegetation which will provide good infiltration that will reduce the surface run off to the water bodies.

Table 3 shows the preliminary analyses of the “Surface” Drain Crossings on Oxford Road 16 within the study area. Figure 6 shows the ‘assumed’ drainage areas.

Table 3: Preliminary Analyses of Existing Drainage Systems by ‘The Rational Method’

Rational Method for drainage area up to 100 ha.

Use runoff coefficient, $C = 0.2$ for primarily pasture and farmlands.

Surface Drain, Culvert & Pipe Crossing Road 16 at:	Time of Concentration (minutes) – use Airport Formula for $C < 0.4$	Intensity for 25-year storm (mm/hr) from Woodstock, Ontario, I-D-F curves	Peak Flow, Q_{25} (m^3/s)	Check Capacity with Inlet Control method	Comments
Henderson Drain, Area = 25.8 ha; Length = 400 m; Slope = 0.62%	68.6 min	37 mm/hr	0.53	Existing 750mm CSP is adequate	450mm diam. Municipal drain below surface drain
Borland Drain, Area = 222 ha; Length = 1,300m; Slope = 0.87%	124 min	25 mm/hr	3.11	Existing 3.5m span x 1.78m rise bridge is adequate	See Bridge inspection report for bridge 843164
Ross Drain, Area = 61.7 ha; Length = 904 m; Slope = 1.38%	79.2 min	35.5 mm/hr	1.23	Existing 2-600mm CSPs are adequate	300mm diam. Municipal drain below surface drain
Roefs Drain, Area = 44.1 ha; Length = 730 m; Slope = 1.37%	71.4 min	38 mm/hr	0.94	Existing 600mm CSP is inadequate Use 750mm	400mm diam. Municipal drain below surface drain
McCall-McCorquodale Area = 959.4 ha; Length = 6,452m; Slope = 0.7%	265 min	16 mm/hr	8.6	Existing 4.25m span x 2.m rise bridge is adequate	See Bridge inspection report for Bridge #843534

Check Boreland and McCall-McCorquodale Drainage Structure capacities using Modified Index Flood Method. The drainage areas are greater than 100ha.

Surface Drain, Culvert & Pipe Crossing Road 16 at:	Soil Group	Curve Number, CN	Base/Net Watershed Classes	Class Coefficient, C	Peak Flow, Q ₂₅ (m ³ /s)	Check with Inlet Control method
Borland Drain, Area = 222 ha (2.22 km ²); Length = 1,300m; Slope = 0.87%	C (silt loam)	76	8.5/8.15	1.84	3.35	Existing 3.5m span x 1.78m rise bridge is adequate
McCall- McCorquodale Area = 959.4 ha (9.594 km ²); Length = 6,452m; Slope = 0.7%	C (silt loam)	76	8.5/8.15	1.84	10.03	Existing 4.25m span x 2.m rise bridge is adequate

Property acquisitions:

The existing Right-of-Way (ROW) varies from 20.1 metres to 30 metres.

Table 3 of Chapter 5 of the County Official Plan recommends 31 metres of Right-of-Way for County Roads in rural areas. This requirement is to accommodate the recommended widths of travel lanes, shoulders and drainage ditches.

In the subsection titled ‘Overview of the Municipal Class EA (2000)’ in the Executive Summary, of the Municipal EA booklet, it is documented that one of the main features of the 2000 Municipal Class EA was that: “reference to property acquisitions in the process flow chart and text deleted due to changes in amended EA Act.”

Where properties are required, property acquisitions will be negotiated with property owners separately from this Class EA process. A total of about 12 acres of properties are required from adjacent property owners. Some of the properties required for this project were obtained when the project was considered in the 1980’s.

Figure 6 shows where property (land) acquisitions will be required for Alternative #4. The County is not proposing land acquisition along the forested area and will work within the existing road allowance to minimize disruption to the forest.

5. Public, First Nations and Agency Consultation

5.1 Public Consultation Centre No. 1

The first Public Consultation Centre (PCC #1) was held on November 27, 2014. The PCC was advertised two consecutive times in the local newspaper and notices were mailed out to stakeholders and also hand delivered to residents within the study area.

Newspaper advertisements, PCC #1 presentation materials, comments and notes taken at PCC #1 are included in Appendix E.

Due to privacy issues, the names, addresses, telephone numbers and emails of peoples not representing First Nations, Agencies and organizations have been blacked out from the comment sheets.

Twenty five (25) people signed the attendance sheet. However, some people that attended did not sign the attendance sheet.

Twelve (12) written and one (1) phone-in comments were received.

5.2 Public Consultation Centre No. 2

The second Public Consultation Centre (PCC #2) was held on January 26, 2016. The PCC was advertised two consecutive times in the local newspaper and notices were mailed out to stakeholders and also hand delivered to residents within the study area.

Newspaper advertisements, PCC #2 presentation materials, comments and notes taken at PCC #2 are included in Appendix F.

Again, due to privacy issues, the names, addresses, telephone numbers and emails of peoples not representing First Nations, Agencies and organizations have been blacked out from the comment sheets.

Twenty four (24) people signed the attendance sheet.

Five (5) written comments were received.

5.3 Public Consultation Centre No. 3

The third Public Consultation Centre (PCC #3) was held on November 15, 2016. The PCC was advertised two consecutive times in the local newspaper and notices were mailed out to First Nations, Agencies and property owners.

Newspaper advertisements, PCC #3 presentation materials, comments and notes taken at PCC #3 are included in Appendix G.

Again, due to privacy issues, the names, addresses, telephone numbers and emails of peoples not representing First Nations, Agencies and organizations have been blacked out from the comment sheets.

Eight (8) people signed the attendance sheet.

Zero (0) comments were received at the writing of this Report.

6. Drinking Water Source Protection

6.1 Vulnerable Areas

According to Upper Thames River Conservation Authority (UTRCA) letter dated November 14, 2014, the Assessment Report for the Upper Thames Watershed delineates three (3) types of Vulnerable Areas:

- Wellhead Protection Areas
- Highly Vulnerable Aquifers
- Significant Groundwater Recharge Areas

UTRCA further advised that the “study area contained areas identified as being a Highly Vulnerable” and the Threats are considered ‘Moderate and Low’.

6.2 Drinking Water Threats

The Clean Water Act (2006) define ‘A Drinking Water Threat’ as an “activity or condition that affects or has the potential to adversely affect the quality or quantity of any water that is or may be used as a source of drinking water”.

On this project, the ‘handling and storage of fuel’ during construction is identified as a Drinking Water Threat. Mitigation measures include - not to re-fuel close to water bodies. Clean up fuel spills immediately.

7. Climate Change

Consideration of Climate change is not included in the Municipal Class EA Planning and Design Process, dated October 2000, as amended in 2007 & 2011. However, some other Environmental Assessment Planning proponents are including Climate Change, Mitigation and Adaptation when preparing Environmental Assessments (EA’s) for projects.

7.1 Greenhouse Gasses (GHGs)

Greenhouse Gasses (GHGs) are gasses listed in the Kyoto Protocol which include Carbon Dioxide (CO₂), Nitrous Oxide (N₂O), Methane (CH₄), Hydrofluorocarbons (HFCs) and Sulphur Hexafluoride (SF₆).

Scientists have noted that the burning of fossil fuels from human activities have caused an increase in GHGs in the Earth’s atmosphere which lead to climate change. The use of gasoline and diesel (fossil fuels) in the operations of vehicles contribute to the generation of GHGs.

7.2 Mitigation and Adaptation

Roads will be affected by climate change from extreme weather events, such as, floods, erosions, droughts, hurricane/ tornados, extreme temperatures, snow falls, etc.

Oxford72hours.ca website lists a timeline of disasters (The Big Ones) in Oxford County. Some of the listed disasters that may affect a roadway are:

Disaster	Year(s) of Disaster
Tornados	1856, 1914, 1933, 1953, 1979, 1988 and 1998
Fires	1872, 1874, 1929, 1930, and 1935
Floods	1894, 1937 and 2000
Blizzards	1971 and 1978
Windstorms	1995,
Ice Storms	2013.

Table 4 – Activity/Risk, Mitigation and Adaptation on Climate Change

Activity/Risk	Mitigation	Adaptation
Use of fossil fuels in construction equipment during construction	Reduce idling of equipment when not in use. In-place recycling of existing asphalt to reduce emissions associated with production of new asphalt.	
Use of fossil fuels in personal and commercial vehicles.	Reduce number of trips. Maintain vehicles per manufacturers’ recommendations. Ride share/ car pool when possible. When possible, use other modes of transportation – cycling & walking. Reduce idling of vehicles when possible.	
Floods – some sections of road washed out.	Design, construct and maintain good drainage system. Read Flood Warnings issued by Agencies.	Close road and provide detour. Carry out repairs when possible.

Erosions of disturbed areas.	Plant and maintain trees and vegetation to increase the carbon sink.	
Drought – dead trees and dead vegetation.	Watering may not be practicable due to drought.	
Hurricane /Tornados – downed trees and flying objects.		Close road and provide detour. Remove dead trees when safe to do so.
Extreme Cold Temperatures – frost heave due to sub-zero air temperatures.	Design and construct road to prevent frost heaves.	Close road and provide detour.
Extreme Hot temperatures – buckling of road due to thermal expansion.		Close road and provide detour.
High Snow fall/accumulation -	Read Weather Warnings issued by Agencies.	Close road. Remove snow from road when possible.
Ice Storm -	Read Weather Warnings issued by Agencies.	
Windstorm -	Read Weather Warnings issued by Agencies.	

8. Statement of Environmental Values

Statement of Environmental Values is not included in the Municipal Class EA Planning and Design Process, dated October 2000, as amended in 2007 & 2011. However, some other Environmental Assessment Planning proponents are including Statement of Environmental Values when preparing EAs for projects.

To help support and sustain the environment, the following initiatives should be implemented on this project:

- excess soil from the project should be sent to the landfill site for use as cover material and/or to gravel pits for pit restorations. Soil should be tested for contaminations as per current Acts and Regulations before hauling to landfill and gravel pits;
- re-use existing road materials by in-place pulverizing of the existing bituminous material and underlying granular materials;
- retain the existing vegetation by stripping and salvaging vegetation and topsoil and re-use them for landscaping of disturbed areas;
- protect existing trees and vegetation by not excavating close to the tree line and avoid close cut clearing. If trees are damaged or removed, re-plant native trees in accordance with municipal tree planting program. Revegetate areas with native vegetation;

- during construction, use calcium and water to control dust generation by construction equipment from unpaved road surfaces;
- identify the Species at Risk (SAR) and their habitats and protect them as per current Acts and regulations.

Appendix A: Contact Lists – First Nations and Agencies

**OXFORD COUNTY
CLASS EA FOR OXFORD ROAD 16 IMPROVEMENTS (ROAD 84)
AGENCY CIRCULATION LIST
PCC #1, November 2014**

REVIEW AGENCY	INVOLVEMENT
Bob Aggerholm Regional Environmental Planner Ministry of the Environment 733 Exeter Road London, ON N6E 1L3	Mandatory Contact
Amanda McCloskey District Planner Ministry of Natural Resources Alymer District Office 615 John Street North Aylmer, ON N5H 2S8	Potential Impact on Natural Features
Ministry of Tourism, Culture and Sport Culture Services Unit Hearst Block, 9th Floor 900 Bay Street Toronto, ON M7A 2E1	Potential Impact on Heritage Features
Ian Wilcox, General Manager Upper Thames River Conservation Authority 1424 Clarke Road London, ON N5V 5B9	Potential Impact on Natural Features
Peter M. Crockett, P.Eng., CAO Oxford County PO Box 1614 21 Reeve Street Woodstock, ON N4S 7Y3	General Information
Joe Pember, Manager, Emergency Services Oxford County 377 Mill Street Woodstock, ON	General Information
Dianne Marshall, CEMC Oxford County Public Health 410 Buller Street Woodstock, ON N4S 4N2	General Information
Gord Hough, Director Planning and Development Department Oxford County PO Box 1614 21 Reeve Street Woodstock, ON N4S 7Y3	General Information
Ontario Provincial Police, Oxford Detachment 110 Mutual Street Ingersoll, ON N5C 1Z7	General Information
Don MacLeod CAO Township of Zorra 274620 27 th Line Ingersoll, ON N5C 3K5	General Information
Aden Corcoran Director of Public Works Township of Zorra 274620 27 th Line Ingersoll, ON N5C 3K5	General Information
John McFarlan Director of Public Works Township of Zorra 274620 27 th Line Ingersoll, ON N5C 3K5	General Information

Ryan Readings Southwestern Ontario Transportation Services 557 Southdale Road East London, ON N6E 1A2	General Information – Busing
Union Gas, London District Office PO Box 5353 Station A 109 Commissioners Street West London, ON N7A 4P1	General Information
Hydro One 56 Embro Street PO Box 130 Beachville, ON N0J 1A0	General Information
Derek Komadowski Implementation Manager – Access Network Bell Canada 100 Dundas Street, 4 th Floor London, ON N6A 4L6	General Information
Wendy Botts Implementation Manager - Access Network Bell Canada PO Box 938 86 Market Street, F2 Brantford, ON N3T 2Z8	General Information
Catholic Education Centre London District Catholic School Board 5200 Wellington Rd. South London, Ontario N5H 2C9	General Information
Thames Valley District School Board 1250 Dundas Street East P.O. Box 5888 London, Ontario N6A 5L1	General Information

First Nation Contact List - PCC #1

TITLE	FirstName	LastName	FN	POSITION	ADDRESS 1	ADDRESS 2	P. CODE
Chief	Chris	Plain	Aamjiwnaang First Nation		978 Tashmoo Avenue	Sarnia, ON	N7T 7H5
	Sharilyn	Johnston	Aamjiwnaang First Nation	Environmental Coordinator	978 Tashmoo Avenue	Sarnia, ON	N7T 7H5
Grand Chief	Gord	Peters	Association of Iroquois & Allied Indians		387 Princess Avenue	London, ON	N6B 2A7
	Geoff	Stonefish	Association of Iroquois & Allied Indians	Office Manager / Communications Coordinator	387 Princess Avenue	London, ON	N6B 2A7
Chief	Louise	Hillier	Caldwell First Nation		PO Box 388	Leamington, ON	N8H 3W3
Chief	Thomas	Bressette	Chippewas of Kettle and Stony Point First Nation		6247 Indian Lane	Kettle & Stony Point FN, ON	N0N 1J0
Chief	R.K. Joe	Miskokomon	Chippewas of the Thames First Nation		320 Chippewa Road, RR # 1	Muncey, ON	N0L 1Y0
	Fallon	Burch	Chippewas of the Thames First Nation	Consultation Officer	320 Chippewa Road, RR # 1	Muncey, ON	N0L 1Y0
Chief	Greg	Peters	Delaware Nation		14760 School House Line, RR # 3	Thamesville, ON	N0P 2K0
	Tina	Jacobs	Delaware Nation	Lands and Resource Consultation Manager	14760 School House Line, RR # 3	Thamesville, ON	N0P 2K0
			London District Chiefs Council (Southern First Nations Secretariat)		22361 Austin Line	Bothwell, ON	N0P 1C0
Chief	M. Bryan	LaForme	Mississaugas of New Credit First Nation		2789 Mississauga Road, RR # 6	Hagersville, ON	N0A 1H0
	Margaret	Sault	Mississaugas of New Credit First Nation	Lands, Membership and Research	2789 Mississauga Road, RR # 6	Hagersville, ON	N0A 1H0
Chief	Patrick	Waddilove	Munsee-Delaware Nation		289 Jubilee Road, RR # 1	Muncey, ON	N0L 1Y0
	Dan	Miskokomon	Munsee-Delaware Nation	Band Administrator	289 Jubilee Road, RR # 1	Muncey, ON	N0L 1Y0
Chief	Joel	Abram	Oneida Nation of the Thames		2212 Elm Avenue	Southwold, ON	N0L 2G0
	Stacey	Phillips	Oneida Nation of the Thames	CEO			
Chief	Ava	Hill	Six Nations of the Grand River Territory		1695 Chiefswood Road, PO Box 5000	Ohsweken, ON	N0A 1M0
Grand Council Chief	Patrick	Madahbee	Union of Ontario Indians		PO Box 711	North Bay, ON	P1B 8J8
Chief	Burton	Kewayosh	Walpole Island First Nation			RR # 3 Wallaceburg, ON	N8A 4K9
	Dean	Jacobs	Walpole Island First Nation	Consultation Manager		RR # 3 Wallaceburg, ON	N8A 4K9

PCC #2
Contact List - Agency and First Nation
January 26, 2016

Ministry of the Environment
733 Exeter Road
London, ON
N6E 1L3
Attention: Bob Aggerholm,
Regional Environmental Planner

Ministry of Natural Resources
Alymer District Office
615 John Street North
Aylmer, ON
N5H 2S8
Attention: Amanda McCloskey,
District Planner

Ministry of Tourism, Culture and Sport
Culture Services Unit
Hearst Block, 9th Floor
900 Bay Street
Toronto, ON
M7A 2E1

Upper Thames River Conservation
Authority
1424 Clarke Road
London, ON
N5V 5B9
Attention: Ian Wilcox,
General Manager

Emergency Services
Oxford County
377 Mill Street
Woodstock, ON
Attention: Manager

Oxford County Public Health
410 Buller Street
Woodstock, ON
N4S 4N2
Attention: Dianne Marshall, CEMC

Oxford County
PO Box 1614 21 Reeve Street
Woodstock, ON
N4S 7Y3
Attention: Peter M. Crockett, P.Eng.,
CAO

Planning and Development Department
Oxford County
PO Box 1614
21 Reeve Street
Woodstock, ON
N4S 7Y3
Attention: Gord Hough, Director

Ontario Provincial Police, Oxford
Detachment
110 Mutual Street
Ingersoll, ON
N5C 1Z7

Township of Zorra
274620 27th Line
Ingersoll, ON
N5C 3K5
Attention: Don MacLeod, CAO

Township of Zorra
274620 27th Line
Ingersoll, ON
N5C 3K5
Attention: Aden Corcoran,
Director of Public Works

Southwestern Ontario Transportation
Services
557 Southdale Road East
London, ON
N6E 1A2
Attention: Ryan Readings

Union Gas, London District Office
PO Box 5353
Station A
109 Commissioners Street West
London, ON
N7A 4P1

Hydro One
56 Embro Street PO Box 130
Beachville, ON
N0J 1A0

Bell Canada
100 Dundas Street, 4th Floor
London, ON
N6A 4L6
Attention: Derek Komadowski,
Implementation Manager – Access
Network

Bell Canada
PO Box 938
86 Market Street, F2
Brantford, ON
N3T 2Z8
Attention: Wendy Botts,
Implementation Manager - Access
Network

Catholic Education Centre
London District Catholic School Board
5200 Wellington Rd. South
London, Ontario
N5H 2C9

Thames Valley District School Board
1250 Dundas Street East P.O. Box 5888
London, Ontario
N6A 5L1

Association of Iroquois & Allied Indians
387 Princess Avenue
London, ON
N6B 2A7
Attention: Geoff Stonefish,
Office Manager / Communications
Coordinator

Union of Ontario Indians
PO Box 711
North Bay, ON
P1B 8J8
Attention: Grand Chief Patrick Madabee

London District Chiefs Council
(Southern First Nations Secretariat)
22361 Austin Line
Bothwell, ON
N0P 1C0

Walpole Island First Nation
RR # 3 Wallaceburg, ON
N8A 4K9
Attention: Chief Burton Kewayosh,

Walpole Island First Nation
RR # 3 Wallaceburg, ON
N8A 4K9
Attention: Dean Jacobs,
Consultation Manager

Oneida Nation of the Thames
2212 Elm Avenue
Southwold, ON
N0L 2G0
Attention: Chief Joel Abram

Oneida Nation of the Thames
2212 Elm Avenue
Southwold, ON
N0L 2G0
Attention: Stacey Phillips, CEO

Chippewas of the Thames First Nation
320 Chippewa Road, RR # 1
Muncey, ON
N0L 1Y0
Attention: Chief R.K. Joe Miskokomon

Chippewas of the Thames First Nation
320 Chippewa Road, RR # 1
Muncey, ON
N0L 1Y0
Attention: Fallon Burch,
Consultation Officer

Munsee-Delaware Nation
289 Jubilee Road, RR # 1
Muncey, ON
N0L 1Y0
Attention: Chief Patrick Waddilove

Munsee-Delaware Nation
289 Jubilee Road, RR # 1
Muncey, ON
N0L 1Y0
Attention: Dan Miskokomon,
Band Administrator

Delaware Nation
14760 School House Line, RR # 3
Thamesville, ON
N0P 2K0
Attention: Chief Gregory Peters

Delaware Nation
14760 School House Line, RR # 3
Thamesville, ON
N0P 2K0
Attention: Tina Jacobs,
Lands and Resource
Consultation Manager

Chippewas of Kettle and Stony Point
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6247 Indian Lane
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Attention: Chief Thomas Bressette

Aamjiwnaang First Nation
978 Tashmoo Avenue
Sarnia, ON
N7T 7H5
Attention: Chief Chris Plain

Aamjiwnaang First Nation
978 Tashmoo Avenue
Sarnia, ON
N7T 7H5
Attention: Sharilyn Johnston,
Environmental Coordinator

Caldwell First Nation
PO Box 388
Leamington, ON
N8H 3W3
Attention: Chief Louise Hillier

Six Nations of the Grand River Territory
1695 Chiefswood Road, PO Box 5000
Ohsweken, ON
N0A 1M0
Attention: Chief G. Ava Hill

Mississaugas of New Credit First Nation
2789 Mississauga Road, RR # 6
Hagersville, ON
N0A 1H0
Attention: Chief M. Bryan LaForme

Mississaugas of New Credit First Nation
2789 Mississauga Road, RR # 6
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Attention: Margaret Sault,
Lands, Membership and Research

PCC #3
Contact List – Agency and First Nation
November 2016

Ministry of the Environment
733 Exeter Road
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Attention: Bob Aggerholm,
Regional Environmental Planner

Ministry of Natural Resources
Aylmer District Office
615 John Street North
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N5H 2S8
Attention: Amanda McCloskey,
District Planner

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Attention: Geoff Stonefish,
Office Manager / Communications
Coordinator

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PO Box 711
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P1B 8J8
Att: Grand Council Chief
Patrick Madahbee

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(Southern First Nations Secretariat)
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RR # 3 Wallaceburg, ON
N8A 4K9
Attention: Chief Dan Miskokomon

Walpole Island First Nation
RR # 3 Wallaceburg, ON
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Consultation Manager

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Southwold, ON
N0L 2G0
Attention: Chief Randall Phillips

Oneida Nation of the Thames
2212 Elm Avenue
Southwold, ON
N0L 2G0
Attention: Stacey Phillips, CEO

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289 Jubilee Road, RR # 1
Muncey, ON
N0L 1Y0
Attention: Chief Roger Thomas

Chippewas of the Thames First Nation
320 Chippewa Road, RR # 1
Muncey, ON
N0L 1Y0
Attention: Chief Leslee White-Eye

Delaware Nation
14760 School House Line, RR # 3
Thamesville, ON
N0P 2K0
Attention: Chief Greg Peters

Delaware Nation
14760 School House Line, RR # 3
Thamesville, ON
N0P 2K0
Attention: Tina Jacobs,
Lands and Resource
Consultation Manager

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320 Chippewa Road, RR # 1
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N0L 1Y0
Attention: Fallon Burch,
Consultation Officer

Chippewas of Kettle and Stony Point
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Lambton Shores, ON
N0N 1J1
Attention: Chief Thomas Bressette

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Sarnia, ON
N7T 7H5
Attention: Chief Joanne Rogers

Aamjiwnaang First Nation
978 Tashmoo Avenue
Sarnia, ON
N7T 7H5
Attention: Sharilyn Johnston,
Environmental Coordinator

Association of Iroquois & Allied Indians
387 Princess Avenue
London, ON
N6B 2A7
Attention: Grand Chief Gord Peters

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PO Box 388
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Attention: Chief Louise Hillier

Six Nations of the Grand River Territory
1695 Chiefswood Road, PO Box 5000
Ohsweken, ON
N0A 1M0
Attention: Chief Ava Hill

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2789 Mississauga Road, RR # 6
Hagersville, ON
N0A 1H0
Attention: Chief R. Stacey LaForme

Mississaugas of New Credit First Nation
2789 Mississauga Road, RR # 6
Hagersville, ON
N0A 1H0
Attention: Julie LaForme,
Lands, Membership and Research

Appendix B: Archaeological and Heritage Studies



1.0 PROJECT REPORT COVER PAGE

LICENSEE INFORMATION:

Contact Information:

Michael B. Henry CD BA FRAI FRSA
Managing Partner
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Port McNicoll, ON L0K 1R0
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Email: mhenry@amick.ca
www.amick.ca

Licensee:

Sarah MacKinnon MSc
P1024

Ontario Archaeology Licence:

PROJECT INFORMATION:

Corporate Project Number:

15798

MTCS Project Number:

P1024-0088-2015

Investigation Type:

Stage 1 Archaeological Assessment

Project Name:

Oxford County Road 16.

Project Location:

Oxford County Road 16 (Road 84) from Kintore to 31st
Line,
Part of Lot 15-16, Concession 11-15 (Geographic
Township of East Zorra, County of Oxford), Town of
Kintore, Oxford County

APPROVAL AUTHORITY INFORMATION:

File Designation Number:

Not Currently Available

REPORTING INFORMATION:

Site Record/Update Forms:

N/A

Date of Report Filing:

December 4 2015

Type of Report:

REVISED

2.0 EXECUTIVE SUMMARY

This report describes the results of the 2015 Stage 1 Archaeological Assessment of Oxford County Road 16 (Road 84) from Kintore to 31st Line, Part of Lot 15-16, Concession 11-15 (Geographic Township of East Zorra, County of Oxford), Town of Kintore, Oxford County, conducted by AMICK Consultants Limited. This study was conducted under Professional Archaeologist License #P1024 issued to Sarah MacKinnon by the Minister of Tourism, Culture and Sport for the Province of Ontario. This assessment was undertaken as part of the Environmental Assessment requirement under the Planning Act (RSO 1990b) and the Provincial Policy Statement (2014). For plans of subdivision, Ontario Regulation 544/06 under the Planning Act (1990b) requires an evaluation of archaeological potential and, where applicable, an archaeological assessment report completed by an archaeologist licensed by the Ministry of Tourism, Culture and Sport (MTCS). Policy 2.6 of the Provincial Policy Statement (PPS 2014) addresses archaeological resources. All work was conducted in conformity with Ontario Ministry of Tourism and Culture (MTC) Standards and Guidelines for Consultant Archaeologists (MTC 2011), the Ontario Heritage Act (RSO 1990a).

AMICK Consultants Limited was engaged by the proponent to undertake a Stage 1 Archaeological Assessment of lands potentially affected by the proposed undertaking and was granted permission to carry out archaeological fieldwork. The entirety of the study area was subject to property inspection and photographic documentation on September 4, 2015

All records, documentation, field notes, photographs and artifacts (as applicable) related to the conduct and findings of these investigations are held at the Lakelands District corporate offices of AMICK Consultants Limited until such time that they can be transferred to an agency or institution approved by the Ontario Ministry of Tourism, Culture and Sport (MTCS) on behalf of the government and citizens of Ontario.

As a result of the property inspection of the study area, the study area has been identified as an area of archaeological potential. Test pitting at a 5 metre interval within the proposed corridor is recommended. The Stage 1 included the north and south side of County Road 16 (Road 84) to account for any potential changes.

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4.0 PROJECT PERSONNEL

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5.0 PROJECT BACKGROUND

This report describes the results of the 2015 Stage 1 Archaeological Assessment of Oxford County Road 16 (Road 84) from Kintore to 31st Line, Part of Lot 15-16, Concession 11-15 (Geographic Township of East Zorra, County of Oxford), Town of Kintore, Oxford County, conducted by AMICK Consultants Limited. This study was conducted under Professional Archaeologist License #P1024 issued to Sarah MacKinnon by the Minister of Tourism, Culture and Sport for the Province of Ontario. This assessment was undertaken as part of the Environmental Assessment requirement under the Planning Act (RSO 1990b) and the Provincial Policy Statement (2014). For plans of subdivision, Ontario Regulation 544/06 under the Planning Act (1990b) requires an evaluation of archaeological potential and, where applicable, an archaeological assessment report completed by an archaeologist licensed by the Ministry of Tourism, Culture and Sport (MTCS). Policy 2.6 of the Provincial Policy Statement (PPS 2014) addresses archaeological resources. All work was conducted in conformity with Ontario Ministry of Tourism and Culture (MTC) Standards and Guidelines for Consultant Archaeologists (MTC 2011), the Ontario Heritage Act (RSO 1990a).

5.1 DEVELOPMENT CONTEXT

AMICK Consultants Limited was engaged by the proponent to undertake a Stage 1 Archaeological Assessment of lands potentially affected by the proposed undertaking and was granted permission to carry out archaeological fieldwork. The entirety of the study area was subject to property inspection and photographic documentation on September 4, 2015

All records, documentation, field notes, photographs and artifacts (as applicable) related to the conduct and findings of these investigations are held at the Lakelands District corporate offices of AMICK Consultants Limited until such time that they can be transferred to an agency or institution approved by the Ontario Ministry of Tourism, Culture and Sport (MTCS) on behalf of the government and citizens of Ontario.

The proposed road improvements have yet to be determined. The Stage 1 included the north and south side of County Road 16 (Road 84) to account for any potential changes

5.2 HISTORICAL CONTEXT

As part of the present study, background research was conducted in order to determine the archaeological potential of the proposed project area.

“A Stage 1 background study provides the consulting archaeologist and Ministry report reviewer with information about the known and potential cultural heritage resources within a particular study area, prior to the start of the field assessment.” (OMCzCR 1993)

The evaluation of potential is further elaborated Section 1.3 of the Standards and Guidelines for Consultant Archaeologist (2011) prepared by the Ontario Ministry of Tourism and Culture:

“ The Stage 1 background study (and, where undertaken, property inspection) leads to an evaluation of the property’s archaeological potential. If the evaluation indicates that there is archaeological potential anywhere on the property, the next step is a Stage 2 assessment. ”
(MTC 2011: 17)

Features or characteristics that indicate archaeological potential when documented within the study area, or within close proximity to the study area (as applicable), include:

- “ - *previously identified archaeological sites*
 - *water sources (It is important to distinguish types of water and shoreline, and to distinguish natural from artificial water sources, as these features affect site locations and types to varying degrees.):*
 - *primary water sources (lakes, rivers, streams, creeks)*
 - *secondary water sources (intermittent streams and creeks, springs, marshes, swamps)*
 - *features indicating past water sources (e.g., glacial lake shorelines indicated by the presence of raised sand or gravel beach ridges, relic river or stream channels indicated by clear dip or swale in the topography, shorelines of drained lakes or marshes, cobble beaches)*
 - *accessible or inaccessible shoreline (e.g., high bluffs, swamp or marsh fields by the edge of a lake, sandbars stretching into marsh)*
 - *elevated topography (e.g., eskers, drumlins, large knolls, plateaux)*
 - *pockets of well-drained sandy soil, especially near areas of heavy soil or rocky ground*
 - *distinctive land formations that might have been special or spiritual places, such as waterfalls, rock outcrops, caverns, mounds, and promontories and their bases. There may be physical indicators of their use, such as burials, structures, offerings, rock paintings or carvings.*
 - *resource areas, including:*
 - *food or medicinal plants (e.g., migratory routes, spawning areas, prairie)*
 - *scarce raw materials (e.g., quartz, copper, ochre or outcrops of chert)*
 - *early Euro-Canadian industry (e.g., fur trade, logging, prospecting, mining)*
 - *areas of early Euro-Canadian settlement. These include places of early military or pioneer settlement (e.g., pioneer homesteads, isolated cabins, farmstead complexes), early wharf or dock complexes, pioneer churches and early cemeteries. There may be commemorative markers of their history, such as local, provincial, or federal monuments or heritage parks.*
 - *Early historical transportation routes (e.g., trails, passes, roads, railways, portage routes)*
 - *property listed on a municipal register or designated under the Ontario Heritage Act that is a federal, provincial or municipal historic landmark or site*

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- *property that local histories or informants have identified with possible archaeological sites, historical events, activities, or occupations”*
(MTC 2011: 17-18)

The evaluation of potential does not indicate that sites are present within areas affected by proposed development. Evaluation of potential considers the possibility for as yet undocumented sites to be found in areas that have not been subject to systematic archaeological investigation in the past. Potential for archaeological resources is used to determine if property assessment of a study area or portions of a study area is required.

“Archaeological resources not previously documented may also be present in the affected area. If the alternative areas being considered, or the preferred alternative selected, exhibit either high or medium potential for the discovery of archaeological remains an archaeological assessment will be required.”

(MCC & MOE 1992: 6-7)

“The Stage 1 background study (and, where undertaken, property inspection) leads to an evaluation of the property’s archaeological potential. If the evaluation indicates that there is archaeological potential anywhere on the property, the next step is a Stage 2 assessment.”

(MTC 2011: 17)

In addition, archaeological sites data is also used to determine if any archaeological resources had been formerly documented within or in close proximity to the study area and if these same resources might be subject to impacts from the proposed undertaking. This data was also collected in order to establish the relative significance of any resources that might be encountered during the conduct of the present study. For example, the relative rarity of a site can be used to assign an elevated level of significance to a site that is atypical for the immediate vicinity. The requisite archaeological sites data of previously registered archaeological sites was collected from the Programs and Services Branch, Culture Programs Unit, MTCS and the corporate research library of AMICK Consultants Limited. The Stage 1 Background Research methodology also includes a review of the most detailed available topographic maps, historical settlement maps, archaeological management plans (where applicable) and commemorative plaques or monuments. When previous archaeological research documents lands to be impacted by the proposed undertaking or archaeological sites within 50 metres of the study area, the reports documenting this earlier work are reviewed for pertinent information. AMICK Consultants Limited will often modify this basic methodology based on professional judgment to include additional research (such as, local historical works or documents and knowledgeable informants).

5.2.1 CURRENT CONDITIONS

The present use of the study area is approximately 6 kilometres of road and road allowance along the north and south side of Oxford County Road 16 (Road 84) between 31 Line and

2015 Stage 1 Archaeological Assessment of Oxford County Road 16 (Road 84) from Kintore to 31st Line, Part of Lot 15-16, Concession 11-15 (Geographic Township of East Zorra, County of Oxford), Town of Kintore, Oxford County (AMICK File #15798/MTCS File #P1024-0088-2015)

roughly 200 metres east of 19th Line (Road 119). The study area consists of the asphalt of Country Road 16, and to the north and south of Oxford County Road 16, gravel, gravel driveways associated with structures, intersecting roads, grassy areas and ditches. The study area is bounded on the north and south by farmland, intersecting road and driveways. A plan of the study area is included within this report as Figure 3. Current conditions encountered during the Stage 1 Property Inspection are illustrated in Figures 4 & 5.

5.2.2 GENERAL HISTORICAL OUTLINE

In 1788, the Hesse District was established within Upper Canada covering the territory of what is today southwestern Ontario. Four years later it became the Western District with the establishment of Norfolk County that included the territory of present-day Oxford County. In 1793, Abraham Canfield a United Empire Loyalist from Connecticut settled in the "Township of Oxford on the Thames". In 1798, these lands were included into a new London District. The Brock District, containing the Oxford County territory, was then split off from the London District in 1840, after Upper Canada had been replaced by the Canada West portion of the Province of Canada governance. (Wikipedia.org)

Legislation passed in 1878 redefined the boundaries of three counties, Oxford, Middlesex, and Norfolk to form the new District of London. A District had its own Court of Quarter Sessions, which was established, in the Courthouse in Vittoria near the Loyalist settlements along Lake Erie. At this time there were 1,200 people in the District, only 200 of whom were resident in Oxford. The lands that would eventually become the Nissouris were still designated as Indian lands. Modest growth slowed even further after 1800 as the government sold large tracts of land to speculators, such as Robert Hamilton of Niagara who owned 6,000 acres in Oxford in addition to many other holdings. These absentee businessmen were content to simply wait until their holdings increased in value due to the efforts of other. Extensive lands were also set aside as school and clergy reserves. Blandford Township was entirely locked up in this way. As a result of these machinations, whereby land was simply held in expectation of future profit, large areas of Upper Canada remained dormant for decades. Nissouri's designation as Indian Land actually kept it, largely, out of the hands of the spectators. Nissouri was partially surveyed in 1811 but work was delayed by the War of 1812 and not resumed until 1819- 20 when the survey was completed by Shubal Park, the Deputy Surveyor of Ontario. The newly surveyed township extended thirteen and a half miles north to south, from the Perth Line to the Governor's Road, and eleven and thirteen sixteenths miles west to east from London Township to Zorra. Nissouri Township was first assessed, separately from Oxford County, in 1821, and the first land grants were made, to 38 veterans of the War of 1812 (History of Zorra).

Figure 2 is a facsimile segment of the Township of East Nissouri map reproduced from The Illustrated Historical Atlas of the County of Oxford (Walker & Miles 1877). Figure 2 illustrates the location of the study area and environs as of 1877. The historic settlement of Kintore is directly to the west of the study area. The present Oxford County Road 16 (Road 84) corresponds to the road illustrated on the Historic Atlas (see figure 2). Although the lots to the north and south of the Early Settlement Road are listed, there are no structures depicted

other than a mill owned by John Marshall on Lot 16. A tributary of the Nissouri Creek is depicted in the atlas crossing the study area.

It must be borne in mind that inclusion of names of property owners and depictions of structures within properties on these maps were sold by subscription. While information included within these maps may provide information about occupation of the property at a specific point in time, the absence of such information does not indicate that the property was not occupied.

5.2.3 SUMMARY OF HISTORICAL CONTEXT

The brief overview of documentary evidence readily available indicates that the study area is situated within an area that was close to the historic transportation routes and in an area well populated during the nineteenth century and as such has potential for sites relating to early Euro-Canadian settlement in the region. Background research indicates the property has potential for significant archaeological resources of Native origins based on proximity to a natural source of potable water in the past.

5.3 ARCHAEOLOGICAL CONTEXT

The Archaeological Sites Database administered by the Ministry of Tourism, Culture and Sport (MTCS) indicates that there is no (0) previously documented sites within 1 kilometre of the study area. However, it must be noted that this is based on the assumption of the accuracy of information compiled from numerous researchers using different methodologies over many years. AMICK Consultants Limited assumes no responsibility for the accuracy of site descriptions, interpretations such as cultural affiliation, or location information derived from the Archaeological Sites Database administered by MTCS. In addition, it must also be noted that a lack of formerly documented sites does not indicate that there are no sites present as the documentation of any archaeological site is contingent upon prior research having been conducted within the study area.

On the basis of information supplied by MTCS, no archaeological assessments have been conducted within 50 metres of the study area. AMICK Consultants Limited assumes no responsibility for the accuracy of previous assessments, interpretations such as cultural affiliation, or location information derived from the Archaeological Sites Database administered by MTCS. In addition, it must also be noted that the lack of formerly documented previous assessments does not indicate that no assessments have been conducted.

5.3.1 FIRST NATIONS REGISTERED SITES

A summary of registered and/or known archaeological sites within a 1-kilometre radius of the study area was gathered from the Archaeological Sites Database, administered by MTCS. As a result it was determined that no (0) archaeological sites relating directly to First Nations habitation/activity had been formally registered within the immediate vicinity of the study area. However, the lack of formally documented archaeological sites does not mean that First Nations people did not use the area; it more likely reflects a lack of systematic archaeological research in the immediate vicinity.

The distance to water criteria used to establish potential for archaeological sites suggests potential for First Nations occupation and land use in the area in the past. This consideration establishes archaeological potential within the study area.

Table 1 illustrates the chronological development of cultures within southern Ontario prior to the arrival of European cultures to the area at the beginning of the 17th century. This general cultural outline is based on archaeological data and represents a synthesis and summary of research over a long period of time. It is necessarily generalizing and is not necessarily representative of the point of view of all researchers or stakeholders. It is offered here as a rough guideline and outline to illustrate the relationships of broad cultural groups and time periods.

5.3.2 EURO-CANADIAN REGISTERED SITES

A summary of registered and/or known archaeological sites within a 1-kilometre radius of the study area was gathered from the Archaeological Sites Database, administered by MTCS. As a result it was determined that no (0) archaeological sites relating directly to Euro-Canadian habitation/activity had been formally registered within the immediate vicinity of the study area.

TABLE 1 CULTURAL CHRONOLOGY FOR SOUTH-CENTRAL ONTARIO

Years ago	Period	Southern Ontario
250	Terminal Woodland	Ontario Iroquois and St. Lawrence Iroquois Cultures
1000 2000	Initial Woodland	Princess Point Culture Saugeen-Point Peninsula-Meadowood Cultures
3000 4000 5000	Archaic	Laurentian

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6000		Culture
7000	Palaeo-Indian	Plano Culture
8000		
9000		Clovis Culture
10000		
11000		(Wright 1972)

5.3.3 LOCATION AND CURRENT CONDITIONS

The study area is described as Oxford County Road 16 (Road 84) from Kintore to 31st Line, Part of Lot 15-16, Concession 11-15 (Geographic Township of East Zorra, County of Oxford), Town of Kintore, Oxford County. This assessment was undertaken as a requirement under the Planning Act (RSO 1990b) in order to support a Draft Plan of Subdivision application and companion Zoning By-law Amendment application as part of the pre-submission process. The present use of the study area is approximately 6 kilometres of road and road allowance along the north and south side of Oxford County Road 16 (Road 84) between 31 Line and roughly 200 metres east of 19th Line (Road 119). The study area consists of the asphalt of Country Road 16, and to the north and south of Oxford County Road 16, gravel, gravel driveways associated with structures, intersecting roads, grassy areas and ditches. The study area is bounded on the north and south by farmland, intersecting roads and driveways. A plan of the study area is included within this report as Figure 3. Current conditions encountered during the Stage 1 Property Inspection are illustrated in Figures 4 & 5.

5.3.4 PHYSIOGRAPHIC REGION

The Oxford till plain occupies a central position adjacent to the Stratford till plain in the peninsula of southwestern Ontario covering about 600 square miles, or 385,000 acres, mostly in Oxford County. An upland surface ranging from 1,000 to 1,200 feet a.s.l., it is crossed by three well-marked valleys cut by glacial melt water streams. The surface is drumlinized. The till is a pale brown, calcareous loam in which Middle Devonian limestone is the dominant material, although grey or pale brown dolostone is also abundant (Chapman and Putnam 1984: 143-144).

5.3.5 SURFACE WATER

Sources of potable water, access to waterborne transportation routes, and resources associated with watersheds are each considered, both individually and collectively to be the highest criteria for determination of the potential of any location to support extended human activity, land use, or occupation. Accordingly, proximity to water is regarded as the primary indicator of archaeological site potential. The Standards and Guidelines for Consultant

Archaeologists stipulates that undisturbed lands within 300 metres of a water source are considered to have archaeological potential (MTC 2011: 21).

Tributaries of Nissouri Creek cross Oxford Road 16 (Road 84), which corresponds, to the tributary illustrated in the Historic Atlas (see figure 2).

5.3.6 CURRENT PROPERTY CONDITIONS CONTEXT

Current characteristics encountered within an archaeological research study area determine if property Assessment of specific portions of the study area will be necessary and in what manner a Stage 2 Property Assessment should be conducted, if necessary. Conventional assessment methodologies include pedestrian survey on ploughable lands and test pit methodology within areas that cannot be ploughed. For the purpose of determining where property Assessment is necessary and feasible, general categories of current landscape conditions have been established as archaeological conventions. These include:

5.3.6.1 BUILDINGS AND STRUCTURAL FOOTPRINTS

A building, in archaeological terms, is a structure that exists currently or has existed in the past in a given location. The footprint of a building is the area of the building formed by the perimeter of the foundation. Although the interior area of building foundations would often be subject to property Assessment when the foundation may represent a potentially significant historic archaeological site, the footprints of existing structures are not typically assessed. Existing structures commonly encountered during archaeological assessments are often residential-associated buildings (houses, garages, sheds), and/or component buildings of farm complexes (barns, silos, greenhouses). In many cases, even though the disturbance to the land may be relatively shallow and archaeological resources may be situated below the disturbed layer (e.g. a concrete garage pad), there is no practical means of assessing the area beneath the disturbed layer. However, if there were evidence to suggest that there are likely archaeological resources situated beneath the disturbance, alternative methodologies may be recommended to study such areas.

The study area contains no buildings or structural footprints.

5.3.6.2 DISTURBANCE

Areas that have been subjected to extensive and deep land alteration that has severely damaged the integrity of archaeological resources are known as land disturbances. Examples of land disturbances are areas of “past quarrying, major landscaping, recent built and industrial uses, sewage and infrastructure development, etc.” (MCL 2005: 15), as well as driveways made of gravel or asphalt or concrete, in-ground pools, and wells or cisterns. Surfaces paved with interlocking brick, concrete, asphalt, gravel and other surfaces meant to support heavy loads or to be long wearing hard surfaces in high traffic areas, must be prepared by the excavation and removal of topsoil, grading, and the addition of aggregate material to ensure appropriate engineering values for the supporting matrix and also to ensure

that the installations shed water to avoid flooding or moisture damage. All hard surfaced areas are prepared in this fashion and therefore have no or low archaeological potential. Major utility lines are conduits that provide services such as water, natural gas, hydro, communications, sewage, and others. These major installations should not be confused with minor below ground service installations not considered to represent significant disturbances removing archaeological potential, such as services leading to individual structures which tend to be comparatively very shallow and vary narrow corridors. Areas containing substantial and deeply buried services or clusters of below ground utilities are considered areas of disturbance, and may be excluded from Stage 2 Property Assessment. Disturbed areas are excluded from Stage 2 Property Assessment due to no or low archaeological potential and often because they are also not viable to assess using conventional methodology.

*“Earthwork is one of the major works involved in road construction. This process includes excavation, material removal, filling, compaction, and construction. Moisture content is controlled, and compaction is done according to standard design procedures. Normally, rock explosion at the road bed is not encouraged. While filling a depression to reach the road level, **the original bed is flattened after the removal of the topsoil.** The fill layer is distributed and compacted to the designed specifications. This procedure is repeated until the compaction desired is reached. **The fill material should not contain organic elements, and possess a low index of plasticity.** Fill material can include gravel and decomposed rocks of a particular size, but should not consist of huge clay lumps. Sand clay can be used. The area is considered to be adequately compacted when the roller movement does not create a noticeable deformation. **The road surface finish is reliant on the economic aspects, and the estimated usage.**” [Emphasis Added]*

(Goel 2013)

The supporting matrix of a hard paved surface cannot contain organic material, which is subject to significant compression, decay and moisture retention. Topsoil has no engineering value and must be removed in any construction application where the surface finish at grade requires underlying support.

Installation of sewer lines and other below ground services associated with infrastructure development often involves deep excavation that can remove archaeological potential. This consideration does not apply to relatively minor below ground services that connect structures and facilities to services that support their operation and use. Major servicing corridors will be situated within adjacent road allowances with only minor, narrow and relatively shallow underground services entering into the study area to connect existing structures to servicing mainlines. The relatively minor, narrow and shallow services buried within a residential property do not require such extensive ground disturbance to remove or minimize archaeological potential within affected areas.

The study area contains previous disturbances. Oxford Road 16 and the intersecting roads constitute a major disturbance. Gravel driveways enter off the road.

5.3.6.3 LOW-LYING AND WET AREAS

Landscape features that are covered by permanently wet areas, such as marshes, swamps, or bodies of water like streams or lakes, are known as low-lying and wet areas. Low-lying and wet areas are excluded from Stage 2 Property Assessment due to inaccessibility.

The study area does not contain low-lying and wet areas.

5.3.6.4 STEEP SLOPE

Landscape which slopes at a greater than (>) 20 degree change in elevation, is known as steep slope. Areas of steep slope are considered uninhabitable, and are excluded from Stage 2 Property Assessment.

Although some portions of the study area that were subject to test pit survey may qualify as steep slope under the Standards and Guideline for Consultant Archaeologists (MTC 2011), AMICK Consultants Limited corporate policy is that slopes are to be test pit surveyed on any occasion where it is safe to do so. This exceeds the requirements of the Standards and Guidelines and offers greater surety of total coverage of viable assessment areas. Slopes are not assessed because steep slopes are interpreted to have low potential, not due to viability to assess, except in cases where the slope is severe enough to become a safety concern for archaeological field crews. In such cases, the Occupational Health and Safety Act takes precedence as indicated in the introduction to the Standards and Guidelines. Assessment of slopes, except where safety concerns arise, eliminates the invariably subjective interpretation of photographs that generates disputes between reviewers and consultant archaeologists. This is done to minimize delays due to conflicts in such interpretations and to increase the efficiency of review.

The study area does not contain areas of steep slope.

5.3.6.5 WOODED AREAS

Areas of the property that cannot be ploughed, such as natural forest or woodlot, are known as wooded areas. These wooded areas qualify for Stage 2 Property Assessment, and are required to be assessed using test pit survey methodology.

The study area does not contain any wooded areas.

5.3.6.6 PLOUGHABLE AGRICULTURAL LANDS

Areas of current or former agricultural lands that have been ploughed in the past are considered ploughable agricultural lands. Ploughing these lands regularly moves the soil around, which brings covered artifacts to the surface, easily identifiable during visual inspection. Furthermore, by allowing the ploughed area to weather sufficiently through

rainfall washing soil off any artifacts, the visibility of artifacts at the surface of recently worked field areas increases significantly. Pedestrian survey of ploughed agricultural lands is the preferred method of property Assessment because of the greater potential for finding evidence of archaeological resources if present.

The study area does not contain any ploughable lands.

5.3.6.7 LAWN, PASTURE, MEADOW

Landscape features consisting of former agricultural land covered in low growth, such as lawns, pastures, meadows, shrubbery, and immature trees. These are areas that may be considered too small to warrant ploughing, (i.e. less than one hectare in area), such as yard areas surrounding existing structures, and land-locked open areas that are technically workable by a plough but inaccessible to agricultural machinery. These areas may also include open area within urban contexts that do not allow agricultural tillage within municipal or city limits or the use of urban roadways by agricultural machinery. These areas are required to be assessed using test pit survey methodology.

The study area does not contain any areas of lawn associated with the road allowance.

5.3.7 SUMMARY

Background research indicates the vicinity of the study area has potential for archaeological resources of Native origins based on proximity to a source of potable water in the past. Background research also suggests potential for archaeological resources of Euro-Canadian origins based on proximity to a historic roadway and documented historic settlement.

Current conditions within the study area indicate that some areas of the property may have no or low archaeological potential and do not require Stage 2 Property Assessment or should be excluded from Stage 2 Property Assessment. A significant proportion of the study area does exhibit archaeological potential and therefore a Stage 2 Property Assessment is required.

Archaeological potential does not indicate that there are necessarily sites present, but that environmental and historical factors suggest that there may be as yet undocumented archaeological sites within lands that have not been subject to systematic archaeological research in the past.

6.0 ANALYSIS AND CONCLUSIONS

AMICK Consultants Limited was engaged by the proponent to undertake a Stage 1 Archaeological Assessment of lands potentially affected by the proposed undertaking and was granted permission to carry out archaeological fieldwork. The entirety of the study area was subject to property inspection and photographic documentation. All records, documentation, field notes, photographs and artifacts (as applicable) related to the conduct

and findings of these investigations are held at the Lakelands District corporate offices of AMICK Consultants Limited until such time that they can be transferred to an agency or institution approved by the Ontario Ministry of Tourism, Culture and Sport (MTCS) on behalf of the government and citizens of Ontario.

Section 7.7.3 of the Standards and Guidelines for Consultant Archaeologists (MTC 2011: 132) outlines the requirements of the Analysis and Conclusions component of a Stage 1 Background Study.

- 1) *“Identify and describe areas of archaeological potential within the project area.*
- 2) *Identify and describe areas that have been subject to extensive and deep land alterations. Describe the nature of alterations (e.g., development or other activity) that have severely damaged the integrity of archaeological resources and have removed archaeological potential.”*

6.1 CHARACTERISTICS INDICATING ARCHAEOLOGICAL POTENTIAL

Section 1.3.1 of the Standards and Guidelines for Consultant Archaeologists specifies the property characteristics that indicate archaeological potential (MTC 2011: 17-18). Factors that indicate archaeological potential are features of the local landscape and environment that may have attracted people to either occupy the land or to conduct activities within the study area. One or more of these characteristics found to apply to a study area would necessitate a Stage 2 Property Assessment to determine if archaeological resources are present. These characteristics are listed below together with considerations derived from the conduct of this study.

- 1) *Previously Identified Archaeological Sites*
Previously registered archaeological sites have not been documented within 300 metres of the study area.
- 2) *Water Sources*
Primary water sources are described as including lakes, rivers streams and creeks. Close proximity to primary water sources (300 metres) indicates that people had access to readily available sources of potable water and routes of waterborne trade and communication should the study area have been used or occupied in the past.

There are no identified primary water sources within 300 metres of the study area.

Secondary water sources are described as including intermittent streams and creeks, springs, marshes, and swamps. Close proximity (300 metres) to secondary water sources indicates that people had access to readily available sources of potable water, at least on a seasonal basis, and in some cases seasonal access to routes of waterborne trade and communication should the study area have been used or occupied in the past.

Tributaries of Nissouri Creek cross the study area.

3) *Features Indicating Past Water Sources*

Features indicating past water resources are described as including glacial lake shorelines indicated by the presence of raised sand or gravel beach ridges, relic river or stream channels indicated by clear dip or swale in the topography, shorelines of drained lakes or marshes, and cobble beaches. Close proximity (300 metres) to features indicating past water sources indicates that people had access to readily available sources of potable water, at least on a seasonal basis, and in some cases seasonal access to routes of waterborne trade and communication should the study area have been used or occupied in the past.

There are no identified features indicating past water sources within 300 metres of the study area.

4) *Accessible or Inaccessible Shoreline*

This form of landscape feature would include high bluffs, swamp or marsh fields by the edge of a lake, sandbars stretching into marsh, etc.

There are no shorelines within 300 metres of the study area.

Elevated Topography

Features of elevated topography that indicate archaeological potential include eskers, drumlins, large knolls, and plateaux.

There are no identified features of elevated topography within the study area.

5) *Pockets of Well-drained Sandy Soil*

Pockets of sandy soil are considered to be especially important near areas of heavy soil or rocky ground.

Not applicable.

6) *Distinctive Land Formations*

These are landscape features that might have been special or spiritual places, such as waterfalls, rock outcrops, caverns, mounds, and promontories and their bases. There may be physical indicators of their use, such as burials, structures, offerings, rock paintings or carvings.

There are no identified distinctive land formations within the study area.

7) *Resource Areas*

Resource areas that indicate archaeological potential include food or medicinal plants (e.g., migratory routes, spawning areas, and prairie), scarce raw materials (e.g.,

quartz, copper, ochre or outcrops of chert) and resources of importance to early Euro-Canadian industry (e.g., logging, prospecting, and mining).

There are no identified resource areas within the study area.

8) Areas of Early Euro-Canadian Settlement

These include places of early military or pioneer settlement (e.g., pioneer homesteads, isolated cabins, and farmstead complexes), early wharf or dock complexes, pioneer churches and early cemeteries. There may be commemorative markers of their history, such as local, provincial, or federal monuments or heritage parks.

The study area is situated in close proximity to a historic settlement of Kintore identified on the historic atlas map.

9) Early Historical Transportation Routes

This includes evidence of trails, passes, roads, railways, portage routes.

The study area is the early settlement road that appears on the Historic Atlas Map of 1877, now known as Oxford County Road 16 (Road 84). Tributaries of the Nissouri Creek cross the study area.

10) Heritage Property

Property listed on a municipal register or designated under the *Ontario Heritage Act* or is a federal, provincial or municipal historic landmark or site.

There are no listed or designated heritage buildings or properties that form a part of the study area. There are no listed or designated heritage buildings or properties that are adjacent to the study area.

11) Documented Historical or Archaeological Sites

This includes property that local histories or informants have identified with possible archaeological sites, historical events, activities, or occupations. These are properties which have not necessarily been formally recognized or for which there is additional evidence identifying possible archaeological resources associated with historic properties in addition to the rationale for formal recognition.

There are no known heritage features, or known historic sites, or known archaeological sites within the study area in addition to those formally documented with the appropriate agencies or previously noted under a different criterion.

6.2 CHARACTERISTICS INDICATING REMOVAL OF ARCHAEOLOGICAL POTENTIAL

Section 1.3.2 of the Standards and Guidelines for Consultant Archaeologists specifies the property characteristics which indicate no archaeological potential or for which

archaeological potential has been removed (MTC 2011: 18-19). These characteristics are listed below together with considerations derived from the conduct of this study.

The introduction of Section 1.3.2 (MTC 2011: 18) notes that “*Archaeological potential can be determined not to be present for either the entire property or a part(s) of it when the area under consideration has been subject to extensive and deep land alterations that have severely damaged the integrity of any archaeological resources. This is commonly referred to as ‘disturbed’ or ‘disturbance’, and may include:’*”

1) Quarrying

There is no evidence to suggest that quarrying operations were ever carried out within the study area.

2) Major Landscaping Involving Grading Below Topsoil

Unless there is evidence to suggest the presence of buried archaeological deposits, such deeply disturbed areas are considered to have lost their archaeological potential. Properties that do not have a long history of Euro-Canadian occupation can have archaeological potential removed through extensive landscape alterations that penetrate below the topsoil layer. This is because most archaeological sites originate at grade with relatively shallow associated excavations into the soil. First Nations sites and early historic sites are vulnerable to extensive damage and complete removal due to landscape modification activities. In urban contexts where a lengthy history of occupation has occurred, properties may have deeply buried archaeological deposits covered over and sealed through redevelopment activities that do not include the deep excavation of the entire property for subsequent uses. Buildings are often erected directly over older foundations preserving archaeological deposits associated with the earlier occupation.

There is evidence to suggest that major landscaping operations involving grading below topsoil were carried out within the study area. Surfaces paved with interlocking brick, concrete, asphalt, gravel and other surfaces meant to support heavy loads or to be long wearing hard surfaces in high traffic areas, must be prepared by the excavation and removal of topsoil, grading, and the addition of aggregate material to ensure appropriate engineering values for the supporting matrix and also to ensure that the installations shed water to avoid flooding or moisture damage. All hard surfaced areas are prepared in this fashion and therefore have no or low archaeological potential. Oxford County Road is in such a disturbed area and has no or low archaeological potential and often because they are also not viable to assess using conventional methodology.

3) Building Footprints

Typically, the construction of buildings involves the deep excavation of foundations, footings and cellars that often obliterate archaeological deposits situated close to the surface.

There are no buildings within the study area.

4) *Sewage and Infrastructure Development*

Installation of sewer lines and other below ground services associated with infrastructure development often involves deep excavation that can remove archaeological potential.

There is no evidence to suggest that substantial below ground services of any kind have resulted in significant impacts to any significant portion of the study area. Major utility lines are conduits that provide services such as water, natural gas, hydro, communications, sewage, and others. These major installations should not be confused with minor below ground service installations not considered to represent significant disturbances removing archaeological potential, such as services leading to individual structures which tend to be comparatively very shallow and vary narrow corridors. Areas containing substantial and deeply buried services or clusters of below ground utilities are considered areas of disturbance, and may be excluded from Stage 2 Property Assessment.

“Activities such as agricultural cultivation, gardening, minor grading and landscaping do not necessarily affect archaeological potential.”

(MTC 2011: 18)

“Archaeological potential is not removed where there is documented potential for deeply buried intact archaeological resources beneath land alterations, or where it cannot be clearly demonstrated through background research and property inspection that there has been complete and intensive disturbance of an area. Where complete disturbance cannot be demonstrated in Stage 1, it will be necessary to undertake Stage 2 assessment.”

(MTC 2011: 18)

Table 2 below summarizes the evaluation criteria of the Ministry of Tourism and Culture together with the results of the Stage 1 Background Study for the proposed undertaking. Based on the criteria, the property is deemed to have archaeological potential on the basis of proximity to water, proximity to the historic settlement of Kintore and historic structures, and the location of early historic settlement roads adjacent to the study area.

**2015 Stage 1 Archaeological Assessment of Oxford County Road 16 (Road 84) from Kintore to 31st Line,
Part of Lot 15-16, Concession 11-15 (Geographic Township of East Zorra, County of Oxford), Town of
Kintore, Oxford County (AMICK File #15798/MTCS File #P1024-0088-2015)**

Table 2 Evaluation of Archaeological Potential

FEATURE OF ARCHAEOLOGICAL POTENTIAL		YES	NO	N/A	COMMENT
1	Known archaeological sites within 300m		N		If Yes, potential determined
PHYSICAL FEATURES					
2	Is there water on or near the property?	Y			If Yes, what kind of water?
2a	Primary water source within 300 m. (lakeshore, river, large creek, etc.)		N		If Yes, potential determined
2b	Secondary water source within 300 m. (stream, spring, marsh, swamp, etc.)	Y			If Yes, potential determined
2c	Past water source within 300 m. (beach ridge, river bed, relic creek, etc.)		N		If Yes, potential determined
2d	Accessible or Inaccessible shoreline within 300 m. (high bluffs, marsh, swamp, sand bar, etc.)		N		If Yes, potential determined
3	Elevated topography (knolls, drumlins, eskers, plateaus, etc.)		N		If Yes, and Yes for any of 4-9, potential determined
4	Pockets of sandy soil in a clay or rocky area		N		If Yes and Yes for any of 3, 5-9, potential determined
5	Distinctive land formations (mounds, caverns, waterfalls, peninsulas, etc.)		N		If Yes and Yes for any of 3-4, 6-9, potential determined
HISTORIC/PREHISTORIC USE FEATURES					
6	Associated with food or scarce resource harvest areas (traditional fishing locations, agricultural/berry extraction areas, etc.)		N		If Yes, and Yes for any of 3-5, 7-9, potential determined.
7	Early Euro-Canadian settlement area within 300 m.	Y			If Yes, and Yes for any of 3-6, 8-9, potential determined
8	Historic Transportation route within 100 m. (historic road, trail, portage, rail corridors, etc.)	Y			If Yes, and Yes for any 3-7 or 9, potential determined
9	Contains property designated and/or listed under the Ontario Heritage Act (municipal heritage committee, municipal register, etc.)				If Yes and, Yes to any of 3-8, potential determined
APPLICATION-SPECIFIC INFORMATION					
10	Local knowledge (local heritage organizations, First Nations, etc.)		N		If Yes, potential determined
11	Recent disturbance not including agricultural cultivation (post-1960-confirmed extensive and intensive including industrial sites, aggregate areas, etc.)		N		If Yes, no potential or low potential in affected part (s) of the study area.

If **YES** to any of 1, 2a-c, or 10 Archaeological Potential is **confirmed**

If **YES** to 2 or more of 3-9, Archaeological Potential is **confirmed**

If **YES** to 11 or No to 1-10 Low Archaeological Potential is **confirmed** for at least a portion of the study area.

6.3 STAGE 1 ANALYSIS AND CONCLUSIONS

As a result of the Stage 1 portion of the study it was determined that the study area has archaeological potential on the basis of proximity to water, proximity to historic settlement structures, the historic settlement of Kintore, and the location of early historic settlement roads adjacent to the study area. The grassy road allowance is to be test pit assessed at a 5 metre interval between test pits. The ditches within the grass are shallow potential is not necessarily removed. In addition, they are less than 5 metres in width and can be incorporated into the five metre grid. While the paved surface of Oxford Road 16 (Road 84) and associated gravel are not viable to assess, the interesting roads situated within the road allowance are generally less than 5 metres and can be incorporated within a 5 metre test pit grid.

7.0 RECOMMENDATIONS

7.1 STAGE 1 RECOMMENDATIONS

Under Section 7.7.4 of the Standards and Guidelines for Consultant Archaeologists (MTC 2011: 133) the recommendations to be made as a result of a Stage 1 Background Study are described.

- 1) *Make recommendations regarding the potential for the property, as follows:
 - a. if some or all of the property has archaeological potential, identify areas recommended for further assessment (Stage 2) and areas not recommended for further assessment. Any exemptions from further assessment must be consistent with the archaeological fieldwork standards and guidelines.
 - b. if no part of the property has archaeological potential, recommend that the property does not require further archaeological assessment.*
- 2) *Recommend appropriate Stage 2 assessment strategies.*

The study area has been identified as an area of archaeological potential.

8.0 ADVICE ON COMPLIANCE WITH LEGISLATION

While not part of the archaeological record, this report must include the following standard advisory statements for the benefit of the proponent and the approval authority in the land use planning and development process:

- a. This report is submitted to the Minister of Tourism and Culture as a condition of licensing in accordance with Part VI of the Ontario Heritage Act, R.S.O. 1990, c. 0.18. The report is reviewed to ensure that it complies with the standards and guidelines issued by the Minister, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Tourism and Culture, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.*
- b. It is an offence under Sections 48 and 69 of the Ontario Heritage Act for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed archaeological fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeological Reports referred to in Section 65.1 of the Ontario Heritage Act.*
- c. Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the Ontario Heritage Act. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed archaeologist to carry out archaeological fieldwork, in compliance with sec. 48 (1) of the Ontario Heritage Act.*
- d. The Cemeteries Act, R.S.O. 1990, c. C.4 and the Funeral, Burial and Cremation Services Act, 2002, S.O. 2002, c.33 (when proclaimed in force) require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services.*
- e. Archaeological sites recommended for further archaeological fieldwork or protection remain subject to Section 48 (1) of the Ontario Heritage Act and may not be altered, or have artifacts removed from them, except by a person holding an archaeological licence.*

2015 Stage 1 Archaeological Assessment of Oxford County Road 16 (Road 84) from Kintore to 31st Line, Part of Lot 15-16, Concession 11-15 (Geographic Township of East Zorra, County of Oxford), Town of Kintore, Oxford County (AMICK File #15798/MTCS File #P1024-0088-2015)

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10.0 MAPS



FIGURE 1 LOCATION OF THE STUDY AREA (GOOGLE MAPS 2012)

2015 Stage 1 Archaeological Assessment of Oxford County Road 16 (Road 84) from Kintore to 31st Line, Part of Lot 15-16, Concession 11-15 (Geographic Township of East Zorra, County of Oxford), Town of Kintore, Oxford County (AMICK File #15798/MTCS File #P1024-0088-2015)

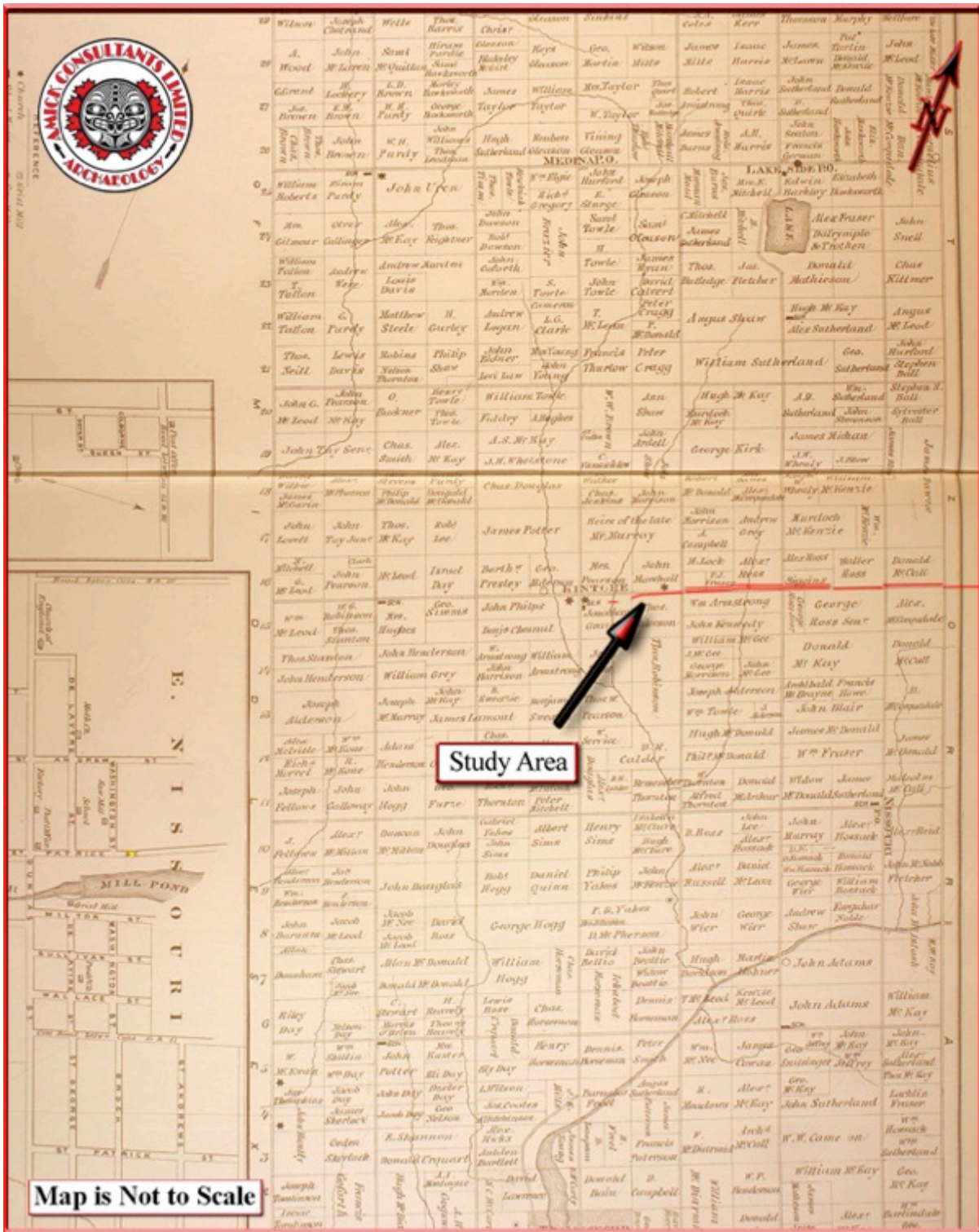


FIGURE 2 FACSIMILE SEGMENT OF THE HISTORIC ATLAS MAP OF THE TOWNSHIP OF EAST NISSOURI (WALKER & MILES 1881)

2015 Stage 1 Archaeological Assessment of Oxford County Road 16 (Road 84) from Kintore to 31st Line, Part of Lot 15-16, Concession 11-15 (Geographic Township of East Zorra, County of Oxford), Town of Kintore, Oxford County (AMICK File #15798/MTCS File #P1024-0088-2015)



FIGURE 3A PLAN OF COUNTY ROAD 16

2015 Stage 1 Archaeological Assessment of Oxford County Road 16 (Road 84) from Kintore to 31st Line, Part of Lot 15-16, Concession 11-15 (Geographic Township of East Zorra, County of Oxford), Town of Kintore, Oxford County (AMICK File #15798/MTCS File #P1024-0088-2015)

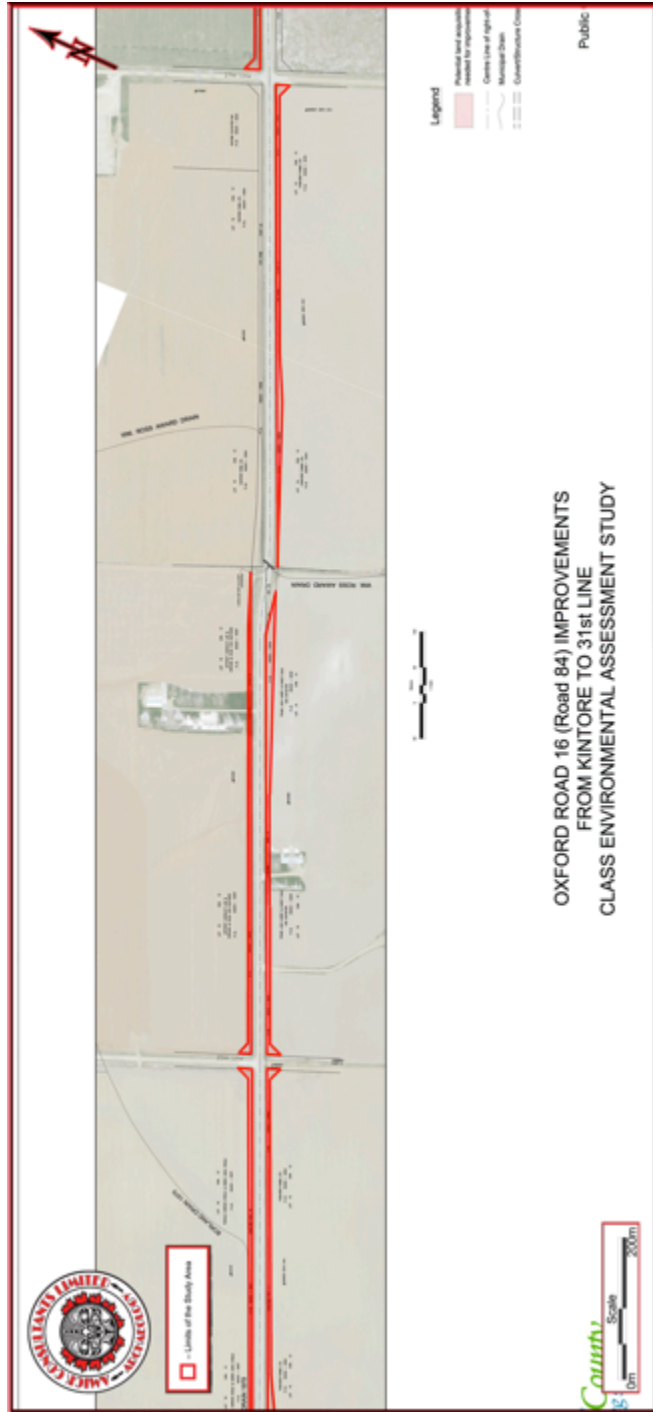


FIGURE 3B PLAN OF COUNTY ROAD 16

2015 Stage 1 Archaeological Assessment of Oxford County Road 16 (Road 84) from Kintore to 31st Line, Part of Lot 15-16, Concession 11-15 (Geographic Township of East Zorra, County of Oxford), Town of Kintore, Oxford County (AMICK File #15798/MTCS File #P1024-0088-2015)



FIGURE 3C PLAN OF COUNTY ROAD 16

2015 Stage 1 Archaeological Assessment of Oxford County Road 16 (Road 84) from Kintore to 31st Line, Part of Lot 15-16, Concession 11-15 (Geographic Township of East Zorra, County of Oxford), Town of Kintore, Oxford County (AMICK File #15798/MTCS File #P1024-0088-2015)



FIGURE 4A AERIAL PHOTO OF THE STUDY AREA (GOOGLE EARTH 2011)

2015 Stage 1 Archaeological Assessment of Oxford County Road 16 (Road 84) from Kintore to 31st Line, Part of Lot 15-16, Concession 11-15 (Geographic Township of East Zorra, County of Oxford), Town of Kintore, Oxford County (AMICK File #15798/MTCS File #P1024-0088-2015)



FIGURE 4B AERIAL PHOTO OF THE STUDY AREA (GOOGLE EARTH 2011)

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FIGURE 4C AERIAL PHOTO OF THE STUDY AREA (GOOGLE EARTH 2011)

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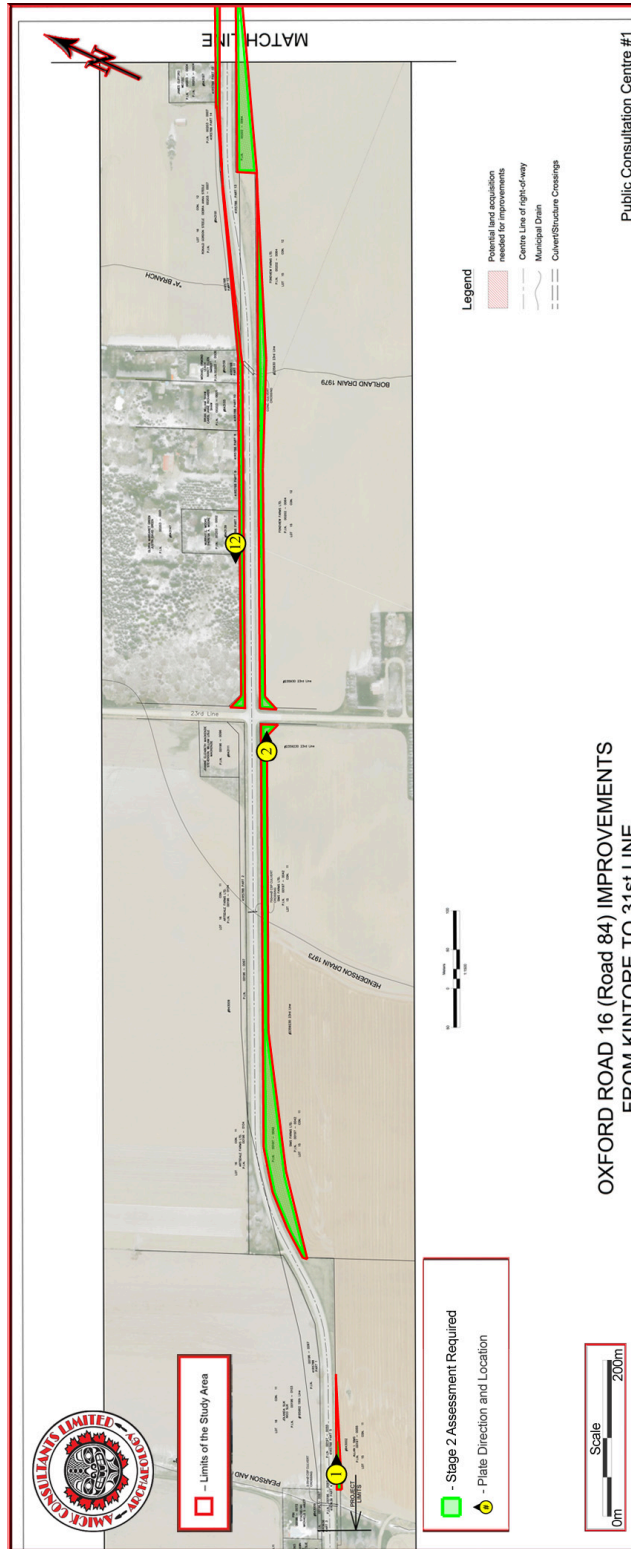


FIGURE 5A DETAILED PLAN OF COUNTY ROAD 16

2015 Stage 1 Archaeological Assessment of Oxford County Road 16 (Road 84) from Kintore to 31st Line, Part of Lot 15-16, Concession 11-15 (Geographic Township of East Zorra, County of Oxford), Town of Kintore, Oxford County (AMICK File #15798/MTCS File #P1024-0088-2015)

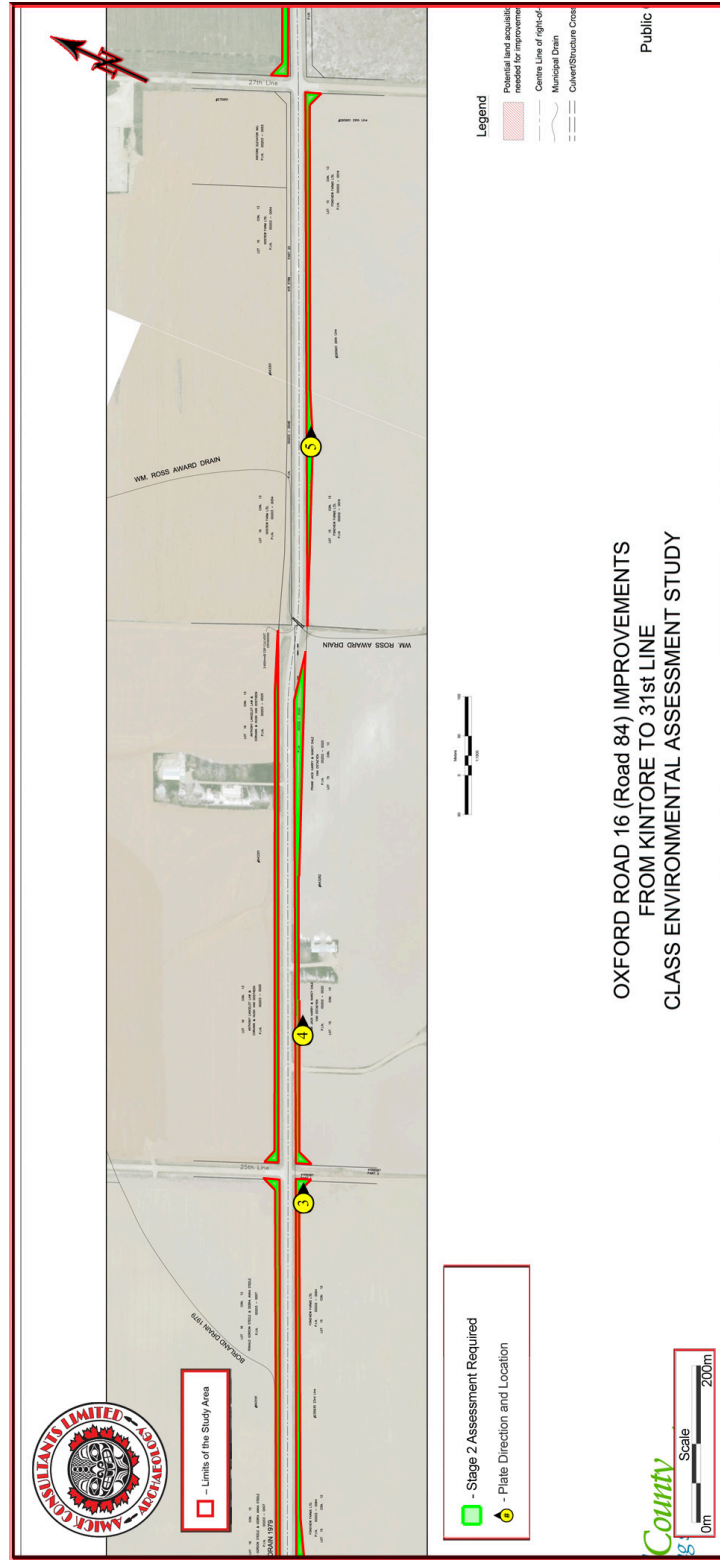


FIGURE 5B DETAILED PLAN OF COUNTY ROAD 16

2015 Stage 1 Archaeological Assessment of Oxford County Road 16 (Road 84) from Kintore to 31st Line, Part of Lot 15-16, Concession 11-15 (Geographic Township of East Zorra, County of Oxford), Town of Kintore, Oxford County (AMICK File #15798/MTCS File #P1024-0088-2015)

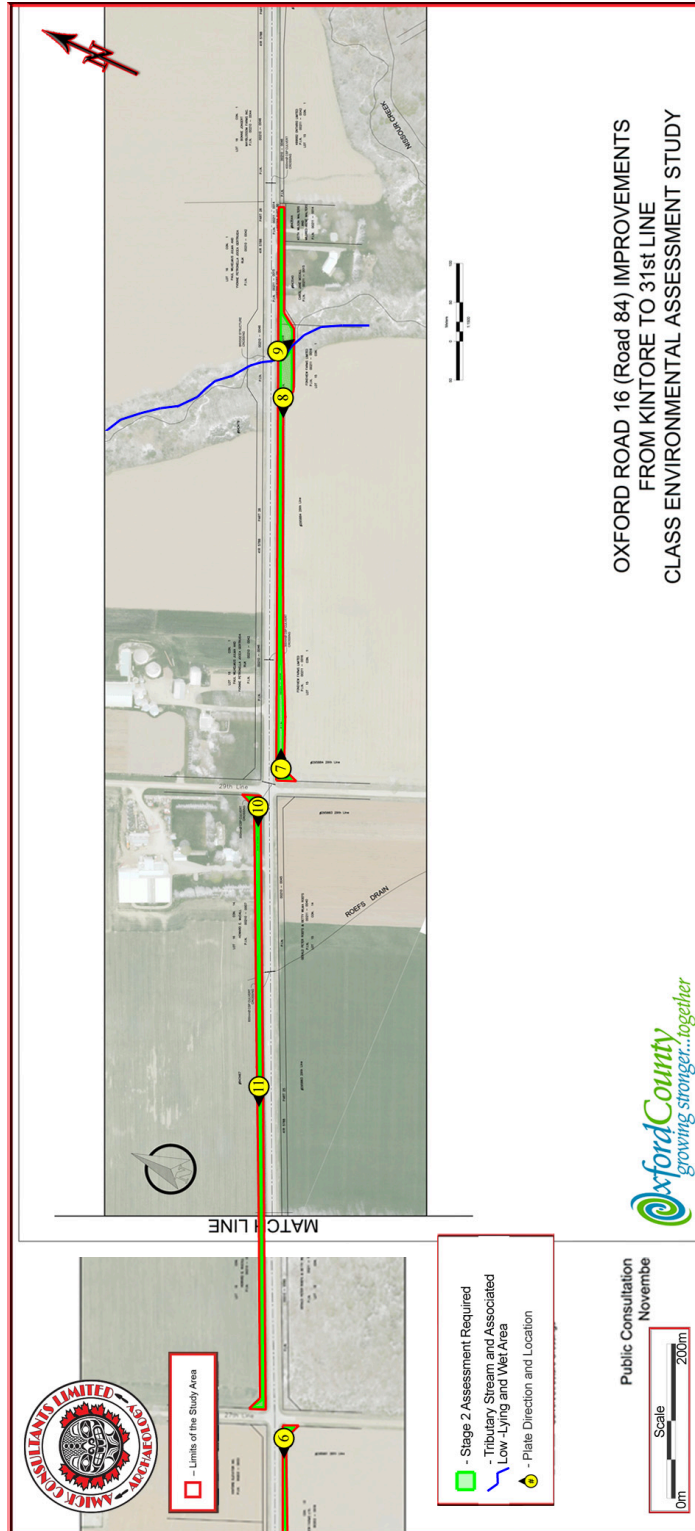


FIGURE 5C DETAILED PLAN OF COUNTY ROAD 16

2015 Stage 1 Archaeological Assessment of Oxford County Road 16 (Road 84) from Kintore to 31st Line, Part of Lot 15-16, Concession 11-15 (Geographic Township of East Zorra, County of Oxford), Town of Kintore, Oxford County (AMICK File #15798/MTCS File #P1024-0088-2015)

11.0 IMAGES



PLATE 1 PROPERTY CONDITIONS



PLATE 2 PROPERTY CONDITIONS



PLATE 3 PROPERTY CONDITIONS



PLATE 4 PROPERTY CONDITIONS



PLATE 5 PROPERTY CONDITIONS



PLATE 6 PROPERTY CONDITIONS

2015 Stage 1 Archaeological Assessment of Oxford County Road 16 (Road 84) from Kintore to 31st Line, Part of Lot 15-16, Concession 11-15 (Geographic Township of East Zorra, County of Oxford), Town of Kintore, Oxford County (AMICK File #15798/MTCS File #P1024-0088-2015)



PLATE 7 PROPERTY CONDITIONS



PLATE 8 PROPERTY CONDITIONS



PLATE 9 PROPERTY CONDITIONS



PLATE 10 PROPERTY CONDITIONS



PLATE 11 PROPERTY CONDITIONS



PLATE 12 PROPERTY CONDITIONS

Appendix C: Natural Environment Inventory



January 19, 2016

1680

Dadean Assam
Oxford County
21 Reeve St., P.O. Box 1614
Woodstock, ON, N4S 7Y3

Dear Mr. Assam,

**RE: Oxford Road 16 Class Environmental Assessment
Natural Environment Characterization Report**

Natural Resource Solutions Inc. (NRSI) was retained in September 2015 by Oxford County to complete the natural environment component of the above noted Class Environmental Assessment (EA). The Class EA has been commissioned by Oxford County in response to required improvements to Oxford Road 16 between the village of Kintore and 31st Line.

For the purposes of this letter, the term “study area” refers to the Oxford Road 16 ROW and adjacent lands within approximately 120 m (Map 1). The study area is within the Middle Thames River watershed and straddles the boundary of Ecoregions 6E and 7E. It is primarily comprised of active agricultural lands and rural residential properties, with smaller, isolated natural feature patches. The study area includes crossings of several small unnamed drainage features as well as the Pearson and Cuskey Drain, Borland Drain, McCall-McCorquodale Drain and Nissouri Creek. Designated natural heritage features within the study area include Significant Valleylands associated with the above-named tributaries of the Middle Thames River) and Significant Woodlands associated with Nissouri Creek and the McCall-McCorquodale Drain within the study area (County of Oxford 1979, County of Oxford 2006).

This letter summarizes background information on natural heritage features, as well as the results of field surveys including Ecological Land Classification (ELC), a fall vascular flora inventory, aquatic habitat characterization, and fish community assessments. The detailed characterization of existing natural features was used to inform an analysis of natural feature significance and sensitivity within the study area with consideration for applicable County and provincial policies and legislation. This report is intended to inform the selection of a preferred alternative design for road improvements as part of the EA process. It is understood that a subsequent impact assessment of the preferred alternative design will be completed during the detailed design stage.

Methods

Background Review and Habitat Screening

A review of existing natural heritage information was completed to identify key natural heritage features and species that are known or have potential to occur within the study area. Requests for background information were sent to MNRF Aylmer District as well as to Upper Thames River Conservation Authority (UTRCA). Background information relevant to the study area was also collected and reviewed from sources including the following:

- Natural Heritage Information Centre (NHIC) (MNRF 2014);
- Land Information Ontario (LIO) data base mapping;
- Oxford County Official Plan (1979);
- Oxford Natural Heritage Study (2006);
- UTRCA (J. Schwindt pers. comm. 2015);
- Department of Fisheries and Oceans Canada (DFO) (DFO 2015);
- Atlas of the Mammals of Ontario (Dobbyn 1994);
- Odonata Atlas of Ontario (C. Jones pers. comm. 2015);
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2015);
- Ontario Butterfly Atlas (Jones *et al.* 2015); and
- Ontario Breeding Bird Atlas (BSC *et al.* 2006).

Based on the results of the background information review, a total of 9 Species at Risk (SAR) and 11 Species of Conservation Concern (SCC) were identified as having records from within the vicinity of the study area (i.e. within 10 km). For the purposes of this report, SAR are defined as species listed as Threatened or Endangered provincially which are afforded protection under the *Endangered Species Act, 2007* (ESA). Within Ontario, SCC refer to:

- Species designated provincially as Special Concern;
- Species that have been assigned a conservation status (S-Rank) of S1 to S3 or SH by the NHIC;
- 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 Committee on the Status of Species at Risk in Ontario (COSSARO). These species are protected by the federal *Species at Risk Act* but not provincially by the ESA.

Habitat for SCC may be considered Significant Wildlife Habitat (SWH), which is afforded protection under the Provincial Policy Statement (OMMAH 2014) and various municipal natural heritage protection policies.

A preliminary screening exercise was conducted on these identified SAR and SCC to determine which species have suitable habitat within the study area. This involved cross-referencing the preferred habitat for reported SAR and SCC (OMNR 2000, MNRF 2015a) against habitats known to occur in the study area. This was completed to ensure that the potential presence of all significant species within the study area was adequately assessed to inform the EA.

Based on this screening exercise, suitable habitat for six SAR and nine SCC were identified within the study area. Full results of the SAR and SCC screening exercise are provided in Appendix I.

A preliminary screening for the presence of SWH was also completed for the study area (Appendix II). The Significant Wildlife Habitat Technical Guide (SWHTG) is a guideline

document that outlines the types of habitats that the MNRF considers significant in Ontario as well as criteria to identify these habitats (OMNR 2000, MNRF 2015b, MNRF 2015c). The SWHTG groups SWH into four broad categories: seasonal concentration areas, rare vegetation communities and specialized wildlife habitat, habitats of SCC, and animal movement corridors. This screening involved the comparison of criteria outlined in the SWHTG against habitats known to occur in the study area. As the study area straddles the boundary of Ecoregions 6E and 7E, criteria from both Ecoregions were considered for the screening of SWH. Based on the results of this preliminary screening exercise, 5 Candidate SWH types were identified within the study area while none were confirmed. These are discussed further under Significance and Sensitivity below.

Field Studies

Aquatic and terrestrial field surveys were undertaken within the study area to characterize natural features and identify those that are significant and sensitive and that have potential to be adversely affected by the proposed development. A total of two site visits were completed in October 2015. Field investigations focused on areas within and immediately adjacent to the municipal road ROW that were most likely to be potentially impacted by the proposed undertaking. Surveys were undertaken in accordance with provincial and local guidance documents.

Vegetation communities within the study area were described and mapped using the Ecological Land Classification (ELC) system for southern Ontario (Lee *et al.* 1998, Lee 2008) on October 2, 2015. A detailed vegetation inventory was completed with a focus on areas within and adjacent to (within approximately 30 m of) the road ROW. Emphasis was placed on the identification of any federally, provincially, or locally significant vegetation species that may occur in the study area.

Aquatic features within the study area were characterized on October 1 and 2, 2015. Detailed aquatic habitat assessments were completed at crossings of Pearson and Cuskey Drain, McCall-McCorquodale Drain and Nissouri Creek (Map 2). Aquatic habitat from 30 m upstream to 50 m downstream of each road crossing was assessed. The following information was collected for each assessed aquatic feature:

- adjacent lands (valley form, riparian habitat, canopy cover, land use etc.);
- channel morphology;
- substrate type and composition;
- water quality (including water temperature, dissolved oxygen, conductivity, pH, and total dissolved solids);
- instream habitat and cover (including critical life stage areas);
- flow conditions; and
- culvert type.

In conjunction with each habitat characterization, electrofishing surveys were conducted at two of the three crossing locations (Pearson and Cuskey Drain and the McCall-McCorquodale Drain) to assess the current fish community present within those aquatic habitats. The locations of the electrofishing surveys are shown on Maps 2A – 2F. An electrofishing survey was not completed for Nissouri Creek since current fisheries information was available for this waterbody from the UTRCA (J. Schwindt pers. comm. 2015). Electrofishing surveys were completed within the 30 and 50 m limits of the aquatic habitat characterizations. A crew of two biologists utilized a backpack electrofishing unit and dip net to capture fish throughout the surveyed stretch, making sure to sample the different habitat types (ie. pools, riffles, undercut banks, overhanging vegetation etc.). All captured fish were identified to species, enumerated, and the

shortest and longest lengths were measured for each species prior to being live released at the location of capture. For each electrofishing survey the water conditions, electrofishing settings, and the duration of sampling were recorded and are summarized in Table 1.

In order to sample fish using electrofishing equipment, a *License to Collect Fish for Scientific Purposes* was obtained from the MNRF Aylmer District. Licence No. 1081341 was issued to NRSI on September 9, 2015.

During the field work program, all incidental observations of mammals, herpetofauna, butterflies, dragonflies, and damselflies were documented on all field visits. This included direct observations of individuals, as well as signs of wildlife presence (i.e. tracks, scat, dens, nests, etc.).

Table 1. Electrofishing Conditions, Settings, and Shocking Time

	Station EMS-001	Station EMS-001
Date	October 1, 2015	October 2, 2015
Sampling start time	10:00	9:30
Sampling end time	10:50	13:00
Air temperature (°C)	16.0	12.0
Water temperature (°C)	10.5	8.0
Time water temp. taken	11:00	10:00
Conductivity (µs/cm)	670	640
Dissolved Oxygen (ppm, %)	9.45, 87.4	10.75, 93.3
Electrofisher Type	Halltech backpack unit	Halltech backpack unit
Number of Netters	1	1
Voltage (V)	150	150
Pulsating Frequency (Hz)	40	40
Shocking time (sec.) - Upstream	200	450
Shocking time (sec.) - Downstream	1006	932

Existing Conditions

Physiography, Geology, Soils and Drainage

Surficial deposit conditions in the study area vary from well-drained loamy till, to imperfectly and poorly-drained clayey and loamy tills (Agriculture and Agri-Food Canada 1996). The study area topography includes drainage ditches along the north and south roadsides, including drainage culverts. Drainage in the study area is flowing predominately south, including the Pearson & Cuskey Drain, McCall-McCorquodale Drain, and Nissouri Creek. Beyond the ROW, topography is predominantly flat to gently-rolling, with relatively small slopes associated with riparian areas.

Vegetation Communities

A total of 7 vegetation communities exist within the study area, with the majority of the surrounding land uses comprised of agricultural lands and rural residential properties. Agricultural lands within the study area consist of corn and soybean annual row crops (OAGM1) and hay perennial cover crops (OAGM2). Vegetation communities identified within the study area are described in Table 2 below. Refer to Maps 2A – 2F for study area ELC communities and surrounding study area land uses.

Table 2. Vegetation Communities Identified within the Study Area

ELC Ecosite Type	ELC Description	Environmental Characteristics
Wetland		
SWDM3-3	Swamp Maple Mineral Deciduous Swamp	This deciduous swamp community is characterized by Freeman's Maple (<i>Acer X freemanii</i>), White Elm (<i>Ulmus americana</i>), and Green Ash (<i>Fraxinus pennsylvanica</i>) in the canopy and sub-canopy. Understorey vegetation is comprised of Common Buckthorn (<i>Rhamnus cathartica</i>), Gray Dogwood (<i>Cornus racemosa</i>), and Red-osier Dogwood (<i>Cornus stolonifera</i>). The groundcover layer is dominated by Yellow Avens (<i>Geum allepicum</i>), False Nettle (<i>Boehmeria cylindrica</i>), and Spotted Jewelweed (<i>Impatiens capensis</i>).
Deciduous Forest		
FODM7	Fresh-Moist Lowland Deciduous Forest	This lowland deciduous forest community occurs in multiple locations throughout the study area, and is associated with treed riparian areas. It is dominated by Black Walnut (<i>Juglans nigra</i>), Crack Willow (<i>Salix fragilis</i>), and Trembling Aspen (<i>Populus tremuloides</i>) in the canopy. The sub-canopy is dominated by Black Walnut, Manitoba Maple (<i>Acer negundo</i>), and Hawthorn (<i>Crataegus sp.</i>). Understorey vegetation is comprised of Red-osier Dogwood, Red Raspberry (<i>Rubus idaeus ssp. melanolasius</i>), and Wild Black Currant (<i>Ribes americanum</i>). The groundcover layer is dominated by Reed Canary Grass (<i>Phalaris arundinacea</i>), Spotted Jewelweed, and American Stinging Nettle (<i>Urtica dioica ssp. gracilis</i>). A distinct habitat inclusion exists within this feature where it is associated with the McCall-McCorquodale Drain: Coniferous Plantation (TAGM1) dominated by Norway Spruce (<i>Picea abies</i>).
FODM4-2	Dry-Fresh White Ash – Hardwood Deciduous Forest	This deciduous forest community exists adjacent to and upslope of a watercourse at the eastern extent of the study area. It may represent a former apple orchard that has since been abandoned and left to naturalize. It is dominated by White Ash (<i>Fraxinus americana</i>), Black Cherry (<i>Prunus serotina</i>), Common Apple (<i>Malus pumila</i>), and Hawthorn in the canopy and sub-canopy. Understorey growth is characterized by White Ash, Choke Cherry (<i>Prunus virginiana</i>), and Gray Dogwood. The groundcover layer is comprised of White Avens (<i>Geum canadense</i>), Garlic Mustard (<i>Alliaria petiolata</i>), and Wild Strawberry (<i>Fragaria virginiana</i>).
FODM5	Dry-Fresh Sugar Maple Deciduous Forest	This deciduous forest community is dominated by Sugar Maple (<i>Acer saccharum</i>), Bitternut Hickory (<i>Carya cordiformis</i>), and American Beech (<i>Fagus grandifolia</i>) in the canopy. Ironwood (<i>Ostrya virginiana</i>), Black Cherry, and Bitternut Hickory comprise the sub-canopy. The understorey is characterized by Choke Cherry, White Ash, and Nannyberry (<i>Viburnum lentago</i>). The groundcover layer is comprised of White Avens, False Solomon's Seal (<i>Maianthemum racemosum</i>), and Running Strawberry-bush (<i>Euonymus obovata</i>).
Meadow		
MEGM3-8	Reed Canary Grass Graminoid Meadow	This graminoid-dominated meadow community is associated with the riparian area in the eastern portion of the study area. Woody species include Red-osier Dogwood, Common Apple, and White Ash. The groundcover is comprised of Reed Canary Grass, Giant Ragweed (<i>Ambrosia trifida</i>), and American Stinging Nettle.
MEMM3	Dry-Fresh Mixed Meadow	This mixed meadow community occurs in the western portion of the study area in two separate locations. The sub-canopy of this community is dominated by Sugar Maple and the understorey by Red-osier Dogwood. The groundcover layer is dominated by Awnless Brome (<i>Bromus inermis ssp. inermis</i>), Tall Goldenrod (<i>Solidago altissima var. altissima</i>), and Wild Strawberry (<i>Fragaria virginiana</i>).
Cultural		
TAGM1	Coniferous Plantation	This coniferous plantation community exists adjacent to residential properties fronting Oxford Road 16. It is dominated by White Pine (<i>Pinus strobus</i>) and White Cedar (<i>Thuja occidentalis</i>) in the canopy and sub-canopy, with lesser amounts of Trembling Aspen, Common Apple, and

ELC Ecosite Type	ELC Description	Environmental Characteristics
		Black Walnut. Understorey growth is sparse and is characterized by Gray Dogwood, Common Buckthorn, and Nannyberry. Groudcover vegetation is sparse due to dense canopy coverage, and is comprised of Bittersweet Nightshade (<i>Solanum dulcamara</i>), Garlic Mustard, and Jack-in-the-pulpit (<i>Arisaema triphyllum</i>).
N/A	Roadside Areas	Roadside areas are dominated by hardy and opportunistic graminoids such as Smooth Brome (<i>Bromus inermis ssp. inermis</i>), Witch Grass (<i>Panicum capillare</i>), and Kentucky Bluegrass (<i>Poa pratensis ssp. pratensis</i>). Few trees exist within the right-of-way, and include White Ash, Freeman's Maple, Norway Spruce, and Norway Maple (<i>Acer platanoides</i>).

Vascular Flora

A total of 113 species of vascular flora were identified within the study area natural features shown on Maps 2A – 2F. A complete list of inventoried species is provided in Appendix III. Of the 113 species observed, approximately 30% were non-native species. Of the grass-dominated roadside areas that are most likely to be impacted by the proposed undertaking, approximately 68% were non-native species.

Appendix I lists federally and provincially significant flora species known from the study area vicinity (within 1 km) based the results of background review and whether suitable habitat is present for each within the study area. No significant vascular flora species were observed within the study area.

Wildlife

Birds

A total of 97 bird species have been recorded in the vicinity of the study area (BSC *et al.* 2006, MNRF 2014). Of these, eight were observed as incidentals during field surveys. Refer to Appendix IV for a complete list of all bird species known and observed in the study area and vicinity, including highest breeding evidence codes in accordance with the OBBA (2001).

Based on background review data, three bird SAR, Barn Swallow (*Hirundo rustica*), Bobolink (*Dolichonyx oryzivorus*), and Eastern Meadowlark (*Sturnella magna*), and three bird SCC, Red-headed Woodpecker (*Melanerpes erythrocephalus*), Eastern Wood-pewee (*Contopus virens*), and Wood Thrush (*Hylocichla mustelina*), were identified as having potential to occur within the study area based on existing records in the vicinity and presence of appropriate habitat (Appendix I). No bird SAR or SCC were observed during field investigations in the study area, however, targeted surveys for birds were not completed.

Herpetofauna

A total of 16 reptile and amphibian species have been recorded from the vicinity of the study area (Ontario Nature 2015). No herpetofauna species were observed incidentally during field investigations in the study area. A complete list of all herpetofauna species known from the study area is provided in Appendix V.

Based on a review of background information, two herptofauna SCC, Eastern Milksnake (*Lampropeltis taylori triangulum*), and Western Chorus Frog (*Pseudacris triseriata*), were identified as having potential to occur within the study area based on existing records in the vicinity and presence of suitable habitat (Appendix I). No herpetofauna SAR or SCC

were observed during field surveys in the study area, however, targeted surveys for reptiles or amphibians were not completed.

Mammals

A total of 29 mammal species are documented within the vicinity of the study area (Dobbyn 1994). No mammal species were observed incidentally during field investigations in the study area. A complete list of all mammal species known from the study area is provided in Appendix VI.

Based on a review of background information, three mammal SAR, Little Brown Myotis (*Myotis lucifuga*), Northern Myotis (*Myotis septentrionalis*), and American Badger (*Taxidea taxus jacksoni*), as well as one mammal SCC, Tri-colored Bat (*Perimyotis subflavus*), were identified as having potential to occur within the study area based on existing records in the vicinity and presence of suitable habitat (Appendix I). No mammal SAR or SCC were observed during field surveys in the study area, however, targeted surveys for mammals were not completed.

Insects

A total of five Lepidoptera and four Odonata species are documented within the vicinity of the study area (Jones *et al.* 2015, C. Jones pers. comm. 2015). No Lepidoptera or Odonata species were observed incidentally during field investigations in the study area. A complete list of all Lepidoptera and Odonata species known from the study area is provided in Appendix VII.

Based on a review of background information, one Lepidoptera SCC, Monarch (*Danaus plexippus*), was identified as having potential to occur within the study area based on existing records in the vicinity and presence of suitable habitat (Appendix I). No Lepidoptera or Odonata SAR or SCC were observed during field surveys in the study area, however, targeted surveys for insects were not completed.

Aquatic Habitat

The following is a description of the aquatic habitat present in each watercourse within the study area from west to east; Pearson and Cuskey Drain, McCall-McCorquodale Drain, and Nissouri Creek (Maps 2A – 2F).

Pearson and Cuskey Drain

This drain flows south under Oxford Road 16 approximately 350 m east of the intersection of Oxford Road 16 and 19th Line in the village of Kintore. Immediately adjacent and to the west of the Pearson & Cuskey Drain, the riparian area is occupied by residential properties with maintained lawns and several mature trees. The lands to the east are exclusively agricultural and were cultivated with corn in 2015. The adjacent lands slope gently towards the water body and several tile drain outlets were observed along the banks, contributing drainage from the fields to the east and west.

North of Oxford Road 16, the drain flows over a moderate gradient and through a relatively wide, straight channel comprised of relatively shallow pools, runs, and riffles. Wetted widths throughout this stretch ranged from 2.1 to 3.7 m with bankfull widths from 3.4 to 6.5 m. Water depths ranged from approximately 0.1 m within the riffles to 0.28 m in the pools. Due to the shallow water depths in the riffles, the majority of fish observed in this stretch occurred in the pool and run habitats, which provided more suitable water depths. Instream cover was generally limited but did occur in the form of woody debris (slumping shrubs and exposed roots) and cobble substrates. Cobble substrate was prevalent throughout this stretch comprising roughly 50% of the overall channel substrates. The remaining substrates included gravel (20%) and sand (20%) with some

silt (5%) and boulder (5%). The banks along both sides of the channel were relatively steep and high (up to approximately 1.2 m) and showed evidence of heavy erosion as a result of freshet flows, which had exposed the roots of trees and shrubs that are growing along the banks. No undercut banks were observed. Within the 30 m surveyed stretch, the channel was shaded by mature deciduous trees which provided close to 90% shade, helping to minimize thermal impacts to the watercourse. The water temperature was measured at 11.5°C at 13:10 on October 1, 2015 and dissolved oxygen levels were good (10.07 ppm and 94.2%) indicating suitable water quality for coolwater fish species. Additional water quality measurements included conductivity (670 µs/cm), pH (7.4), and total dissolved solids (320 ppm). Throughout the channel there is evidence of nutrient enrichment due to encrusted and filamentous algae growing on substrates. Following a long riffle, the channel flows through a pool and into a large metal corrugated steel pipe culvert (diameter 3.3 m) which conveys flow south, under Oxford Road 16. Within the culvert the wetted width was measured at 1.78 m and depth was 0.26 m. At the downstream end of the culvert near its outlet a large school of small Cyprinidae were observed.

South of Oxford Road 16, the channel narrows slightly but continues to flow over a moderate gradient through a straight channel with consistent riffle, run, and pool sequences. Wetted widths throughout the 50 m stretch ranged from 2.0 to 3.0 m with bankfull widths from 2.1 to 3.0 m. Water depths ranged from approximately 0.15 m within the riffles to 0.28 m in the pools. However, generally, the riffles were deeper throughout the downstream stretch when compared to upstream. Riffles and pools provided suitable cover for fish within the system in addition to small backwater areas, undercut banks, woody debris, embedded and unembedded cobble, and overhanging vegetation including shrubs, grasses, and herbaceous plants. A narrow vegetated buffer exists along both banks of the drain beyond the 50 m surveyed reach with bank vegetation extending to approximately 5 m on the east bank and up to 8 m on the west bank before transitioning to corn field and manicured lawn, respectively. The vegetation includes a variety of shrub and herbaceous plant species including Red Osier Dogwood, Crack Willow, Spotted Jewelweed, American Stinging Nettle, Spotted Joe-Pye Weed (*Eutrochium maculatum*), asters (*Asteraceae* spp.), goldenrods (*Solidago* spp.), and Common Milkweed (*Asclepias syriaca*). The dense bank vegetation provided good bank stability and a fair amount of shading for the channel (approximately 50 – 75%). No mature trees were noted along the banks to provide additional shade benefits. Banks exhibited a relatively uniform slope (approximately 135°) on both sides, indicating channelization, with a height of roughly 2.5 m to the top of bank. The channel appeared incised to depths ranging from 0.3 to 1.0 m. Within the channel, substrates continued to be dominated by cobble (50%) with gravel (20%), sand (20%), silt (5%), and boulder (5%) contributing to the remaining substrate composition. The water temperature downstream of the culvert, at 10.5°C, was slightly colder than upstream, and Watercress (*Nasturtium officinale*) was observed at several locations along the edges of the channel, indicating potential groundwater inputs. Additional water quality measurements included dissolved oxygen (9.45 ppm and 87.4%), conductivity (670 µs/cm), pH (7.4), and total dissolved solids (320 ppm). Throughout the channel there is evidence of nutrient enrichment due to encrusted and filamentous algae growing on substrates.

Pearson and Cuksey Drain was identified as a permanent feature and the presence of a variety of fish species captured and observed upstream and downstream of the culvert indicates this water body as direct fish habitat. The UTRCA has classified this watercourse as a 'type 2 system' in the Oxford Natural Heritage Study. According to the study, a type 2 system is a permanent, warmwater feature that supports a variety of baitfish species (UTRCA 2006).

McCall-McCorquodale Drain

This drain flows south under Oxford Road 16 approximately 5.5 km east of the intersection of Oxford Road 16 and 19th Line in Kintore and eventually flows into Nissouri Creek. The adjacent lands to the west and to the east of the riparian corridor, north of Oxford Road 16, are exclusively agricultural and cultivated. The lands to the east, south of the road, are occupied by a residential property with maintained lawns and mature trees. The adjacent lands slope gently towards the water body from the east and west.

North of Oxford Road 16 the drain flows over a low to moderate gradient and through a natural, meandering channel comprised of consistent pools, runs, and riffles. Wetted widths throughout this stretch ranged from 2.5 to 3.8 m with bankfull widths from 2.8 to 4.6 m. Water depths ranged from approximately 0.09 m within the riffles to 0.27 m in the pools. Channel substrates were fairly well distributed with cobble (30%), gravel (25%), sand (25%), silt (15%) and some muck (5%). The banks were densely vegetated on both sides and provided cover at many locations where it was overhanging the channel. Additional cover was present throughout the surveyed stretch in the form of backwater areas, undercut banks, and cobble. Woody debris was also noted to be prevalent throughout this stretch including slumping shrubs and large fallen Black Walnut trees which cut across the channel and created pools underneath as a result of scouring. This woody debris and overhanging vegetation provided direct shade for close to 50% of the channel. Additional shade was provided by large, mature Black Walnut and Crack Willow trees that were growing throughout the vegetated buffer adjacent to the water body. This natural buffer extended approximately 80 m to the west and between 10 and 20 m to the east, beyond which were cultivated agricultural fields. The water temperature was measured at 8.0°C at 12:30 on October 2, 2015 and dissolved oxygen levels were good (10.75 ppm and 93.3%) indicating suitable water quality for cool and coldwater fish species. Additional water quality measurements included conductivity (640 µs/cm), pH (7.36), and total dissolved solids (320 ppm). Water-cress was observed at several locations along the edges of the channel, indicating potential groundwater inputs. Throughout the channel there is also evidence of nutrient enrichment due to encrusted and filamentous algae growing on substrates. The channel flows through an open-bottom concrete box culvert measured at 4.38 m wide and 1.42 m high (measured to the top of the water). A large pool was observed at the upstream side of this culvert and bank erosion was noted on both sides on the culvert's foundation, indicating a potential undersized culvert. Within the culvert the channel deflected off the east side of the foundation, creating a build-up of sand and silt along a portion of the west side.

South of Oxford Road 16, the channel exits the culvert into a pool and widens but continues to flow through a slightly meandering channel with riffle, run, and pool sequences. Wetted widths throughout the 50 m stretch ranged from 3.4 to 4.9 m with bankfull widths from 4.1 to 5.8 m. Water depths ranged from approximately 0.1 m within the riffles to 0.32 m in the pools. Heavy erosion was noted throughout this stretch, particularly along the outside bends of the channel where tree roots were exposed and banks formed close to a 90° angle. Bank heights ranged from 0.3 to 0.8 m and bank stability was classified as poor to fair due to the low bank vegetation. Where bank vegetation was observed it was comprised of goldenrods, asters, Spotted Jewelweed, American Stinging Nettle, and grasses; however, the majority of this vegetation coverage occurred within the ROW and extended south from the road up to 20 m. This vegetation provided some cover where it was overhanging the channel nearest to the road, however most of the instream habitat and cover was provided by the pool and riffle habitat, undercut banks, and cobble. Substrates continued to be dominated by cobble (35%) with gravel (25%), sand (25%), silt (10%), and boulder (5%) contributing to the

remaining substrate composition. Mature deciduous trees provided the majority of shading for the channel and beyond the ROW provided up to 100% shade in some areas, helping to maintain the cold water temperature, which was measured at 8.0°C. Similar to the upstream reach, water-cress was present in low abundance along the banks nearest to the culvert outlet and filamentous algae was observed growing on channel substrates.

McCall-McCorquodale Drain was identified as a permanent feature and the presence of a variety of fish species captured and observed upstream and downstream of the culvert indicates this water body as direct fish habitat. The UTRCA has classified this watercourse as a 'type 2 system', similar to Pearson & Cuskey Drain (UTRCA 2006).

Nissouri Creek

Nissouri Creek flows south, parallel to 31st Line along the east side, under Oxford Road 16. The adjacent lands to the west and to the east of the riparian corridor are exclusively agricultural and cultivated on both the north and south sides of the road.

North of Oxford Road 16, Nissouri Creek flows over a moderate gradient through a straightened channel comprised of shallow riffles and runs. Wetted widths throughout this stretch were approximately 1.5 m with bankfull widths around 4.5 m and water depths up to 0.1 m. Substrates throughout this section were dominated by cobble and gravel with some boulders and areas of sand. The channel flows through heavily eroded banks on both sides where cedar roots were exposed from cedar hedges planted along the top of each bank. Bank height throughout this section was up to 1.5 m with slopes of approximately 120°. The cedar hedges provide close to 100% shade for the channel before it exits the hedges near the road ROW. At this location the cedar hedges transition to meadow habitat with a variety of herbaceous plants and grasses. The channel gradient was noted to decrease, which resulted in an increase in water depth up to 0.46 m at the entrance to an open bottom concrete box culvert which directs the flow under the road. This culvert was measured at 5.65 m wide and 1.7 m high (measured to the top of water). The decrease in gradient and increase in water depth resulted in a transition to predominantly fine substrates (sand and silt) at the culvert entrance. Similar to the McCall-McCorquodale Drain culvert entrance some erosion of the banks was noted along the upstream foundations of the culvert indicating potential flow restriction and an improperly sized culvert. South of Oxford Road 16, the creek narrows and flows through an incised channel with wetted widths up to 2.11 m and bankfull widths up to 2.5 m. Water depths were measured up to 0.21 m and substrates were dominated by fine materials including sand and silt with some muck. Occasional areas of gravel and cobble were noted in deep riffles. Instream habitat and cover included pools, backwater areas, undercut banks, overhanging bank vegetation, and some areas of riffle habitat with cobble. Bank vegetation was moderate to high south of Oxford Road 16, which created fairly good bank stability and likely caused the incised channel throughout this stretch. Water temperature was measured at 11.0°C at 14:00 on October 1, 2015 and moderately abundant Water-cress was observed along the banks south of the road, indicating potential groundwater discharge to the creek. Additional water quality measurements included conductivity (710 µs/cm), pH (6.83), and total dissolved solids (360 ppm). Nutrient enrichment was also evident throughout this creek due to the presence of encrusted algae.

Nissouri Creek was identified as a permanent feature and the presence of a variety of fish species upstream and downstream of the culvert indicates this watercourse as direct fish habitat. The UTRCA has classified Nissouri Creek as a 'type 1 system' in the Oxford Natural Heritage Study. A type 1 system is defined as a permanent, warmwater

or cold/coolwater feature that may support sensitive or significant species. This may include species at risk, top level predators, sportfish, sensitive species, or the habitat to support these species (UTRCA 2006).

Fish Community

A total of 410 fish, representing 8 different species, were captured during electrofishing surveys within the study area (Table 3). A list of fish species inventoried and known from the study area is also summarized in Appendix IV. Historical fish sampling records were obtained from the UTRCA and have been included in both Table 3 and Appendix IV.

The fish community in each of the three watercourses was found to be comprised of species that are common and widespread throughout southern Ontario. The most common species within the study area are indicative of coolwater thermal regimes, however warmwater species were also noted. The identified species are relatively tolerant to changes in water quality and habitat conditions. Several different environments and trophic levels are represented indicating the presence of a variety of habitats.

Historic records of Northern Brook Lamprey (*Ichthyomyzon fossor*) were identified by NHIC (MNRF 2014) within the study area from May 27, 1931. This species is currently classified as Special Concern provincially and federally and is protected under Schedule 1 of the Species at Risk Act (SARA); consequently, this species is considered a SCC in Ontario. However, a review of federal Department of Fisheries and Oceans (DFO) SAR red-line mapping did not indicate the presence of any fish or mussel SAR within the study area and no SAR were captured during electrofishing surveys conducted by UTRCA or NRSI. Furthermore, the study area watercourses were not found to provide suitable habitat as substrates documented in the study area were generally too large to support this species (Appendix I). Generally, Northern Brook Lamprey require clean coarse gravel substrates with a relatively swift, unidirectional current for spawning. Larval lamprey require soft substrates comprised of silt and sand in which they can create burrows, where they reside for between 3 and 7 years. These burrows have been found to range from 0.2 to 0.6m deep (COSEWIC 2007). As such, it is not expected that any aquatic SAR or SCC, including Northern Brook Lamprey, are currently present within the study area.

Table 3. Fish Species Identified within the Study Area

Scientific Name	Common Name	S-rank	National Status (SARA) ⁴	Provincial Status (ESA) ⁴	Environment ⁴	Trophic Status ⁴	Thermal Regime ⁴
<i>Catostomus commersonii</i>	White Sucker ^{1,3}	S5	No status	No status	benthic	invertivore/ detritivore	coolwater
<i>Culaea inconstans</i>	Brook Stickleback ^{1,2,3}	S5	No status	No status	benthopelagic	planktivore/ invertivore	coolwater
<i>Luxilus cornutus</i>	Common Shiner ^{2,3}	S5	No status	No status	benthopelagic	planktivore/ invertivore	coolwater
<i>Luxilus chrysocephalus</i>	Striped Shiner ³	S4	Not at Risk	Not at Risk	benthopelagic	invertivore	coolwater
<i>Pimephales notatus</i>	Bluntnose Minnow ³	S5	No status	No status	benthopelagic	detritivore	warmwater
<i>Campostoma anomalum</i>	Central Stoneroller ^{1,3}	S4	Not at Risk	Not at Risk	benthic	herbivore	coolwater
<i>Pimephales promelas</i>	Fathead Minnow ^{1,3}	S5	No status	No status	benthopelagic	detritivore/ invertivore	warmwater
<i>Rhinichthys obtusus</i>	Blacknose Dace ^{1,2,3}	S5	No status	No status	benthic	invertivore	coolwater

Scientific Name	Common Name	S-rank	National Status (SARA) ⁴	Provincial Status (ESA) ⁴	Environment ⁴	Trophic Status ⁴	Thermal Regime ⁴
<i>Semotilus atromaculatus</i>	Creek Chub ^{1,3}	S5	No status	No status	benthopelagic	invertivore/ carnivore	coolwater
<i>Etheostoma flabellare</i>	Fantail Darter ^{1,3}	S4	No status	No status	benthic	invertivore	coolwater
<i>Etheostoma nigrum</i>	Johnny Darter ^{1,2,3}	S5	No status	No status	benthic	invertivore	coolwater
<i>Micropterus dolomieu</i>	Smallmouth Bass ³	S5	No status	No status	benthopelagic	invertivore/ carnivore	coolwater
<i>Lepomis gibbosus</i>	Pumpkinseed ³	S5	No status	No status	benthopelagic	invertivore/ carnivore	warmwater

¹NRSI 2015

²UTRCA 2015

³UTRCA 1993, 2000, 2005

⁴Eakins 2015

Natural Feature Significance and Sensitivity

Analysis of the significance and sensitivity of existing natural features was used to identify those features and habitats that are sensitive to disturbance based on the rarity or significance of the feature or the functions/processes and/or policies, legislation, or planning related studies. The following is a brief discussion of the results of this analysis with regards to significant natural areas and features which may represent natural feature constraints to be considered as part of the selection of a preferred alternative design for the proposed undertaking.

Wetlands

Wetlands directly provide habitat for various species of wildlife and plants while many other species indirectly benefit from the hydrologic functions that wetlands provide such as flow augmentation, recharge and discharge (UTRCA 2006).

One wetland is found within the study area, a small (1.7ha) Swamp Maple Mineral Deciduous Swamp (SWDM3-3) (Map 2B), which is unevaluated. This wetland feature falls within the same watershed as the Lakeside Wildwood PSW complex, however, it is greater than 750 m from the nearest wetland polygon of the PSW complex. At this time, there does not appear to be a rationale for including the wetland in the PSW complex. All non-PSWs and unevaluated wetlands are considered to be of local significance in the County of Oxford (UTRCA 2006, County of Oxford 1979).

Development within non-PSWs and within 30 m of non-PSWs ≤ 2 ha in size is prohibited under UTRCA's Ontario Regulation 157/06 unless in the opinion of the UTRCA, the control of flooding, erosion, dynamic beaches, pollution or the conservation of land will not be affected by the development and no negative impacts on the feature or its ecological function will result.

An OWES wetland evaluation of the SWDM3-3 feature may be required during detailed design, in consultation with the MNR, to further inform protection and impact mitigation measures. The need for the evaluation will be dependent on the design of the preferred alternative and the potential for impact to the feature. Consultation with the UTRCA may also be required to confirm and accurately survey the wetland boundary as part of detailed design of the proposed undertaking if there is potential for impact to this feature.

Woodlands

Woodlands provide environmental and economic benefits such as erosion prevention, water retention, provision of habitat, recreation and sustainable harvest of woodland products (UTRCA 2006).

Based on a review of background information, two Significant Woodlands are found within the study area (County of Oxford 2006). Specifically, the woodlands associated with Nissouri Creek and McCall-McCorquodale Drain (FODM7, FODM4-2; Map 2F). These woodland features were designated as significant based on a study that compared vegetation patch characteristics within the context of the County of Oxford as a whole. In order to evaluate significance on a landscape scale, nine criteria were developed (County of Oxford 2006). A minimum of one criteria was required to be met in order for a vegetation patch to be designated as Significant. A review of the nine criteria was conducted with respect to the woodlands associated with Nissouri Creek and McCall-McCorquodale Drain in order to confirm the presence of the attributes and/or functions for which the woodlands were designated as significant (Appendix IX). The review confirmed these woodland features currently meet more than one of the nine criteria and should therefore remain designated as Significant Woodlands. Development or site alteration is not permitted within Significant Woodlands under Section 3.3.3 of the UTRCA Environmental Planning Policy Manual (UTRCA 2006). Development or site alteration may be permitted within adjacent lands (within 50 m) to Significant Woodlands provided it is demonstrated to the satisfaction of the UTRCA that no negative impacts on the feature or its ecological function will result (UTRCA 2006).

The County of Oxford Official Plan (1979) considers Significant Woodlands as Environmental Protection Areas. Under Section 3.2.4.1.1 of the County of Oxford Official Plan (1979), activities that create or maintain infrastructure authorized under an EA process may be permitted within and adjacent to an Environmental Protection Area.

Three additional woodlands are also present within the study area including a Fresh-Moist Lowland Deciduous Forest (FODM7) associated with the Pearson & Cuskey Drain, a Maple Mineral Deciduous Swamp (SWDM3-3), and a Dry-Fresh Sugar Maple Deciduous Forest (FODM5).

Development or site alteration may be permitted in other woodlands or within their adjacent lands (within 50 m) provided it is demonstrated to the satisfaction of the UTRCA that no negative impacts on the feature or its ecological function will result (UTRCA 2006).

Under Sections 3.2.7.1 and 3.2.4.2 of the County of Oxford Official Plan (1979), activities that create or maintain infrastructure authorized under an EA process may also be permitted within or immediately adjacent to non-significant woodlands.

The creation of strategically placed new habitat, linkages or restoration of other ecosystem functions may be considered as mitigation measures for development within or adjacent to other woodlands (UTRCA 2006). The County of Oxford Official Plan (1979) requires the County to consider alternative road and pavement width and standards so as to minimize the cutting of trees when developing plans for the construction and/or widening of County roads. Where tree cutting is necessary, tree replacement shall be a minimum ratio of two trees for each tree lost in connection with the widening or construction of County roads (County of Oxford 1979).

Valleylands

Valleylands are natural areas that occur in a valley or other landform depression that has water flowing through or standing for some period of the year (OMMAH 2014).

Valleylands provide several ecological functions including nutrient and sediment cycling and transport, fish and wildlife habitat, natural linkages and migration corridors between different habitat features, and act as a reservoir for biodiversity.

Three Significant Valleylands are present within the study area and include the valleylands associated with Pearson & Cuskey Drain and McCall-McCorquodale Drain. The section of Nissouri Creek that lies south of Oxford Rd 16 is also identified as Significant Valleyland (County of Oxford 1979).

Under Section 3.3.4 of the UTRCA Environmental Planning Policy Manual, development and/or site alteration is not permitted in natural valleylands (UTRCA 2006).

Development and/or site alteration may be permitted within 50 m of valleylands provided it is demonstrated to the satisfaction of the UTRCA that no negative impacts on the feature or its ecological function will result (UTRCA 2006).

The County of Oxford Official Plan (1979) considers Significant Valleylands as Environmental Protection Areas. Under Section 3.2.4.1.1 of the County of Oxford Official Plan (1979), activities that create or maintain infrastructure authorized under an EA process may be permitted within and adjacent to an Environmental Protection Area.

Significant Wildlife Habitat

The results of background information review, agency consultation, and field studies were used to assess the presence of SWH within the study area based on the PPS (OMMAH 2014), the Natural Heritage Reference Manual (OMNR 2010) and the SWHTG (MNRF 2015b, 2015c).

Based on background information and field investigations, no SWH types were confirmed within the study area and five SWH types were identified as candidate. Development or site alteration is not permitted within or adjacent to SWH unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions as outlined in Section 2.1.5 of the PPS (OMMAH 2014). This is also consistent with UTRCA and County of Oxford policies (UTRCA 2006, County of Oxford 1979)

Candidate SWH types identified for the study area include the following:

- Raptor Wintering Area;
- Bat Maternity Colonies;
- Snake Hibernaculum;
- Amphibian Breeding Habitat (Woodland); and
- Special Concern and Rare Wildlife Species.

The following sections discuss each of the above Candidate SWH types in detail.

Raptor Wintering Area

Winter habitat for raptors must provide a combination of fields and woodlands that contain roosting, foraging, and resting habitats (OMNR 2011). Hay fields, pastures and open meadows provide critical winter roosting areas for Northern Harriers (*Circus cyaneus*) and Short-eared Owls (*Asio flammeus*) in Southern Ontario. Open habitats are also preferred by Rough-legged Hawks (*Buteo lagopus*), Red-tailed Hawks (*Buteo jamaicensis*) and Snowy Owls (*Nyctea scandiaca*). Wintering American Kestrels (*Falco sparverius*) use a wide variety of

open to semi-open habitats, including meadows, grasslands, early successional communities, open parkland, agricultural fields, and both urban and suburban areas. Other wintering raptors, such as the Long-eared Owl (*Asio otus*), occur in more closed habitats, with denser vegetation and smaller open patches.

A combination of forested and open habitats occur within and adjacent to the study area and could provide suitable Raptor Wintering Area SWH. However, because the proposed road upgrades will be confined to relatively narrow areas within and adjacent to the ROW, no negative impacts to this Candidate SWH type are anticipated. Therefore, no targeted surveys to confirm the presence of this Candidate SWH type are considered necessary.

Bat Maternity Colonies

Bat maternity (or nursery) colonies are day roosts inhabited solely by females and juveniles/subadults and are used for giving birth and raising young (OMNR 2011). They can range in size from tens to hundreds of adult females and their young and some species form individual maternal roosts (OMNR 2011). Maternity colonies can be located in human structures (e.g., barns and attics), in tree cracks and hollows, and under loose tree bark. Guidelines for identifying candidate significant bat maternity colony are outlined by the MNRF (OMNR 2011) and the SWHTG (MNRF 2015b, 2015c). These documents recommend that all deciduous or mixed forest communities (FOD, FOM, SWD, and SWM) should be assessed for cavity trees $\geq 25\text{cm}$ dbh (diameter at breast height) which may be suitable for roosting bats. There are several wooded areas within the study area (FODM5, FODM7, FODM4-2, SWDM3-3; Map 2) that may be suitable for bat maternal roosts, however, no specific assessments have been completed to date. Targeted bat habitat surveys may therefore be required during detailed design depending on the design of the preferred alternative and the potential for impact to woodlands and trees which may provide this Candidate SWH type.

Snake Hibernaculum

Snakes depend on hibernation sites located below frost lines in burrows, rock crevices and other natural locations to escape freezing temperatures (OMNR 2011). Suitable snake hibernaculum can be obvious and easy to identify (e.g. obvious broken or fissured rock that provides access to subterranean sites below the frost line). However, often access to these sites are along tree roots, through broken foundations, or through mammal burrows which are difficult to see. It is also possible that seeps and springs are potentially important hibernation sites for some snake species such as the Northern Ribbonsnake (OMNR 2011).

A circular pile of rocks enclosed by wooden posts was observed adjacent to the intersection of Oxford Road 16 and 29th Line, and was considered to potentially contain an old infilled well (see Appendix X). See Map 2D for the presence of this structure. This feature may therefore provide suitable hibernaculum habitat for snakes. Targeted surveys for snakes would be required to confirm or rule out the presence of this Candidate SWH type. The need for additional targeted surveys may be determined based on the potential for impact to this feature during the detailed design stage.

Woodland Amphibian Breeding Habitat

Most amphibians require a source of water to reproduce and during spring, many of these species concentrate in woodland ponds to mate and lay eggs. Amphibian woodland breeding ponds may be along the edge of swamps, in floodplains, in groundwater seeps, or in depressions in upland forests but must

be within 120 m of upland habitat (OMNR 2011). There are several species of frog and salamander that are dependent on a combination of upland woodland and woodland ponds. The presence of 20 or more individuals of these species confirms these areas as SWH (MNR 2015b, MNR 2015c).

Candidate SWH for woodland amphibian breeding was identified based on the presence of SWDM3-3 deciduous swamp habitat within the study area, as well as potential for vernal pool habitat within the FODM5, FODM7, FODM4-2, forest communities. Spring-based amphibian call surveys would be required to confirm or rule out the presence of this Candidate SWH type within the study area. The need for additional targeted surveys may be determined based on the potential for impact to this feature during the detailed design stage.

Special Concern and Rare Wildlife Species Habitat

Special Concern and Rare Wildlife species are those species defined above as SCC. Confirmed habitat for SCC may be considered Significant Wildlife Habitat (OMNR 2000). Based on background information, 11 SCC were reported from the vicinity of the study area. Candidate habitat for 9 of these species was identified within the study area as discussed above and listed in Appendix I. The location of these Candidate SWH types within the study area are summarized in Table 4.

Table 4. Candidate Special Concern and Rare Wildlife SWH within the Oxford Road 16 Class EA Study Area

Species	Preferred Habitat ^{1,2}	Candidate SWH in Study Area (ELC Vegetation Community)	Map Reference(s)
Vascular Flora			
Oswego-tea (<i>Monarda didyma</i>)	Moist woods, swampy thickets and roadsides.	Swamp Maple Mineral Deciduous Swamp (SWDM3-3) and the roadside of Oxford Road 16	Maps 2A – 2F
Birds			
Grasshopper Sparrow (<i>Ammodramus savannarum</i>)	Well-drained grassland or prairie with low cover of grasses, taller weeds on sandy soil; hayfields or weedy fallow fields; uplands with ground vegetation of various densities; perches for singing; requires tracts of grassland >10ha.	Perennial Cover Crop (OAGM2)	Maps 2A – 2F
Eastern Wood-pewee (<i>Contopus virens</i>)	Open, deciduous, mixed or coniferous forest; predominated by oak with little understory; forest clearings, edges; farm woodlots, parks.	Fresh-Moist Lowland Deciduous Forest (FODM7), Dry-Fresh White Ash – Hardwood Deciduous Forest (FODM4-2), Dry-Fresh Sugar Maple Deciduous Forest (FODM5)	Maps 2D, 2E, and 2F
Wood Thrush (<i>Hylocichla mustelina</i>)	Undisturbed moist mature deciduous or mixed forest with deciduous sapling growth; near pond or swamp; hardwood forest edges; must have some	Fresh-Moist Lowland Deciduous Forest (FODM7), Dry-Fresh White Ash – Hardwood Deciduous Forest (FODM4-2), Dry-Fresh Sugar Maple Deciduous	Maps 2D, 2E, and 2F

	trees higher than 12m.	Forest (FODM5)	
Red-headed Woodpecker (<i>Melanerpes erythrocephalus</i>)	Open, deciduous forest with little understory; fields or pasture lands with scattered large trees; wooded swamps; orchards, small woodlots or forest edges; groves of dead or dying trees; feeds on insects and stores nuts or acorns for winter; loss of habitat is limiting factor; requires cavity trees with at least 40 cm dbh; require about 4 ha for a territory.	Swamp Maple Mineral Deciduous Swamp (SWDM3-3), Fresh-Moist Lowland Deciduous Forest (FODM7), Dry-Fresh White Ash – Hardwood Deciduous Forest (FODM4-2), Dry-Fresh Sugar Maple Deciduous Forest (FODM5)	Maps 2B, 2D, 2E, and 2F
Reptiles and Amphibians			
Eastern Milksnake (<i>Lampropeltis taylori triangulum</i>)	Farmlands, meadows, hardwood or aspen stands; pine forest with brushy or woody cover; river bottoms or bog woods; hides under logs, stones, or boards or in outbuildings.	Fresh-Moist Lowland Deciduous Forest (FODM7), Dry-Fresh White Ash – Hardwood Deciduous Forest (FODM4-2), Dry-Fresh Sugar Maple Deciduous Forest (FODM5), Perennial Cover Crop (OAGM2), Reed Canary Grass Graminoid Meadow (MEGM3-8), Dry-Fresh Mixed Meadow (MEMM3)	Maps 2A – 2F
Western Chorus Frog (<i>Pseudacris triseriata</i>)	Roadside ditches or temporary ponds in fields; swamps or wet meadows; woodland or open country with cover and moisture; small ponds and temporary pools.	Reed Canary Grass Graminoid Meadow (MEGM3-8), Swamp Maple Mineral Deciduous Swamp (SWDM3-3), and roadside ditches of Oxford Road 16	Maps 2A – 2F
Mammals			
Tri-colored Bat (<i>Perimyotis subflavus</i>)	Open woods near water; roosts in trees, cliff crevices, buildings or caves; hibernates in damp, draft-free, warm caves, mines or rock crevices	Swamp Maple Mineral Deciduous Swamp (SWDM3-3), Fresh-Moist Lowland Deciduous Forest (FODM7), Dry-Fresh White Ash – Hardwood Deciduous Forest (FODM4-2), Dry-Fresh Sugar Maple Deciduous Forest (FODM5)	Maps 2B, 2D, 2E, and 2F
Lepidoptera			
Monarch (<i>Danaus plexippus</i>)	Host plant is Milkweed (<i>Asclepias</i> spp.)	Reed Canary Grass Graminoid Meadow (MEGM3-8), roadsides of Oxford Road 16	Maps 2A – 2F

¹OMNR 2000, ²Layberry *et al.* 1998

Development or site alteration within habitats of SCC is permitted under the PPS if it can be demonstrated that there will be no negative impacts to the form or function of these areas (OMMAH 2014). The need for additional targeted surveys may be determined based on the potential for impact to this Candidate SWH type during the detailed design stage.

Fish Habitat

Pearson and Cuskey Drain, McCall-McCorquodale Drain, and Nissouri Creek provide direct habitat for fish as discussed above. Various habitat features were identified during field investigations within each watercourse including pools, riffles, and substrates of sand, gravel, and cobble. The riparian habitat provides a food source for fish, stream bed and bank stability, cover and habitat for young fish, water temperature regulation, and the mitigation of water quality impacts from runoff. These watercourses are therefore assumed to provide suitable spawning, nursery, and rearing habitats as well as various food sources on which fish depend directly upon in order to carry out their life processes.

Following the selection of the preferred road improvement design, a DFO self-assessment screening exercise is recommended to be completed in order to determine the need for DFO involvement in the proposed development. This tool allows for an assessment to determine if serious harm to fish, as defined by the federal *Fisheries Act*, will occur based on details of the proposed activity.

This project will not require a DFO review as long as:

- there is no temporary or permanent increase in the existing footprint below the high water mark(s),
- there is no new temporary or permanent fill placed below the high water mark(s),
- channel realignment is not required,
- there is no proposed narrowing of the channel,
- any obstruction to fish passage respects timing windows,
- work provides for fish passage, and
- work can be done in isolation of flowing water

If the above can be achieved there will be no need to involve DFO. However, there will still be a requirement to avoid causing serious harm to fish by following best management practices. If proposed culvert works result in any of the above listed, a DFO review of the project will be required.

Habitat of Provincially Endangered and Threatened Species

Based on the results of background information screening exercises, habitat for six SAR were identified as potentially present within the study area (Appendix II). These habitats are described below.

Barn Swallow

Several structures on private property which may provide Barn Swallow (*Hirundo rustica*) nest sites occur within the study area. Barn Swallow is designated as provincially Threatened; therefore, this species and its general habitat are protected under the ESA. It represents one of many species of common aerial-foraging insectivorous birds that are of conservation concern in northeastern Canada and the United States due to long-term population declines for a combination of reasons that are not well understood (Heagy *et al.* 2014). Habitat for this species is protected under the General Habitat provisions of the ESA and is categorized as 1) nest, 2) the area within 5 m of the nest, and 3) the area between 5 m and 200 m of the nest (OMNR 2013a).

The entirety of the study area represents suitable foraging habitat for Barn Swallow. However, no suitable nesting structures occur within or immediately

adjacent to (i.e., within 30 m) the Oxford Road 16 ROW. Therefore, no impact to nesting habitat is anticipated as a result of the proposed undertaking.

Furthermore, the relatively small footprint that may be required for road widening is not anticipated to cause negative impact to existing foraging habitat. The proposed undertaking is therefore not anticipated to require MNRF authorization or permitting to address impacts to Barn Swallow or its general habitat.

Bobolink and Eastern Meadowlark

Perennial cover crop fields (i.e., hay fields; OAGM2) within the study area may provide suitable breeding habitat for Eastern Meadowlark (*Sturnella magna*) and Bobolink (*Dolichonyx orizyvorus*). These species are designated as provincially Threatened; therefore, these species and their general habitats are protected under the ESA. Similar to many grassland birds in Ontario, Eastern Meadowlark and Bobolink populations are shrinking due to changes in land use and the loss of suitable habitat that has resulted from development and changes in agricultural practices. Because Bobolink and Eastern Meadowlark have similar habitat preferences and face similar threats, they are considered together under the same protection policies of the ESA and its species-specific regulations. Habitat for Eastern Meadowlark is protected under the General Habitat provisions of the ESA and is categorized as 1) a nest area and 10 m around the nest, 2) the area between 10 m and 100 m of the nest or centre of approximated defended territory, and 3) the area of continuous suitable habitat between 100 m and 300 m of the nest or approximated centre of defended territory (MNRF 2014). Similarly, habitat for Bobolink is protected under the General Habitat provisions of the ESA and is categorized as 1) a nest area and 10 m around the nest, 2) the area between 10 m and 60 m of the nest or centre of approximated defended territory, and 3) the area of continuous suitable habitat between 60 m and 300 m of the nest or approximated centre of defended territory (OMNR 2013a).

Impact potential to Bobolink and Eastern Meadowlark habitat, and the need for additional targeted surveys, will be determined based on details of the preferred alternative design. However, due to the relatively small footprint that may be required for road widening, it is not anticipated that the proposed undertaking will cause negative impact to Bobolink or Eastern Meadowlark, or their general habitat.

Little Brown Myotis and Northern Myotis

Little Brown Myotis (*Myotis lucifuga*) will use buildings and occasionally tree cavities as maternity and day roost sites (OMNR 2000), both of which are present within the study area. Northern Myotis (*Myotis septentrionalis*) prefer tree cavities or spaces under loose bark and will occasionally use buildings for maternity and day roost sites (OMNR 2000), all of which are also present within the study area. These species are listed as Endangered in Ontario; therefore, these species and their general habitats are protected under the ESA. Myotis species are experiencing significant declines in population sizes throughout eastern North America due to the fungus, *Pseudogymnoascus destructans* which causes “white nose syndrome”, and is terminal to bats. Bats are affected by the fungus during hibernation where it grows on their muzzles, ears, and wing membranes and results in the arousal of individuals from hibernation more frequently, and/or for longer periods than normal, and in the premature expenditure of fat reserves which they rely on for winter survival.

Field studies confirmed the presence of two cavity trees within approximately 30m of the Oxford Road 16 ROW (Map 2). These trees may provide suitable maternity colony or roosting habitat for SAR bats. Additional targeted surveys may be required, in consultation with the MNRF, to assess the use of these trees by SAR bats. The need for targeted surveys and MNRF consultation will be determined based on details of the preferred alternative design.

American Badger

Suitable habitat for American Badger (*Taxidea taxus jacksoni*) is limited within the study area, however, is present in the form of meadow habitat (MEMM3) and transitional habitat between treed areas and agricultural fields. This species is designated as Endangered in Ontario; therefore, this species and its general habitat is protected under the ESA. Similar to grassland birds discussed above, the greatest threat to American Badger populations in Ontario is the loss and fragmentation of native and human-maintained grassland habitats due to development and changes in agricultural practices. American Badger habitat is defined under Section 24 of the O. Reg. 242/08 of the ESA as 1) den currently being used or was used by American Badger in the previous 12 months, 2) the area within 5 m of the entrance of the den, and 3) a Woodchuck (*Marmota monax*) burrow or Franklin's Ground Squirrel (*Spermophilus franklinii*) burrow that i) is being used or was used by a Woodchuck or Franklin's Ground Squirrel at any time in the past, and ii) is within 850 m of an American Badger den.

Potential dens were not observed within the road ROW during field investigations. Impact potential to American Badger habitat, and the need for additional targeted surveys, will be determined based on details of the preferred alternative design.

Summary of Natural Feature Constraints

A summary of natural features identified as constraints to the proposed road improvements is provided below. Although many of these features are identified as significant, there are allowances in the provincial and local policies to permit activities that create or maintain infrastructure authorized under an EA process. The design of the preferred alternative should seek to minimize impacts to these features wherever possible.

- The locally significant Swamp Maple Mineral Deciduous Swamp (SWDM3-3, Map 2) falls within the proposed 30 m ROW.
- Significant Woodlands are associated with McCall-McCorquodale Drain and Nissouri Creek.
- Significant Valleyland features are associated with the Pearson & Cuskey Drain, McCall-McCorquodale Drain, and Nissouri Creek floodplains. Additional studies may be required once the preferred alternative is selected to inform potential impacts to these features (e.g. slope stability assessment).
- Fish habitat is present in Pearson & Cuskey Drain, McCall-McCorquodale Drain, and Nissouri Creek. Completion of a DFO self-assessment screening exercise is recommended for each crossing to determine DFO involvement in the proposed development. Further consultation and review with DFO may be required once the preferred alternative is selected, if there is the potential to cause serious harm to fish habitat.
- The design of the preferred alternative should have regard for potential SWH; additional targeted surveys may be considered during detailed design to confirm/rule out Candidate SWH.

- No SAR were confirmed within the study area, but candidate habitat for the several SAR was identified within the study area. Due to the relatively small footprint that may be required for road widening, it is not anticipated that the proposed undertaking will cause negative impact to SAR, or their general habitat. The exception being Little Brown Myotis and Northern Myotis, and only if they are found to be using the candidate cavity trees identified as habitat. Potential impacts to SAR bats will need to be considered in consultation with MNRF once the preferred alternative is selected and the need to remove those trees is determined.

Conclusions

Natural Resource Solutions Inc. (NRSI) was retained in 2015 by Oxford County to complete the natural heritage component of the Oxford Road 16 Class EA. This report summarizes background information on natural heritage features, as well as the methods and results of a scoped field program within the study area.

The characterization of existing natural features was used to inform an analysis of the significance and sensitivity of natural features within the study area. This information is intended to inform the selection of a preferred alternative design that seeks to avoid or minimize impact to existing natural features and species. In summary, proposed road improvements to Oxford Road 16, such as the widening of the road ROW from 20 m to 30 m, may have the potential to impact existing natural features within the study area. These include potential for impact to adjacent wetland, Significant Woodland and Significant Valleyland features, Candidate SWH types (snake hibernaculum and woodland amphibian breeding habitat) and bat SAR habitat.

This analysis is one component of the EA which will inform the selection of the preferred alternative. Other components which need to be considered are technical feasibility, potential impacts to the local community (i.e. social impacts), cost, and input from a variety of stakeholders.

The final EA will include an impact assessment based on details of the preferred alternative design. The details of the proposed undertaking will be reviewed and compared to the existing conditions in the study area. The need for additional targeted field surveys will be considered based on the detailed design to inform the impact assessment. Adverse environmental impacts likely to arise directly or indirectly from the proposed development will be discussed with the project team and options for minimizing impacts will be examined. Recommendations for mitigation measures will be proposed to offset negative impacts on the natural environment and species occupying the study area. In addition, potential enhancements or compensation measures that can be achieved will also be highlighted.

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MAPS



Map 1

Oxford Road 16 Class EA Study Area

Legend

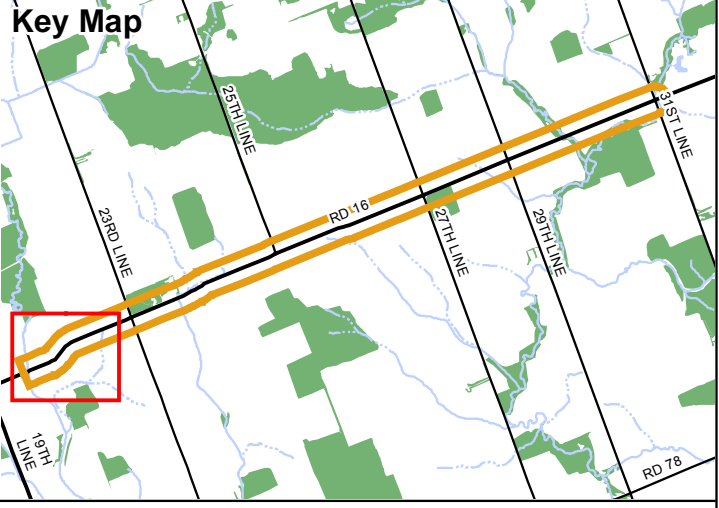
- Study Area
- Primary Road
- Secondary Road
- Permanent Watercourse
- Intermittent Watercourse
- Waterbody
- Provincially Significant Wetland (PSW)
- Wooded Area
- ANSI, Life Science

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

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Oxford Road 16 Class EA Vegetation Communities and Aquatic Survey Locations



- Legend**
- Study Area
 - Aquatic Habitat Point (AHP)
 - Electrofishing Monitoring Station (EMS)
 - Permanent Watercourse
 - Intermittent Watercourse
 - Ecological Land Classification (ELC)
 - (CGL_2) Parkland
 - (CVR) Residential
 - (FODM7) Fresh-Moist Lowland Deciduous Forest Ecosite
 - (MEMM3) Dry-Fresh Mixed Meadow Ecosite
 - (OAGM1) Annual Row Crops
 - (OAGM2) Perennial Cover Crops

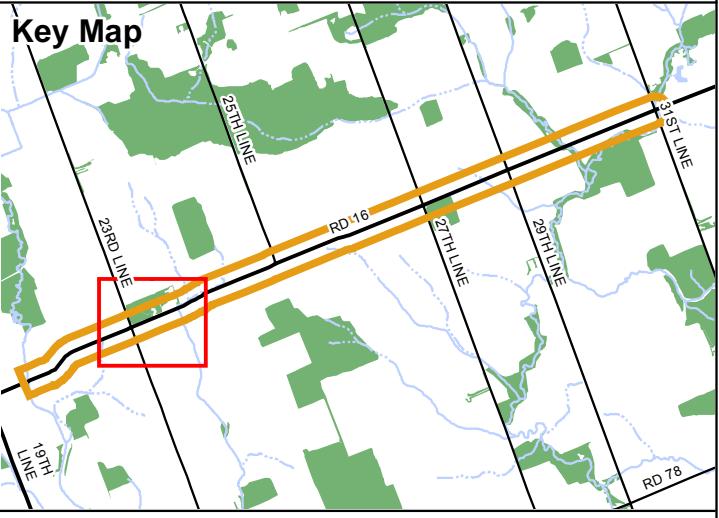


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Map 2B
Oxford Road 16 Class EA
Vegetation Communities and
Aquatic Survey Locations



- Legend**
- Study Area
 - Permanent Watercourse
 - Intermittent Watercourse
 - Locally Significant Wetland
 - Ecological Land Classification (ELC)
 - (CVR) Residential
 - (OAGM1) Annual Row Crops
 - (OAGM2) Perennial Cover Crops
 - (SWDM3-3) Swamp Maple Mineral Deciduous Swamp Type
 - (TAGM1) Coniferous Plantation



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Project: 1680 Date: October 28, 2015	NAD83 - UTM Zone 18 Size: 11x17" 1:3,000
0 50 100 150 200 Metres	



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500000

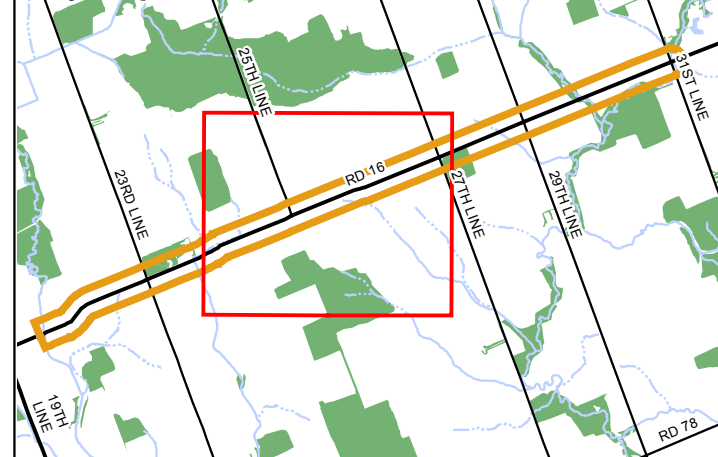
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Map 2C

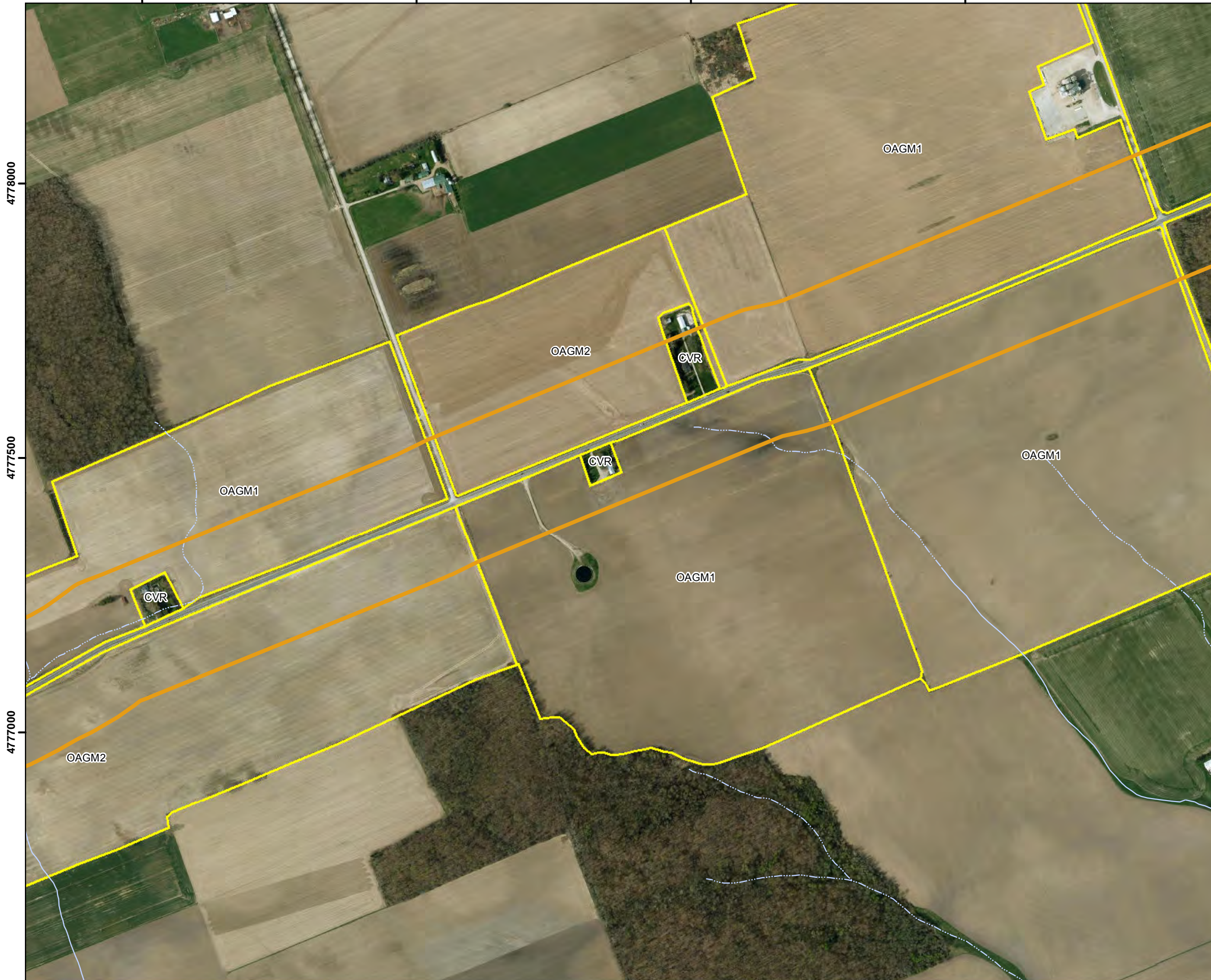
Oxford Road 16 Class EA Vegetation Communities and Aquatic Survey Locations

Key Map



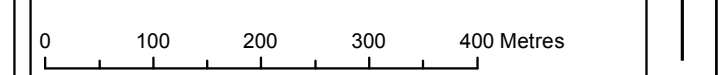
Legend

- Study Area
- Permanent Watercourse
- Intermittent Watercourse
- Ecological Land Classification (ELC)
 - (CVR) Residential
 - (OAGM1) Annual Row Crops
 - (OAGM2) Perennial Cover Crops



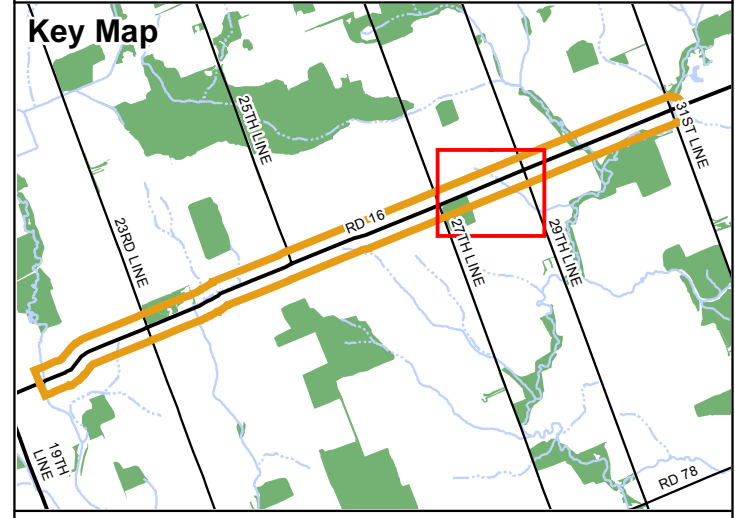
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Project: 1680 Date: October 28, 2015	NAD83 - UTM Zone 18 Size: 11x17" 1:7,000
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Map 2D
Oxford Road 16 Class EA
Vegetation Communities and
Aquatic Survey Locations

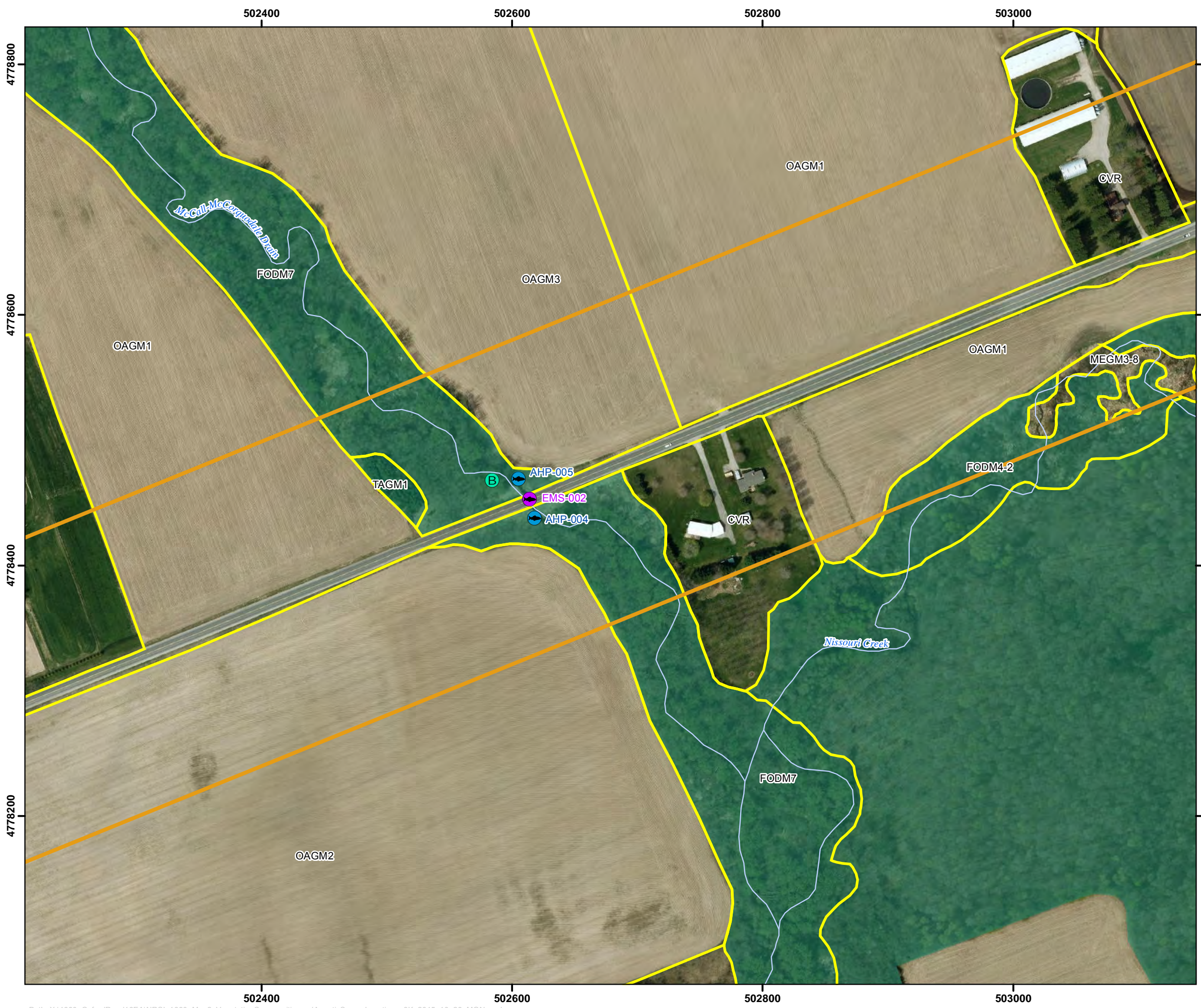


- Legend**
- Study Area
 - Potential Snake Hibernaculum
 - Cavity Tree
 - Permanent Watercourse
 - Intermittent Watercourse
 - Ecological Land Classification (ELC)
 - (CVR) Residential
 - (FODM5) Dry-Fresh Sugar Maple Deciduous Forest
 - (OAGM1) Annual Row Crops
 - (OAGM2) Perennial Cover Crops

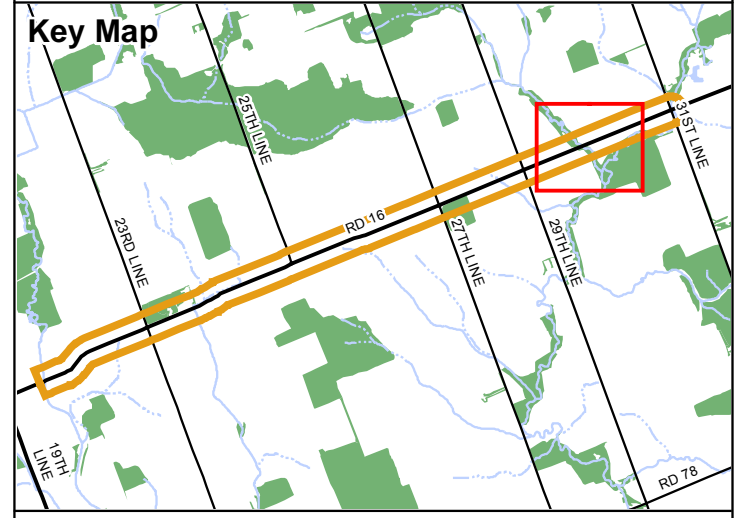


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Project: 1680 Date: October 28, 2015	NAD83 - UTM Zone 18 Size: 11x17" 1:3,000



Map 2E
Oxford Road 16 Class EA
Vegetation Communities and
Aquatic Survey Locations



- Legend**
- Study Area
 - Aquatic Habitat Point (AHP)
 - Electrofishing Monitoring Station (EMS)
 - Cavity Tree
 - Permanent Watercourse
 - Significant Woodland (County of Oxford 2006)
 - Ecological Land Classification (ELC)
- (CVR) Residential
(FODM4-2) Dry-Fresh White Ash-Hardwood Deciduous Forest Type
(FODM7) Fresh-Moist Lowland Deciduous Forest Ecosite
(MEGM3-8) Reed Canary Grass Graminoid Meadow Type
(OAGM1) Annual Row Crops
(OAGM2) Perennial Cover Crops
(OAGM3) Specialty Crops
(TAGM1) Coniferous Plantation



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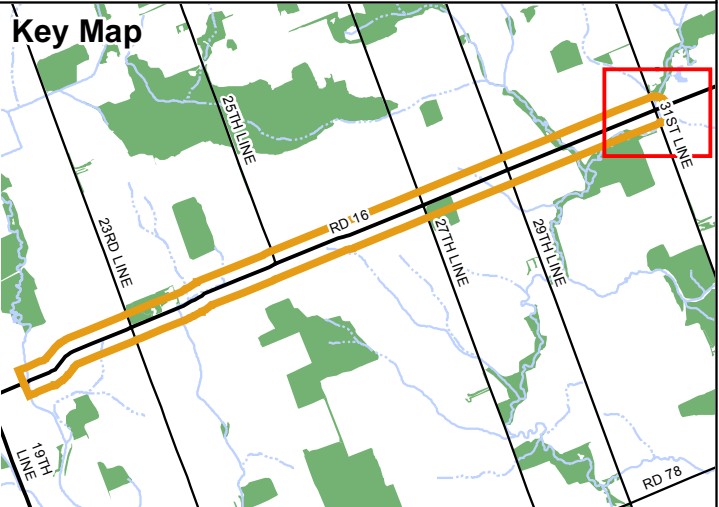
Project: 1680 Date: October 28, 2015	NAD83 - UTM Zone 18 Size: 11x17" 1:3,000
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4779000
4778800
4778600
4778400



Map 2F
Oxford Road 16 Class EA
Vegetation Communities and
Aquatic Survey Locations



- Legend**
- Study Area
 - Aquatic Habitat Point (AHP)
 - Permanent Watercourse
 - Intermittent Watercourse
 - Significant Woodland (County of Oxford 2006)
 - Ecological Land Classification (ELC)
 - (FODM4-2) Dry-Fresh White Ash-Hardwood Deciduous Forest Type
 - (FODM7) Fresh-Moist Lowland Deciduous Forest Ecosite
 - (MEGM3-8) Reed Canary Grass Graminoid Meadow Type
 - (OAGM1) Annual Row Crops
 - (OAGM2) Perennial Cover Crops



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Project: 1680 Date: October 28, 2015	NAD83 - UTM Zone 18 Size: 11x17" 1:3,000	

APPENDIX I
Federally and Provincially Significant Species Known for the Study Area and
Vicinity

Federally and Provincially Significant Species Known from the Study Area and Vicinity

Scientific Name	Common Name	SRANK ¹	COSSARO ²	COSEWIC ³	SARA Schedule ⁴	Habitat Preference ^{5,6,7,8,9,10,11,12,13,14}	Background Source	Suitable Habitats within Study Area	Observed by NRSI
Vascular Flora									
<i>Collinsia verna</i>	Blue-eyed Mary	SX	EXP	XT	Schedule 1	Rich deciduous forests, especially in ravines and moist areas.	MNRF 2015b	No	No
<i>Frasera caroliniensis</i>	American Columbo	S2	END	E	Schedule 1	Woodlands on sandy and clay soils.	MNRF 2015b	No	No
<i>Monarda didyma</i>	Oswego-tea	S3	--	--	--	Moist woods, swampy thickets and roadsides.	MNRF 2015b	Yes	No
Birds									
<i>Ammodramus savannarum</i>	Grasshopper Sparrow	S4B	--	SC	--	Well-drained grassland or prairie with low cover of grasses, taller weeds on sandy soil; hayfields or weedy fallow fields; uplands with ground vegetation of various densities; perches for singing; requires tracts of grassland >10ha.	BSC et al. 2008	No; All fields within study area are actively being used for agriculture.	No
<i>Chaetura pelagica</i>	Chimney Swift	S4B, S4N	THR	T	Schedule 1	Commonly found in urban areas near buildings; nests in hollow trees, crevices of rock cliffs, chimneys; highly gregarious; feeds over open water.	BSC et al. 2008	No	No
<i>Contopus virens</i>	Eastern Wood-pewee	S4B	SC	SC	--	Open, deciduous, mixed or coniferous forest; predominated by oak with little understory; forest clearings, edges; farm woodlots, parks.	BSC et al. 2008	Yes	No
<i>Dolichonyx oryzivorus</i>	Bobolink	S4B	THR	T	--	Large, open expansive grasslands with dense ground cover; hayfields, meadows or fallow fields; marshes; requires tracts of grassland >50 ha.	BSC et al. 2008	Yes	No
<i>Hirundo rustica</i>	Barn Swallow	S4B	THR	T	--	Farmlands or rural areas; cliffs, caves, rock niches; buildings or other man-made structures for nesting; open country near body of water.	BSC et al. 2008	Yes; foraging habitat is present within the study area.	No
<i>Hylocichla mustelina</i>	Wood Thrush	S4B	SC	T	--	Undisturbed moist mature deciduous or mixed forest with deciduous sapling growth; near pond or swamp; hardwood forest edges; must have some trees higher than 12m.	BSC et al. 2008	Yes	No
<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker	S4B	SC	T	Schedule 1	Open, deciduous forest with little understory; fields or pasture lands with scattered large trees; wooded swamps; orchards, small woodlots or forest edges; groves of dead or dying trees; feeds on insects and stores nuts or acorns for winter; loss of habitat is limiting factor; requires cavity trees with at least 40 cm dbh; require about 4 ha for a territory.	BSC et al. 2008	Yes	No

Scientific Name	Common Name	SRANK ¹	COSSARO ²	COSEWIC ³	SARA Schedule ⁴	Habitat Preference ^{5,6,7,8,9,10,11,12,13,14}	Background Source	Suitable Habitats within Study Area	Observed by NRSI
<i>Riparia riparia</i>	Bank Swallow	S4B	THR	T	--	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.	BSC et al. 2008	No	No
<i>Setophaga cerulea</i>	Cerulean Warbler	S3B	THR	E	Schedule 1	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).	MNRF 2015b	No	No
<i>Sturnella magna</i>	Eastern Meadowlark	S4B	THR	T	--	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.	BSC et al. 2008	Yes	No
Herpetofauna									
<i>Chelydra serpentina serpentina</i>	Snapping Turtle	S3	SC	SC	Schedule 1	Permanent, semi-permanent fresh water; marshes, swamps or bogs; rivers and streams with soft muddy banks or bottoms; often uses soft soil or clean dry sand on south-facing slopes for nest sites.	Ontario Nature 2015; MNRF 2015b	No	No
<i>Emydoidea blandingii</i>	Blanding's Turtle	S3	THR	T	Schedule 1	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.	Ontario Nature 2015	No	No
<i>Lampropeltis taylori triangulum</i>	Eastern Milksnake	S3	SC	SC	Schedule 1	Farmlands, meadows, hardwood or aspen stands; pine forest with brushy or woody cover; river bottoms or bog woods; hides under logs, stones, or boards or in outbuildings.	Ontario Nature 2015	Yes	No
<i>Pseudacris triseriata</i> pop. 2	Western Chorus Frog (Great Lakes/St. Lawrence - Canadian Shield Population)	S3	NAR	T	Schedule 1	Roadside ditches or temporary ponds in fields; swamps or wet meadows; woodland or open country with cover and moisture; small ponds and temporary pools.	Ontario Nature 2015	Yes	No

Scientific Name	Common Name	SRANK ¹	COSSARO ²	COSEWIC ³	SARA Schedule ⁴	Habitat Preference ^{5,6,7,8,9,10,11,12,13,14}	Background Source	Suitable Habitats within Study Area	Observed by NRSI
Mammals									
<i>Perimyotis subflavus</i>	Tri-colored Bat	S3?		E	Schedule 1	Open woods near water; roosts in trees, cliff crevices, buildings or caves; hibernates in damp, draft-free, warm caves, mines or rock crevices	Dobbyn 1994	Yes; Suitable roosting habitat (cavity trees, forested habitat) and foraging habitat present (forested habitat adjacent to watercourses) present within study area.	No
<i>Myotis leibii</i>	Eastern Small-footed Myotis	S2S3	END			Roosts in open, sunny, rocky habitats; males and females roost alone, however, females will form maternity colonies of up to 2 to 3 adults; hibernates in cold dry caves or mines; forages in forests and over waterbodies	Dobbyn 1994	No	No
<i>Myotis septentrionalis</i>	Northern Myotis	S3	END	E	Schedule 1	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, manmade structures but prefers hollow trees or under loose bark; forages within forests, below canopy.	Dobbyn 1994	Yes; Suitable roosting habitat (cavity trees, forested habitat) and foraging habitat present (forested habitat) present within study area.	No
<i>Taxidea taxus jacksoni</i>	American Badger	S2	END	E	Schedule 1	Open habitat such as meadows, prairies, and oak savannahs as well as grassy and weedy edges of fields and forests; dens in new hole or enlarged existing hole.	Dobbyn 1994, Naughton 2012	Yes; Suitable habitat is present within the study area, specifically, grassy and weedy edges of fields.	No
<i>Myotis lucifuga</i>	Little Brown Myotis	S4	END	E	Schedule 1	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; forages primarily in wetlands, forest edges.	Dobbyn 1994	Yes; Suitable roosting habitat (cavity trees, buildings) and foraging habitat (forested areas) present within study area.	No
Insects									
<i>Danaus plexippus</i>	Monarch	S2N, S4B	SC	SC	Schedule 1	Host plant is Milkweed (<i>Asclepias</i> spp.)	Jones et al. 2015	Yes	No

Scientific Name	Common Name	SRANK ¹	COSSARO ²	COSEWIC ³	SARA Schedule ⁴	Habitat Preference ^{5,6,7,8,9,10,11,12,13,14}	Background Source	Suitable Habitats within Study Area	Observed by NRSI
Fish									
<i>Ichthyomyzon fossor</i>	Northern Brook Lamprey (GL-USL Pop.)	S3	SC	SC (April 2007)	Schedule 1	Adults in clean, clear riffles and runs of small rivers with gravel and sand substrates; ammocoetes occupy quiet water with sand, silt and detritus substrates.	MNRF 2015b	No	No

^{1,2}MNRF 2015a, ^{3,4}Government of Canada 2015, ⁵MNRF 2000, ⁶Layberry et al. 1998, ⁷Eakins 2015, ⁸Best and Jennings 1997, ⁹Johnson and Gates 2008, ¹⁰Johnson et al. 2011, ¹¹Moosman et al. 2013, ¹²USFWS 2013, ¹³Whitby et al. 2013, ¹⁴Moosman et al. 2015

LEGEND
SRANK
S2 Imperiled
S3 Vulnerable
S4 Apparently Secure
B Breeding
N Non-breeding
SX Extirpated
COSSARO/COSEWIC
END/E Endangered
THR/T Threatened
SC/SC Special Concern
EXP/XT Extirpated
NAR Not at Risk
SARA Schedule
Schedule 1 Officially Protected under SARA

APPENDIX II
Significant Wildlife Habitat Assessment Tables

Significant Wildlife Habitat Assessment Tables

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E and 7E.

	Wildlife Species ¹	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes ¹	Habitat Criteria and Information Sources ¹	Defining Criteria ¹	Assessment Details
Wildlife Habitat: Raptor Wintering Area					
<p><u>Rationale:</u> Sites used by multiple species, a high number of individuals and used annually are most significant</p>	<p>Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl</p> <p><u>Special Concern:</u> Short-eared Owl Bald Eagle</p>	<p>Hawks/Owls: Combination of ELC Community Series; need to have present one Community Series from each land class: Forest: FOD, FOM, FOC</p> <p>Upland: CUM, CUT, CUS, CUW</p>	<p>The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors.</p> <p>Raptor wintering sites need to be > 20 ha^{cxlviii, cxlix} with a combination of forest and upland.^{xvi, xvii, xviii, xix, xx, xxi}</p> <p>Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands^{cxlix}</p> <p>Field area of the habitat is to be wind swept with limited snow depth or accumulation.</p> <p>Eagle sites have open water, large trees and snags available for roosting</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> • OMNRF Ecologist or Biologist • Field Natural Clubs • Natural Heritage Information Center (NHIC) Raptor Winter Concentration Area • Data from Bird Studies Canada • Reports and other information available from Conservation Authorities CAs. 	<p>Studies confirm the use of these habitats by:</p> <ul style="list-style-type: none"> • One or more Short-eared Owls or; One or more Bald Eagles or; At least 10 individuals and two listed hawk/owl species • To be significant a site must be used regularly (3 in 5 years)^{cxlix} for a minimum of 20 days by the above number of birdsⁱ. • The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"^{ccxi} • SWHMiST^{cxlix} Index #10 and #11 provides development effects and mitigation measures. 	<p>Suitable combination of hayfield and treed habitat exists within the study area.</p> <p>Candidate SWH</p>
Wildlife Habitat: Bat Maternity Colonies					
<p><u>Rationale:</u> Known locations of forested bat maternity colonies is extremely rare in all Ontario landscapes.</p>	<p>Big Brown Bat Silver-haired Bat</p>	<p>Maternity colonies considered SWH are found in forested Ecosites.</p> <p>All ELC Ecosites in ELC Community Series: FOD FOM SWD SWM</p>	<p>Maternity colonies can be found in tree cavities, vegetation and often in buildings^{xxii, xxv, xxvi, xxvii, xxxi} (buildings are not considered to be SWH).</p> <ul style="list-style-type: none"> • Maternity roosts are not found in caves and mines in Ontario^{xxii}. • Maternity colonies located in Mature deciduous or mixed forest stands^{ccix, ccx} with >10/ha large diameter (>25cm dbh) wildlife trees^{ccvii} • Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3^{ccxiv} or class 1 or 2^{ccxii}. • Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred^{ccx} <p><u>Information Sources</u></p> <ul style="list-style-type: none"> • OMNRF for possible locations and contact for local experts • University Biology Departments with bat experts. 	<ul style="list-style-type: none"> • Maternity Colonies with confirmed use by: <ul style="list-style-type: none"> • >10 Big Brown Bats • >5 Adult Female Silver-haired Batsⁱ • The area of the habitat includes the entire woodland or the forest stand ELC Ecosite or an Ecoelement containing the maternity colonies. • Evaluation methods for maternity colonies should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for wind Power Projects"^{ccv}. • SWHMiST^{cxlix} Index #12 provides development effects and mitigation measures. 	<p>The study area contains suitable forested habitat (FODM7, FODM4-2, FODM5, SWDM3-3).</p> <p>Candidate SWH</p>

Wildlife Habitat: Snake Hibernaculum

<p>Rationale: Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant</p>	<p>Snakes: Eastern Gartersnake Northern Watersnake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake</p> <p>Special Concern: Milksnake Eastern Ribbonsnake</p> <p>Lizard: Special Concern (Southern Shield population): Five-lined Skink</p>	<p>For all snakes, habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice and Cave, and Alvar sites may be directly related to these habitats.</p> <p>Observations of congregations of snakes on sunny warm days in the spring or fall is a good indicator.</p> <p>For Five-lined Skink, ELC Community Series of FOD and FOM and Ecosites: FOC1 FOC3</p>	<p>• For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural locations. The existence of features that go below the frost line; such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH.</p> <p>• Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line. • Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover.</p> <p>• Five-lined skink prefer mixed forests with rock outcrop openings providing cover rock overlaying granite bedrock with fissures cciii.</p> <p>Information Sources</p> <p>• In spring, local residents or landowners may have observed the emergence of snakes on their property (e.g. old dug wells).</p> <p>• Reports and other information from CAs.</p> <p>• Local Field naturalists and experts, as well as university herpetologists may also know where to find some of these sites. clubs</p> <p>• Natural Heritage Information Center (NHIC)</p> <p>• OMNRF ecologist or biologist may be aware of locations of wintering skinks</p>	<p>Studies confirming:</p> <ul style="list-style-type: none"> • Presence of snake hibernacula used by a minimum of five individuals of a snake sp. <u>or</u>; individuals of two or more snake spp. • Congregations of a minimum of five individuals of a snake sp. <u>or</u>; individuals of two or more snake spp. near potential hibernacula (eg. foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct)¹. • Note: If there are Special Concern Species present, then site is SWH • Note: Sites for hibernation possess specific habitat parameters (e.g. temperature, humidity, etc.) and consequently are used annually, often by many of the same individuals of a local population [i.e. strong hibernation site fidelity]. Other critical life processes (e.g. mating) often take place in close proximity to hibernacula. The feature in which the hibernacula is located plus a 30m buffer is the SWH¹ • SWHMiST^{cxlix} Index #13 provides development effects and mitigation measures for snake hibernacula. • Presence of any active hibernaculum for skink is significant. • SWHMiST^{cxlix} Index #37 provides development effects and mitigation measures for five-lined skink wintering habitat. 	<p>The study area contains suitable habitat (i.e. old stone well) that would support potential snake hibernacula.</p> <p>Candidate SWH</p>
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Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E and 7E.

Wildlife Habitat: Amphibian Breeding Habitat (Woodland)					
<p>Rationale: These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations.</p>	<p>Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog</p>	<p>All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD</p> <p>Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians.</p>	<ul style="list-style-type: none"> • Presence of a wetland, pond or woodland pool (including vernal pools) >500m² (about 25m diameter) ^{ccvii} within or adjacent (within 120m) to a woodland (no minimum size) ^{cbxxxii, lxiii, lxvi, lxvii, lxviii, lxxx, lxxx}. Some small wetlands may not be mapped and may be important breeding pools for amphibians. • Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat ^{cxlviii}. <p>Information Sources</p> <ul style="list-style-type: none"> • Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records • Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their property. • OMNRF District • OMNRF wetland evaluations • Field naturalist clubs • Canadian Wildlife Service Amphibian Road Call Survey • Ontario Vernal Pool Association: http://www.ontariovernalpools.org 	<p>Studies confirm:</p> <ul style="list-style-type: none"> • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults or eggs masses) ^{lxxi} or 2 or more of the listed frog species with Call Level Codes of 3. • A combination of observational study and call count surveys ^{cviii} will be required during the spring March-June when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. • The habitat is the woodland area plus a 230m radius of woodland area ^{lxiii, lxv, lxvii, lxviii, lxxx, lxxx} if a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is the be included in the habitat. • SWHMiST ^{cxlix} Index #14 provides development effects and mitigation measures. 	<p>Suitable amphibian breeding habitat may exist within the study area. However, specific field surveys were not conducted to confirm.</p> <p>Candidate SWH</p>

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 6E and 7E.

Wildlife Habitat: Special Concern and Rare Wildlife Species					
<p>Rationale: These species are quite rare or have experienced significant population declines in Ontario.</p>	<p>All Special Concern and Provincially Rare (S1-S3, SH) plant and animal species. Lists of these species are tracked by the Natural Heritage Information Centre.</p>	<p>All plant and animal element occurrences (EO) within a 1 or 10km grid.</p> <p>Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy.</p>	<p>When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or provincially Rare species; linking candidate habitat on the site needs to be completed to ELC Ecosites ^{lxxviii}.</p> <p>Information Sources</p> <ul style="list-style-type: none"> • Natural Heritage Information Centre (NHIC) will have the Special Concern and Provincially Rare (S1-S3, SH) species lists with and element occurrences data. • NHIC Website: "Get Information": http://nhic.mnr.gov.on.ca • Ontario Breeding Bird Atlas ^{ccv} • Expert advice should be sought as many of the rare spp. have little information available about their requirements. 	<p>Studies Confirm:</p> <ul style="list-style-type: none"> • Assessment/inventory of the site for the identified special concern or rare species needs to be completed during the time of year when the species is present or easily identifiable. • The area of the habitat to the finest ELC scale that protects the habitat form and function is the SWH, this must be delineated through detailed field studies. The habitat needs to be easily mapped and cover an important life stage component for a species e.g. specific nesting habitat or foraging habitat. • SWHMiST ^{cxlix} Index #37 provides development effects and mitigation 	<p>Several Special Concern and Provincially Rare (S1-S3, SH) species records are documented within the vicinity of the study area and have been included in the table below.</p> <p>Candidate SWH</p>
Special Concern and Rare Wildlife Species - Vascular Flora					
<p>Oswego-tea (<i>Monarda didyma</i>)</p>		<p>Moist woods, swampy thickets and roadsides.</p>		<p>Suitable habitat is present within study area (SWDM3-3, roadsides). Not observed during targeted vascular flora field investigations within 30 m of the existing roadside.</p> <p>Candidate SWH</p>	

Special Concern and Rare Wildlife Species - Birds		
Grasshopper Sparrow (<i>Ammodramus savannarum</i>)	Well-drained grassland or prairie with low cover of grasses, taller weeds on sandy soil; hayfields or weedy fallow fields; uplands with ground vegetation of various densities; perches for singing; requires tracts of grassland >10ha.	Suitable habitat is present within the study area as agricultural hayfields. Candidate SWH
Eastern Wood-pewee (<i>Contopus virens</i>)	Open, deciduous, mixed or coniferous forest; predominated by oak with little understory; forest clearings, edges; farm woodlots, parks.	Suitable habitat is present (FODM7, FODM4-2, FODM5) within the study area. Candidate SWH
Wood Thrush (<i>Hylocichla mustelina</i>)	Undisturbed moist mature deciduous or mixed forest with deciduous sapling growth; near pond or swamp; hardwood forest edges; must have some trees higher than 12m.	Suitable habitat is present within the study area (FODM7, FODM4-2, FODM5). Candidate SWH
Red-headed Woodpecker (<i>Melanerpes erythrocephalus</i>)	Open, deciduous forest with little understory; fields or pasture lands with scattered large trees; wooded swamps; orchards, small woodlots or forest edges; groves of dead or dying trees; feeds on insects and stores nuts or acorns for winter; loss of habitat is limiting factor; requires cavity trees with at least 40 cm dbh; require about 4 ha for a territory.	Suitable habitat is present within the study area (SWDM3-3, FODM7, FODM4-2, FODM5, agricultural hayfields with scattered large trees). Candidate SWH
Special Concern and Rare Wildlife Species - Reptiles and Amphibians		
Snapping Turtle (<i>Chelydra serpentina serpentina</i>)	Permanent, semi-permanent fresh water; marshes, swamps or bogs; rivers and streams with soft muddy banks or bottoms; often uses soft soil or clean dry sand on south-facing slopes for nest sites.	Suitable habitat is not present within the study area. Watercourses within study area do not have soft muddy substrates. Not SWH
Eastern Milksnake (<i>Lampropeltis taylori triangulum</i>)	Farmlands, meadows, hardwood or aspen stands; pine forest with brushy or woody cover; river bottoms or bog woods; hides under logs, stones, or boards or in outbuildings.	Suitable habitat is present within the study area (agricultural fields, FODM7, FODM4-2, FODM5). Candidate SWH
Western Chorus Frog (<i>Pseudacris triseriata</i> pop. 2)	Roadside ditches or temporary ponds in fields; swamps or wet meadows; woodland or open country with cover and moisture; small ponds and temporary pools.	Suitable habitat is present within the study area (SWDM3-3, MEGM3 8, roadside ditches). Candidate SWH
Special Concern and Rare Wildlife Species - Mammals		
Tri-colored Bat (<i>Perimyotis subflavus</i>)	Open woods near water; roosts in trees, cliff crevices, buildings or caves; hibernates in damp, draft-free, warm caves, mines or rock crevices	Suitable roosting habitat (FODM7, FODM4-2, FODM5) and foraging habitat present (forested habitat adjacent to watercourses) present within study area. Candidate SWH
Special Concern and Rare Wildlife Species - Insects		
Monarch (<i>Danaus plexippus</i>)	Host plant is Milkweed (Asclepias spp.)	Suitable habitat is present within the study area. Common Milkweed (Asclepias syriaca) was observed during vascular flora field investigations. Candidate SWH

Special Concern and Rare Wildlife Species - FishNorthern Brook Lamprey (*Ichthyomyzon fossor*)

Adults in clean, clear riffles and runs of small rivers with gravel and sand substrates; ammocoetes occupy quiet water with sand, silt and detritus substrates.

Suitable habitat is not present within the study area. Substrates are too large to support this species.

Not SWH

APPENDIX III
Vascular Plant Species Reported From the Study Area

Vascular Plant Species Reported From the Study Area

Scientific Name	Common Name	SRANK ¹	COSSARO ²	COSEWIC ³	SARA Schedule ³	Oxford County ⁴	NHIC Data ¹	NRSI Observed
Pteridophytes	Ferns & Allies							
Equisetaceae	Horsetail Family							
<i>Equisetum arvense</i>	Field Horsetail	S5				X		X
Gymnosperms	Conifers							
Cupressaceae	Cypress Family							
<i>Thuja occidentalis</i>	White Cedar	S5				X		X
Pinaceae	Pine Family							
<i>Picea abies</i>	Norway Spruce	SE3				I		X
<i>Pinus strobus</i>	Eastern White Pine	S5				X		X
Dicotyledons	Dicots							
Aceraceae	Maple Family							
<i>Acer negundo</i>	Manitoba Maple	S5				X		X
<i>Acer platanoides</i>	Norway Maple	SE5						X
<i>Acer saccharum ssp. saccharum</i>	Sugar Maple	S5				X		X
<i>Acer X freemanii</i>	Freeman's Maple							X
Anacardiaceae	Sumac or Cashew Family							
<i>Toxicodendron rydbergii</i>	Poison-ivy	S5				X		X
Apiaceae	Carrot or Parsley Family							
<i>Cicuta maculata</i>	Spotted Water-hemlock	S5				X		X
<i>Daucus carota</i>	Wild Carrot	SE5				I		X
Asclepiadaceae	Milkweed Family							
<i>Asclepias syriaca</i>	Common Milkweed	S5				X		X
Asteraceae	Composite or Aster Family							
<i>Ambrosia artemisiifolia</i>	Common Ragweed	S5				X		X
<i>Ambrosia trifida</i>	Giant Ragweed	S5				X		X
<i>Arctium minus ssp. minus</i>	Common Burdock	SE5				I		X
<i>Bidens frondosa</i>	Devil's Beggar-ticks	S5				X		X
<i>Cichorium intybus</i>	Chicory	SE5				I		X
<i>Cirsium arvense</i>	Canada Thistle	SE5						X
<i>Cirsium vulgare</i>	Bull Thistle	SE5				I		X
<i>Coryza canadensis</i>	Horseweed	S5				X		X
<i>Eupatorium maculatum ssp. maculatum</i>	Spotted Joe-pye-weed	S5				X		X
<i>Euthamia graminifolia</i>	Flat-topped Bushy Goldenrod	S5				X		X
<i>Matricaria discoidea</i>	Pineapple-weed	SE5				I		X
<i>Solidago altissima var. altissima</i>	Tall Goldenrod	S5				X		X

Scientific Name	Common Name	SRANK ¹	COSSARO ²	COSEWIC ³	SARA Schedule ³	Oxford County ⁴	NHIC Data ¹	NRSI Observed
<i>Solidago canadensis</i>	Canada Goldenrod	S5				X		X
<i>Sonchus arvensis</i> ssp. <i>arvensis</i>	Field Sow-thistle	SE5				I		X
<i>Symphotrichum lanceolatum</i> var. <i>lanceolatum</i>	Tall White Aster	S5				X		X
<i>Symphotrichum lateriflorum</i> var. <i>lateriflorum</i>	Calico Aster	S5				X		X
<i>Symphotrichum novae-angliae</i>	New England Aster	S5				X		X
<i>Symphotrichum pilosum</i> var. <i>pilosum</i>	Hairy Aster	S5				X		X
<i>Symphotrichum urophyllum</i>	Arrow-leaved Aster	S4				X		X
<i>Taraxacum officinale</i>	Common Dandelion	SE5				I		X
<i>Tussilago farfara</i>	Coltsfoot	SE5				I		X
Balsaminaceae	Touch-me-not Family							
<i>Impatiens capensis</i>	Spotted Touch-me-not	S5				X		X
Berberidaceae	Barberry Family							
<i>Caulophyllum thalictroides</i>	Blue Cohosh	S5				X		X
Betulaceae	Birch Family							
<i>Ostrya virginiana</i>	Hop Hornbeam	S5				X		X
Brassicaceae	Mustard Family							
<i>Alliaria petiolata</i>	Garlic Mustard	SE5				I		X
Caprifoliaceae	Honeysuckle Family							
<i>Sambucus canadensis</i>	Common Elderberry	S5				X		X
<i>Triosteum aurantiacum</i>	Wild Coffee	S5				X		X
<i>Viburnum lentago</i>	Nannyberry	S5				X		X
<i>Viburnum opulus</i>	Guelder Rose	SE4				I		X
Celastraceae	Staff-tree Family							
<i>Euonymus obovata</i>	Running Strawberry-bush	S5				X		X
Chenopodiaceae	Goosefoot Family							
<i>Chenopodium album</i> var. <i>album</i>	Lamb's-quarters	SE5				I		X
Cornaceae	Dogwood Family							
<i>Cornus alternifolia</i>	Alternate-leaved Dogwood	S5				X		X
<i>Cornus amomum</i> ssp. <i>obliqua</i>	Silky Dogwood	S5				X		X
<i>Cornus foemina</i> ssp. <i>racemosa</i>	Red Panicked Dogwood	S5				X		X
<i>Cornus stolonifera</i>	Red-osier Dogwood	S5				X		X
Cucurbitaceae	Gourd Family							
<i>Echinocystis lobata</i>	Prickly Cucumber	S5				X		X
<i>Sicyos angulatus</i>	One-seeded Bur-cucumber	S5						X

Scientific Name	Common Name	SRANK ¹	COSSARO ²	COSEWIC ³	SARA Schedule ³	Oxford County ⁴	NHIC Data ¹	NRSI Observed
Fabaceae	Pea Family							
<i>Coronilla varia</i>	Variable Crown-vetch	SE5						X
<i>Robinia pseudo-acacia</i>	Black Locust	SE5				I		X
Fagaceae	Beech Family							
<i>Fagus grandifolia</i>	American Beech	S5				X		X
Gentianaceae	Gentian Family							
<i>Frasera caroliniensis</i>	American Columbo	S2	END	E	Schedule 1	?	X	
Geraniaceae	Geranium Family							
<i>Geranium robertianum</i>	Herb Robert	SE5				I		X
Grossulariaceae	Currant Family							
<i>Ribes americanum</i>	Wild Black Currant	S5				X		X
Hydrophyllaceae	Water-leaf Family							
<i>Hydrophyllum virginianum</i>	Virginia Water-leaf	S5				X		X
Juglandaceae	Walnut Family							
<i>Carya cordiformis</i>	Bitternut hickory	S5				X		X
<i>Juglans nigra</i>	Black Walnut	S4				X		X
Lamiaceae	Mint Family							
<i>Glechoma hederacea</i>	Creeping Charlie	SE5				I		X
<i>Monarda didyma</i>	Oswego-tea	S3				X	X	
<i>Prunella vulgaris ssp. lanceolata</i>	Heal-all	S5				X		X
Malvaceae	Mallow Family							
<i>Malva neglecta</i>	Cheeses	SE5				I		X
Oleaceae	Olive Family							
<i>Fraxinus americana</i>	White Ash	S5				X		X
<i>Fraxinus pennsylvanica</i>	Green Ash	S5				X		X
Onagraceae	Evening-primrose Family							
<i>Circaea lutetiana ssp. canadensis</i>	Yellowish Enchanter's Nightshade	S5				X		X
Oxalidaceae	Wood Sorrel Family							
<i>Oxalis stricta</i>	Upright Yellow Wood-sorrel	S5				X		X
Ranunculaceae	Buttercup Family							
<i>Anemone acutiloba</i>	Sharp-lobed Hepatica	S5				X		X
<i>Ranunculus recurvatus var. recurvatus</i>	Hooked Buttercup	S5				X		X

Scientific Name	Common Name	SRANK ¹	COSSARO ²	COSEWIC ³	SARA Schedule ³	Oxford County ⁴	NHIC Data ¹	NRSI Observed
<i>Thalictrum pubescens</i>	Tall Meadow-rue	S5				X		X
Rhamnaceae		Buckthorn Family						
<i>Rhamnus cathartica</i>	Common Buckthorn	SE5				I		X
<i>Frangula alnus</i>	Glossy Buckthorn	SE5				I		X
Rosaceae		Rose Family						
<i>Agrimonia gryposepala</i>	Tall Hairy Agrimony	S5				X		X
<i>Crataegus species</i>	Hawthorn species							X
<i>Fragaria virginiana</i>	Wild Strawberry	S5						X
<i>Geum aleppicum</i>	Yellow Avens	S5				X		X
<i>Geum canadense</i>	White Avens	S5				X		X
<i>Malus pumila</i>	Common Crabapple	SE5				I		X
<i>Prunus serotina</i>	Black Cherry	S5				X		X
<i>Prunus virginiana ssp. virginiana</i>	Choke Cherry	S5				X		X
<i>Rubus idaeus ssp. melanolasius</i>	Wild Red Raspberry	S5				X		X
<i>Rubus occidentalis</i>	Thimble-berry	S5				X		X
Salicaceae		Willow Family						
<i>Populus deltoides ssp. deltoides</i>	Eastern Cottonwood	S5				X		X
<i>Populus tremuloides</i>	Trembling Aspen	S5				X		X
<i>Salix fragilis</i>	Crack Willow	SE5				I		X
<i>Salix nigra</i>	Black Willow	S4?				X		X
Scrophulariaceae		Figwort Family						
<i>Collinsia verna</i>	Blue-eyed Mary	SX	EXP	XT	Schedule 1	X	X	
<i>Linaria vulgaris</i>	Butter-and-eggs	SE5				I		X
<i>Verbascum thapsus</i>	Common Mullein	SE5				I		X
Solanaceae		Nightshade Family						
<i>Solanum dulcamara</i>	Bitter Nightshade	SE5				I		X
Tiliaceae		Linden Family						
<i>Tilia americana</i>	American Basswood	S5				X		X
Ulmaceae		Elm Family						
<i>Ulmus americana</i>	White Elm	S5				X		X
Urticaceae		Nettle Family						
<i>Boehmeria cylindrica</i>	False Nettle	S5				X		X
<i>Pilea pumila</i>	Dwarf Clearweed	S5				X		X
<i>Urtica dioica ssp. gracilis</i>	American Stinging Nettle	S5				X		X
Verbenaceae		Vervain Family						

Scientific Name	Common Name	SRANK ¹	COSSARO ²	COSEWIC ³	SARA Schedule ³	Oxford County ⁴	NHIC Data ¹	NRSI Observed
<i>Verbena hastata</i>	Blue Vervain	S5				X		X
<i>Verbena urticifolia</i>	White Vervain	S5				X		X
Vitaceae	Grape Family							
<i>Parthenocissus vitacea</i>	Woodbine	S5				X		X
<i>Vitis riparia</i>	Riverbank Grape	S5				X		X
Monocotyledons	Monocots							
Araceae	Arum Family							
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit	S5				X		X
Cyperaceae	Sedge Family							
<i>Carex species</i>	Sedge species							X
<i>Carex gracillima</i>	Graceful Sedge	S5				X		X
<i>Carex radiata</i>	Radiate Sedge	S5				X		X
Liliaceae	Lily Family							
<i>Maianthemum racemosum ssp. racemosum</i>	False Solomon's Seal	S5				X		X
Orchidaceae	Orchid Family							
<i>Epipactis helleborine</i>	Common Helleborine	SE5				I		X
Poaceae	Grass Family							
<i>Agrostis gigantea</i>	Redtop	SE5				I		X
<i>Bromus inermis ssp. inermis</i>	Awnless Brome	SE5				I		X
<i>Dactylis glomerata</i>	Orchard Grass	SE5				I		X
<i>Digitaria sanguinalis</i>	Large Crabgrass	SE5				I		X
<i>Elymus virginicus var. virginicus</i>	Virginia Wild Rye	S5				X		X
<i>Festuca arundinacea</i>	Tall Fescue	SE5				I		X
<i>Glyceria striata</i>	Fowl Meadow Grass	S5				X		X
<i>Panicum capillare</i>	Witch Grass	S5				X		X
<i>Phalaris arundinacea</i>	Reed Canary Grass	S5				X		X
<i>Phragmites australis ssp. Australis</i>	European Common Reed	SNA						X
<i>Poa pratensis ssp. pratensis</i>	Kentucky Bluegrass	S5				X		X
<i>Setaria viridis</i>	Green Foxtail	SE5				I		X
						Total	3	113

¹MNRF 2014, ²MNRF 2015a, ³Government of Canada 2015, ⁴Oldham 1993

LEGEND				
SRANK		COSSARO/COSEWIC	Oxford County	SARA Schedule
S2 Imperiled	SX Presumed Extirpated	END/E Endangered	X Present and Native	Schedule 1 Officially
S3 Vulnerable	S#? Rank Uncertain	EXP/XT Extirpated	I Present and Introduced	
S4 Apparently Secure	SE Exotic Species		? Questionable Records	
S5 Secure				
SNA Unranked				

APPENDIX IV
Bird Species Reported From the Study Area

Bird Species Reported From the Study Area

Scientific Name	Common Name	SRANK ¹	COSSARO ²	COSEWIC ³	SARA Schedule ³	OBBA ⁴	OBBA ⁴	NHIC Data ¹	NRSI Observed
						17MH97	17NH07		
Anatidae	Ducks, Geese & Swans								
<i>Branta canadensis</i>	Canada Goose	S5				P	FY		X
<i>Aix sponsa</i>	Wood Duck	S5				FY	P		
<i>Anas platyrhynchos</i>	Mallard	S5				FY	FY		
Phasianidae	Partridges, Grouse & Turkeys								
<i>Phasianus colchicus</i>	Ring-necked Pheasant	SNA				T			
<i>Bonasa umbellus</i>	Ruffed Grouse	S4				D	S		
<i>Meleagris gallopavo</i>	Wild Turkey	S5				FY	FY		
Ardeidae	Hérons & Bitterns								
<i>Ardea herodias</i>	Great Blue Heron	S4B				H			
<i>Butorides virescens</i>	Green Heron	S4B				P			
Cathartidae	Vultures								
<i>Cathartes aura</i>	Turkey Vulture	S5B				H	H		X
Accipitridae	Hawks, Kites, Eagles & Allies								
<i>Circus cyaneus</i>	Northern Harrier	S4B	NAR	NAR			H		
<i>Accipiter striatus</i>	Sharp-shinned Hawk	S5	NAR			CF			
<i>Accipiter cooperii</i>	Cooper's Hawk	S4	NAR	NAR			FY		
<i>Buteo jamaicensis</i>	Red-tailed Hawk	S5	NAR	NAR		P	FY		
Rallidae	Rails, Gallinules & Coots								
<i>Rallus limicola</i>	Virginia Rail	S5B					T		
<i>Porzana carolina</i>	Sora	S4B					S		
Charadriidae	Plovers								
<i>Charadrius vociferus</i>	Killdeer	S5B, S5N				NE	FY		X
Scolopacidae	Sandpipers, Phalaropes & Allies								
<i>Actitis macularia</i>	Spotted Sandpiper	S5				T	FY		
<i>Bartramia longicauda</i>	Upland Sandpiper	S4B					S		
<i>Scolopax minor</i>	American Woodcock	S4B				D	S		
Columbidae	Pigeons & Doves								
<i>Columba livia</i>	Rock Pigeon	SNA				T	AE		
<i>Zenaida macroura</i>	Mourning Dove	S5				T	AE		

Scientific Name	Common Name	SRANK ¹	COSSARO ²	COSEWIC ³	SARA Schedule ³	OBBA ⁴	OBBA ⁴	NHIC Data ¹	NRSI Observed
						17MH97	17NH07		
Cuculiformes	Cuckoos & Anis								
<i>Coccyzus americanus</i>	Yellow-billed Cuckoo	S4B				S	T		
<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo	S5B				S			
Strigidae	Typical Owls								
<i>Megascops asio</i>	Eastern Screech-Owl	S4	NAR	NAR		A	T		
<i>Bubo virginianus</i>	Great Horned Owl	S4				S	S		
Apodidae	Swifts								
<i>Chaetura pelagica</i>	Chimney Swift	S4B, S4N	THR	T	Schedule 1	H	T		
Trochilidae	Hummingbirds								
<i>Archilochus colubris</i>	Ruby-throated Hummingbird	S5B				T	NE		
Alcedinidae	Kingfishers								
<i>Megasceryle alcyon</i>	Belted Kingfisher	S4B				D	T		
Picidae	Woodpeckers								
<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker	S4B	SC	T	Schedule 1	H			
<i>Melanerpes carolinus</i>	Red-bellied Woodpecker	S4				T	NY		
<i>Picoides pubescens</i>	Downy Woodpecker	S5				P	NY		
<i>Picoides villosus</i>	Hairy Woodpecker	S5				P	NY		
<i>Colaptes auratus</i>	Northern Flicker	S4B				T	NY		
<i>Dryocopus pileatus</i>	Pileated Woodpecker	S5				T			
Falconidae	Caracaras & Falcons								
<i>Falco sparverius</i>	American Kestrel	S4				FY	T		
Tyrannidae	Tyrant Flycatchers								
<i>Contopus virens</i>	Eastern Wood-Pewee	S4B	SC	SC		T	FY		
<i>Empidonax alnorum</i>	Alder Flycatcher	S5B				T			
<i>Empidonax traillii</i>	Willow Flycatcher	S5B				T	CF		
<i>Empidonax minimus</i>	Least Flycatcher	S4B				S	T		
<i>Sayornis phoebe</i>	Eastern Phoebe	S5B				NY	NE		
<i>Myiarchus crinitus</i>	Great Crested Flycatcher	S4B				T	NE		
<i>Tyrannus tyrannus</i>	Eastern Kingbird	S4B				P	NY		

Scientific Name	Common Name	SRANK ¹	COSSARO ²	COSEWIC ³	SARA Schedule ³	OBBA ⁴	OBBA ⁴	NHIC Data ¹	NRSI Observed
						17MH97	17NH07		
Vireonidae	Vireos								
<i>Vireo gilvus</i>	Warbling Vireo	S5B				T	T		
<i>Vireo olivaceus</i>	Red-eyed Vireo	S5B				T	NE		
Corvidae	Crows & Jays								
<i>Cyanocitta cristata</i>	Blue Jay	S5				T	CF		X
<i>Corvus brachyrhynchos</i>	American Crow	S5B				A	FY		X
Alaudidae	Larks								
<i>Eremophila alpestris</i>	Horned Lark	S5B				FY	FY		
Hirundinidae	Swallows								
<i>Tachycineta bicolor</i>	Tree Swallow	S4B				AE	AE		
<i>Stelgidopteryx serripennis</i>	Northern Rough-winged Swallow	S4B				P	T		
<i>Riparia riparia</i>	Bank Swallow	S4B	THR	T		AE	AE		
<i>Petrochelidon pyrrhonota</i>	Cliff Swallow	S4B				AE	AE		
<i>Hirundo rustica</i>	Barn Swallow	S4B	THR	T		AE	AE		
Paridae	Chickadees & Titmice								
<i>Poecile atricapillus</i>	Black-capped Chickadee	S5				FY	CF		X
Sittidae	Nuthatches								
<i>Sitta carolinensis</i>	White-breasted Nuthatch	S5				S	CF		
Certhiidae	Creepers								
<i>Certhia americana</i>	Brown Creeper	S5B				T			
Troglodytidae	Wrens								
<i>Troglodytes aedon</i>	House Wren	S5B				T	NY		
<i>Troglodytes hiemalis</i>	Winter Wren	S5B				T			
Poliopitidae	Gnatcatchers								
<i>Poliopitila caerulea</i>	Blue-gray Gnatcatcher	S4B					P		
Turdidae	Thrushes								
<i>Sialia sialis</i>	Eastern Bluebird	S5B	NAR	NAR		CF	AE		
<i>Catharus fuscescens</i>	Veery	S4B				A	T		
<i>Hylocichla mustelina</i>	Wood Thrush	S4B	SC	T		T	NY		
<i>Turdus migratorius</i>	American Robin	S5B				CF	NY		X

Scientific Name	Common Name	SRANK ¹	COSSARO ²	COSEWIC ³	SARA Schedule ³	OBBA ⁴	OBBA ⁴	NHIC Data ¹	NRSI Observed
						17MH97	17NH07		
Mimidae	Mockingbirds, Thrashers & Allies								
<i>Dumetella carolinensis</i>	Gray Catbird	S4B				T	CF		
<i>Toxostoma rufum</i>	Brown Thrasher	S4B				T	CF		
Sturnidae	Starlings								
<i>Sturnus vulgaris</i>	European Starling	SNA				CF	NY		
Motacillidae	Pipits								
Bombycillidae	Waxwings								
<i>Bombycilla cedrorum</i>	Cedar Waxwing	S5B				S	AE		
Parulidae	Wood Warblers								
<i>Seiurus aurocapillus</i>	Ovenbird	S4B				T	T		
<i>Parkesia noveboracensis</i>	Northern Waterthrush	S5B				S	S		
<i>Mniotilta varia</i>	Black-and-white Warbler	S5B				S			
<i>Geothlypis philadelphia</i>	Mourning Warbler	S4B				S			
<i>Geothlypis trichas</i>	Common Yellowthroat	S5B				A	CF		
<i>Setophaga ruticilla</i>	American Redstart	S5B				S	A		
<i>Setophaga cerulea</i>	Cerulean Warbler	S3B	THR	E	Schedule 1			X	
<i>Setophaga petechia</i>	Yellow Warbler	S5B				T	CF		
<i>Setophaga pinus</i>	Pine Warbler	S5B					T		
Emberizidae	New World Sparrows & Allies								
<i>Pipilo erythrophthalmus</i>	Eastern Towhee	S4B					S		
<i>Spizella passerina</i>	Chipping Sparrow	S5B				CF	CF		
<i>Spizella pusilla</i>	Field Sparrow	S4B				T	T		
<i>Pooecetes gramineus</i>	Vesper Sparrow	S4B				CF	T		
<i>Passerculus sandwichensis</i>	Savannah Sparrow	S4B				CF	FY		
<i>Ammodramus savannarum</i>	Grasshopper Sparrow	S4B		SC		S			
<i>Melospiza melodia</i>	Song Sparrow	S5B				CF	CF		
<i>Melospiza georgiana</i>	Swamp Sparrow	S5B				T	CF		

Scientific Name	Common Name	SRANK ¹	COSSARO ²	COSEWIC ³	SARA Schedule ³	OBBA ⁴	OBBA ⁴	NHIC Data ¹	NRSI Observed
						17MH97	17NH07		
Cardinalidae		Cardinals, Grosbeaks & Allies							
<i>Piranga olivacea</i>	Scarlet Tanager	S4B				S			
<i>Cardinalis cardinalis</i>	Northern Cardinal	S5				T	FY		
<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak	S4B				P	NY		
<i>Passerina cyanea</i>	Indigo Bunting	S4B				A	NY		
Icteridae		Blackbirds							
<i>Dolichonyx oryzivorus</i>	Bobolink	S4B	THR	T	No Schedule	T	CF		
<i>Agelaius phoeniceus</i>	Red-winged Blackbird	S4				CF	CF		
<i>Sturnella magna</i>	Eastern Meadowlark	S4B	THR	T		T	CF		
<i>Quiscalus quiscula</i>	Common Grackle	S5B				CF	CF		
<i>Molothrus ater</i>	Brown-headed Cowbird	S4B				P	FY		
<i>Icterus galbula</i>	Baltimore Oriole	S4B				P	FY		
Fringillidae		Finches & Allies							
<i>Carpodacus mexicanus</i>	House Finch	SNA				T	AE		
<i>Carpodacus purpureus</i>	Purple Finch	S4B				S			
<i>Spinus tristis</i>	American Goldfinch	S5B				T	FY		X
Passeridae		Old World Sparrows							
<i>Passer domesticus</i>	House Sparrow	SNA				AE	AE		
Total						89	82	1	8

¹MNRF 2014, ²MNRF 2015a, ³Government of Canada 2015, ⁴BSC et al. 2008

LEGEND
SRANK
S3 Vulnerable
S4 Apparently Secure
S5 Secure
B Breeding
N Non-breeding
SNA Unranked
COSSARO/COSEWIC
END/E Endangered
THR/T Threatened
SC/SC Special Concern
NAR Not at Risk
SARA Schedule
Schedule 1 Officially Protected under SARA

APPENDIX V
Reptile and Amphibian Species Reported From the Study Area

Reptile and Amphibian Species Reported From the Study Area

Scientific Name	Common Name	SRANK ¹	COSSARO ²	COSEWIC ³	SARA Schedule ³	Ontario Reptile and Amphibian Atlas (17MH97) ⁴	Ontario Reptile and Amphibian Atlas (17NH07) ⁴	NHIC Data ¹
Turtles								
<i>Chelydra serpentina serpentina</i>	Snapping Turtle	S3	SC	SC	Schedule 1	X		X
<i>Chrysemys picta marginata</i>	Midland Painted Turtle	S5					X	
<i>Emydoidea blandingii</i>	Blanding's Turtle (<i>Great Lakes/St Lawrence population</i>)	S3	THR	T	Schedule 1		X	
Snakes								
<i>Lampropeltis taylori triangulum</i>	Eastern Milksnake	S3	SC	SC	Schedule 1	X	X	
<i>Storeria dekayi dekayi</i>	Northern Brownsnake	S5	NAR	NAR			X	
<i>Storeria occipitomaculata occipitomaculata</i>	Northern Red-bellied Snake	S5					X	
<i>Thamnophis sirtalis sirtalis</i>	Eastern Gartersnake	S5					X	
Salamanders								
<i>Notophthalmus viridescens viridescens</i>	Red-spotted Newt	S5				X		
<i>Plethodon cinereus</i>	Eastern Red-backed Salamander	S5				X	X	
Toads and Frogs								
<i>Anaxyrus americanus</i>	American Toad	S5				X		
<i>Hyla versicolor</i>	Tetraploid Gray Treefrog	S5				X	X	
<i>Pseudacris triseriata</i> pop. 2	Western Chorus Frog (<i>Great Lakes/St. Lawrence - Canadian Shield Population</i>)	S3	NAR	T	Schedule 1	X	X	
<i>Pseudacris crucifer</i>	Spring Peeper	S5				X	X	
<i>Lithobates clamitans melanota</i>	Northern Green Frog	S5				X	X	
<i>Lithobates pipiens</i>	Northern Leopard Frog	S5	NAR	NAR			X	
<i>Lithobates sylvatica</i>	Wood Frog	S5				X	X	
Total						10	13	1

¹MNRF 2014, ²MNRF 2015a, ³Government of Canada 2015, ⁴Ontario Nature 2015

LEGEND
SRANK
S3 Vulnerable
S5 Secure
COSSARO/COSEWIC
NAR Not at Risk
SC Special Concern
THR/T Threatened
SARA Schedule
Schedule 1 Officially protected under SARA

APPENDIX VI
Mammal Species Reported From the Study Area

Mammal Species Reported From the Study Area

Scientific Name	Common Name	SRANK ¹	COSSARO ²	COSEWIC ³	SARA Schedule ³	Ontario Mammal Atlas ⁴	NHIC Data ¹	NRSI Observed
Didelphimorphia	Opossums							
<i>Didelphis virginiana</i>	Virginia Opossum	S4				X		
Insectivora	Shrews and Moles							
<i>Blarina brevicauda</i>	Northern Short-tailed Shrew	S5				X		
<i>Condylura cristata</i>	Star-nosed Mole	S5				X		
Chiroptera	Bats							
<i>Eptesicus fuscus</i>	Big Brown Bat	S5				X		
<i>Lasionycteris noctivagans</i>	Silver-haired Bat	S4				X		
<i>Lasiurus borealis</i>	Red Bat	S4				X		
<i>Lasiurus cinereus</i>	Hoary Bat	S4				X		
<i>Myotis leibii</i>	Eastern Small-footed Bat	S2S3	END			X		
<i>Myotis lucifugus</i>	Little Brown Myotis	S4	END	E	Schedule 1	X		
<i>Myotis septentrionalis</i>	Northern Myotis	S3	END	E	Schedule 1	X		
<i>Perimyotis subflavus</i>	Tri-colored Bat	S3?		E	Schedule 1	X		
Lagomorpha	Rabbits and Hares							
<i>Lepus europaeus</i>	European Hare	SNA				X		
<i>Sylvilagus floridanus</i>	Eastern Cottontail	S5				X		
Rodentia	Rodents							
<i>Castor canadensis</i>	Beaver	S5				X		
<i>Glaucomys volans</i>	Southern Flying Squirrel	S4	NAR	NAR		X		
<i>Marmota monax</i>	Woodchuck	S5				X		
<i>Microtus pennsylvanicus</i>	Meadow Vole	S5				X		
<i>Ondatra zibethicus</i>	Muskrat	S5				X		
<i>Peromyscus leucopus</i>	White-footed Mouse	S5				X		
<i>Peromyscus maniculatus</i>	Deer Mouse	S5				X		
<i>Rattus norvegicus</i>	Norway Rat	SNA				X		
<i>Sciurus carolinensis</i>	Eastern Gray Squirrel	S5				X		
<i>Tamiasciurus hudsonicus</i>	Red Squirrel	S5				X		
<i>Tamias striatus</i>	Eastern Chipmunk	S5				X		
<i>Zapus hudsonius</i>	Meadow Jumping Mouse	S5				X		
Cetacea	Whales							

Scientific Name	Common Name	SRANK ¹	COSSARO ²	COSEWIC ³	SARA Schedule ³	Ontario Mammal Atlas ⁴	NHIC Data ¹	NRSI Observed
Carnivora	Carnivores							
<i>Canis latrans</i>	Coyote	S5				X		
<i>Mephitis mephitis</i>	Striped Skunk	S5				X		
<i>Mustela erminea</i>	Ermine	S5				X		
<i>Mustela vison</i>	American Mink	S4				X		
<i>Procyon lotor</i>	Northern Raccoon	S5				X		
<i>Taxidea taxus jacksoni</i>	American Badger	S2	END	E	Schedule 1	X		
<i>Vulpes vulpes</i>	Red Fox	S5				X		
Artiodactyla	Deer and Bison							
<i>Odocoileus virginianus</i>	White-tailed Deer	S5				X		
Total						33	0	0

¹MNRF 2014; ²MNRF 2015a; ³Government of Canada 2015; ⁴Dobbyn 1994

LEGEND
SRANK
S2 Imperiled
S3 Vulnerable
S4 Apparently Secure
S5 Secure
SNA Unranked
COSSARO/COSEWIC
NAR Not at Risk
END/E Endangered
SARA Schedule
Schedule 1 Officially protected under SARA

APPENDIX VII
Butterfly, Damselfly, and Dragonfly Species Reported From the Study Area

Butterfly, Damselfly, and Dragonfly Species Reported From the Study Area

Scientific Name	Common Name	SRANK ¹	COSSARO ²	COSEWIC ³	SARA Schedule ³	TEA Atlas (17MH97) ⁴	TEA Atlas (17NH07) ⁴	Odonata Atlas (17MH97) ⁵	Odonata Atlas (17NH07) ⁵
Lepidoptera									
Pieridae	Whites and Sulphurs								
<i>Colias philodice</i>	Clouded Sulphur	S5					X		
Nymphalidae	Brush-footed Butterflies								
<i>Coenonympha tullia</i>	Common Ringlet	S5					X		
<i>Danaus plexippus</i>	Monarch	S2N, S4B	SC	SC	Schedule 1		X		
<i>Megisto cymela</i>	Little Wood-Satyr	S5					X		
<i>Polygonia interrogationis</i>	Question Mark	S5				X			
Odonata									
Calopterygidae	Broadwinged Damselflies								
<i>Calopteryx maculata</i>	Ebony Jewelwing								X
Coenagrionidae	Narrow-winged Damselflies								
<i>Argia fumipennis violacea</i>	Violet Dancer								X
<i>Enallagma exsulans</i>	Stream Bluet								X
<i>Ischnura posita</i>	Fragile Forktail								X
Total						1	4	0	4

¹MNRF 2014, ²MNRF 2015a, ³Government of Canada 2015, ⁴Jones et al. 2015, ⁵C. Jones pers. comm. 2015

LEGEND
SRANK
S2 Imperiled
S4 Apparently Secure
S5 Secure
COSSARO/COSEWIC
SC Special Concern
SARA Schedule
Schedule 1 Officially protected under SARA

APPENDIX VIII
Fish Species Reported From the Study Area

Fish Species Reported from the Study Area

Scientific Name	Common Name	SRANK ¹	COSSARO ²	COSEWIC ³	SARA Schedule ³	NHIC ¹	UTRCA ⁴	UTRCA ⁵	UTRCA ⁶	UTRCA ⁷	NRSI Observed
Petromyzontidae	Lampreys										
<i>Ichthyomyzon fossor</i>	Northern Brook Lamprey (GL-USL Pop.)	S3	SC	SC (April 2007)	Schedule 1	X					
Cyprinidae	Carps and Minnows										
<i>Campostoma anomalum</i>	Central Stoneroller	S4		NAR (April 1998)				X	X		X
<i>Luxilus cornutus</i>	Common Shiner	S5					X	X		X	
<i>Luxilus chrysocephalus</i>	Striped Shiner	S4	NAR	NAR (April 1993)				X			
<i>Pimephales notatus</i>	Bluntnose Minnow	S5	NAR	NAR (April 1998)				X	X		
<i>Pimephales promelas</i>	Fathead Minnow	S5						X			X
<i>Rhinichthys obtusus</i>	Blacknose Dace	S5					X	X	X	X	X
<i>Semotilus atromaculatus</i>	Creek Chub	S5					X	X	X		X
Catostomidae	Suckers										
<i>Catostomus commersonii</i>	White Sucker	S5					X	X	X		X
Gasterosteidae	Sticklebacks										
<i>Culaea inconstans</i>	Brook Stickleback	S5						X		X	X
Centrarchidae	Sunfishes and Basses										
<i>Lepomis gibbosus</i>	Pumpkinseed	S5						X			
<i>Micropterus dolomieu</i>	Smallmouth Bass	S5							X		
Percidae	Perches and Darters										
<i>Etheostoma flabellare</i>	Fantail Darter	S4					X	X	X		X
<i>Etheostoma nigrum</i>	Johnny Darter	S5					X	X	X	X	X
Total						1	6	12	8	4	8

¹MNRF 2014, ²MNRF 2015a, ³Government of Canada 2015, ⁴UTRCA 1993, ⁵UTRCA 2000, ⁶UTRCA 2005; ⁷UTRCA 2015

LEGEND
SRANK
S3 Vulnerable
S4 Apparently Secure
S5 Secure
COSSARO
SC Special Concern
COSEWIC
SC Special Concern
SARA Schedule
Schedule 1 Officially Protected under SARA

APPENDIX IX
Review of Criteria for Significance of Terrestrial Habitats within the Study Area

Review of Criteria for Significance of Terrestrial Habitats within the Study Area

Criteria¹	Locally Significant Woodland Feature A²	Criteria Met?	Locally Significant Woodland Feature B³	Criteria Met?
Ecological Function				
Patches that contain rare species	Historical records of rare species within vicinity of woodland feature. Suitable habitat identified as present for several rare species (Appendix I).	To be Confirmed	Historical records of rare species within vicinity of woodland feature. Suitable habitat identified as present for several rare species (Appendix I).	To be Confirmed
Patches that contain habitat designated in the Official Plans of Oxford County	Woodland feature does not contain designated habitat under the Official Plan of Oxford County	No	Woodland feature does not contain designated habitat under the Official Plan of Oxford County	No
Patches within 150 m of designated, non-wetland habitats in the Official Plan OR within 750 m of designated wetland habitats in the Official Plan (PSW, Locally Significant Wetland)	Woodland feature are within 750 m of Lakeside Wildwood PSW complex	Yes	Woodland feature are within 750 m of Lakeside Wildwood PSW complex	Yes
Patches >10 ha in size	Woodland feature is greater than 10 ha in size	Yes	Woodland feature is greater than 10 ha in size	Yes
Patches with interior habitat	Woodland feature contains interior habitat	Yes	Woodland feature does not contain interior habitat	No
Patches that occur within well-head capture zones or intrinsic groundwater susceptibility areas.	Woodland feature not within well-head capture zone or intrinsic groundwater susceptibility area.	No	Woodland feature not within well-head capture zone or intrinsic groundwater susceptibility area.	No
Patches that contain an open watercourse or are within 50 m of an open watercourse.	Woodland feature contains an open watercourse	Yes	Woodland feature contains an open watercourse	Yes
Representation				
Patches with the largest amount of area on each landform and soil type in Oxford County and all patches that occur on valleylands.	Woodland feature occurs on Significant Valleylands. Feature is not the largest vegetation patch to occur on its specific soil type.	Yes	Woodland feature does not occur on valleylands. Feature is not the largest vegetation patch to occur on its specific soil type.	No
Patches that contain large amounts of each natural vegetation community type	Woodland feature does not contain large amounts of each natural vegetation community type	No	Woodland feature does not contain large amounts of each natural vegetation community type	No
Total Criteria Met		5		3

¹County of Oxford 2006

²Feature A is defined as the vegetation patch associated with Nissouri Creek and McCall-McCorquodale Drain to the west of the intersection of Oxford Rd 16 and 31st Line

³Feature B is defined as the vegetation patch associated with Nissouri Creek to the east of the intersection of Oxford Rd 16 and 31st Line

APPENDIX X
Photo Log



Figure 1. Potential Snake Hibernaculum.



Figure 2. Potential Snake Hibernaculum.



Figure 3. Potential Snake Hibernaculum. View from above.



Figure 4. Potential Snake Hibernaculum.

Appendix D: Geotechnical Investigation



- **Oxford County**

Geotechnical Investigation

FINAL

Project Name

Geotechnical Investigation for Part of Oxford Road 16

Project Number

KCH-00227972-GE

Prepared By:

exp Services Inc.
15701 Robin's Hill Road
London, ON, N5V 0A5
Canada

Date Submitted

October 2015

Oxford County

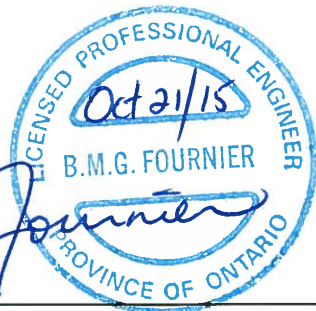
Geotechnical Investigation

Type of Document:
Final Report

Project Name:
Geotechnical Investigation for Part of Oxford Road 16

Project Number:
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Legal Notification

This report was prepared by **exp** Services Inc. for the account of **Oxford County**.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. **Exp** Services Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this project.

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Appendix C	Grain Size Analysis
Appendix D	Oxford County Pavement Design for Road 16

1. Introduction

As requested, **exp** Services Inc. (**exp**) has conducted a geotechnical investigation to determine the asphalt and granular thicknesses along Oxford Road 16, from Kintore to Township of Zorra 31st Line. It is understood that the proposed work program will consist of road rehabilitation. This report summarizes the results of the geotechnical investigation and provides geotechnical engineering guidelines to assist with the design and construction of the proposed project.

1.1 Terms of Reference

The geotechnical investigation was generally performed in accordance with our proposal P15-225, dated July 15, 2015. This investigation was authorized by Oxford County through Purchase Order PO2015-01165 dated August 14, 2015.

The purpose of this investigation was to examine the asphalt and granular thicknesses along the various roads listed above by drilling widely spaced sampled boreholes, and based on an interpretation of the factual data, to provide engineering guidelines for the geotechnical design of road rehabilitation, in accordance with information provided by Oxford County.

This report is provided on the basis of the terms of reference presented above and on the assumption that the design will be in accordance with applicable codes and standards. If there are any changes in the design features relevant to the geotechnical analyses, or if any questions arise concerning geotechnical aspects of the codes and standards, this office should be contacted to review the design.

The information in this report in no way reflects on the environmental aspects of the soil. Should specific information in this regard be needed, additional testing may be required.

2. Methodology

The fieldwork was carried out on August 20, 2015. In general, the geotechnical investigation consisted of the drilling of a total of thirteen (13) boreholes to a depth of approximately 2 m. The approximate locations of the boreholes are shown in Appendix A.

Underground utility locates were carried out for each road section prior to the drilling fieldwork being carried out. Traffic control during the drilling was conducted in general conformance with Ministry of Transportation, Ontario Traffic Manual Book 7 – Temporary Conditions.

The boreholes were advanced using truck-mounted equipment operated by a specialist contractor.

Within the boreholes, Standard Penetration Tests (SPTs) were performed to assess the compactness of the underlying soils and to obtain representative samples. Where needed, auger samples were also collected. During the drilling, the stratigraphy in the boreholes was examined and logged in the field by exp geotechnical personnel. Short-term groundwater level observations within the open boreholes and the natural moisture contents of recovered soil samples were recorded on the borehole logs.

After the completion of the field analysis, the test holes were then backfilled and surfaced with a layer of “cold patch” asphalt.

Representative samples of the various soil strata encountered at the test locations were taken to our laboratory in our Cambridge Office for further examination by a geotechnical engineer and laboratory classification testing. Laboratory testing included *in situ* moisture contents and one composite grain size analysis from each road section.

3. Site and Subsurface Conditions

3.1 Site Description

The proposed work is along the following road section:

- **Oxford Road 16**– from Kintore to Township of Zorra 31st Line

The roadway surface along this section presently has fair flexible pavement conditions as observed during the drilling.

3.2 Soil Stratigraphy

In general, sandy silt and/or sandy silt till was encountered below the asphalt and granular fill. The detailed stratigraphy encountered in each borehole is described in the attached borehole logs and summarized in the table below. It must be noted that boundaries of soil indicated are inferred from non-continuous sampling and observations during drilling. These boundaries are intended to reflect transition zones for the purposes of geotechnical design and should not be interpreted as exact planes of geological change. Thicknesses should not be used for design purposes.

TABLE 1
Summary of Existing Pavement Structure and Subgrade

Borehole Location	Approximate Asphalt Thickness, (mm)	Approximate Granular Fill Depth (mm)	Subgrade Description
BH1*	n/a	1600	Sandy Silt Till
BH2	150	400	Sandy Silt
BH3	150	600	Sandy Silt
BH4	150	600	Sandy Silt
BH5	150	300	Sandy Silt
BH6	75	600	Sandy Silt and Sandy Silt Till
BH7	150	300	Sandy Silt
BH8	150	400	Sandy Silt
BH9	150	500	Sandy Silt and Sandy Silt Till
BH10	150	500	Sandy Silt Fill and Sandy Silt
BH11	150	400	Sandy Silt and Sandy Silt Till
BH12	100	500	Sandy Silt
BH13	225	700	Sandy Silt Till

* Borehole had to be drilled off edge of shoulder due to utility conflicts.

3.2 Existing Subgrade

As noted in the borehole logs and Table 1, the subgrade along the road section generally consists of sandy silt or sandy silt till. The compactness condition/consistency is generally stiff or loose to compact. Locally, the granular base is underlain by sandy silt fill containing traces of gravel, organics, and asphalt fragments. Grain size analyses were conducted on selected composite samples of the native subgrade material from each road section, with results presented in Appendix C.

A grain size analysis was conducted on a selected sample of the subgrade at Borehole 6 and 7 on Oxford Road 16. The results indicate the subgrade at these locations consists of 62% silt, 23% sand, 8% gravel, and 7% clay.

3.3 Groundwater Conditions

The boreholes were generally dry upon completion. It is noted that insufficient time was allowed to observe the stabilized groundwater levels.

It is further noted that the depth to the groundwater table may vary in response to climatic or seasonal conditions, and, as such, may differ at the time of construction, with higher levels in wet seasons. Capillary rise effects should also be anticipated within fine-grained soils.

4. Discussion and Recommendations

4.1 General

Along each road section, the average Granular Base Equivalencies (GBE), asphalt (ASP) thicknesses, and granular base/subbase (GB) thicknesses of the existing pavement structures were all found to be at or above the recommended configuration for the specified class of roads. A summary of the findings is given in the table below.

TABLE 2
Summary of Existing Pavement Structure and Traffic

Road Designation	Average Asphalt Thickness (mm)	Average Granular Thickness (mm)	Average Granular Base Equivalency GBE* (mm)	Recommended GBE (mm)	2012/2013 Traffic (AADT)
Rural	145	483	614	685	2483

* For existing GBE, Equivalency Factors used: 2.00 for existing asphalt, 0.67 for old granular, medium subgrade for GBE calculation.

** Recommended GBE based on existing pavement structure design drawings for each road section, provided by Oxford County.

4.2 Pavement Rehabilitation

The results of the investigation show that the average asphalt thickness along this road section is close to the Oxford County design requirement. However, the overall GBE along this section is less than required and is attributed to a lower granular base thickness. Assuming that overall road grade changes are not possible, full reconstruction may be considered. Alternatively an asphalt overlay of 35 to 40 mm of HL3 would increase the GBE to the required thickness.

4.3 General Comments

For localized re-construction, assuming that grade changes are not allowed for the roadways, the best option is the removal of the existing asphalt along with some of the underlying granular fill, and removed from site. The existing pavement structure would be cut to below the existing subgrade level to receive the new pavement structures.

The proposed pavement area to be reconstructed or added should be stripped of all asphalt and other obviously unsuitable material. The exposed subgrade must then be proof rolled. Any soft spots revealed by this or any other observations must be sub excavated and backfilled with approved granular material compacted to 100 percent Standard Proctor Maximum Dry Density (SPMDD). All fill required to backfill service trenches, or to raise the subgrade to design levels must conform to current County Standards or O.P.S. Standards. Preferably, native materials should be used to maintain uniform subgrade conditions, provided that adequate compaction can be achieved. Where native materials are too wet and/or unsuitable for reuse, imported granular material should be used to backfill under roads, driveways, sidewalks, curb and gutters as per current County Standards or O.P.S. Standards. Where free-draining backfill is required, and for backfill in confined areas, Granular 'B' Type II fill is recommended.

Disposal of excavated materials should conform to the current Ministry of the Environment Guidelines and Regulations.

Good drainage provisions will optimize pavement performance. Accordingly, the subgrade in areas to be paved should be crowned and shaped to promote drainage. The final grading plan should be reviewed prior to finalizing the design requirement.

Where the new pavement joins the existing pavement, a straight vertical joint should be placed to receive the new asphalt as a transition joint. The transition joint should be routed and sealed.

Provided the preceding recommendations are followed, the pavement thickness design requirements given in Table 3 are recommended. A function design life of about fifteen years has been used to establish the pavement design. This represents the number of years to the first major rehabilitation, assuming regular maintenance is carried out. If recommendations on street classification other than those specified are required, **exp** should be contacted for further comments.

TABLE 3
Suggested Flexible Pavement Thickness Design*

Road Section	Asphalt Wearing Course (HL3 or HL4) (mm)	Asphalt Binder Course (HL8) (mm)	Granular Base (OPSS Granular 'A') (mm)	Granular Subbase (Granular 'B') (mm)
Oxford Road 16	HL-4 40	60	150	500
<ol style="list-style-type: none"> 1. If construction is undertaken under adverse weather conditions such as wet/freezing subgrade preparation, the granular sub-base requirements should be reviewed at that time by the geotechnical engineer. 2. A program of in-place density testing must be carried out to verify that satisfactory levels of compaction are being achieved. 3. Granular base/sub-base should be compacted to 100% Standard Proctor maximum dry density. Asphaltic concrete should be compacted per OPS requirements. 4. Minimum overlay should be 40 mm for mill and overlay option for shoulder or edge repair. 				

*Based on Oxford County design drawings, included in Appendix D.

Additional comments on the construction of roadways are as follows:

1. The most severe loading conditions on pavement areas and the subgrade may occur during construction. Consequently, special provisions such as restricted lanes, half-loads during paving, etc., may be required, especially if construction is carried out during unfavourable weather.
2. It is recommended that **exp** be retained to review the final pavement structure designs and drainage plans prior to construction to ensure that they are consistent with the recommendations of this report.

4.3 Curbs and Gutters

The following recommendations are provided should curbs and gutters need to be locally replaced or constructed on an as needed basis. The concrete for the curbs and gutters should be proportioned, mixed placed and cured in accordance with the requirements of OPSS 353 and OPSS 1350, and the required CSA standards.

During cold weather, the freshly placed concrete should be covered with insulating blankets to protect against freezing.

4.4 Inspection and Testing

An effective inspection and testing program is an essential part of construction monitoring. The Inspection and Testing Program for road reconstruction typically includes the following items:

- Subbase examination prior to asphalt placement;
- Inspection of the asphalt placement;
- Inspection, compaction, and materials testing for subbase, base and surface asphalt, including laboratory testing on asphalt sampling to confirm conformance to project specifications and standards;
- Inspection, compaction, and materials testing for concrete curb and gutter, including laboratory testing on concrete sampling to confirm conformance to project specifications and standards.

5. General Comments

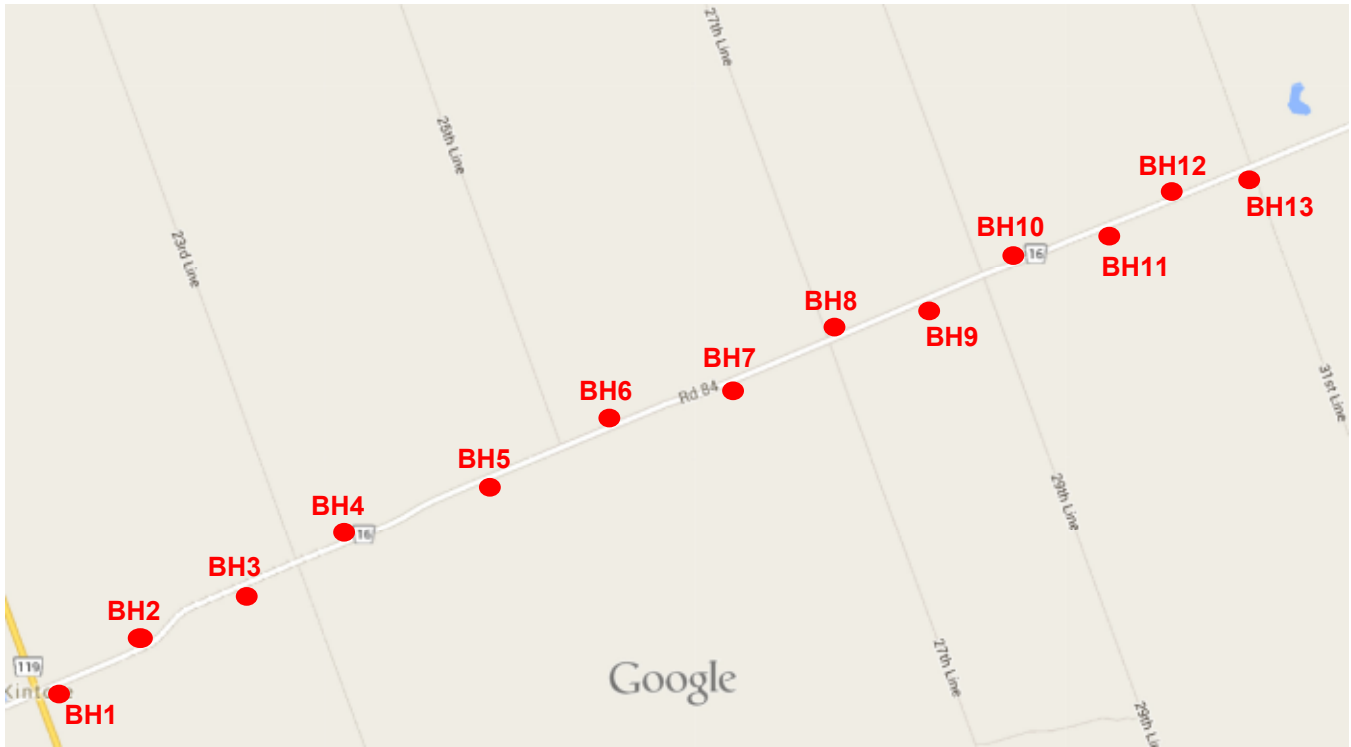
The comments given in this report are intended only for the guidance of design engineers. The number of test holes required to determine the localized underground conditions between test holes affecting construction costs, techniques, sequencing, equipment, scheduling, etc. would be much greater than has been carried out for design purposes. Contractors bidding on or undertaking the works should in this light, decide on their own investigations, as well as their own interpretations of the factual borehole results, so that they may draw their own conclusions as to how the subsurface conditions may affect them.

Exp Services Inc. should be retained for a general review of the final design and specifications to verify that this report has been properly interpreted and implemented. If not afforded the privilege of making this review, exp Services Inc. will assume no responsibility for interpretation of the recommendations in this report.

We trust that this report is satisfactory to your present requirements and we look forward to assisting you in the completion of this project. Should you have any questions, please contact the office at your convenience.

Appendix A

Borehole Location Maps



Map data ©2015 Google 500 m

APPROXIMATE BOREHOLE LOCATIONS - OXFORD ROAD 16

Appendix B

Borehole Logs

NOTES ON SAMPLE DESCRIPTIONS

- All descriptions included in this report follow the 'modified' Massachusetts Institute of Technology (M.I.T.) soil classification system. The laboratory grain-size analysis also follows this classification system. Others may designate the Unified Classification System as their source; a comparison of the two is shown for your information. Please note that, with the exception of those samples where the grain size analysis has been carried out, all samples are classified visually and the accuracy of the visual examination is not sufficient to differentiate between the classification systems or exact grain sizing. The M.I.T. system has been modified and the **exp** classification includes a designation for cobbles above the 75 mm size and boulders above the 200 mm size.

UNIFIED SOIL CLASSIFICATION	Fines (silt and clay)		Sand			Gravel		Cobbles
			Fine	Medium	Coarse	Fine	Coarse	
M.I.T. SOIL CLASSIFICATION	Clay	Silt	Sand			Gravel		
			Fine	Medium	Coarse			
Sieve Sizes								
			0.075 - 200	40	10	4	3/4	80
Particle Size (mm)		0.002	0.06	0.2	0.6	2.0	5.0	20

- Fill:** Where fill is designated on the borehole log, it is defined as indicated by the sample recovered during the boring process. The reader is cautioned that fills are heterogeneous in nature and variable in density or degree of compaction. The borehole description therefore, may not be applicable as a general description of the site fill material. All fills should be expected to contain obstructions such as large concrete pieces or subsurface basements, floors, tanks, even though none of these obstructions may have been encountered in the borehole. Since boreholes cannot accurately define the contents of the fill, test pits are recommended to provide supplementary information. Despite the use of test pits, the heterogeneous nature of fill will leave some ambiguity as to the exact and correct composition of the fill. Most fills contain pockets, seams, or layers of organically contaminated soil. This organic material can result in the generation of methane gas and/or significant ongoing and future settlements. The fill at this site has been monitored for the presence of methane gas and the results are recorded on the borehole logs. The monitoring process neither indicates the volume of gas that can be potentially generated or pinpoints the source of the gas. These readings are to advise of a potential or existing problem (if they exist) and a detailed study is recommended for sites where any explosive gas/methane is detected. Some fill material may be contaminated by toxic waste that renders the material unacceptable for deposition in any but designated land fill sites; unless specifically stated, the fill on the site has not been tested for contaminants that may be considered hazardous. This testing and a potential hazard study can be carried out if you so request. In most residential/commercial areas undergoing reconstruction, buried oil tanks are common, but not detectable using conventional geotechnical procedures.
- Glacial Till:** The term till on the borehole logs indicates that the material originates from a geological process associated with glaciation. Because of this geological process, the till must be considered heterogeneous in composition and as such, may contain pockets and/or seams of material such as sand, gravel, silt or clay. Till often contains cobbles (75 to 200 mm in diameter) or boulders (greater than 200 mm diameter) and therefore, contractors may encounter them during excavation, even if they are not indicated on the borehole logs. It should be appreciated that normal sampling equipment can not differentiate the size or type of obstruction. Because of the horizontal and vertical variability of till, the sample description may be applicable to a very limited area; therefore, caution is essential when dealing with sensitive excavations or dewatering programs in till material.

BH 1

Sheet 1 of 1

BOREHOLE LOG



PROJECT Oxford County Roads

PROJECT NO. KCH-00227972-GE

CLIENT County of Oxford

DATUM Local

DRILL TYPE/METHOD Solid Stem

DATES: Boring August 20, 2015

Water Level _____

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES			BULK DENSITY (kN/m ³)	SHEAR STRENGTH	
					TYPE	NUMBER	RECOVERY (mm or %)		N VALUE (blows or RQD %)	S Field Vane Test (#=Sensitivity)
0		TOPSOIL, dark brown, rootlets, moist								
0.13		GRANULAR FILL, Grey/brown, sand & gravel (sub-rounded & angular), asphalt inclusions, moist, compact to loose								
					S1	375	13			
					S2		9			
					S3		25			
1.72		SANDY SILT TILL, Grey/brown, trace gravel, some clay, moist, very stiff								
1.98		End of Borehole at 1.98 m depth								

NOTES

1) Borehole interpretation requires assistance by exp before use by others. Borehole Logs must be read in conjunction with exp Report KCH-00223655-GE. For definition of terms used on logs, see sheets prior to logs.

2) Upon completion, borehole open to 1.98 m and dry.

SAMPLE LEGEND

AS Auger Sample SS Split Spoon ST Shelby Tube
 Rock Core (eg. BQ, NQ, etc.) VN Vane Sample

OTHER TESTS

G Specific Gravity C Consolidation
H Hydrometer CD Consolidated Drained Triaxial
S Sieve Analysis CU Consolidated Undrained Triaxial
γ Unit Weight UU Unconsolidated Undrained Triaxial
P Field Permeability UC Unconfined Compression
K Lab Permeability DS Direct Shear

WATER LEVELS

Apparent Measured Artesian (see Notes)

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Sheet 1 of 1

BOREHOLE LOG



PROJECT Oxford County Roads

PROJECT NO. KCH-00227972-GE

CLIENT County of Oxford

DATUM Local

DRILL TYPE/METHOD Solid Stem

DATES: Boring August 20, 2015

Water Level _____

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES			BULK DENSITY (kN/m ³)	SHEAR STRENGTH	
					TYPE	NUMBER	RECOVERY (mm or %)		N VALUE (blows or RQD %)	S Field Vane Test (#=Sensitivity)
0		ASPHALT, ~.150 m								
0.15		FILL, ~Brown sand & gravel, some cobbles, damp, compact								
0.50		FILL, Dark brown/black, sandy silt, trace gravel, asphalt fragments, moist, compact			S1	400	29		○	●
0.76		SANDY SILT, Dark grey/brown, trace clay, trace fine gravel, moist, firm			S2	250	7		●	▲
		becoming light brown at depth			S3		5		●	○
1.98		End of Borehole at 1.98 m depth								

NOTES

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- Upon completion, borehole open to 1.98 m and dry.

SAMPLE LEGEND

- AS Auger Sample
- SS Split Spoon
- ST Shelby Tube
- Rock Core (eg. BQ, NQ, etc.)
- VN Vane Sample

OTHER TESTS

- G Specific Gravity
- H Hydrometer
- S Sieve Analysis
- γ Unit Weight
- P Field Permeability
- K Lab Permeability
- C Consolidation
- CD Consolidated Drained Triaxial
- CU Consolidated Undrained Triaxial
- UU Unconsolidated Undrained Triaxial
- UC Unconfined Compression
- DS Direct Shear

WATER LEVELS

- Apparent
- Measured
- Artesian (see Notes)

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Sheet 1 of 1

BOREHOLE LOG



PROJECT Oxford County Roads

PROJECT NO. KCH-00227972-GE

CLIENT County of Oxford

DATUM Local

DRILL TYPE/METHOD Solid Stem

DATES: Boring August 20, 2015

Water Level _____

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES			BULK DENSITY (kN/m ³)	SHEAR STRENGTH	
					TYPE	NUMBER	RECOVERY (mm or %)		N VALUE (blows or RQD %)	S Field Vane Test (#=Sensitivity)
0		ASPHALT, ~.150 m								
0.15		FILL, ~Brown sand & gravel, damp, compact								
0.45		FILL, Grey/brown, sandy silt, trace gravel, trace clay, moist, compact								
1.06		SANDY SILT, Light brown, trace clay, moist, firm			S1	100	19			
1.52		SANDY SILT TILL, Grey/brown, mottled, trace clay, trace gravel, moist, very stiff			S2	350	7			
1.98		End of Borehole at 1.98 m depth			S3	225	16			

NOTES

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2) Upon completion, borehole open to 1.98 m and dry.

SAMPLE LEGEND

AS Auger Sample SS Split Spoon ST Shelby Tube
 Rock Core (eg. BQ, NQ, etc.) VN Vane Sample

OTHER TESTS

G Specific Gravity C Consolidation
 H Hydrometer CD Consolidated Drained Triaxial
 S Sieve Analysis CU Consolidated Undrained Triaxial
 γ Unit Weight UU Unconsolidated Undrained Triaxial
 P Field Permeability UC Unconfined Compression
 K Lab Permeability DS Direct Shear

WATER LEVELS

Apparent Measured Artesian (see Notes)

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Sheet 1 of 1

BOREHOLE LOG



PROJECT Oxford County Roads

PROJECT NO. KCH-00227972-GE

CLIENT County of Oxford

DATUM Local

DRILL TYPE/METHOD Solid Stem

DATES: Boring August 20, 2015

Water Level _____

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES			BULK DENSITY (kN/m ³)	SHEAR STRENGTH					
					TYPE	NUMBER	RECOVERY (mm or %)		N VALUE (blows) or RQD (%)	S Field Vane Test (#=Sensitivity)	▲ Penetrometer	■ Torvane	Atterberg Limits and Moisture	
									100	200	kPa			
											W _p	W	W _L	
											● SPT N Value	× Dynamic Cone		
											10	20	30	40
0		ASPHALT, ~.100 m												
0.10		FILL, ~Brown sand & gravel, damp, compact												
0.50		FILL, Grey/brown, sandy silt, some gravel, moist, compact				S1	350	17						
0.76		SANDY SILT, Bark brown/black, trace clay, trace gravel, moist, firm				S2	50	6						
1		becoming grey/brown, mottled yellow, sandy silt with thin fine sand seams				S3	350	7						
1.98		End of Borehole at 1.98 m depth												

NOTES

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- Upon completion, borehole open to 1.98 m and dry.

SAMPLE LEGEND

- AS Auger Sample
- SS Split Spoon
- ST Shelby Tube
- Rock Core (eg. BQ, NQ, etc.)
- VN Vane Sample

OTHER TESTS

- G Specific Gravity
- H Hydrometer
- S Sieve Analysis
- γ Unit Weight
- P Field Permeability
- K Lab Permeability
- C Consolidation
- CD Consolidated Drained Triaxial
- CU Consolidated Undrained Triaxial
- UU Unconsolidated Undrained Triaxial
- UC Unconfined Compression
- DS Direct Shear

WATER LEVELS

- Apparent
- Measured
- Artesian (see Notes)

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Sheet 1 of 1

BOREHOLE LOG



PROJECT Oxford County Roads

PROJECT NO. KCH-00227972-GE

CLIENT County of Oxford

DATUM Local

DRILL TYPE/METHOD Solid Stem

DATES: Boring August 20, 2015

Water Level _____

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES			BULK DENSITY (kN/m ³)	SHEAR STRENGTH	
					TYPE	NUMBER	RECOVERY (mm or %)		N VALUE (blows) or RQD (%)	S Field Vane Test (#=Sensitivity)
0		ASPHALT, ~.225 m								
0.23		FILL, ~Brown sand & gravel, damp, dense								
0.60		SANDY SILT TILL, Grey/brown, trace fine to coarse grained gravel, trace clay, moist, stiff to very stiff			S1	375	33			
					S2	225	12			
					S3	450	24			
		sand seams at depth								
1.98		End of Borehole at 1.98 m depth								

NOTES

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2) Upon completion, borehole open to 1.98 m and dry.

SAMPLE LEGEND

AS Auger Sample SS Split Spoon ST Shelby Tube
 Rock Core (eg. BQ, NQ, etc.) VN Vane Sample

OTHER TESTS

G Specific Gravity C Consolidation
H Hydrometer CD Consolidated Drained Triaxial
S Sieve Analysis CU Consolidated Undrained Triaxial
γ Unit Weight UU Unconsolidated Undrained Triaxial
P Field Permeability UC Unconfined Compression
K Lab Permeability DS Direct Shear

WATER LEVELS

Apparent Measured Artesian (see Notes)

BH 2

Sheet 1 of 1

BOREHOLE LOG



PROJECT Oxford County Roads

PROJECT NO. KCH-00227972-GE

CLIENT County of Oxford

DATUM Local

DRILL TYPE/METHOD Solid Stem

DATES: Boring August 20, 2015

Water Level _____

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES			BULK DENSITY (kN/m ³)	SHEAR STRENGTH					
					TYPE	NUMBER	RECOVERY (mm or %)		N VALUE (blows) or RQD (%)	S Field Vane Test (#=Sensitivity)	▲ Penetrometer	■ Torvane	Atterberg Limits and Moisture	
								W _p W W _L ● SPT N Value × Dynamic Cone 10 20 30 40						
0		ASPHALT, ~.150 m												
0.15		FILL, Brown sand & gravel, some cobbles, damp to moist, compact												
0.45		SANDY SILT, Grey/brown, mottled, trace clay, trace gravel, moist to very moist, firm			S1	350	19							
					S2	200	5							
		becoming sandy silt till			S3	187	8							
1.98		End of Borehole at 1.98 m depth												

NOTES

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- Upon completion, borehole open to 1.98 m and dry.

SAMPLE LEGEND

- AS Auger Sample
- SS Split Spoon
- ST Shelby Tube
- Rock Core (eg. BQ, NQ, etc.)
- VN Vane Sample

OTHER TESTS

- G Specific Gravity
- H Hydrometer
- S Sieve Analysis
- γ Unit Weight
- P Field Permeability
- K Lab Permeability
- C Consolidation
- CD Consolidated Drained Triaxial
- CU Consolidated Undrained Triaxial
- UU Unconsolidated Undrained Triaxial
- UC Unconfined Compression
- DS Direct Shear

WATER LEVELS

- Apparent
- Measured
- Artesian (see Notes)

BH 3

Sheet 1 of 2

BOREHOLE LOG



PROJECT Oxford County Roads

PROJECT NO. KCH-00227972-GE

CLIENT County of Oxford

DATUM Local

DRILL TYPE/METHOD Solid Stem

DATES: Boring August 20, 2015

Water Level _____

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES			BULK DENSITY (kN/m ³)	SHEAR STRENGTH	
					TYPE	NUMBER	RECOVERY (mm or %)		N VALUE (blows) or RQD (%)	S Field Vane Test (#=Sensitivity)
0		ASPHALT, ~.150 m								
0.15		FILL, ~Brown sand & gravel, some cobbles, damp to moist, compact								
0.61		SANDY SILT, Grey/brown, mottled, trace clay, trace fine gravel, moist, firm to stiff			S1	400	22		○	●
1					S2	300	8		●	
1.98		End of Borehole at 1.98 m depth			S3		10		● ○	▲

Continued Next Page

NOTES

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- Upon completion, borehole open to 1.98 m and dry.

SAMPLE LEGEND

- AS Auger Sample
- SS Split Spoon
- ST Shelby Tube
- Rock Core (eg. BQ, NQ, etc.)
- VN Vane Sample

OTHER TESTS

- G Specific Gravity
- H Hydrometer
- S Sieve Analysis
- γ Unit Weight
- P Field Permeability
- K Lab Permeability
- C Consolidation
- CD Consolidated Drained Triaxial
- CU Consolidated Undrained Triaxial
- UU Unconsolidated Undrained Triaxial
- UC Unconfined Compression
- DS Direct Shear

WATER LEVELS

- Apparent
- Measured
- Artesian (see Notes)

BH 3

Sheet 2 of 2

BOREHOLE LOG



PROJECT Oxford County Roads PROJECT NO. KCH-00227972-GE
 CLIENT County of Oxford DATUM Local
 DRILL TYPE/METHOD Solid Stem DATES: Boring August 20, 2015 Water Level _____

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES			BULK DENSITY (kN/m ³)	SHEAR STRENGTH	
					TYPE	NUMBER	RECOVERY (mm or %)		N VALUE (blows) or RQD (%)	Field Vane Test (#=Sensitivity)
3		End of Borehole at 1.98 m depth							40	80 kPa
4									Atterberg Limits and Moisture	
5									W _p	W _L
									● SPT N Value	× Dynamic Cone
									10	20
									30	40

NOTES

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- Upon completion, borehole open to 1.98 m and dry.

SAMPLE LEGEND

- AS Auger Sample SS Split Spoon ST Shelby Tube
- Rock Core (eg. BQ, NQ, etc.) VN Vane Sample

OTHER TESTS

- G Specific Gravity C Consolidation
- H Hydrometer CD Consolidated Drained Triaxial
- S Sieve Analysis CU Consolidated Undrained Triaxial
- γ Unit Weight UU Unconsolidated Undrained Triaxial
- P Field Permeability UC Unconfined Compression
- K Lab Permeability DS Direct Shear

WATER LEVELS

- ▽ Apparent ▼ Measured ▲ Artesian (see Notes)

BH 4

Sheet 1 of 1

BOREHOLE LOG



PROJECT Oxford County Roads

PROJECT NO. KCH-00227972-GE

CLIENT County of Oxford

DATUM Local

DRILL TYPE/METHOD Solid Stem

DATES: Boring August 20, 2015

Water Level _____

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES			BULK DENSITY (kN/m ³)	SHEAR STRENGTH	
					TYPE	NUMBER	RECOVERY (mm or %)		N VALUE (blows) or RQD (%)	• S Field Vane Test (#=Sensitivity)
0		ASPHALT, ~.150 m								
0.15		FILL, ~Brown sand & gravel, some cobbles, moist, dense								
0.61		SANDY SILT, Grey/brown, mottled, trace clay, trace fine gravel, moist to very moist, firm			S1	375	35		○	●
1					S2	50	5		●	
1.98		End of Borehole at 1.98 m depth			S3		7		●	○

NOTES

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2) Upon completion, borehole open to 1.98 m and dry.

SAMPLE LEGEND

AS Auger Sample SS Split Spoon ST Shelby Tube
 Rock Core (eg. BQ, NQ, etc.) VN Vane Sample

OTHER TESTS

G Specific Gravity C Consolidation
 H Hydrometer CD Consolidated Drained Triaxial
 S Sieve Analysis CU Consolidated Undrained Triaxial
 γ Unit Weight UU Unconsolidated Undrained Triaxial
 P Field Permeability UC Unconfined Compression
 K Lab Permeability DS Direct Shear

WATER LEVELS

Apparent Measured Artesian (see Notes)



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Sheet 1 of 1

BOREHOLE LOG

PROJECT Oxford County Roads

PROJECT NO. KCH-00227972-GE

CLIENT County of Oxford

DATUM Local

DRILL TYPE/METHOD Solid Stem

DATES: Boring August 20, 2015

Water Level _____

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES			BULK DENSITY (kN/m ³)	SHEAR STRENGTH	
					TYPE	NUMBER	RECOVERY (mm or %)		N VALUE (blows or RQD %)	S Field Vane Test (#=Sensitivity)
0		ASPHALT, ~.150 m								
0.15		FILL, ~Brown sand & gravel, moist, compact								
0.35		FILL, Grey/brown sandy silt, trace gravel, trace clay, moist, stiff								
					S1	400	19		○	●
					S2	350	9			●
1										
1.22		SANDY SILT, Reddish brown, trace clay, moist, stiff with sand seams								▲
					S3	300	8		●	○
1.98		End of Borehole at 1.98 m depth								▲
2										

NOTES

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2) Upon completion, borehole open to 1.98 m and dry.

SAMPLE LEGEND

AS Auger Sample SS Split Spoon ST Shelby Tube
 Rock Core (eg. BQ, NQ, etc.) VN Vane Sample

OTHER TESTS

G Specific Gravity C Consolidation
 H Hydrometer CD Consolidated Drained Triaxial
 S Sieve Analysis CU Consolidated Undrained Triaxial
 γ Unit Weight UU Unconsolidated Undrained Triaxial
 P Field Permeability UC Unconfined Compression
 K Lab Permeability DS Direct Shear

WATER LEVELS

▽ Apparent ▼ Measured ▲ Artesian (see Notes)

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Sheet 1 of 1

BOREHOLE LOG



PROJECT Oxford County Roads

PROJECT NO. KCH-00227972-GE

CLIENT County of Oxford

DATUM Local

DRILL TYPE/METHOD Solid Stem

DATES: Boring August 20, 2015

Water Level _____

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES			BULK DENSITY (kN/m ³)	SHEAR STRENGTH	
					TYPE	NUMBER	RECOVERY (mm or %)		N VALUE (blows or RQD %)	S Field Vane Test (#=Sensitivity)
0	0.08	ASPHALT, ~.075 m								
		FILL, ~Brown sand & gravel, moist, compact								
	0.50	FILL, Dark brown/black, sandy silt, trace organics, moist, compact								
	0.76	SANDY SILT, Grey/brown, trace clay, trace gravel, mottled, moist, stiff								
	1.52	SANDY SILT TILL, Grey/brown, trace clay, trace gravel, moist, very stiff								
	1.98	End of Borehole at 1.98 m depth								

NOTES

- Borehole interpretation requires assistance by exp before use by others. Borehole Logs must be read in conjunction with exp Report KCH-00223655-GE. For definition of terms used on logs, see sheets prior to logs.
- Upon completion, borehole open to 1.98 m and dry.

SAMPLE LEGEND

- AS Auger Sample
- SS Split Spoon
- ST Shelby Tube
- Rock Core (eg. BQ, NQ, etc.)
- VN Vane Sample

OTHER TESTS

- G Specific Gravity
- H Hydrometer
- S Sieve Analysis
- γ Unit Weight
- P Field Permeability
- K Lab Permeability
- C Consolidation
- CD Consolidated Drained Triaxial
- CU Consolidated Undrained Triaxial
- UU Unconsolidated Undrained Triaxial
- UC Unconfined Compression
- DS Direct Shear

WATER LEVELS

- Apparent
- Measured
- Artesian (see Notes)

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Sheet 1 of 1

BOREHOLE LOG



PROJECT Oxford County Roads

PROJECT NO. KCH-00227972-GE

CLIENT County of Oxford

DATUM Local

DRILL TYPE/METHOD Solid Stem

DATES: Boring August 20, 2015

Water Level _____

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES			BULK DENSITY (kN/m ³)	SHEAR STRENGTH	
					TYPE	NUMBER	RECOVERY (mm or %)		N VALUE (blows or RQD %)	S Field Vane Test (#=Sensitivity)
0		ASPHALT, ~.150 m								
0.15		FILL, ~Brown sand & gravel, damp, compact								
0.33		FILL, Grey brown, sandy silt, trace clay, moist, compact								
0.76		SANDY SILT, Grey/brown, trace clay, trace gravel, mottled, moist, stiff with fine sand seams			S1	375	11		○	●
1		changes to light brown colour and becomes firm at bottom			S2	250	9		●	○
1.98		End of Borehole at 1.98 m depth			S3	50	8		●	

NOTES

- Borehole interpretation requires assistance by exp before use by others. Borehole Logs must be read in conjunction with exp Report KCH-00223655-GE. For definition of terms used on logs, see sheets prior to logs.
- Upon completion, borehole open to 1.98 m and dry.

SAMPLE LEGEND

- AS Auger Sample
- SS Split Spoon
- ST Shelby Tube
- Rock Core (eg. BQ, NQ, etc.)
- VN Vane Sample

OTHER TESTS

- G Specific Gravity
- H Hydrometer
- S Sieve Analysis
- γ Unit Weight
- P Field Permeability
- K Lab Permeability
- C Consolidation
- CD Consolidated Drained Triaxial
- CU Consolidated Undrained Triaxial
- UU Unconsolidated Undrained Triaxial
- UC Unconfined Compression
- DS Direct Shear

WATER LEVELS

- Apparent
- Measured
- Artesian (see Notes)

BH 8

Sheet 1 of 1

BOREHOLE LOG



PROJECT Oxford County Roads

PROJECT NO. KCH-00227972-GE

CLIENT County of Oxford

DATUM Local

DRILL TYPE/METHOD Solid Stem

DATES: Boring August 20, 2015

Water Level _____

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES			BULK DENSITY (kN/m ³)	SHEAR STRENGTH	
					TYPE	NUMBER	RECOVERY (mm or %)		N VALUE (blows or RQD %)	S Field Vane Test (#=Sensitivity)
0		ASPHALT, ~.150 m								
0.15		FILL, ~Brown sand & gravel, damp, compact								
0.45		FILL, Brown to dark brown, sandy silt, trace fine gravel, trace organics, moist, compact			S1	300	19		○	●
1					S2	225	11			●
1.52		SANDY SILT, Grey/brown, trace clay, trace gravel, mottled, moist to very moist, firm			S3	400	6		●	○
1.98		End of Borehole at 1.98 m depth								▲

NOTES

1) Borehole interpretation requires assistance by exp before use by others. Borehole Logs must be read in conjunction with exp Report KCH-00223655-GE. For definition of terms used on logs, see sheets prior to logs.

2) Upon completion, borehole open to 1.98 m and dry.

SAMPLE LEGEND

AS Auger Sample SS Split Spoon ST Shelby Tube
 Rock Core (eg. BQ, NQ, etc.) VN Vane Sample

OTHER TESTS

G Specific Gravity C Consolidation
 H Hydrometer CD Consolidated Drained Triaxial
 S Sieve Analysis CU Consolidated Undrained Triaxial
 γ Unit Weight UU Unconsolidated Undrained Triaxial
 P Field Permeability UC Unconfined Compression
 K Lab Permeability DS Direct Shear

WATER LEVELS

Apparent Measured Artesian (see Notes)

BH 9

Sheet 1 of 1

BOREHOLE LOG



PROJECT Oxford County Roads

PROJECT NO. KCH-00227972-GE

CLIENT County of Oxford

DATUM Local

DRILL TYPE/METHOD Solid Stem

DATES: Boring August 20, 2015

Water Level _____

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES			BULK DENSITY (kN/m ³)	SHEAR STRENGTH	
					TYPE	NUMBER	RECOVERY (mm or %)		N VALUE (blows or RQD %)	Field Vane Test (#=Sensitivity)
0		ASPHALT, ~.150 m								
0.15		FILL, ~Brown sand & gravel, damp, compact								
0.50		FILL, Grey/brown, sandy silt, trace fine gravel, trace organics, trace clay, moist, compact			S1	350	22		○	●
0.76		SANDY SILT, Grey/brown, trace clay, moist, firm			S2	300	7		●	
1.52		SANDY SILT TILL, Grey/brown, trace clay, trace gravel, moist, stiff			S3		13		●○	▲
1.98		End of Borehole at 1.98 m depth								

NOTES

1) Borehole interpretation requires assistance by exp before use by others. Borehole Logs must be read in conjunction with exp Report KCH-00223655-GE. For definition of terms used on logs, see sheets prior to logs.

2) Upon completion, borehole open to 1.98 m and dry.

SAMPLE LEGEND

AS Auger Sample SS Split Spoon ST Shelby Tube
 Rock Core (eg. BQ, NQ, etc.) VN Vane Sample

OTHER TESTS

G Specific Gravity C Consolidation
 H Hydrometer CD Consolidated Drained Triaxial
 S Sieve Analysis CU Consolidated Undrained Triaxial
 γ Unit Weight UU Unconsolidated Undrained Triaxial
 P Field Permeability UC Unconfined Compression
 K Lab Permeability DS Direct Shear

WATER LEVELS

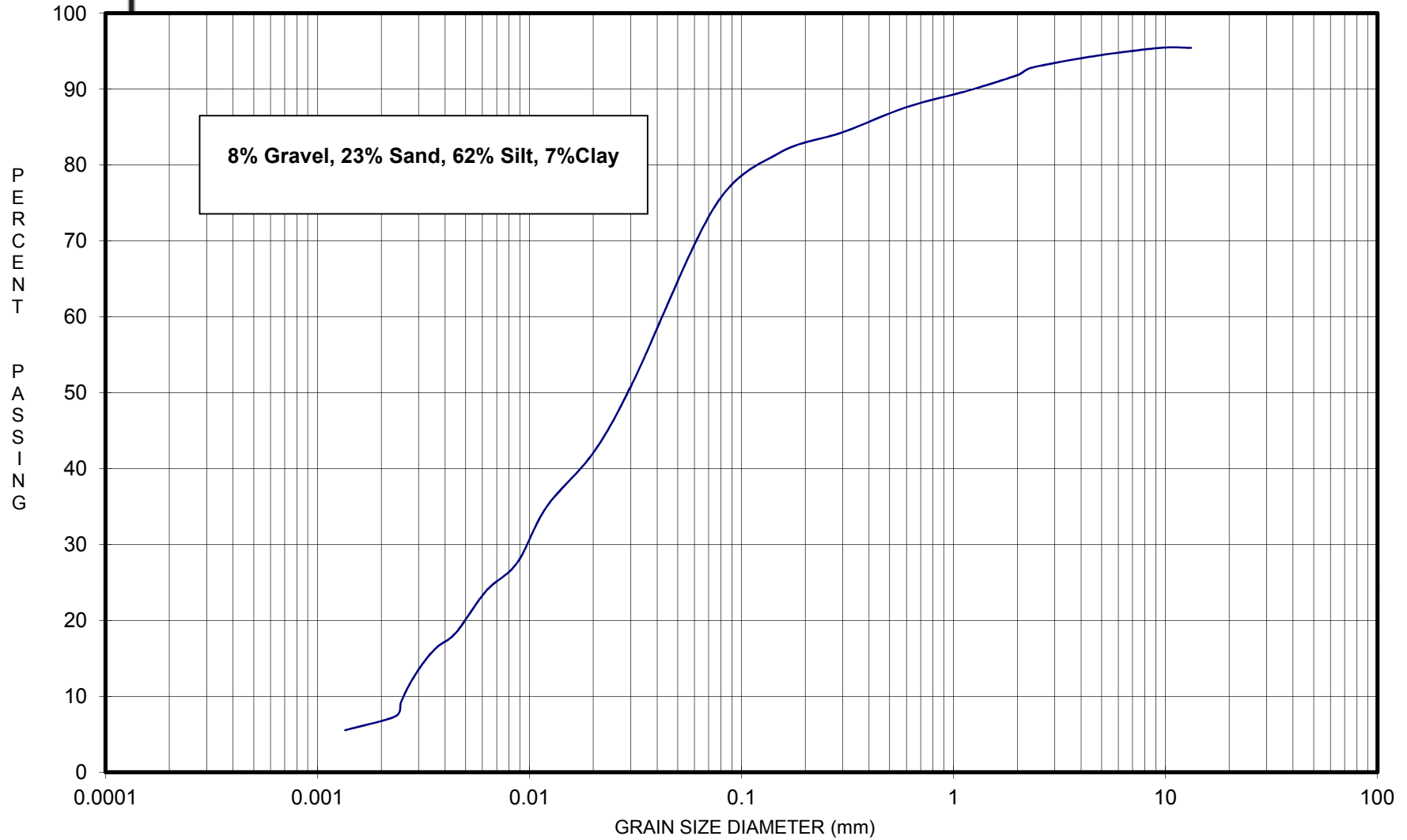
Apparent Measured Artesian (see Notes)

Appendix C

Grain Size Analyses



MECHANICAL GRAIN SIZE ANALYSIS



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE
	SILT			SAND			GRAVEL		
MODIFIED M.I.T. CLASSIFICATION							Oxford County Roads Project: KCH-00227972-GE		
Sample Description: Oxford Road 16: BH 6 - SS 2 & BH 7 - SS 2							Figure 2		

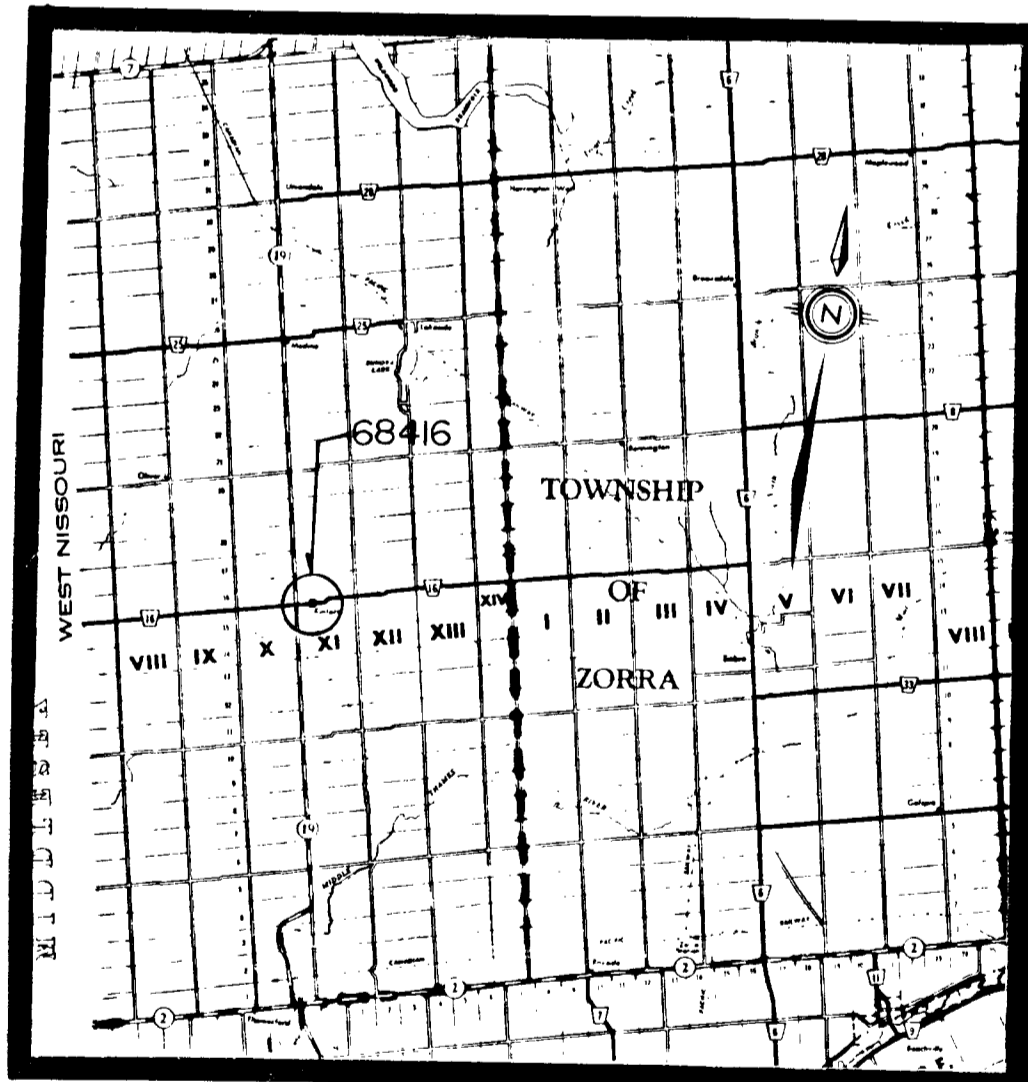
Appendix D

Oxford County Pavement Design for Road 16

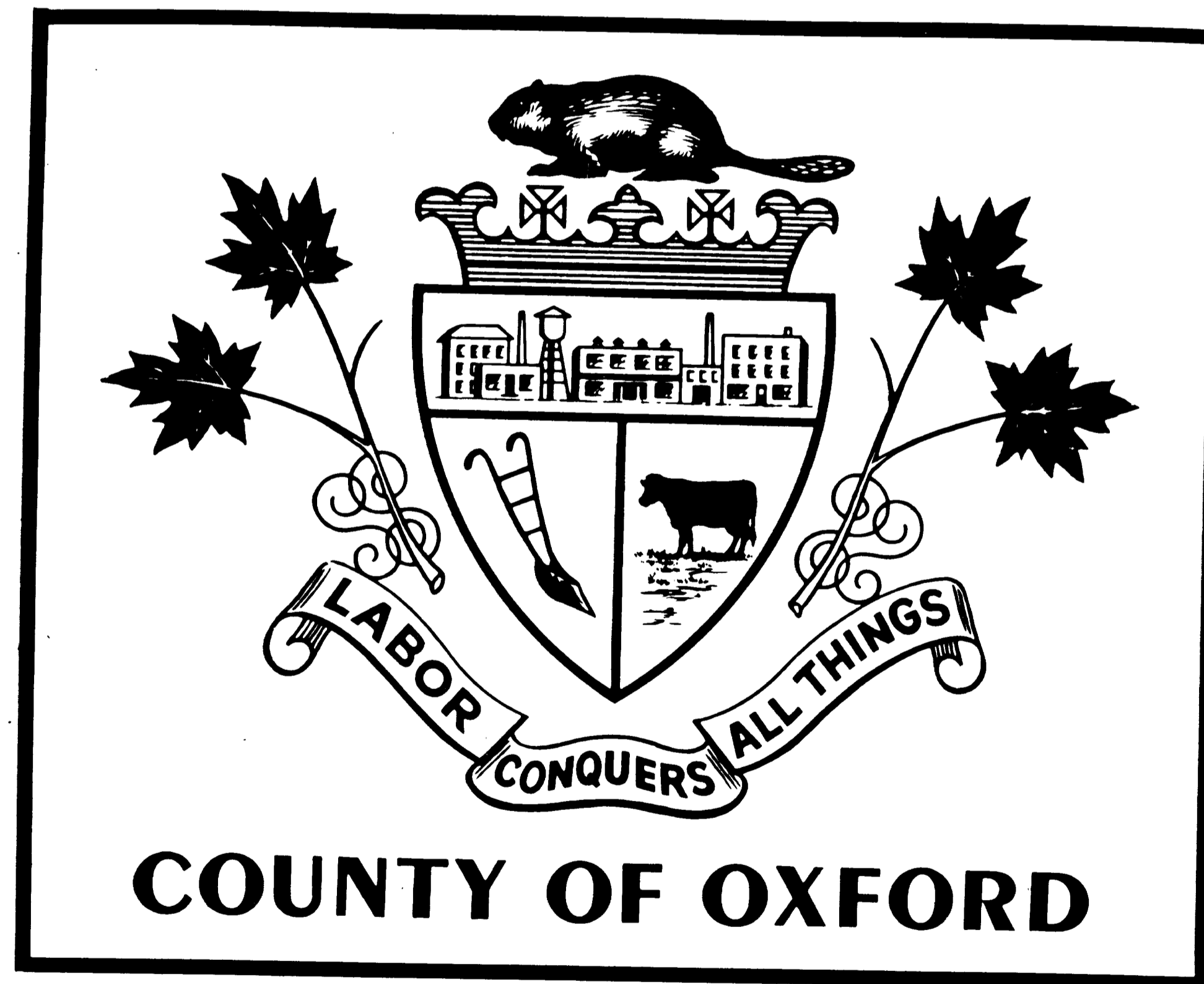
COUNTY OF OXFORD

RS-1001-0-1985

COUNTY ROAD 16
CONC. XI, LOT 15&16
TOWNSHIP OF ZORRA

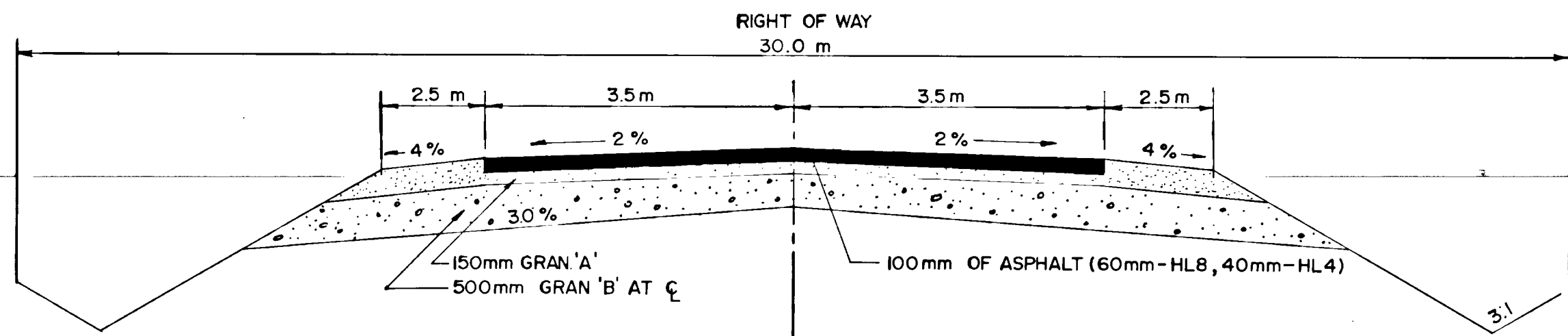


KEY PLAN

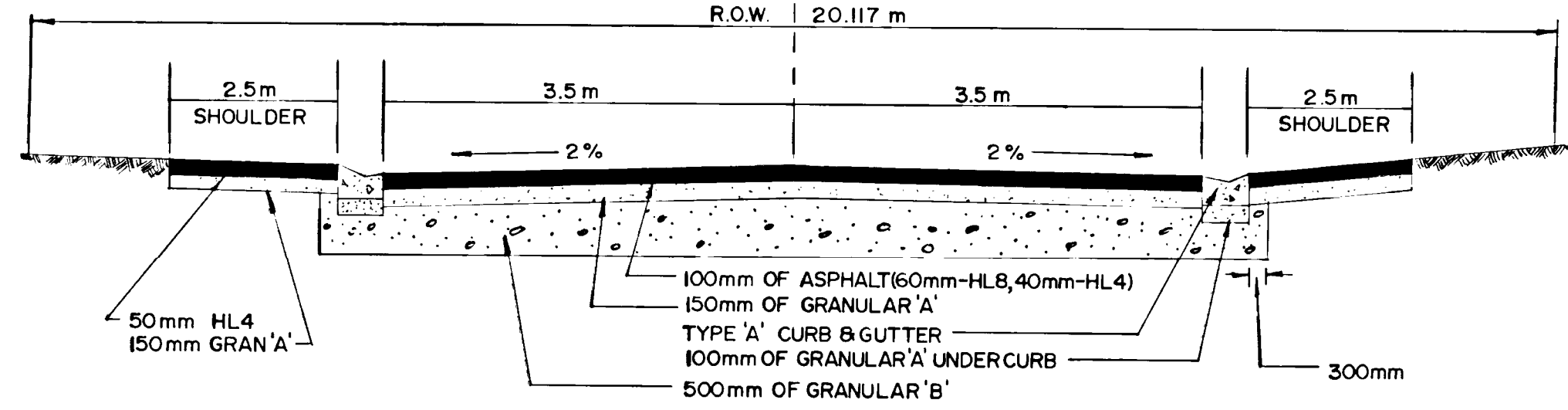


CONTRACT N^o 68416

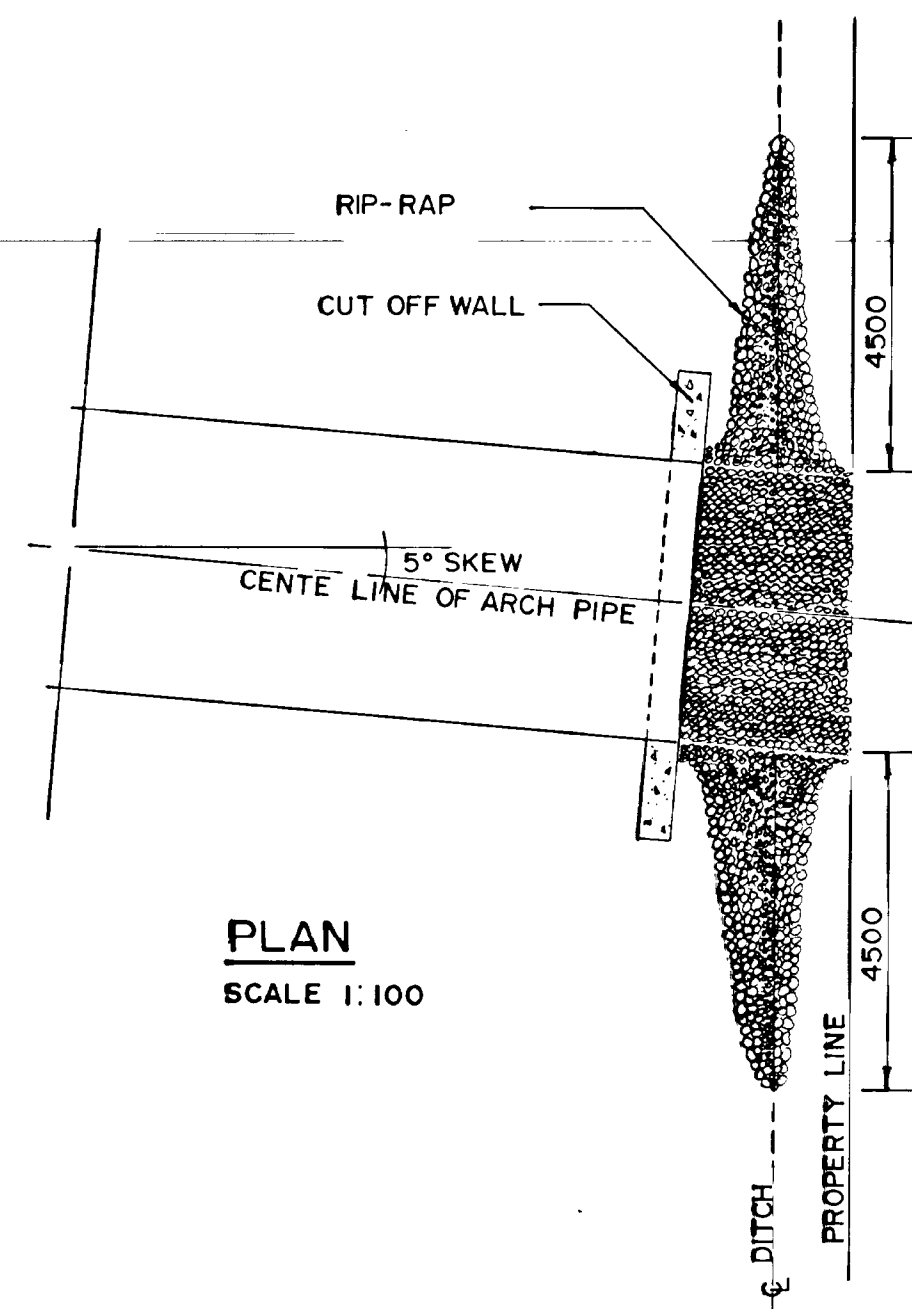
D.L. PRATT P. ENG.
DIRECTOR OF ENGINEERING



TYPICAL RURAL ROAD CROSS-SECTION

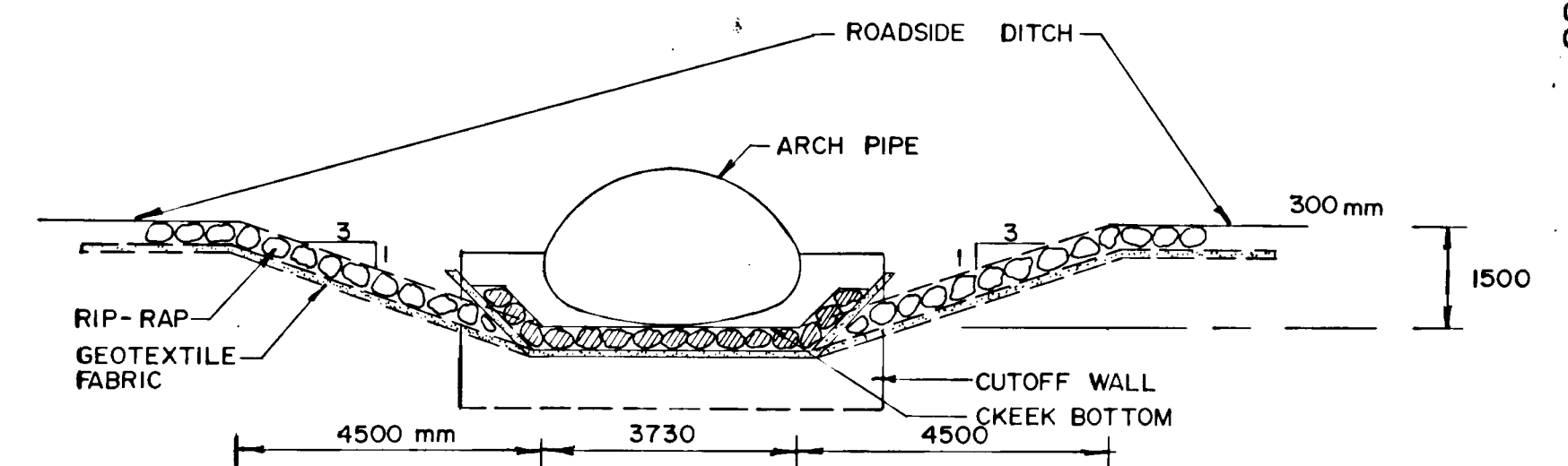


TYPICAL URBAN ROAD CROSS-SECTION
N.T.S.



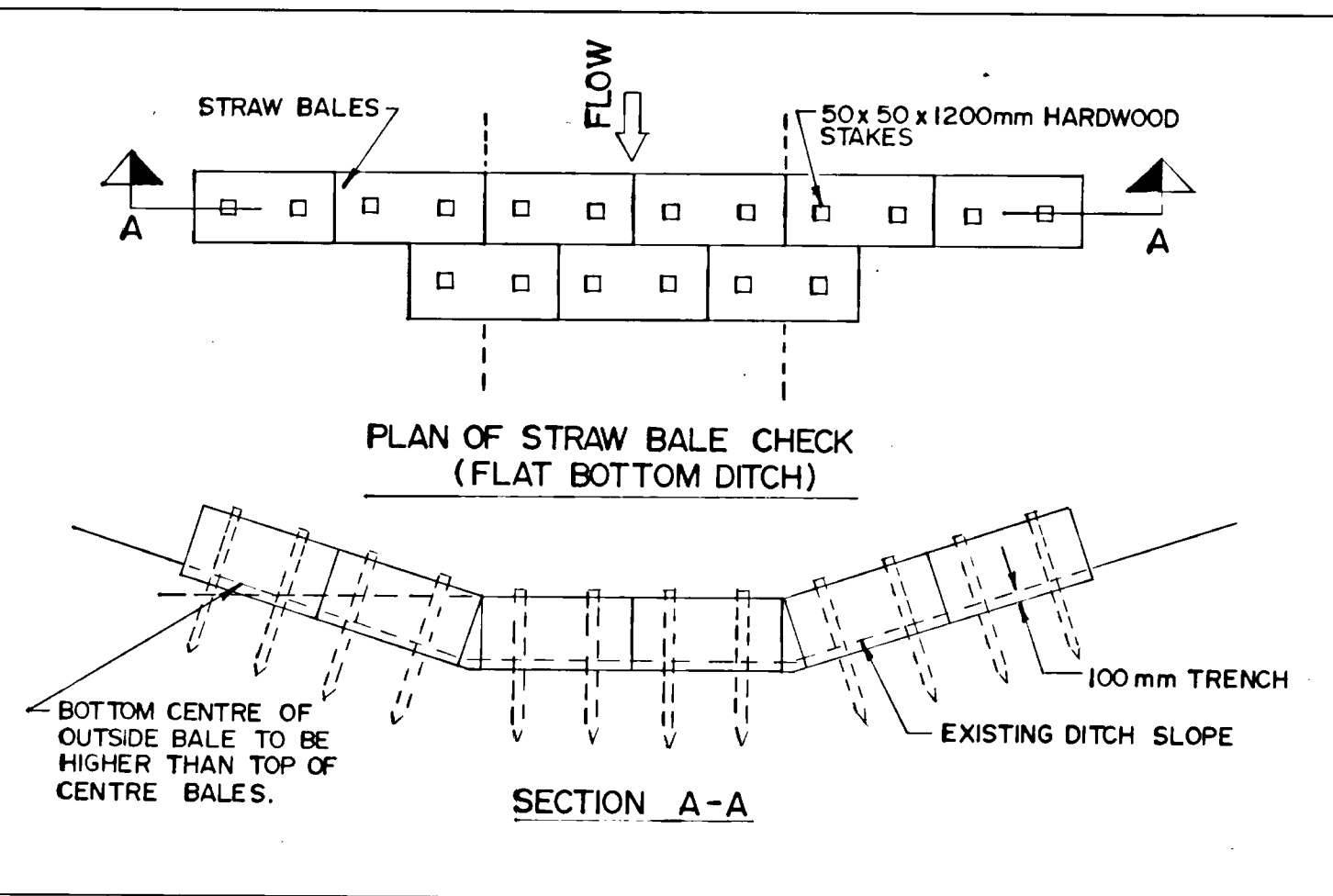
PLAN
SCALE 1:100

RIP-RAP DETAIL



SECTION
SCALE 1:100

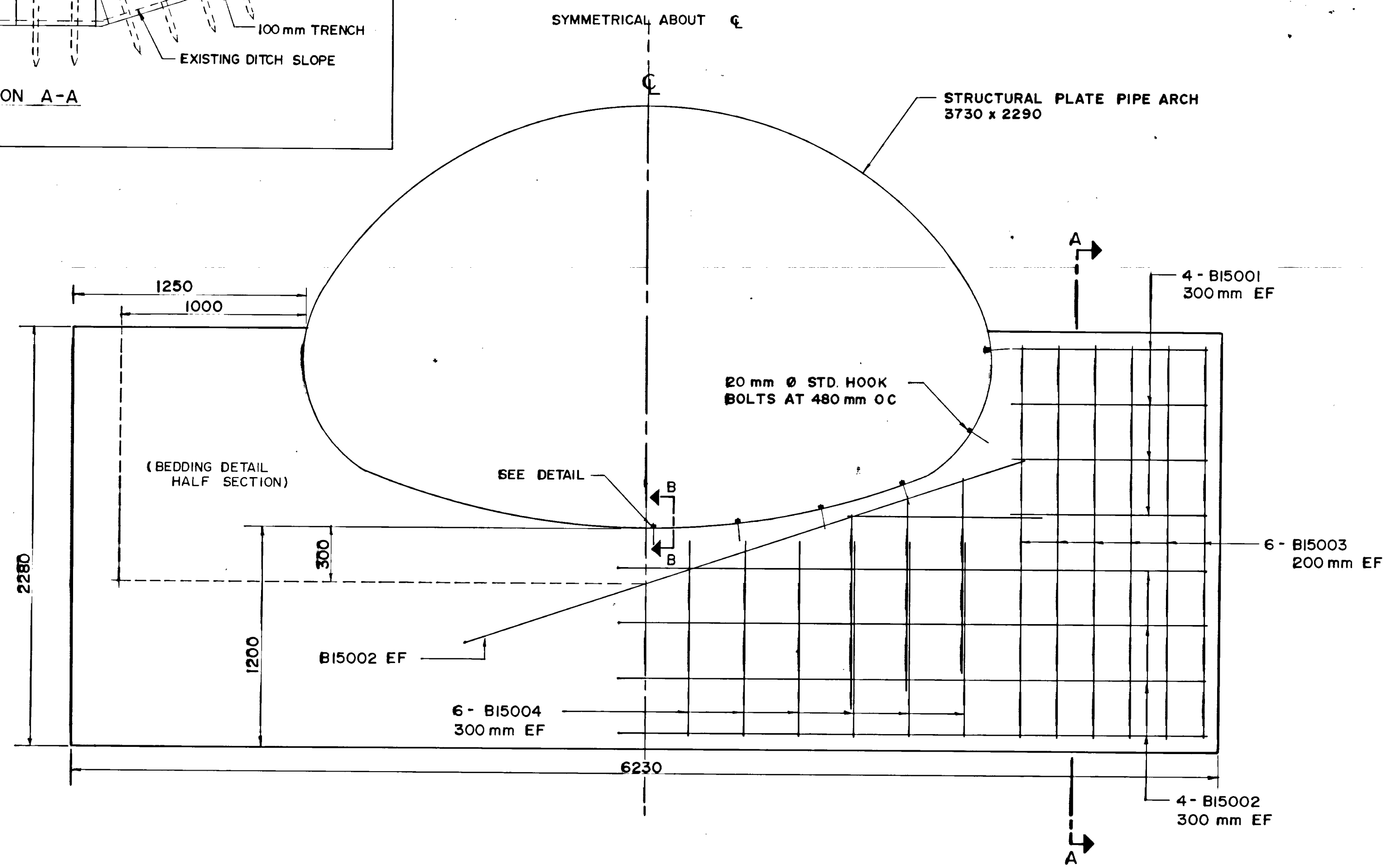
- NOTES
- A. RIP-RAP TO BE HAND LAID.
 - B. GEOTEXTILE FABRIC TO BE NONWOVEN WITH A UNIT WEIGHT OF 270 g/m².



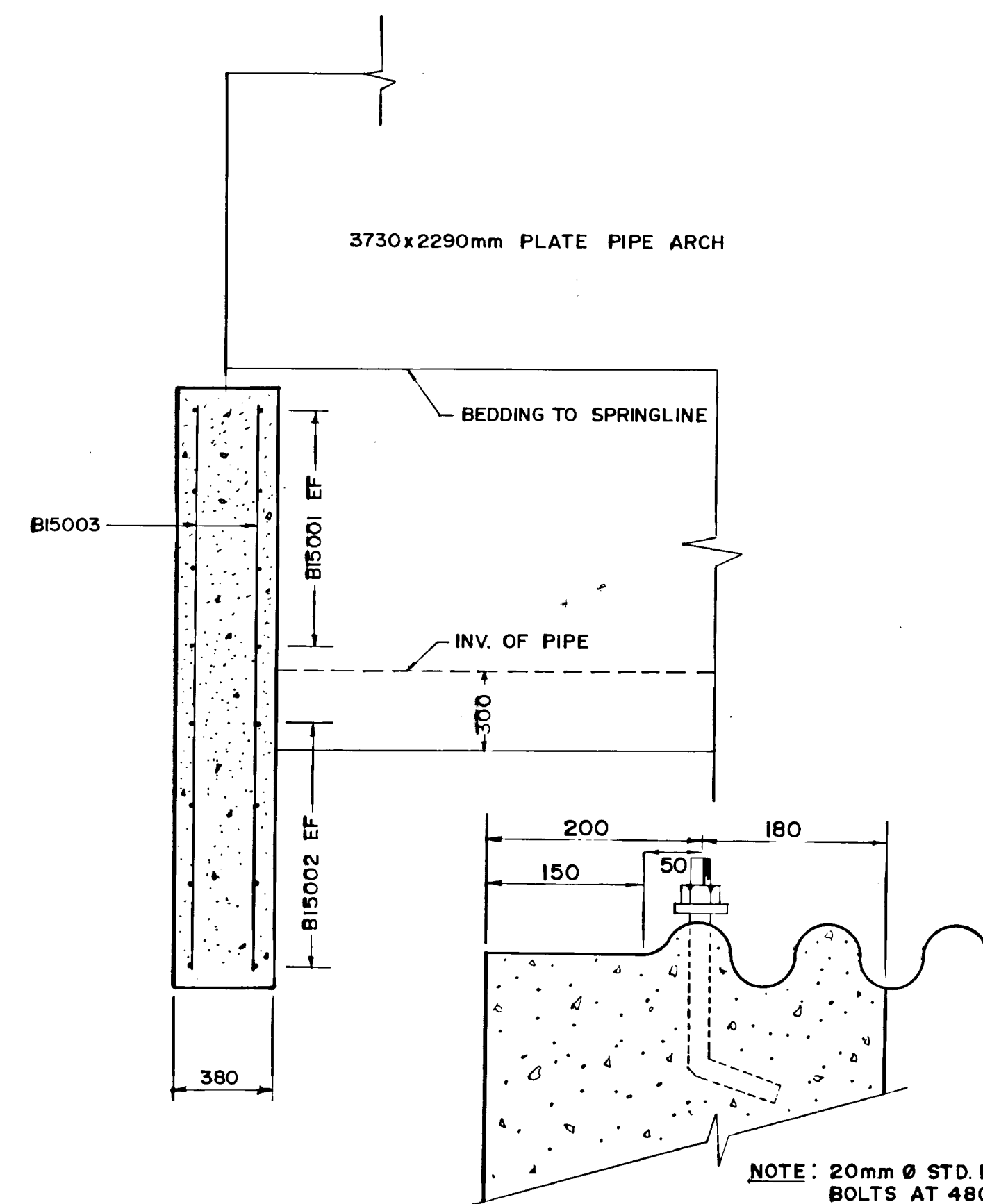
BAR LIST

BAR N ^o	QUANTITY	LENGTH (m)	COMMENTS
BI5001	20	1.06	
BI5002	20	3.20	
BI5003	24	2.13	
BI5004	36	1.06	
ANCHOR BOLTS	12	0.15	20mm Ø HOOK

- NOTES
- A. REINFORCING STEEL CLEAR COVER: 75mm
 - B. E.F. DENOTES EACH FACE.
 - C. NUMBER OF BARS SHOWN ARE FOR ONE WALL ONLY
 - D. DESIGN FROM O.P.S.D.-812.01 TYPE 'A'
 - E. CUTOFF WALLS TO BE CONSTRUCTED AT BOTH ENDS OF THE PIPE.
 - F. F.F. DENOTES FRONT FACE.



CUT OFF WALL ELEVATION
SCALE 1:20



SECTION A-A
SCALE 1:20

SECTION B-B
SCALE 1:5

CONTRACT N^o: _____



COUNTY OF OXFORD
ENGINEERING DEPARTMENT

COUNTY ROAD

DESIGNED BY: _____

APPROVED BY: _____

DWN BY: D. HARRIS
CHECKED BY: T. DECOO C.E.T.

DATE: JAN 07 / 86

SCALE: HOR: AS SHOWN
VERT: _____

DATE	REVISIONS & ADDITIONS	BY

DWG N^o: _____

Appendix E: Public Consultation Centre No. 1 & Comments

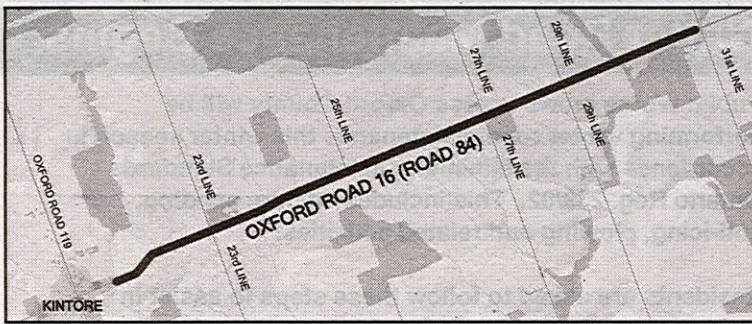


Fall is here and the leaves have begun to change. In Southside Park in Woodstock, with colourful arrays of yellow, orange and red give the distinct feeling that winter is right around the corner. BRUCE CHESSELL/Sentinel-Review



Public Notice

NOTICE OF STUDY COMMENCEMENT/ NOTICE OF PUBLIC CONSULTATION CENTRE #1
Class Environmental Assessment Study
Oxford County Road 16 (Road 84) Improvements From Kintore to 31st Line



Oxford County is conducting a Class Environmental Assessment (Class EA) for Oxford County Road 16 (Road 84) to consider options for transportation corridor improvements to satisfy future travel demands on Oxford County Road 16 (Road 84), from Kintore to 31st Line (see map).

In order to best address travel demand along Oxford County Road 16 (Road 84), a number of road improvement alternatives are being examined as part of the study including road widening improvements, pedestrian and cycling facilities and over-all traffic operations, as well as the impact of such improvements on the social and natural environments. The study is being conducted in compliance with Schedule C of the Municipal Class Environmental Assessment (October 2000, amended 2007 & 2011), which is approved under the Ontario Environmental Assessment Act. The study will define the problem or opportunity, identify and evaluate alternative solutions, and determine a preferred solution in consultation with area stakeholders, regulatory agencies, and the public.

Public and review agency consultation is a key element of the Class EA process and interested members of the public, local business community and agencies are encouraged to attend the first Public Consultation Centre (PCC #1) to view and provide input on the recommended design for Oxford Road 16.

WHEN: Thursday, November 27, 2014 – 7:00-8:30 p.m.

WHERE: Chalmers United Church, 842989 Road 84, Kintore, Ontario

Upon completion of the study, a comprehensive Environmental Study Report will be prepared and placed on the public record for a 30-day review period. The document will detail the planning process and the preferred alternative including how the public and agency input was received.

We are interested in hearing any comments or input that you may have about this study. Please contact the following project engineer if you have any questions, comments, or wish to obtain more information about the project.

Mr. Nathan Bokma, P.Eng., Oxford County Public Works Dept.
 21 Reeve Street, P.O. Box 1614, Woodstock, Ontario N4S 7Y3
 519-539-9800, ext. 3102, or nbokma@oxfordcounty.ca

Information will be collected according to the Freedom of Information and Protection of Privacy Act. With exception of personal information, all comments will be part of public record.

Robert Walton, P.Eng.
 Director of Public Works

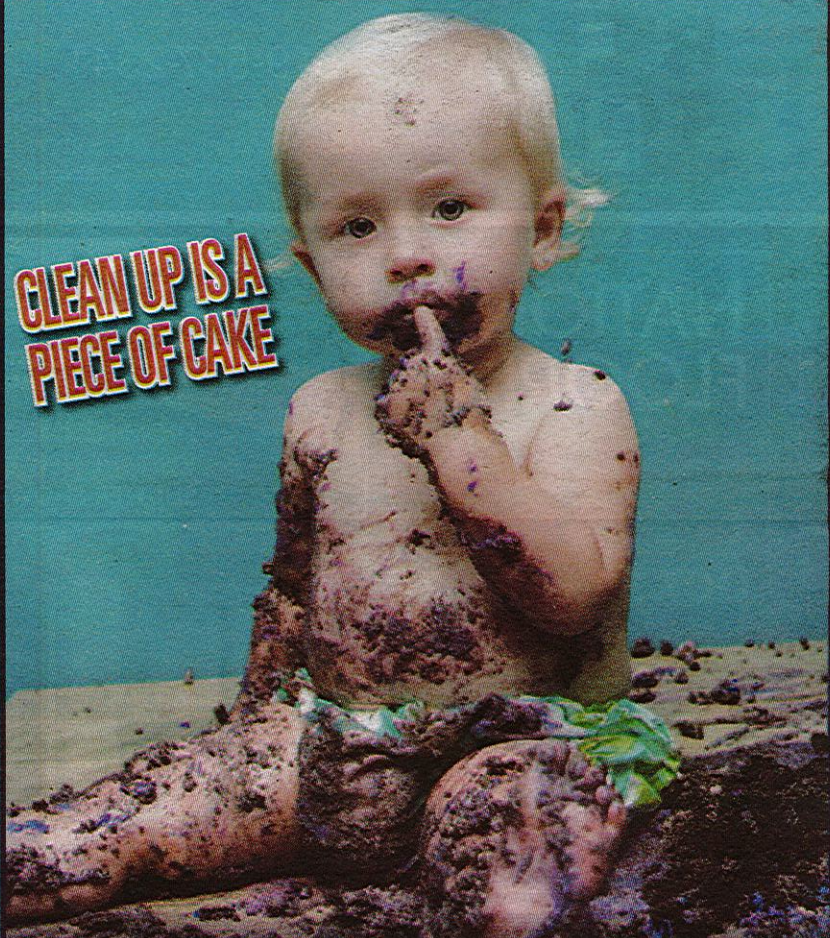
www.oxfordcounty.ca



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Public Notices

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Auction Sales

Auction Sales

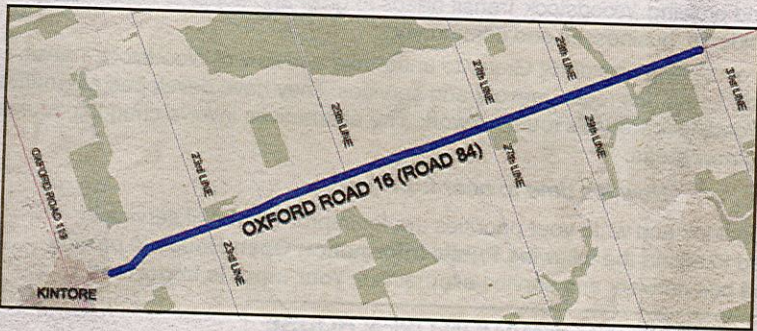
Auction Sales

Auction Sales



Public Notice

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Robert Walton, P.Eng.
Director of Public Works

www.oxfordcounty.ca



@OxfordCounty

Auction Sales

Auction Sales

Auction Sales

Auction Sales

SHORT NOTICE ESTATE AUCTION

Selling contents of a Langton Estate and an Aylmer home and other local estates at the SHACKELTON AUCTION CENTER - #51570 Lyons Line, Springfield, ON NOL 2J0 - 8 kms north of Aylmer on HWY #73 then 5 kms east of Lyons on Lyons Line OR 14 kms south of the 401 HWY on the Putnam Rd.

*****THURSDAY EVE NOVEMBER 27TH, 5:30PM*****

Including antique and modern furnishings, appliances, glass & china, collectables, tools. Our usual large Thursday auction with 2 auctioneers selling.

See our website on November 25th for pictures.

JOHN, MIKE & LES SHACKELTON - AUCTIONEERS

Shackelton Auctions Inc.

(519) 765-4450

www.shackeltonauctions.com

NEW FURNITURE AUCTION

Tuesday Night, 6:30 p.m. November 25th
(Preview 5 p.m.)

The Mount Elgin Community Centre
333024 Plank Line, 19 Hwy, Mount Elgin



Auctioneer, Morris Kikkert has been instructed from a Toronto wholesale company to sell by public auction, thousands of dollars of **NEW FURNITURE, NEW MATTRESS SETS, PRINTS, ARTWORK, DECORATOR FURNITURE, AREA CARPETS, MINK BLANKETS, and other HOME ITEMS!**

Leather Reclining Sofa Sets, Love Seats, Sectional, 3 Piece Upholstered Living Room Sets, Coffee, Lamp & Cocktail Tables, Occasional Chairs, Tables: Dining & Kitchen Tables, Chair & Benches.

Mattress Sets: Double, Queen and King. Pillow Top, Memory Foam & Orthopedic. All Brand New in Plastic. Bed Frames As Well.

An assortment of designer, decorator prints in Modern-Country Scenes. Mink blankets (different patterns.) Various sizes of area carpets and many more items for your home!

Don't Miss It!

BUY NEW FURNITURE AT YOUR PRICE, THE LIVE AUCTION WAY!

Mark this date on your calendar!

Terms: Cash, Debit, Visa or MasterCard. 10% Buyer Premium

519-485-4891

Food served by the Mount Elgin Community Members

Please note: Items need to be removed the night of the Auction.

LARGE COLLECTOR AUCTION

Featuring more items from the DALE EVOY estate, globe collection from TED CZERECHOWICZ, the JIM & ALMA DOAN collection and a Private collection. Auction will be held at the Shackelton Auction Center - #51570 Lyons Line, Springfield ON. NOL 2J0. - located 14kms south of the 401 on the Putnam Rd (exit 208) between London & Woodstock.

*****SATURDAY NOVEMBER 29TH, 9:00AM*****

Highlights include restored gas pumps; clock face ECO air meter; several advertising, soda, gas & oil signs; approx 15 original gas pump globes - Shell, Texaco etc; great selection of oil cans including Buffalo, Red Indian, Enarco, Texaco, Supertest etc; Enarco oil bottles; Soda fountain dispensers; Delaval & Diamond Dyes cabinets; country store collectables; barbershop pole; large assortment of tobacco tins; vintage padlocks; Coca Cola vending machine; Wurlitzer bubbler juke box; hundreds of collectables.

PLAN TO ATTEND THIS VERY INTERESTING AUCTION - OVER 600 LOTS!!

SEE OUR WEBSITES FOR MORE DETAILED LIST & PICTURES.

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TERMS: Payment by cash, proper cheque with ID, Interac, Visa or M/C day of auction. Ten percent buyers premium. Fifteen percent buyers premium for online bidders. Lots of parking and food booth on grounds.

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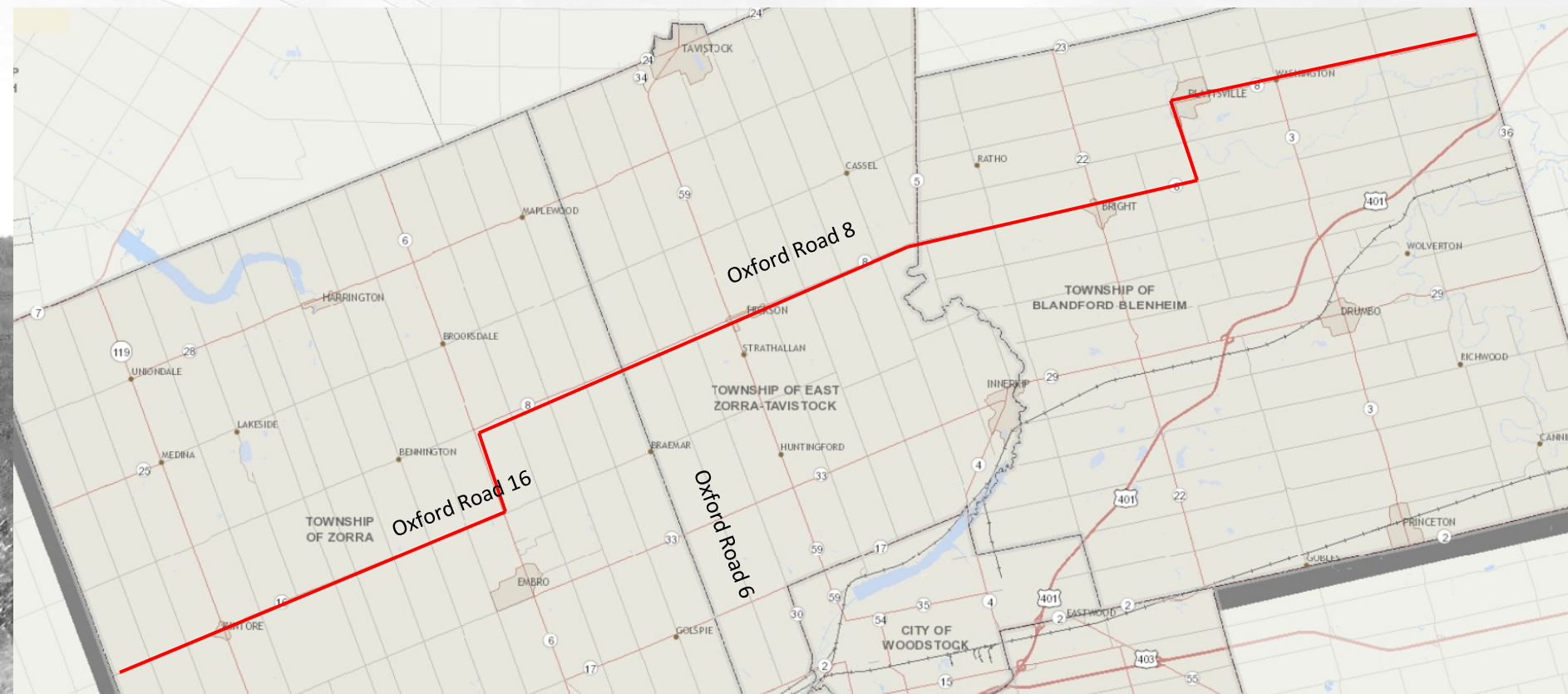
Oxford County Road 16 Improvements Kintore to 31st Line Class Environmental Assessment

Public Consultation Centre #1
Chalmers United Church – Kintore
November 27, 2014

Why are we here?

- Oxford Road 16 has been identified by the County as an East-West transportation corridor across the County.

(Oxford Road 16 ↔ Oxford Road 6 ↔ Oxford Road 8)



Why are we here?

- The County is looking at improving pavement width, road shoulders, and drainage for safety and maintenance purposes.
- The purpose of this Public Consultation Centre is to gather input from the public, property owners and stakeholders along Oxford Road 16.

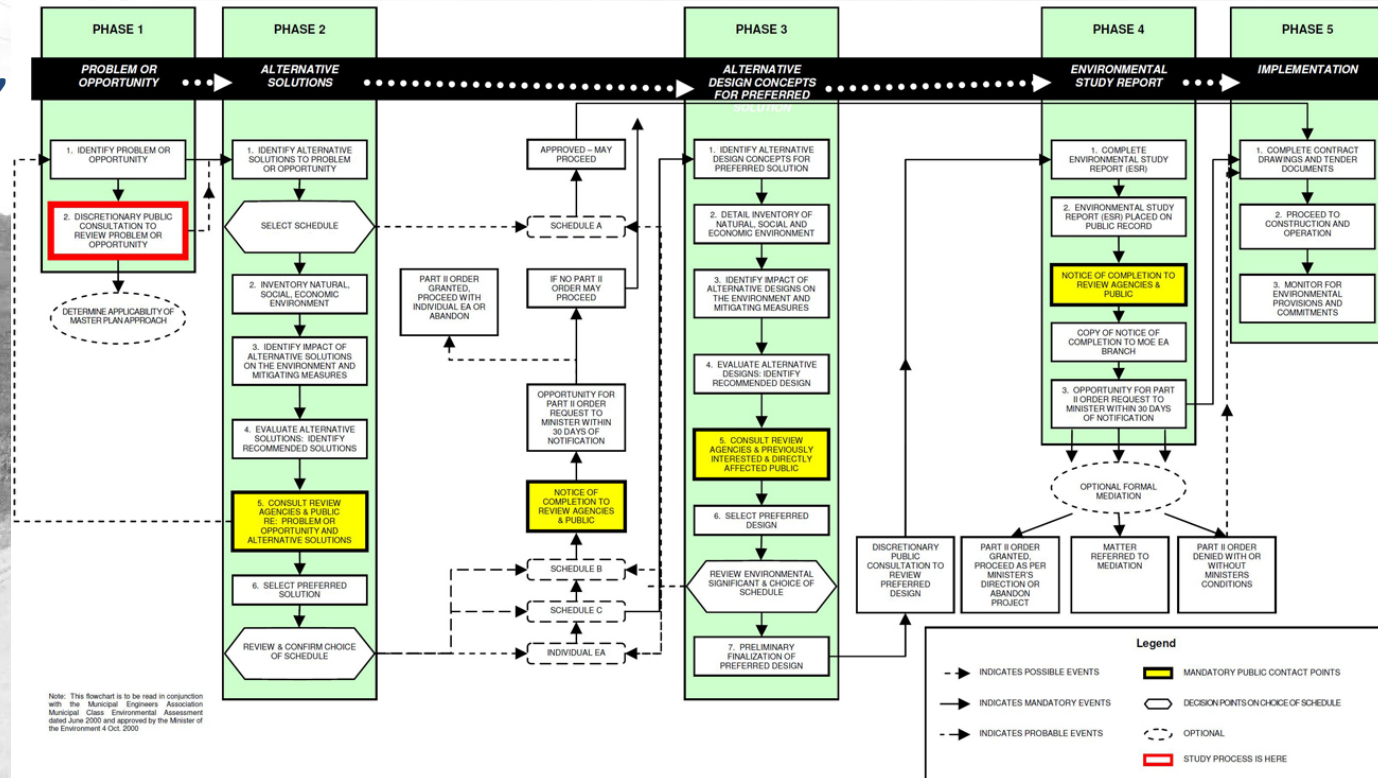


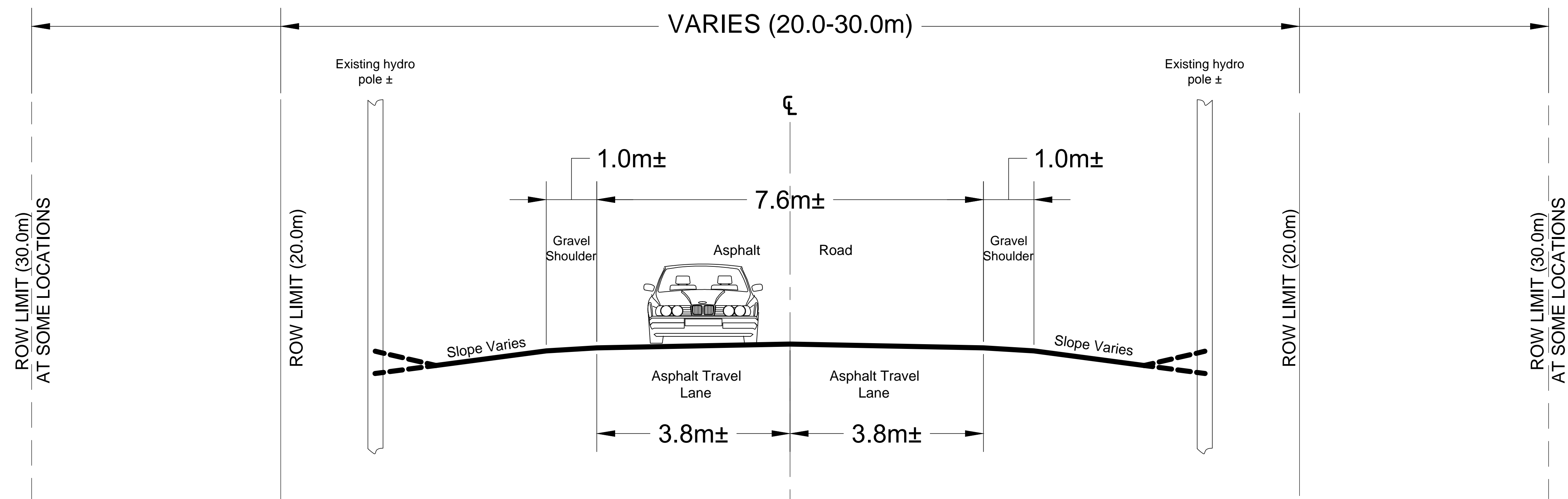
Project Timelines

- This project will be phased out over several years, due to property acquisitions, budgetary and timing restrictions.
- Class EA timing (approximate):
 - Public Consultation Centre #2 for Alternative Solutions (Spring 2015)
 - Public Consultation Centre #3 for Recommended Solution (Summer 2015)
 - Notice of Completion (Fall 2015)
- Potential project timing:
 - First phase of construction in 2016
 - Subsequent phases to follow, hopefully concluding in 2018
 - Asphalt surface treatment could be done for later phases of project to carry roadway over until improvements are completed.

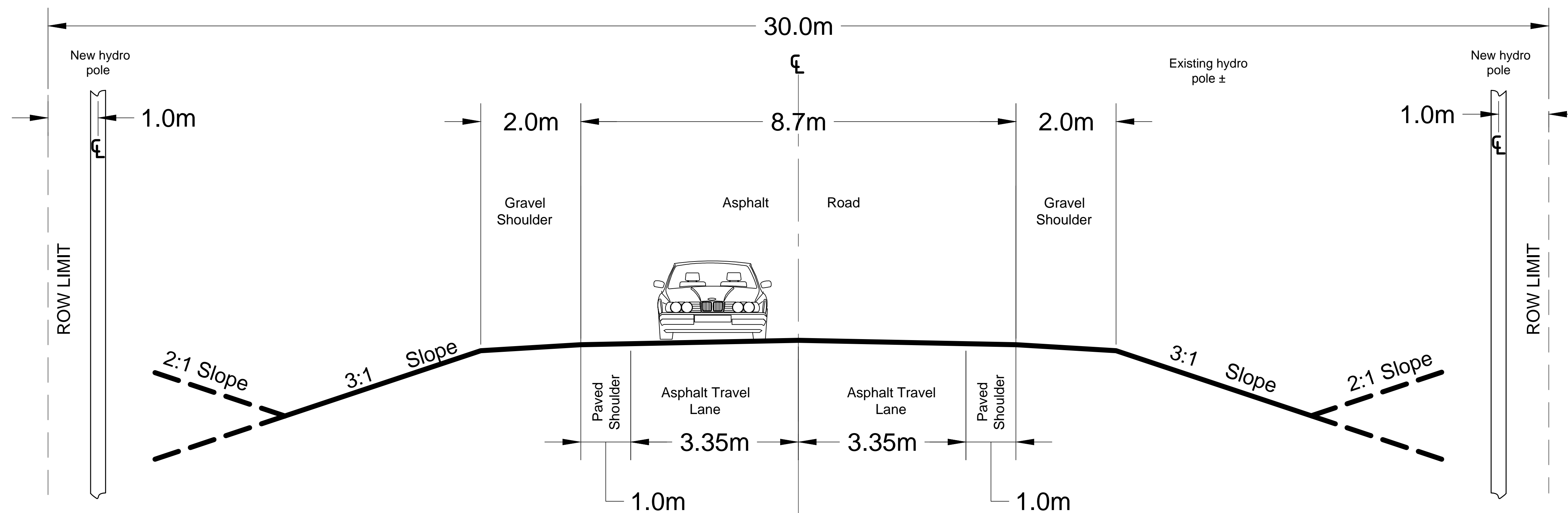
Class EA Process for Oxford Road 16

- With the information provided by the public, the County will proceed with the alternatives to consider in the Class EA process.
- This project is following a 'Schedule C' Class EA (see figure).
- If you have any input, please speak to a representative from the County or fill out a comment sheet.
- Thanks for your cooperation in this project!





EXISTING TYPICAL ROAD CROSS SECTION



TYPICAL ROAD CROSS SECTION
(East of 31st Line and West of Oxford Road 119)



**Questions & Comments -
Oxford Road 16 Class Environmental Assessment, From Kintore to Zorra 31st Line,**

Verbal comments at Public Consultation Centre #1 on November 27, 2014 are noted below:

Accidents Reports/Records,
Speeding & how to Control/Enforce?
Any work planned within the Community of Kintore?
Existing & Future Traffic Volumes- Cobble Hill Rd to Rd 119, Rd 119 to 31st Line, 31st Line to Rd 6,
Any work on Zorra Roads (Township of Zorra)?
What is the value of land?
Property Acquisitions – Owners contacted?
Rutting at Rd 16 & 119 intersection – any plan for repairs?
Adding Cycling Lanes?
Any cost savings in maintenance with wider pavement?
How do you deal with Large Farm Equipment?
What will the County like to do on this section of Road?
Did the idea (improvement work) come from Council or Staff or both?
Any plans to go East of 31st Line with Drainage improvements? Flooding at lowest point.
Bad sight lines at Zorra 31st Line
Sink holes on one property – property owner to provide more details to County
Will telephone poles be relocated?
Any plans to bury overhead hydro line?

Written comment(s) received = 12 and phone-in comment(s) received = 1, are noted below:

Poor drainage in Kintore.
Rutting of pavement at Road 16 and Road 119 at intersection,
Options for traffic calming through Kintore,
Do nothing – motorists are using Road 16 to by-pass part of Highway 401.
More trucks (heavy) are now using Road 16,
Data from similar projects showing traffic before and after the improvements,
When will property owners be contacted about property acquisitions?
Provide wider pavement and shoulders,
Widening is a waste of money,
Previous attempt to widen was not supported by majority of the land owners,
Cracked pavement is because of poor roadbed/too much traffic loads,
Truck loading is in excess of 40 tons that the road was originally designed to handle,
The quality of aggregates found north on Highway 401 is not good,
Increase road safety using traffic calming and not increase shoulder and pavement widths,
Provide drainage to prevent ponding in ditches,
Consider climate change,
1 metre (m) shoulder provided on other parts of Road 16 does not meet bike lane width,
Cost justification – maintenance costs between wider pavement and narrow pavement,
Road will be used mostly by commuters outside Oxford County,



AAMJIWNAANG FIRST NATION

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

November 20, 2014

Our File # 2014-0050

Nathan Bokma
Project Engineer
Oxford County – Public Works Department
21 Reeve Street, P.O. Box 1614
Woodstock, Ontario
N4S 7Y3

**COUNTY OF OXFORD
RECEIVED**
NOV 27 2014
REFER TO _____
File/ EDMS: _____

Attention: Nathan Bokma

**Re: Notice of Study Commencement/Notice of Public Consultation Centre # 1
Class Environmental Assessment Study
Oxford County Road 16(Road 84) Improvements from Kintore to 31st Line**

Dear Mr. Bokma:

Thank you for the information regarding the above noted project received November 3, 2014. The information has been entered by our staff in our log.

The information was provided to Aamjiwnaang First Nation's Environment Committee at a recent committee meeting for their review and consideration. The committee members have decided not to recommend engaging in a full consultation process with regards to this project at this time. The committee, however, would like to continue to receive project information for their future review. Should any future consultation engagement be recommended, we will notify you at that time. Please continue to forward any documentation on this project for our consideration.

Aamjiwnaang First Nation continues to assert and exercise our Aboriginal Rights and Title to all parts of our Reserve and Traditional Territory.

Sincerely,

for/ *Christine Rogus*
Sharilyn Johnston
Environmental Coordinator
Aamjiwnaang First Nation
sjohnston@aamjiwnaang.ca

"Saving our Home and Native Land"

**Ministry of Tourism,
Culture and Sport**

Culture Services Unit
Programs and Services Branch
401 Bay Street, Suite 1700
Toronto ON M7A 0A7
Tel: 416 314 5424
Fax: 416 212 1802

**Ministère du Tourisme,
de la Culture et du Sport**

Unité des services culturels
Direction des programmes et des services
401, rue Bay, Bureau 1700
Toronto ON M7A 0A7
Tél: 416 314 5424
Télé: 416 212 1802



November 28, 2014 (EMAIL ONLY)

Nathan Bokma
Project Engineer
Oxford County – Public Works Department
21 Reeve Street, P.O. Box 1614
Woodstock, ON N4S 7Y3
E: nbokma@oxfordcounty.ca

MTCS file #: 0002172
Proponent: Oxford County
Subject: Notice of Study Commencement
Class Environmental Assessment Study
Oxford County Road 16 (Road 84) Improvements
From Kintore to 31st Line
Location: Oxford County

Dear Nathan Bokma:

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

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

Under the EA process, the proponent is required to determine a project's potential impact on cultural heritage resources.

Archaeological Resources

Your EA project may impact archaeological resources and you may screen the project with the MTCS [Criteria for Evaluating Archaeological Potential](#) to determine if an archaeological assessment is needed. MTCS archaeological site data is available at archaeologicalsites@ontario.ca. A municipal archaeological review procedure using an archaeological management plan may also be used to determine archaeological potential where one exists. If your EA project area exhibits archaeological potential, then an archaeological assessment by an *Ontario Heritage Act* (OHA) licensed archaeologist, who is responsible for submitting the report directly to MTCS for review, will be required.

Built Heritage and Cultural Heritage Landscapes

The attached MTCS checklist *Screening for Impacts to Built Heritage and Cultural Heritage Landscapes* helps determine whether your EA project may impact cultural heritage resources. Municipal Clerks can provide information on property registered or designated under the *Ontario Heritage Act*.

In addition, the Municipal Engineers Association provides screening criteria under the Municipal Class EA for bridges with a [checklist](#) and [background material](#) available online.

If your EA project has the potential to impact heritage resources, a Heritage Impact Assessment (HIA) prepared by a qualified consultant will be required. Our Ministry's [Info Sheet #5: Heritage Impact Assessments and Conservation Plans](#) outlines the scope of HIAs. Please send HIAs to MTCS for review, and make them available to local organizations or individuals who have expressed interest in heritage.

Environmental Assessment Reporting

All technical heritage studies and their recommendations are to be addressed and incorporated into EA projects. Please advise MTCS whether an archaeological assessment and/or a heritage impact assessment will be completed for your EA project, and provide them to MTCS before issuing a Notice of Completion. 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. MTCS is in no way liable if the information in the completed checklists is found to be inaccurate or incomplete.

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

Sincerely,

Chris Mahood, MCIP, RPP
Heritage Planner
chris.mahood@ontario.ca
416-314-5424

Copied to: Frank Gross, Oxford County (fgross@oxfordcounty.ca)

Please notify MTCS if archaeological resources are impacted by EA project work. All activities impacting archaeological resources must cease immediately, and a licensed archaeologist is required to carry out a determination of their nature and significance.

If human remains are encountered, all activities must cease immediately and the local police as well as the Cemeteries Regulation Unit of the Ministry of Consumer Services must be contacted. In situations where human remains are associated with archaeological resources, MTCS should also be notified to ensure that the site is not subject to unlicensed alterations which would be a contravention of the Ontario Heritage Act.

"Inspiring a Healthy Environment"

November 14, 2014

County of Oxford
Public Works
21 Reeve Street, P.O. Box 1614
Woodstock, Ontario
N4S 7Y3

Attention: Nathan Bokma – (via e-mail: nbokma@oxfordcounty.ca)

Dear Mr. Bokma:

**Re: Class Environmental Assessment
Notice of Study Commencement
Oxford County Road 16 (Road 84) Improvements from Kintore to 31st Line
Oxford County**

We are in receipt of the "Notice of Study Commencement" for the Municipal Class Environmental Assessment (EA) regarding review of the Oxford Road 16 (Road 84) improvements from Kintore to 31st Line, County of Oxford. We offer the following comments:

General Comments

- 1) We would appreciate the opportunity for our technical staff to review and provide comments on any upcoming draft documents and proposed alternatives including any draft Environmental Study Report. Please note that our scope of review is based on the policies set out in the Upper Thames River Conservation Authority Planning Policy Manual (June 28, 2006). EA and subsequent detail design project review for the Oxford County Road 16 (Road 84) corridor improvement project would generally be guided by, but not limited to, natural heritage, natural hazard and pollution prevention areas of concern for lands regulated within our jurisdiction.
- 2) According to the enclosed project location mapping, portions of the project may traverse through natural hazard and natural heritage areas regulated by the Conservation Authority. Depending on project specifics, Section 28 permits may be required for those portions of the works. The UTRCA regulates development within the Regulation Limit in accordance with Ontario Regulation 157/06 made pursuant to Section 28 of the *Conservation Authorities Act*. This regulation requires proponents to obtain written approval from the

UTRCA prior to undertaking any works in the regulated area including filling, grading, construction, alteration to a watercourse and/or interference with a wetland.

Our staff can provide digital mapping which outlines the boundaries of the natural heritage and natural hazard features present within the study area. Ideally, these natural heritage and natural hazard features should be identified in the Environmental Study Report and avoided as inappropriate places for development. Our natural heritage and natural hazard features digital mapping may be obtained by contacting our GIS department (contact: Phil Simm, 519-451-2800 x 247). Generally the fee involved with obtaining digital mapping of our natural heritage and natural hazard features is \$100 but this fee will be waived as the mapping is intended for use by one of our member municipalities for a Municipal Class EA.

Hydrology/Hydraulic Considerations

- 3) In regards to detail design for watercourse crossings and/or road redesign in the vicinity of flood and erosion hazard land, please note that hydrology information may be available for various watercourses within the study area. HEC-RAS geometry and flow files may be obtained by contacting our Water Resource Engineering staff (contact: Mark Shifflett, 519-451-2800 x239). Generally there is a fee involved with obtaining our HEC-RAS and flow files but this fee will be waived as the modeling is intended for use by one of our member municipalities for a Municipal Class EA. We note this modeling may need to be updated as part of the study.

Water Quality, Woodlands and Other Natural Heritage Features

- 4) The study area lies within a portion of the Middle Thames subwatershed. Please refer to our latest (2012) edition of the Upper Thames River Watershed Report Cards – [see Middle Thames] for information related to water quality, woodlands and other natural heritage features, available on our website at:

www.thamesriver.on.ca/Watershed_Report_Cards/Watershed_Report_Cards-2012.htm

Fisheries Review

- 7) According to our records County Road 16 (Road 84) through the study area crosses a number of watercourses with varying thermal regimes and fish populations. To protect these local fish populations during their spawning and nursery periods, there will be stream specific times of the year when no in-water work or activity should occur. If any in-water work is proposed at the stream crossings, we recommend you contact us to discuss construction timing info.

While it is anticipated that some of these comments can be dealt with at the detail design stage, we are providing them in advance of the EA in order to facilitate early consultation. Our office

would like to be included in future circulations regarding this project. We would appreciate receiving information and reports as they become available in order to ensure that we can meet the project deadlines with our comments.

Please note: We are also providing Drinking Water Source Protection information for all projects occurring in areas identified as vulnerable. To that end, please review the attached Drinking Water Source Protection information (Appendix A).

If you have any questions, please do not hesitate to contact the undersigned.

Yours truly,

UPPER THAMES RIVER CONSERVATION AUTHORITY



Karen M. Winfield

Land Use Regulations Officer

Encl. - Appendix A (Drinking Water Source Protection Information applicable to Oxford County Road 16 (Road 84), County of Oxford Class EA study)

c.c. – Frank Gross, County of Oxford – (via e-mail: fgross@oxfordcounty.ca)

Appendix A – Drinking Water Source Protection Information applicable to Oxford County Road 16 (Road 84), County of Oxford Class EA Study

DRINKING WATER SOURCE PROTECTION

The *Clean Water Act* (CWA), 2006 is intended to protect existing and future sources of drinking water. The Act is part of the Ontario government's commitment to implement the recommendations of the Walkerton Inquiry as well as protecting and enhancing human health and the environment. The CWA sets out a framework for source protection planning on a watershed basis with Source Protection Areas established based on the watershed boundaries of Ontario's 36 Conservation Authorities. The Upper Thames River, Lower Thames Valley and St. Clair Region Conservation Authorities have entered into a partnership for The Thames-Sydenham Source Protection Region. Drinking Water Source Protection represents the first barrier for protecting drinking water including surface and ground water from becoming contaminated or overused thereby ensuring a sufficient, clean, safe supply now and for the future.

Assessment Reports:

The Thames-Sydenham Source Protection Region has prepared *Assessment Reports* which contain detailed scientific information that:

- identifies vulnerable areas associated with drinking water systems;
- assesses the level of vulnerability in these areas; and
- identifies activities within those vulnerable areas which pose threats to the drinking water systems, and assess the risk due to those threats.

The Assessment Report for the Upper Thames watershed delineates three types of vulnerable areas: Wellhead Protection Areas, Highly Vulnerable Aquifers and Significant Groundwater Recharge Areas. We wish to advise that the study area contains areas identified as being a Highly Vulnerable.

Mapping which shows these areas is available at:

Highly Vulnerable Aquifers:

http://www.sourcewaterprotection.on.ca/downloads/assessment_reports/UTRCA/Appendices/A1-Maps/Map4-3-2_Highly%20Vulnerable%20Aquifers.pdf

Source Protection Plans:

Using the information in the *Assessment Report*, a *Proposed Source Protection Plan* has been developed for the Upper Thames watershed. The *Proposed Source Protection Plan*, along with any written comments, have now been submitted to the Province for approval by the Minister of the Environment. The *Proposed Source Protection Plan* is available at:

http://www.sourcewaterprotection.on.ca/sp_planning_protectionplan.html

The *Proposed Plan* consists of a range of policies that together, will reduce the risks posed by the identified water quality and quantity threats in the vulnerable areas. These proposed policies include a range of voluntary and regulated approaches to manage or prohibit activities which pose a threat to drinking water. Activities that can lead to; low, medium and significant threats have been identified in

Appendix 10 of the *Upper Thames River Source Protection Area Assessment Report*, dated August 12, 2011. Available at:

http://www.sourcewaterprotection.on.ca/downloads/assessment_reports/UTRCA/Appendices/A10-Threats%20and%20Risk%20Assessment.pdf

AREA OF VULNERABILITY	VULNERABILITY SCORE	THREATS CIRCUMSTANCES &
Highly Vulnerable Aquifer (HVA)	6	Moderate and Low Threats
Significant Groundwater Recharge Area (SGRA)	n/a	n/a
Wellhead Protection Area (WHPA)	n/a	n/a

NOTE: Certain Activities on this property may be considered *Moderate or Low* threats to drinking water.

Under the CWA, the Source Protection Committee has the authority to include policies in the *Proposed Source Protection Plan* that may prohibit or restrict activities identified as posing a *significant threat* to drinking water. Municipalities may also have or be developing policies that apply to vulnerable areas when reviewing development applications. Proponents considering land use changes, site alteration or construction in these areas need to be aware of this possibility.

Provincial Policy Statement (PPS, 2005):

Section 2.2.1 requires that:

“Planning authorities shall protect, improve or restore the quality and quantity of water by: d) implementing necessary restrictions on development and site alteration to:

1. *protect all municipal drinking water supplies and designated vulnerable areas; and*
2. *protect, improve or restore vulnerable surface and ground water features, and their hydrological functions”*

Section 2.2.2 requires that:

“Development and site alteration shall be restricted in or near sensitive surface water features and sensitive ground water features such that these features and their related hydrologic functions will be protected, improved or restored”.

Municipalities must be consistent with the Provincial Policy Statement when making decisions on land use planning and development.



**NOTICE OF STUDY COMMENCEMENT/
NOTICE OF PUBLIC CONSULTATION CENTRE #1
CLASS ENVIRONMENTAL ASSESSMENT STUDY**

**Oxford County Road 16 (Road 84) Improvements
From Kintore to 31st Line**

PUBLIC COMMENT SHEET

Name: _____

Address: _____

Email: _____

When I hear there was going to be a meeting about our road I assumed it would have something to do with the poor job that was done at our crossroads. The ruts have become huge!!!!. My husband witnessed a mini van running the stop sign (which many do) and became air-born through the intersection. The poor job they hade done on the sidewalk beside our store (which was sloped towards the building and away from the drains) resulted in a \$8701 cost to us to put up a cement 3' retaining wall along the side of our building (our foundation has been eroded away by the water flow and freezing in winter breaking away our foundation.) While they where digging approximately 8" - 12' down they found an previous side walk. NO WONDER MOST OF THE VIL-LAGE HAS WATTER ISSUES IN THEIR BASEMENT!

Before you go putting \$\$\$\$\$ in to other road improvements we need to address what is needed in our little village.

We need the intersection and road lowered by 2' -3' to help with the basement water issues. It might be a good idea to put up a stop light because constantly the huge stop sign and blinking red light are not enough to make people stop.

At this time the proposed widening of the road is a waste of our tax \$\$\$\$\$\$\$\$\$.

This is my opinion on this matter.

Thank you for your input. Please complete and return your Comment Sheet by mail, fax, or email to:

Nathan Bokma, P.Eng
Project Engineer
Phone: 519-539-9800, ext 3102
Email: nbokma@oxfordcounty.ca

Oxford County Public Works
21 Reeve Street, P.O. Box 1614
Woodstock, Ontario N4S 7Y3
Fax: 519-421-4711



**NOTICE OF STUDY COMMENCEMENT/
NOTICE OF PUBLIC CONSULTATION CENTRE #1
CLASS ENVIRONMENTAL ASSESSMENT STUDY
Oxford County Road 16 (Road 84) Improvements
From Kintore to 31st Line**

PUBLIC COMMENT SHEET

Name: _____

Address: _____

Email: _____

Comments/Questions/Suggestions: As a long time cyclist
living in Kintore, I think this is
a great idea. traffic has increased by
a significant amount since Hwy 7 was under
construction. This area continues to be a
vital route for cyclists as both Hwy 2 and 7
are unrideable. I am the 2014 Provincial
Deathlon Champion and the great roads of Oxford
are essential to my training!

Also, this is an agricultural hub. There is a
lot of tractors on these roads which could
benefit from the widening. Then, there the
road with fast trucks and commuters who
speed (regularly over 120 kph) they need to be safe!

Thank you for your input. Please complete and return your Comment Sheet by mail, fax, or email to:

Nathan Bokma, P.Eng
Project Engineer
Phone: 519-539-9800, ext 3102
Email: nbokma@oxfordcounty.ca

Oxford County Public Works
21 Reeve Street, P.O. Box 1614
Woodstock, Ontario N4S 7Y3
Fax: 519-421-4711

From:
Sent: December-19-14 11:05 AM
To: Nathan Bokma
Subject: Oxford county Road 16 EA

Hi Nathan:

I have added my remarks about the Road 16 project and would appreciate an acknowledgment of your receipt of them

Comments regarding the reconstruction of Oxford Road 16, 31st Line west to Kintore

Comments have been solicited regarding the environmental assessment (EA) for this project.

The main premise at the preliminary meeting for the EA was said to be to increase safety. I have driven this road to look specifically at the surface and it has cracked longitudinally across most of the section under review. From personal discussions with 3 road building engineers I know, these sorts of cracks are a failure of the roadbed, or allowing too much weight on the given roadbed design. It would seem more appropriate to state that the real purpose of such a project is to bring the current condition up to a new standard (or even the old one when the road was upgraded in the 70s) for whatever purpose seems justifiable or necessary and to be forthright about the standard you expect the design to achieve. Considering that Mr. Walton said that speeding is a societal problem, and the police reiteration that for increased safety, we need to slow down, it would seem that to satisfy an objective of increased safety we need to build the road with traffic calming barriers, not increased shoulders and pavement.

Road building engineers and farmers are working with the same soil properties but usually on opposite sides of the equations. Farmers want high porosity, low compaction and good moisture holding soil profiles while engineers want just the opposite, well compacted, low moisture, tightly knit profiles. Both farmers and road builders require some considerations of drainage, and for Mr. Walton to say at the preliminary meeting that drainage was not the County engineering responsibility was glib at best, unfortunate in any event, or almost negligent at worst. To consider a road profile without drainage cannot be a good thought. While it may not be the County's financial responsibility, drainage must be considered. It now needs to be considered more than ever before because of changing weather events and the effects that befall our infrastructure. The annual road builders engineering conference in the USA includes many sessions on the effects of climate change for both maintenance and design of North American roads. Private enterprise in this country and the Government of BC are grappling with these problems now because of inadequate culverts on steep slopes and big precipitation events. . (Personal communications with H. Sturm, P.Eng, Stantec Corp.)

We have seen failures of road drainage systems in Burlington this past summer, As well, their total storm sewer system is now considered to be inadequate for the current weather event conditions, even though it was "engineered" to

the standard design of the day. We have also seen road failures in Oxford County with the roadbed slumping on a road east of Tillsonburg this past summer. This only happens when the design was not adequate and either the plasticity of the subsoil was underestimated or the construction was not floated over these unstable soils, or drainage was inadequate so that the subsoil became plastic. These situations of unstable clay soils are well known in some areas of Canada particularly on the north shore of the St. Lawrence where Tyrell clays have failed taking the road with them and have caused serious loss of life in the process. While we do not have Tyrell clays here, most of Oxford is underlain with clay soil and the soil map from Report No.23 of the Ontario Soil Survey shows this to be true for some of the area of this part of Road 16. There are 7 soil types under this roadbed and the drainage ranges from good to imperfect to poor. This sort of variation means that drainage considerations and solutions need to be designed to respond to the variable conditions on this road length. Otherwise we will have water in ditches for longer than desired and the consequence of that is a source for West Nile virus carrying mosquito breeding grounds. I have not been aware of any drainage works on the project area done under the Drainage Act recently and suspect the standard to which most current drains exist is only ½” in 24 hours. This is not satisfactory with today’s climate and variable weather patterns. The current weather events are more variable and extreme than long term records suggest. Wider paved surfaces and wider shoulders with the associated underdrains result in faster runoff and will tax the current drainage systems beyond capacity. Catchment areas may need to be included but these must drain to dry at times to prevent insect proliferation.

Comments were made at the preliminary meeting about pavement surface failures on Oxford Road 6 south of Beachville with grooving due to tire compaction. There can be several reasons for this but the first is that the engineering was not done to the axle loads possible within the Highway Traffic Act especially with the quarry close by and the cement plants a few kilometers north. We now have milk trailers that carry 40 Tons and these will use County Road 16 on a regular basis. This 40 tons is the old standard for total gross weight, so roadbeds require more substantial designs now to accommodate this. It will have some bearing if the sections of County Road 16 that subtend the section under discussion have been upgraded or if not, then some weight control needs to be put on this thoroughfare across North Oxford in order to preserve a surface for safe conduct. From discussions with contractors, I know that the quality of aggregate found north of 401 is not good enough to meet the design specifications of 401. Oxford 16 is a road that does take some 401 traffic and that traffic pattern is changing from one of using Oxford 16 to Oxford 8 to 401, to one of using Oxford 16 to the 31st Line, south for one intersection and going east there to the 401. This includes travel over township roads and they certainly do not have the roadbed to carry truck traffic, but it is happening with gravel trailers to the Cement plants and roof trusses from Thorndale. Thus considerations of the quality of aggregate and the level of compaction required is important in the construction process.

The one other thing that should be considered in an EA is the cost effectiveness including the carbon cost. It was mentioned that the maintenance workers really like the 8.9 m. pavement on sections abutting the project. No costs were given as to maintenance savings, whether higher roads meant less snow, better visibility to plow snow, easier ditch bank grass trimming, etc. No costs were offered for crash repairs, in fact no crash data were presented when I know that the OPP gave the County Engineer weekly reports of all crashes in Oxford at least up until the present administration (personal communication with Roy Brankley, P.Eng.). It is impossible to measure the effectiveness of a project with a goal of increased safety if crash reports are not included. One does not have even a starting point. Increased pavement and increased shoulders on higher roads will not be any safer if the speed is not controlled.

One other comment is made about the 1 m, strip left outside the white fog stripe and bicycles. This is not the regulated bike lane, but at least 0.5 m narrow for the 1.5 m legislated bike lane. Having a 1 m strip encourages bike use because it appears to be a bike lane. With increased speeds, of vehicles there will be increased turbulence from both cars and trucks. The Newtonian physics of masses attracting each other proportional to their masses and inversely proportional to the distance between them is not well considered by cyclists, and increased turbulence only makes things worse. It should be a consideration for negligence to not include this sort of design parameter on a surface that it was said at the preliminary meeting will be engineered to a safety standard of 100 km /hr traffic velocity.

How this sort of project can be justified for capital costs is another matter. Its greatest use will be a corridor road and my guess is that the use will be disproportionately by users who do not pay taxes to Oxford County. Reasons for this are myriad, but it is a road across north Oxford between London and the 401. We in Oxford just do not have the population to outnumber users from other locations. With wide and new pavement, speeds will increase, traffic will increase and the use of carbon will increase with the associated increase in carbon dioxide production at higher speeds I believe it is irresponsible to design this road without costs to limit speeding and while the financial responsibility for policing has again been downloaded to the township, there needs to be some way to have the fines associated with

enforcement pay for that enforcement, not siphoned off to the province. Otherwise safety will not be maintained on this road project.

Sincerely



NOTICE OF STUDY COMMENCEMENT/
NOTICE OF PUBLIC CONSULTATION CENTRE #1
CLASS ENVIRONMENTAL ASSESSMENT STUDY
Oxford County Road 16 (Road 84) Improvements
From Kintore to 31st Line

PUBLIC COMMENT SHEET

Name: _____

Address: _____

Email: _____

Comments/Questions/Suggestions: _____

① We would love to have this section of road wider, with larger shoulders to make it safer for people to pull off the side of the road, bike, walk and run.

② We would like to see a natural gas line put in from Kintore to the Kintore Elevators at this time. Natural Gas would be a huge savings for the elevators and any residents that would like to hook in. While fixing the road, appears to be an efficient and practical time to install a natural gas line.
 (The elevators would also be a BIG customer!)

③ In heavy rains flooding across the road at the East end of our property and in front of our driveway often occurs. It would be great to have that fixed for our convenience and for all those who are unable to travel on this road when it is closed due to flooding.

Thank you for your input. Please complete and return your Comment Sheet by mail, fax, or email to:

Nathan Bokma, P.Eng
Project Engineer
Phone: 519-539-9800, ext 3102
Email: nbokma@oxfordcounty.ca

Oxford County Public Works
21 Reeve Street, P.O. Box 1614
Woodstock, Ontario N4S 7Y3
Fax: 519-421-4711



**NOTICE OF STUDY COMMENCEMENT/
NOTICE OF PUBLIC CONSULTATION CENTRE #1
CLASS ENVIRONMENTAL ASSESSMENT STUDY
Oxford County Road 16 (Road 84) Improvements
From Kintore to 31st Line**

PUBLIC COMMENT SHEET

Name: _____

Address: _____

Email: _____

Comments/Questions/Suggestions: _____

- could data be provided from similar projects showing before/after traffic volumes?

- what would the options be for traffic "calming" entering the village of Kintore?

- when will property owners be contacted about possible acquisition?

Thank you for your input. Please complete and return your Comment Sheet by mail, fax, or email to:

Nathan Bokma, P.Eng.
Project Engineer
Phone: 519-539-9800 Ext 3102
Email: nbokma@oxfordcounty.ca

Oxford County Public Works
21 Reeve St, PO Box 1614
Woodstock ON N4S 7Y3
Fax: 519-421-4711

With the exception of personal information, all comments will be included in the Project Files and will become part of the public record.

From:
Sent: December-16-14 2:32 PM
To: Nathan Bokma
Subject: Oxford County Road 16 (Road 84) Improvements From Kintore to 31st Line

Mr. Nathan Bokma, P.Eng

I am interested in the outcome of the meeting that happened on November 27 2014. I was unable to attend but was wondering if you have any feedback that you have obtained in regards to the road project. I live at _____ and own the majority of the bush there. I have a workshop driveway that has a ¾ plugged culvert and doesn't flow well. My neighbour is at a lower elevation and has expressed concerns due to water shed. If during the road project there might be an opportunity to address that problem or any options that would be available we would appreciate your consultation . Also I was wondering If there were any plans to bring utilities up the road such as fibre optics or natural gas.

From:
Sent: November-04-14 9:05 AM
To: Nathan Bokma
Subject: Oxford Road 16 (Road 84)

Tuesday November 4, 2014

Dear Nathan Bokma,

We have received the notice of study commencement in the mail. As per your request, I am sending my input.

I live [redacted]. We experience a very high volume of traffic through the village both on Highway 119 and on Road 84. Family vehicles, buses, large trucks and tractors pass through here constantly throughout the day. And along with their passing is a lot of noise.

I do not want Road 16 (84) fixed up because it will definitely increase the volume of traffic that passes through here.

We have lived here since [redacted] and the volume of traffic has steadily increased over the years. What used to be a relatively quiet village, is no longer one. People are already using this "corridor" to by-pass part of the 401.

Appendix F: Public Consultation Centre No. 2 & Comments

General Help Wanted General Help Wanted General Help Wanted General Help Wanted



JOIN OUR TEAM

DISCOVERY NIGHT

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Tenants may pay the amounts owing to secure the contents of the spaces prior to the auction up to two hours before the auction end date.


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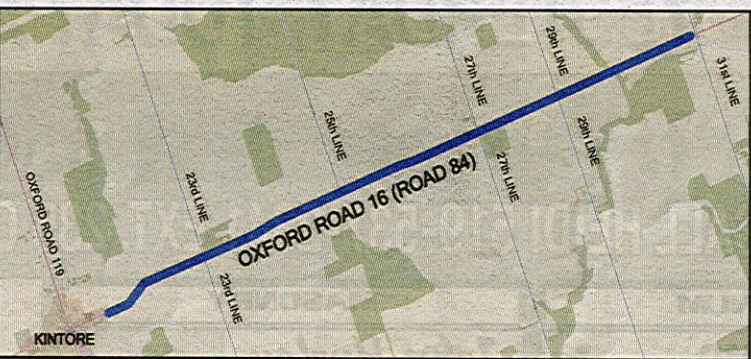
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Public Notice

NOTICE OF PUBLIC CONSULTATION CENTRE #2 CLASS ENVIRONMENTAL ASSESSMENT (CLASS EA) OXFORD ROAD 16 (Road 84) Improvements, from Kintore to 31st Line



Oxford County is conducting a Class Environmental Assessment (Class EA) for Oxford County Road 16 (Road 84), from Kintore to 31st Line (see map), to consider options for transportation corridor improvements to satisfy future travel demands on Oxford Road 16 (Road 84).

In order to best address travel demands along Oxford County Road 16 (Road 84), a number of road improvement alternatives are being examined as part of the study including road widening, pedestrian and cycling facilities and over-all traffic operations, as well as the impact of such improvements on the social and natural environments. The study is being conducted in accordance with Schedule C of the Municipal Class Environmental Assessment (October 2000, amended 2007 & 2011), which is approved under the Ontario Environmental Assessment Act. The study will define the problem or opportunity, identify and evaluate alternative solutions, and determine a preferred solution in consultation with area stakeholders, regulatory agencies and the public.

Public and review agency consultation is a key element of the Class EA process. Interested members of the public, businesses and agencies are encouraged to attend the second Public Consultation Centre (PCC #2) to view and provide input on the alternative solutions for part of Oxford Road 16.

WHEN: Tuesday, January 26, 2016, from 7:00 pm to 8:30 p.m.
WHERE: Chalmers United Church, 842989 Road 84, Kintore, Ontario

Upon completion of the study, an Environmental Study Report will be prepared and placed on public record for a 30-day review period. The document will detail the planning process and the preferred alternative.

We are interested in hearing any comments or input that you may have about this study. For further information, please contact:

Dadean Assam, P.Eng., Oxford County Public Works Dept.
21 Reeve Street, P.O. Box 1614, Woodstock, Ontario N4S 7Y3
519-539-9800, ext. 3117, or dassam@oxfordcounty.ca

Information will be collected according to the Municipal Freedom of Information and Protection of Privacy Act. With exception of personal information, all comments will be part of public record.

Robert Walton, P.Eng.
Director of Public Works

oxfordcounty.ca

oxfordcounty.ca f t

Carpet/Flooring

Albert Versteeg

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COMPUTER SLOW?...We can help! Repairs, Sales, tune-ups, Virus Scans. SHURR Electronics, 157 Thames St. S. Ingersoll 519-485-2790

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SNOW REMOVAL: minimum \$20 for snow removal. Also junk removal and small indoor renovations. 519-421-3150.

Tillsonburg Power & Sail Squadron is Hosting a

TORONTO BOAT SHOW BUS TRIP

Sat Jan 16, 2016

Bus Leaves at 9:30 am From Quality Inn Woodstock
Returning at 9:00 pm - Quality Inn Woodstock.

\$35⁰⁰ Per Person - Includes Bus & Show Ticket

For More Information
Call ERIC at 519-537-8945 or
JOAN at 1-519-842-5618



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We are a progressive privately owned and operated business in Woodstock Ontario that is growing to meet our increased customer needs.

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**** Steel Production Welder & Welder Fitter ****
(Small / Medium sized Weldments)

Qualified applicants need to possess the following as a minimum.

- Minimum 2-3 years current experience as a Steel Production Welder and or Steel Welder Fitter.
- Certified or Certifiable to CWB.
- Proven experience in Hardwire MIG, Pulse and Metal Cored processes (A weld test will be required as part of the interview process)
- Technical background would be an asset.
- Ability to read and understand imperial and metric engineering drawings.
- Ability to work with minimal supervision.
- Desire to succeed and grow.
- Ability to work day shifts and or afternoon shifts.

For the right person advancement in this department is very possible.

We can offer the following Remuneration

An Excellent Wage Base

Starting rate \$19.00/hr to \$20.00/hr with a wage review after 90 day probation period.

Benefits

Complete benefits package enrolment after successful completion of our 90-day probation period.

Company sponsored Pension Plan.

To commence after 12 months employment.

Reply to: Box 491, c/o Sentinel Review, 16 Brock St. Woodstock, Ont N4S 3B4

We will only be contacting those applicants we feel could fill these positions.

Thank you in advance for submitting your resume.

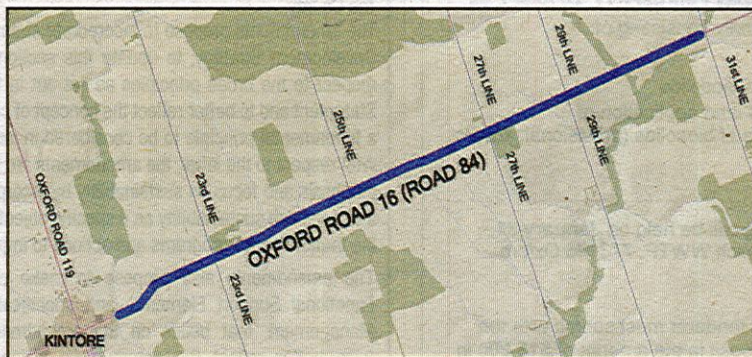
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Public Notice

**NOTICE OF PUBLIC CONSULTATION CENTRE #2
CLASS ENVIRONMENTAL ASSESSMENT (CLASS EA)**

OXFORD ROAD 16 (Road 84) Improvements, from Kintore to 31st Line



Oxford County is conducting a Class Environmental Assessment (Class EA) for Oxford County Road 16 (Road 84), from Kintore to 31st Line (see map), to consider options for transportation corridor improvements to satisfy future travel demands on Oxford Road 16 (Road 84).

In order to best address travel demands along Oxford County Road 16 (Road 84), a number of road improvement alternatives are being examined as part of the study including road widening, pedestrian and cycling facilities and over-all traffic operations, as well as the impact of such improvements on the social and natural environments. The study is being conducted in accordance with Schedule C of the Municipal Class Environmental Assessment (October 2000, amended 2007 & 2011), which is approved under the Ontario Environmental Assessment Act. The study will define the problem or opportunity, identify and evaluate alternative solutions, and determine a preferred solution in consultation with area stakeholders, regulatory agencies and the public.

Public and review agency consultation is a key element of the Class EA process. Interested members of the public, businesses and agencies are encouraged to attend the second Public Consultation Centre (PCC #2) to view and provide input on the alternative solutions for part of Oxford Road 16.

WHEN: Tuesday, January 26, 2016, from 7:00 pm to 8:30 p.m.

WHERE: Chalmers United Church, 842989 Road 84, Kintore, Ontario

Upon completion of the study, an Environmental Study Report will be prepared and placed on public record for a 30-day review period. The document will detail the planning process and the preferred alternative.

We are interested in hearing any comments or input that you may have about this study. For further information, please contact:

Dadean Assam, P.Eng., Oxford County Public Works Dept.
21 Reeve Street, P.O. Box 1614, Woodstock, Ontario N4S 7Y3
519-539-9800, ext. 3117, or dassam@oxfordcounty.ca

Information will be collected according to the Municipal Freedom of Information and Protection of Privacy Act. With exception of personal information, all comments will be part of public record.

Robert Walton, P.Eng.
Director of Public Works

oxfordcounty.ca



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**City of Woodstock
2016 Dog tags now available**

- Dog Tags are available at Woodstock City Hall (Main Floor), 500 Dundas Street, Monday - Friday 8:30 a.m. - 4:30 p.m.
- If you are unable to attend during business hours, ensure the information on your invoice is correct. If you did not receive an invoice you may print the dog tag registration application from the City of Woodstock website and include spayed/neutered verification. Enclose the completed form/invoice and payment in an envelope and deposit in the mail slot beside the Reeve Street door. Your tag and receipt will be mailed to you.
- All dog owners are required to register their dog(s) with the City of Woodstock. Dog owners who do not register their dog by January 31 of each year may be subject to a fine.
- For more information please call 519-539-1291 or visit the City of Woodstock website. www.cityofwoodstock.ca

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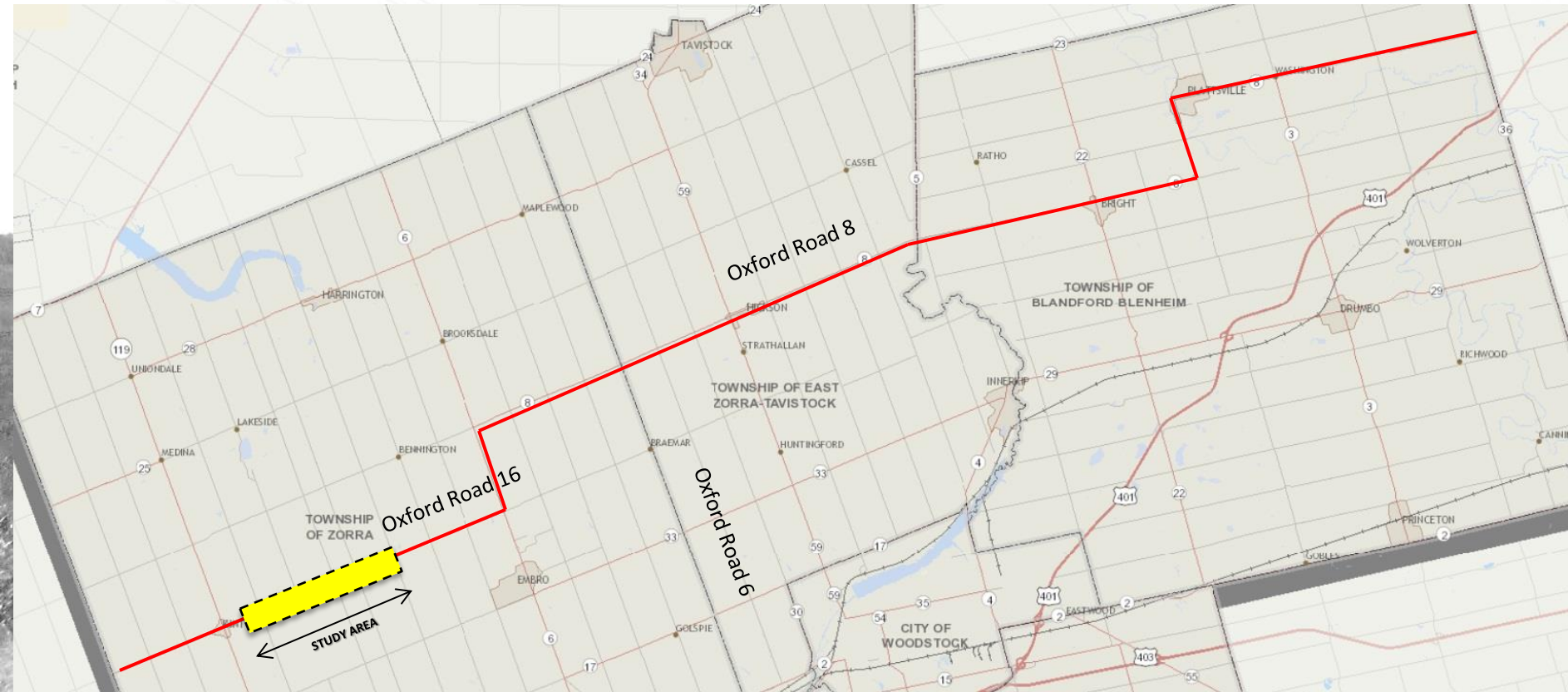
Oxford County Road 16 Improvements Kintore to 31st Line Class Environmental Assessment

**Public Consultation Centre #2
Chalmers United Church – Kintore
January 26, 2016**

Why are we here?

- Oxford Road 16 has been identified by the County as an East-West transportation corridor across the County.

(Oxford Road 16 \longleftrightarrow Oxford Road 6 \longleftrightarrow Oxford Road 8)



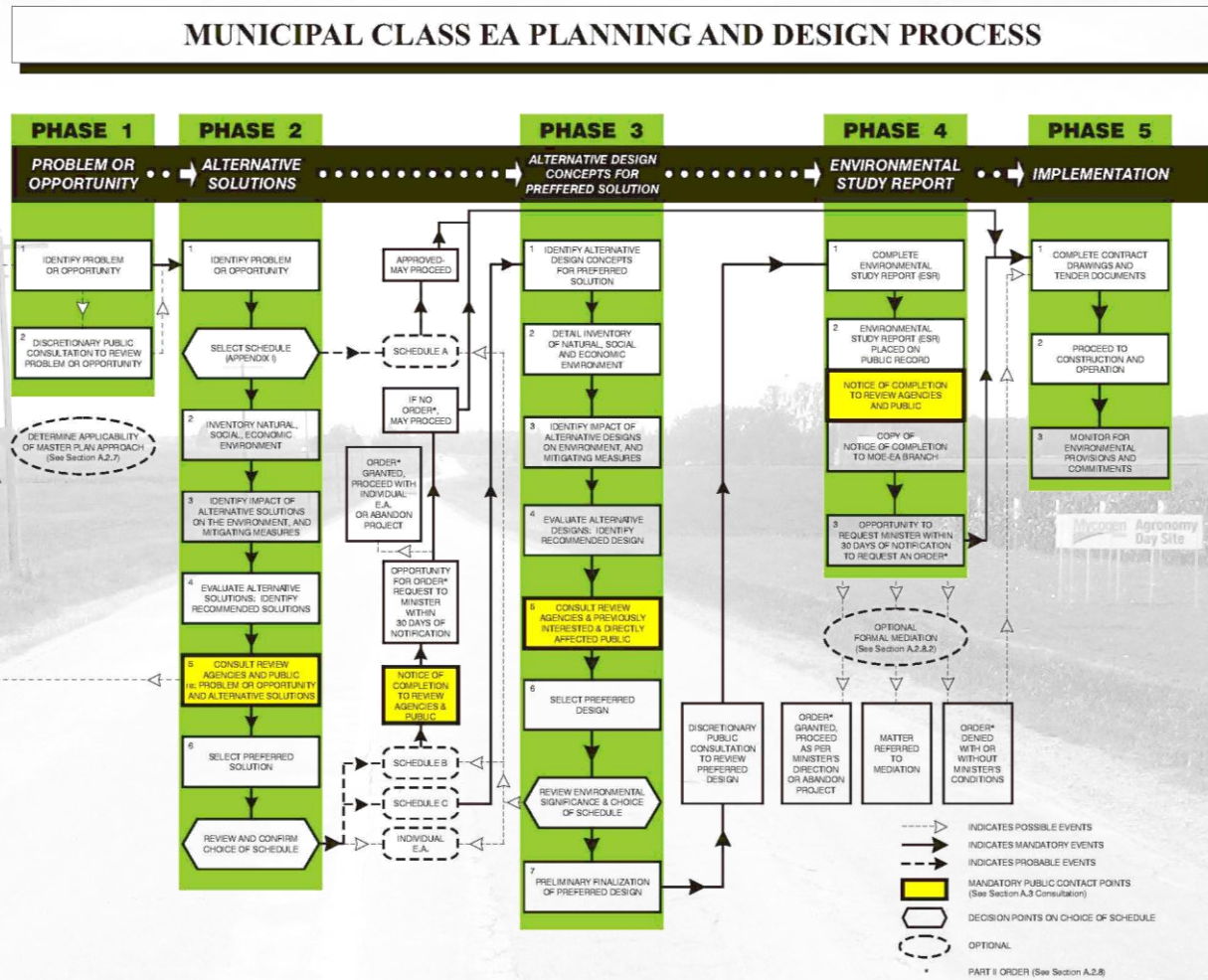
Study Area

- Oxford Road 16 has been identified by the County as an East-West transportation corridor across the County (Oxford Road 16 \leftrightarrow Oxford Road 6 \leftrightarrow Oxford Road 8)
- The County is looking at road improvements for safety and ease of maintenance.
- The purpose of this Public Consultation Centre is to gather input from the public, property owners and stakeholders for use in the planning process.



Purpose of Municipal Class EA

- Identify Problem or Opportunity
- Consult with Stakeholders
- Consider Alternative Solutions
- Assess impacts of alternative solutions on the environment,
- Determine a preferred solution.
- This project is following a 'Schedule C' Class EA (see figure).



Technical Studies

A number of technical studies have been completed or are in the process of completion for this Class EA, and their findings are summarized below:

Collision Reports

- Police collision records from 2006 to 2014 were reviewed. A total of 35 collisions were reported to the Police. 20 were single vehicle accidents due to loss of control. 8 were collisions with animals and 7 collisions involved two vehicles.

Archaeological and Built Heritage Assessment

- The Stage 1 Archaeological report has been submitted to the Ministry of Tourism, Culture and Sport (MTCS) for their review.
- Some archaeological potential exists on the undisturbed portions of the Right-of-Way (i.e. grassed areas). A Stage 2 Archaeological Assessment is recommended to be completed if work will be done on the undisturbed areas of the Right-of-Way (ROW).
- A Built Heritage Assessment Checklist has been completed as required by MTCS. There were no built heritage resources identified along this portion of Oxford Road 16.

Drainage

- There are 4 municipal drains, one private drain and one creek crossing. When the snow melts in the Spring and/or after heavy rainfalls, flooding sometimes occur at one location. This is one of the locations that drainage improvement is required.

Technical Studies (Cont'd)

Natural Environment Characterization Report

- This portion of the Oxford Road 16 is in the Middle Thames River watershed, which is under the jurisdiction of the Upper Thames River Conservation Authority (UTRCA).
- A draft version of the report has been completed and provided to Oxford County.
- No Species at Risk (SAR) were confirmed within the study area, but candidate habitat for several SAR was identified within the study area.
- Additional investigations are recommended once the preferred alternative is determined.

Geotechnical Investigation

- Boreholes, up to 2 metres deep-, were completed along the study area for this Class EA.
- The existing road consists of 75mm to 225mm of asphalt, 300mm to 700mm of granular materials and sandy silt below.
- The report recommends improvement to the pavement structure to carry the current traffic loading.

Traffic Volumes

- The traffic count in 2012/2013 was 2,483 vehicles per day. Assuming 1.5% increase in vehicle traffic per year, the traffic volume in 20 years is estimated to be 3,344.

Problem/Opportunity Statement

After completing a review of relevant background information and reviewing the Technical Studies and traffic operations, the problem statement can be identified as follows:

There is a need for improved roadway and traffic operations throughout the Oxford Road 16 corridor in order to improve safety for all road users travelling along the roadway.

Corridor improvements are required in order to satisfy the goals and objectives of the Transportation Master Plan, as well as provide a safe access for all road users.

Alternative Solutions

1. ***Do nothing:*** Status quo with no improvements to corridor operations. This alternative is used as a “benchmark” in which all other alternatives are compared. This alternative does not address the identified issues along the corridor. Estimated Construction Cost = \$0
2. ***Rehabilitate existing road and maintain existing road width and alignments:*** This alternative consists of removal of the existing asphalt from the road down to the granular base and placement of two layers of new asphalt or cold recycle the existing asphalt and overlay with new asphalt. Estimated Construction Cost = \$3,500,000.
3. ***Reconstruct and maintain existing road width and alignments:*** This alternative consists of removal of existing asphalt and granular material to native soil and rebuilding the roadway with new granular materials and asphalt. Estimated Construction Cost = \$3,900,000.
4. ***Reconstruct road to a wider 2-lane rural cross-section, including realignments and drainage improvements:*** This alternative consists of widening the existing travelled lane widths and gravel shoulders. Realigning the horizontal and vertical curves were required. Improve drainage. Estimated Construction Cost = \$5,000,000, including property acquisitions and utility relocations.

Evaluation Criteria and Sub-Factors		Part of Oxford Road 16 Improvements Class EA - Alternative Solutions			
		Alternative 1: Do Nothing	Alternative 2: Rehabilitate Existing Road Surface	Alternative 3: Reconstruct Road with no Re-alignment and Drainage Improvements	Alternative 4: Reconstruct Road with New Cross-Section including Alignment and Drainage Improvements
Transportation Environment	Traffic Operations				
	Safety				
	Road Geometry				
Social Environment	Impacts to Residential Properties				
	Impacts to Agricultural Properties				
Natural Environment	Impacts to Vegetation/Trees				
	Stormwater/ Drainage				
	Noise Impact				
Cost Estimate	Construction	\$0	\$3,500,000	\$3,900,000	\$5,000,000
	Maintenance				
Summary					



Thanks for Attending!

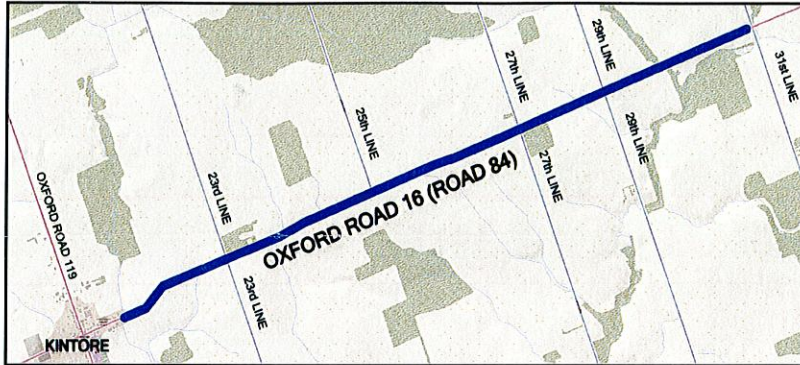
Please provide your comments by completing a comment sheet and returning it to us. You can also mail, fax, or email your comment sheet **by March 21, 2016**.

If you have any questions or comments, please contact:

Dadean Assam, P. Eng.
Manager of Construction
Oxford County
Public Works Department
21 Reeve Street, P.O. Box 1614
Woodstock, Ontario N4S 7Y3
Tel: 519-539-9800 Ext. 3117
Fax: 519-421-4711
dassam@oxfordcounty.ca

**NOTICE OF PUBLIC CONSULTATION CENTRE #2
CLASS ENVIRONMENTAL ASSESSMENT (CLASS EA)**

OXFORD ROAD 16 (Road 84) Improvements, from Kintore to 31st Line



Oxford County is conducting a Class Environmental Assessment (Class EA) for Oxford County Road 16 (Road 84), from Kintore to 31st Line (see map), to consider options for transportation corridor improvements to satisfy future travel demands on Oxford Road 16 (Road 84).

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WHEN: Tuesday, January 26, 2016, from 7:00 pm to 8:30 p.m.

WHERE: Chalmers United Church, 842989 Road 84, Kintore, Ontario

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We are interested in hearing any comments or input that you may have about this study. For further information, please contact:

Dadean Assam, P.Eng., Oxford County Public Works Dept.
21 Reeve Street, P.O. Box 1614, Woodstock, Ontario N4S 7Y3
519-539-9800, ext. 3117, or dassam@oxfordcounty.ca

Information will be collected according to the Municipal Freedom of Information and Protection of Privacy Act. With exception of personal information, all comments will be part of public record.

Robert Walton, P.Eng.
Director of Public Works

oxfordcounty.ca



COUNTY OF OXFORD
CAO/CLERK'S OFFICE
RECEIVED

JAN - 6 2016

REFER TO

Rob W

File/EDMS:

From: Karen Winfield <winfieldk@thamesriver.on.ca>
Sent: September-02-16 2:24 PM
To: Dadean Assam; Mike Hughes
Cc: Mark Shifflett; Mark Snowsell
Subject: 843009 Road 84, Zorra, 190 John St, Kintore
Attachments: 843009 Road 84, Kintore, Zorra.pdf

Hi Mike/Dadean,

Please see attached UTRCA mapping of property located at 843009 Road 84 in the Township of Zorra - noting mapping should be printed landscape on legal size (8 1/2 x 14 inch) paper for scales to be accurate.

Just got off the phone with the landowner. He advised:

- there have been problems with flooding at his property since the downstream neighbour installed the field culvert - before he purchased the property.
- previous landowner of 843009 apparently advised his basement/crawl space flooded after the field culvert at 843002 was installed.
- thinks downstream neighbour was originally told to install an 8' culvert but only installed 6'. (I'm not sure what the size of that culvert is btw...)
- the road is a County road and the road culvert may be undersized as well. (He had other concerns about this culvert related to truck traffic, stability of the culvert with heavy truck traffic and where they brake in relation to the Kintore corner... but I will leave that up to Dadean.) He is under the impression the County will be redoing the road next year - advised he was working out of town during the last meeting and was unable to attend but he would like this culvert looked at.
- has experienced more flooding since more agricultural lands upstream have field tiled.
- during the last flood he noted the bottleneck appears to be the field culvert and the County culvert as it was backing up the banks upstream of both culverts but was running with no issues or bank flooding downstream of the culverts.

Advised the landowner I would touch base with both the County and the Township for:

Dadean - Is this a County Road? Are there plans to redo the road next year and is the County by any chance assessing this culvert?

Mike - Is the agricultural field culvert at 843002 Road 84 part of the Engineer's Report for the Municipal Drain or is it a private structure? Did any correspondence ever go into the Township drain file about sizing of the culvert.... do you know if it was sized as proposed? (I don't think our office has any info about this culvert as looks like it has been there for at least 15 years according to our aerial photography...)

Please advise.

Thank-you,

Karen W.

>>> Mark Shifflett 26/08/2016 1:25 PM >>>
Karen,

Received phone call through our emergency flood line.....

Mike Stachelski?

519 215 2866

190 John St, Kintore

Rd 84

emergency #843009

Sounded like a residential house on Silver? Creek.

Flooded last night in intense rain.

Blaming an undersized downstream culvert on his neighbour (agricultural) property.

Sounded like there was a history of dispute over this culvert.

He also had concerns of road culvert.

Suggested that someone could call him back next week to discuss..... seemed ok with that.

Mark Shifflett

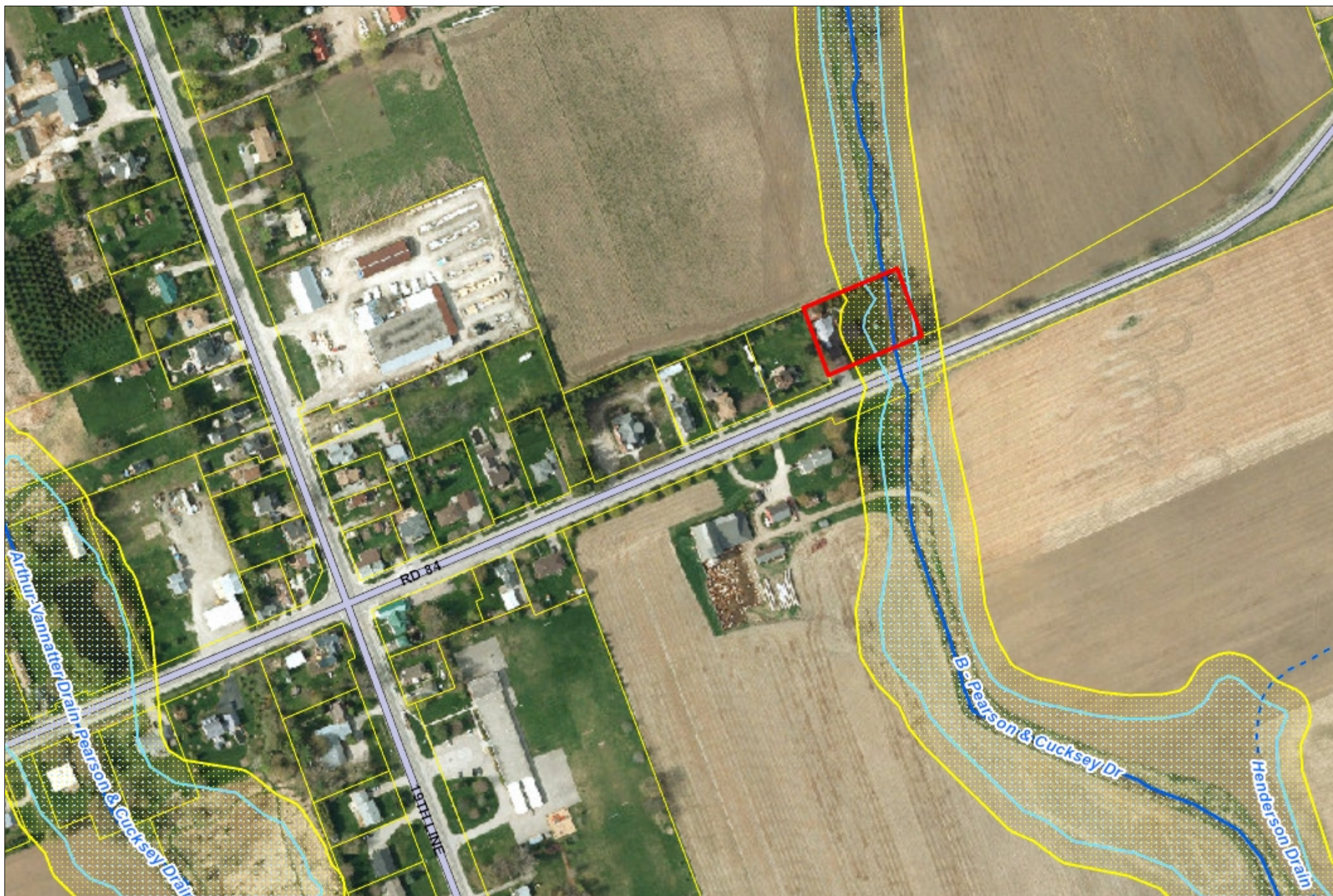
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Regulation Limit

Regulation under s.28 of the *Conservation Authorities Act*
Development, interference with wetlands, and alterations
to shorelines and watercourses. O.Reg 157/06, 97/04.

Legend

- Watercourse
 - Open
 - Tiled
- Flooding Hazard
- Regulation Limit 2015
- Assessment Parcel (MPAC)



The Regulation Limit depicted on this map schedule is a representation of O.Reg 157/06 under O.Reg 97/04.

The Regulation Limit is a conservative estimation of the hazard lands within the UTRCA watershed. Depending on the specific characteristics of the hazard land and the land use proposed, the Regulation Limit may be subject to change.

The UTRCA disclaims explicitly any warranty, representation or guarantee as to the content, sequence, accuracy, timeliness, fitness for a particular purpose, merchantability or completeness of any of the data depicted and provided herein.

The UTRCA assumes no liability for any errors, omissions or inaccuracies in the information provided herein and further assumes no liability for any decisions made or actions taken or not taken by any person in reliance upon the information and data furnished hereunder.

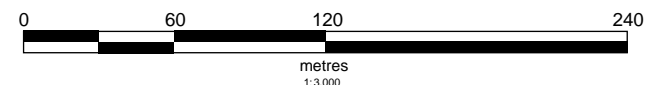
This map is not a substitute for professional advice. Please contact UTRCA staff for any changes, updates and amendments to the information provided.

This document is not a Plan of Survey.

Sources: Base data, 2010 Aerial Photography used under licence with the Ontario Ministry of Natural Resources Copyright © Queen's Printer for Ontario; City of London.

Notes:
843009 Road 84, Kintore, Township of Zorra
Mapping prepared to denote location only.
Created By: KMW September 2, 2016

* Please note: Any reference to scale on this map is only appropriate when it is printed landscape on legal-sized (8.5" x 14") paper.



UPPER THAMES RIVER

CONSERVATION AUTHORITY

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Public Consultation Centre #2

January 26, 2016, 7:00pm to 8:30pm

CLASS ENVIRONMENTAL ASSESSMENT

Oxford Rd 16 (Road 84) Improvements, from Kintore to 31st Line

Comments/questions by Public after County's presentation (Notes by F Gross)

- provide a map of Alternative #4
- what is life span of Alternative #2 to #4?; Answer: 10yrs for Alternative #2, 20 yrs for Alternative #3 and #4
- hill at 'McCalls' corner
- 31st Line sight lines; gravel trucks and roof truss trucks (heading east) turn right at 31st Line and go south to Road 78 across to Innerkip
- cost savings alternative #3 vs #4, Answer: we will look at cost benefits
- we are getting more rain than in the past
- there is no economic benefit to Oxford in having an east west corridor
- gravel source for road construction; north or south of the 401?
- where will utility poles be relocated? Answer: within right of way
- would it be possible for natural gas line to be installed? Answer: we will consider during design
- is London promoting traffic to use this route?
- will load restrictions remain? Answer: no, not with Alternative #3 or #4
- detour during construction?
- what are % trucks?
- County comment: part of construction may proceed in 2017; work may be completed in 3 phases
- A property owner moves feed from 23rd Line to across from Church;
- Any thought of installing deer warning lights to warn drivers of deer in the area?
- Some drivers attempting to stop on the shoulders sometimes enter the ditch because the shoulders are narrow
- Traffic detours may be a challenge when the Road is closed for construction.

Notes marked on map:

- WM. Ross Award Drain – flooding has occurred on south side of road
- At Lot 16, Concession 1 – can ditch (north side) flow to west?
- At Lot 15, Concession 1 – concerns with water running
- Bell telephone lines partly overhead from Zorra 25th to 27th and partly buried

From: Aden Corcoran
Sent: January-29-16 9:07 AM
To: Dadean Assam
Subject: County Road 16

Hi Dadean,

Hope all is well with you.

I was busy and unable to attend the PIC for the work you are planning on your Road 16. I do have a comment.

The sightlines at the intersection of CR 16 and Township of Zorra 29th Line are very poor. I would like to see this situation improved at this intersection as part of the project design.

Any questions or comments, please contact me.

Aden Corcoran, C.E.T.
Director of Public Works
Township of Zorra
(519) 485-2490 ext 227 or 1-888-699-3868
(519) 485-2520 fax
acorcoran@zorra.on.ca
www.zorra.on.ca

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Fax: 519 873-5020

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

January 11th, 2016

Oxford County Public Works
21 Reeve Street
P.O. Box 1614
Woodstock, Ontario
N4S 7Y3

Attention: Mr. Dadean Assam, P. Eng.
Manager of Construction

**Re: Notice of Public Consultation Centre #2, Oxford Road 16 (Road 84) Improvements,
From Kintore to 31st, Line**

Dear Mr. Assam:

This letter is this ministry's response to the Notice of Public Information Centre #2 for the above noted project. This response acknowledges that this study is being completed following the Municipal Engineers Association Municipal Class EA.

Thank you for the opportunity to comment on this project.

As you know, the 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 public agencies, and the general public, consultation with First Nations and Metis is required.

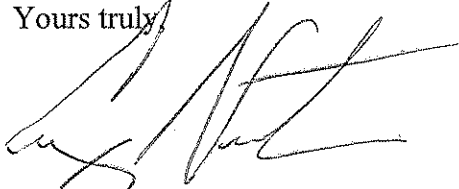
Consultation with First Nation and Metis Communities

The Crown has a duty to consult First Nation and Metis communities if there is a potential impact to Aboriginal or treaty rights. As the proponent of this project, the County of Oxford has a responsibility to conduct adequate consultation with First Nation and Metis communities as part of the environmental assessment process. The Crown is therefore, delegating the procedural aspects of consultation to the County of Oxford as outlined in the attached document.

The County of Oxford must contact the Director, Environmental Approvals Branch if this project may adversely affect an Aboriginal or treaty right. The Ministry will then determine whether the Crown has a duty to consult. Information and resources to assist the County of Oxford in fulfilling this requirement are provided as an attachment.

Please keep this office fully informed of the status of this project as it proceeds through the Class EA process. Thank you in advance.

Yours truly,

A handwritten signature in black ink, appearing to read 'Craig Newton', written over a horizontal line.

Craig Newton
Regional Environmental Planner / Regional EA Coordinator
Ministry of the Environment & Climate Change
Southwestern Region
(519) 873-5014

Attachment (1)

ABORIGINAL CONSULTATION INFORMATION

Consultation with Interested Persons under the Ontario Environmental Assessment Act

Proponents subject to the Ontario *Environmental Assessment Act* are required to consult with interested persons, which may include First Nations and Métis communities. In some cases, special efforts may be required to ensure that Aboriginal communities are made aware of the project and are afforded opportunities to provide comments. Direction about how to consult with interested persons/communities is provided in the Code of Practice: Consultation in Ontario's Environmental Assessment Process available on the Ministry's website:

<https://www.ontario.ca/environment-and-energy/consultation-ontarios-environmental-assessment-process>

As an early part of the consultation process, proponents are required to contact the Ontario Ministry of Aboriginal Affairs' Consultation Unit and visit Aboriginal Affairs and Northern Development Canada's Aboriginal and Treaty Rights Information System (ATRIS) to help identify which First Nation and Métis communities may be interested in or potentially impacted by their proposed projects.

ATRIS can be accessed through the Aboriginal Affairs and Northern Development Canada website:

http://sidelt-atris.aadnc-aandc.gc.ca/atris_online/

For more information in regard Aboriginal consultation as part of the Environmental Assessment process, refer to the Ministry's website:

www.ontario.ca/government/environment-assessments-consulting-aboriginal-communities

You are advised to provide notification directly to all of the First Nation and Métis communities who may be interested in the project. You should contact First Nation communities through their Chief and Band Council, and Métis communities through their elected leadership.

Rights-based consultation with First Nation and Métis Communities

Proponents should note that, in addition to requiring interest-based consultation as described above, certain projects may have the potential to adversely affect the ability of First Nation or Métis communities to exercise their established or credibly asserted Aboriginal or treaty rights. In such cases, Ontario may have a duty to consult those Aboriginal communities.

Activities which may restrict or reduce access to unoccupied Crown lands, or which could result in a potential adverse impact to land or water resources in which harvesting rights are exercised, may have the potential to impact Aboriginal or treaty rights. For assistance in determining whether your proposed project could affect these rights, please refer to the attached "Preliminary Assessment Checklist: First Nation and Métis Community Interest."

If there is likely to be an adverse impact to Aboriginal or treaty rights, accommodation may be required to avoid or minimize the adverse impacts. Accommodation is an outcome of consultation and includes any mechanism used to avoid or minimize adverse impacts to Aboriginal or treaty rights and traditional uses. Solutions could include mitigation such as

v.1.14.0

adjustments in the timing or geographic location of the proposed activity. Accommodation may in certain circumstances involve the provision of financial compensation, but does not necessarily require it.

For more information about the duty to consult, please see the Ministry's website at:

www.ontario.ca/government/duty-consult-aboriginal-peoples-ontario

The proponent must contact the Director, Environmental Approvals Branch if a project may adversely affect an Aboriginal or treaty right, consultation has reached an impasse, or if a Part II Order or an elevation request is anticipated; the Ministry will then determine whether the Crown has a duty to consult.

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 125 St. Clair Avenue West, 1 st Floor Toronto, ON, M4V 1P5

Delegation of Procedural Aspects of Consultation

Proponents have an important and direct role in the consultation process, including a responsibility to conduct adequate consultation with First Nation and Métis communities as part of the environmental assessment process. This is laid out in existing environmental assessment codes of practice and guides that can be accessed from the Ministry's environmental assessment website at

www.ontario.ca/environmentalassessments

The Ministry relies on consultation conducted by proponents when it assesses the Crown's obligations and directs proponents during the regulatory process. Where the Crown's duty to consult is triggered, various additional procedural steps may also be asked of proponents as part of their delegated duty to consult responsibilities. In some situations, the Crown may also become involved in consultation activities.

Ontario will have an oversight role as the consultation process unfolds but will be relying on the steps undertaken and information you obtain to ensure adequate consultation has taken place. To ensure that First Nation and Métis communities have the ability to assess a project's potential to adversely affect their Aboriginal or treaty rights, Ontario requires proponents to undertake certain procedural aspects of consultation.

The proponent's responsibilities for procedural aspects of consultation include:

- Providing notice to the elected leadership of the First Nation and/or Métis communities (e.g., First Nation Chief) as early as possible regarding the project;

- Providing First Nation and/or Métis communities with information about the proposed project including anticipated impacts, information on timelines and your environmental assessment process;
- Following up with First Nation and/or Métis communities to ensure they received project information and that they are aware of the opportunity to express comments and concerns about the project. If you are unable to make the appropriate contacts (e.g. are unable to contact the Chief) please contact the Environmental Assessment and Planning Coordinator at the Ministry's appropriate regional office for further direction.
- Providing First Nation and/or Métis communities with opportunities to meet with appropriate proponent representatives to discuss the project;
- Gathering information about how the project may adversely impact the relevant Aboriginal and/or Treaty rights (for example, hunting, fishing) or sites of cultural significance (for example, burial grounds, archaeological sites);
- Considering the comments and concerns provided by First Nation and/or Métis communities and providing responses;
- Where appropriate, discussing potential mitigation strategies with First Nation and/or Métis communities;
- Bearing the reasonable costs associated with these procedural aspects of consultation, which may include providing support to help build communities' capacity to participate in consultation about the proposed project.
- Maintaining a Consultation Record to show evidence that you, the proponent, completed all the steps itemized above or at a minimum made meaningful attempts to do so.
- Upon request, providing copies of the Consultation Record to the Ministry. The Consultation Record should:
 - summarize the nature of any comments and questions received from First Nation and/or Métis communities
 - describe your response to those comments and how their concerns were considered
 - include a communications log indicating the dates and times of all communications; and
 - document activities in relation to consultation.

Successful consultation depends, in part, on early engagement by proponents with First Nation and Métis communities. Information shared with communities must be clear, accurate and complete, and in plain language where possible. The consultation process must maintain sufficient flexibility to respond to new information, and we trust you will make all reasonable efforts to build positive relationships with all First Nation and Métis communities contacted. If you need more specific guidance on Aboriginal consultation steps in relation to your proposed project, or if you feel consultation has reached an impasse, please contact the Environmental Assessment and Planning Coordinator at the Ministry's appropriate regional office.

Preliminary Assessment Checklist: First Nation and Métis Community Interests and Rights

In addition to other interests, some main concerns of First Nation and Métis communities may pertain to established or asserted rights to hunt, gather, trap, and fish – these activities generally occur on Crown land or water bodies. As such, projects related to Crown land or water bodies, or changes to how lands and water are accessed, may be of concern to Aboriginal communities.

Please answer the following questions and keep related notes as part of your consultation record. "Yes" responses will indicate a potential adverse impact on Aboriginal or treaty rights.

Where you have identified that your project may trigger rights-based consultation through the following questions, you should arrange for a meeting between you and the Environmental Assessment and Planning Coordinator at the Ministry's appropriate regional office to provide an early opportunity to confirm whether Ontario's duty to consult is triggered and to discuss roles and responsibilities in that event.

	YES	NO
1. Are you aware of concerns from First Nation and Métis communities about your project or a similar project in the area? <i>The types of concerns can range from interested inquiries to environmental complaints, and even to land use concerns. You should consider whether the interest represents on-going, acute and/or widespread concern.</i>		
2. Is your project occurring on Crown land, or is it close to a water body? Might it change access to either?		
3. Is the project located in an open or forested area where hunting or trapping could take place?		
4. Does the project involve the clearing of forested land?		
5. Is the project located away from developed, urban areas?		
6. Is your project close to, or adjacent to, an existing reserve? <i>Projects in areas near reserves may be of interest to the First Nation and Métis communities living there.</i>		
7. Will the project affect First Nations and/or Métis ability to access areas of significance to them?		
8. Is the area subject to a land claim? <i>Information about land claims filed in Ontario is available from the Ministry of Aboriginal Affairs; information about land claims filed with the federal government is available from Aboriginal Affairs and Northern Development Canada.</i>		
9. Does the project have the potential to impact any archaeological sites?		



PUBLIC CONSULTATION CENTRE #2,
JANUARY 26, 2016, 7:00 pm to 8:30 pm
CLASS ENVIRONMENTAL ASSESSMENT
Oxford Road 16 (Road 84) Improvements,
From Kintore to 31st Line

PUBLIC COMMENT SHEET
COUNTY OF OXFORD
RECEIVED

JAN 27 2016

REFER TO _____
FILE/ EDMS: _____

Name: _____

Address: _____

Email: _____

Comments/Questions/Suggestions: _____

If improvements to Oxford Road 16 are made traffic will travel faster than it already does.

Traffic in the village of Kintore going east or west can be seen doing 80 km.

Thank you for your input. Please complete and return your Comment Sheet by mail, fax, or email to:

Dadean Assam, P.Eng.,
Manager of Construction,
Phone: 519-539-9800 Ext 3117
Email: dassam@oxfordcounty.ca

Oxford County Public Works
21 Reeve St, PO Box 1614
Woodstock ON N4S 7Y3
Fax: 519-421-4711



PUBLIC CONSULTATION CENTRE #2,
JANUARY 26, 2016, 7:00 pm to 8:30 pm
CLASS ENVIRONMENTAL ASSESSMENT
Oxford Road 16 (Road 84) Improvements,
From Kintore to 31st Line

PUBLIC COMMENT SHEET

Name: _____

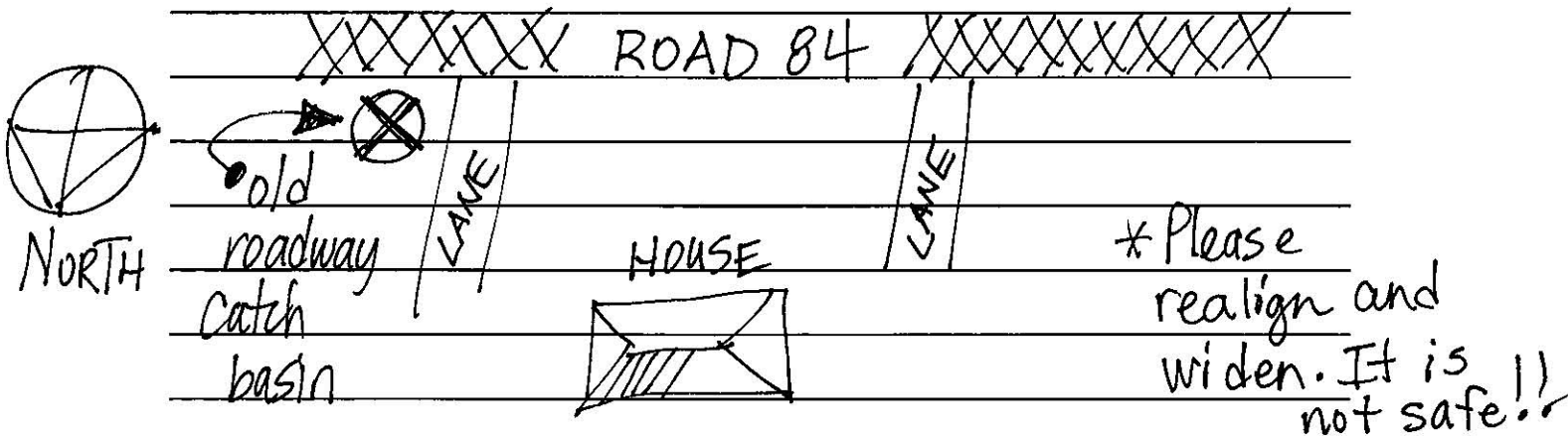
Address: _____

Email: _____

Comments/Questions/Suggestions: SPEEDING, Snowplows nailing mailboxes!

Drainage is a huge concern. Borland Drain is undersized at roadway and across McCall's field. Backs up to drain tile @ houses.

* Also ancient catch basin at the front of our property needs to be filled



Thank you for your input. Please complete and return your Comment Sheet by mail, fax, or email to:

Dadean Assam, P.Eng.,
Manager of Construction,
Phone: 519-539-9800 Ext 3117
Email: dassam@oxfordcounty.ca

Oxford County Public Works
21 Reeve St, PO Box 1614
Woodstock ON N4S 7Y3
Fax: 519-421-4711



Friday, September 16th, 2016

Subject: Ross and Borland Drains
Township of Zorra/ County of Oxford

Dear Sir/Madam:

We have scheduled an informal meeting at the Zorra Township office, location of 274620 27th Line at Hwy 119 on Friday, September 30th, 2016 at 11 a.m.

This meeting is in regards to the Ross and Borland Drains to review the proposed work with the affected parties and the County of Oxford.

If you have any questions or concerns and are not able to attend the meeting please contact the undersigned.

Yours truly,

Mike Hughes, C.B.C.O.
Drainage Superintendent
Township of Zorra
519-485-2490 x 222
mhughes@zorra.on.ca



Public Works
P.O. Box 1614, 21 Reeve Street, Woodstock, ON N4S 7Y3

COUNTY OF OXFORD
RECEIVED

JAN 25 2016

REFER TO _____
File/ EDMS: _____

AI
~~ARTSDALE FARMS LTD
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THAMESFORD ON
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RETURN TO SENDER
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Bureau inexistant
- Refused by addressee
Refusé par le destinataire

Appendix G: Public Consultation Centre No. 3 & Comments

Public Notices

Public Notices

Public Notices

Public Notices

Public Notices



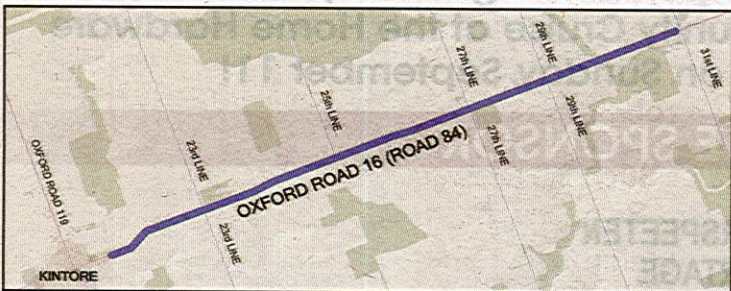
Public Notice

NOTICE OF PUBLIC CONSULTATION CENTRE #3

CLASS ENVIRONMENTAL ASSESSMENT (CLASS EA)

OXFORD ROAD 16 (ROAD 84) IMPROVEMENTS, FROM KINTORE TO ZORRA 31ST LINE

Oxford County is conducting a Class Environmental Assessment (Class EA) for Oxford County Road 16 (Road 84), from Kintore to 31st Line (see map), to consider options for transportation corridor improvements to satisfy future travel demands on Oxford Road 16 (Road 84).



In order to best address travel demands along Oxford County Road 16 (Road 84), a number of road improvement alternatives are being examined as part of the study including active transportation and over-all traffic operations, as well as the impacts of such improvements on the social, economic and natural environments. The study is being conducted in accordance with Schedule

C of the Municipal Class Environmental Assessment (October 2000, amended 2007 & 2011), which is approved under the Ontario Environmental Assessment Act. The study will define the problem or opportunity, identify and evaluate alternative solutions, and determine a preferred alternative in consultation with Area Stakeholders, Review Agencies, First Nations and the Public.

The Public, Review Agency and First Nations consultation is a key element of the Class EA process. Interested members of the Public, Businesses, Review Agencies and First Nations are encouraged to attend the third Public Consultation Centre (PCC #3) to view and provide input on the recommended design for part of Oxford Road 16.

WHEN: Tuesday, November 15, 2016, from 7:30 pm to 7:45 pm.

WHERE: Council Chamber, Township of Zorra, 274620 27th Line, Ingersoll ON

Upon completion of the study, an Environmental Study Report will be prepared and placed on public record for a 30-day review period. The document will detail the planning process and the preferred alternative.

For further information, please contact:

Dadean Assam, P.Eng., Oxford County Public Works Dept.
21 Reeve Street, P.O. Box 1614, Woodstock, Ontario N4S 7Y3
519-539-9800, ext. 3117, or dassam@oxfordcounty.ca

Information will be collected according to the Municipal Freedom of Information and Protection of Privacy Act. With exception of personal information, all comments will be part of public record.

Robert Walton, P.Eng.
Director of Public Works

oxfordcounty.ca



Public Notices

Public Notices

Public Notices



**TOWN OF INGERSOLL
COMMUNITY DEVELOPMENT GRANT PROGRAM
APPLICATIONS BEING ACCEPTED**

The Town of Ingersoll is receiving applications from non-profit community groups and organizations for the Community Development Assistance Program for 2017. The application form and funding policy are available at the Town Hall office located at 130 Oxford Street, Ingersoll, or on the Town's website at www.ingersoll.ca under Clerks Department Application Forms.

Submission deadline for applications to be considered in the 2017 budget is:

Monday, October 31, 2016

For further information please contact:

Michael Graves, Clerk
Town of Ingersoll
130 Oxford Street
Ingersoll, ON N5C 2V5
Phone: 519-485-0120
Email: mgraves@ingersoll.ca



**THE CORPORATION
OF THE TOWNSHIP
OF NORWICH**

**Invitation to Community Groups to Submit Grant Proposals
2017 Budget Deliberations**

Community groups requesting financial support from the Township of Norwich are invited to submit written proposals by Friday, December 16, 2016 at 4:00 pm.

Application forms may be picked up at the Municipal Office in Norwich or on the Township of Norwich web-site www.norwich.ca under Local Government / Township Departments / Financial Services / Community Grants Program.

Additional information is available by contacting Michael Legge, Director of Finance at the Township of Norwich Offices, 285767 Airport Road, Norwich, Ontario N0J 1P0 during regular business hours 8:30 a.m. to 4:30 pm or by email to mlegge@norwich.ca.

Please direct completed applications to:

Community Grants Program
Michael Legge
Director of Finance/Treasurer
285767 Airport Road
Norwich, Ontario N0J 1P0
Telephone: 519-468-2410 ext. 233
E-mail: mlegge@norwich.ca

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Coming Events

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You're Invited to the
Grade 8 Orientation Day on November 2, 2016
 at
St. Mary's Catholic High School

"Experience Life as a WARRIOR!"
 Our FOCUS is:

- Building Friendships**
 involving interactive social opportunities, arts and athletics
- Building a Strong Foundation**
 through academic excellence
- Building Character**
 through a faith-centered and supportive community environment
- Building YOUR Future**
 starts at St. Mary's Catholic High School

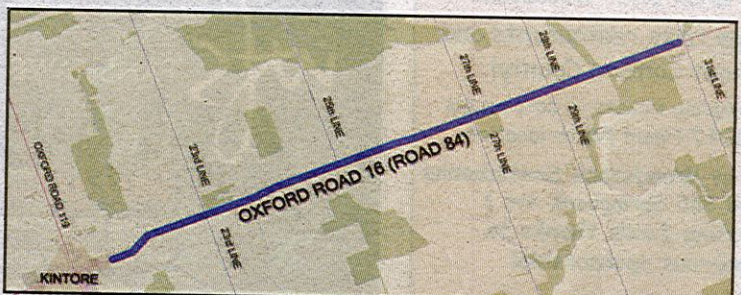
Please call Guidance for details / information 519-675-4435

Oxford County
growing stronger...together

Public Notice

NOTICE OF PUBLIC CONSULTATION CENTRE #3
CLASS ENVIRONMENTAL ASSESSMENT (CLASS EA)
OXFORD ROAD 16 (Road 84) Improvements, from Kintore to Zorra 31st Line

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 21 Reeve Street, P.O. Box 1614, Woodstock, Ontario N4S 7Y3
 519-539-9800, ext. 3117, or dassam@oxfordcounty.ca

Information will be collected according to the Municipal Freedom of Information and Protection of Privacy Act. With exception of personal information, all comments will be part of public record.

Robert Walton, P.Eng.
 Director of Public Works

oxfordcounty.ca

FIND STUFF IN THE CLASSIFIEDS!

WOODSTOCK TOY & COLLECTIBLES EXPO
 Sunday, Oct. 30, 10:00 a.m. to 3:00 p.m.
Auditorium & Mutual/Market Buildings
Woodstock Fairgrounds, 875 Nellis Street
 Featuring NASCAR, N.H.R.A., Old Tin Toys, Comics, Hot Wheels, Dolls, Die Cast Banks, Action Figures, Farm Toys, Records, Sports Cards, Retro Video Games, Coins & More. Several new dealers. 220+ tables
 Admission \$5.00/person. Children under 12-Free (with adult)
 For Vendor Space Call 519-426-8875 or email toyshow@kwic.com

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 Marilynn VandenBorre, R.P.N.

*Nail Trimming/Filing *Corns
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519-602-7030 Cell
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 519-842-7351

KEEP CALM AND CALL FIRE CHIEF BOB

Bob Parsons
 Sales Representative
 519.550.5840
 bob@tillsonburghomes.com

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16 km West of Tillsonburg on Hwy #3
 1 km North on Carter Rd, Aylmer

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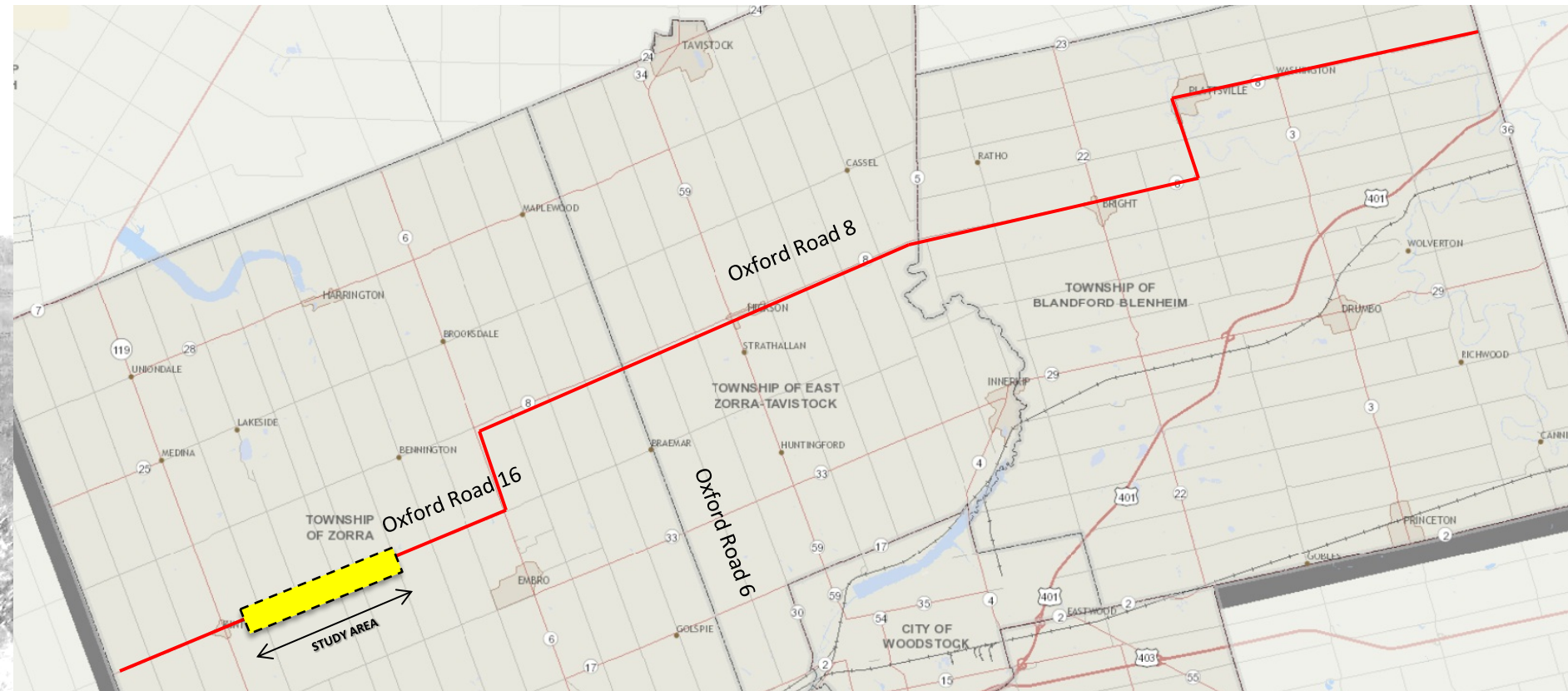
Oxford Road 16 Improvements, From Kintore to Zorra 31st Line, Class Environmental Assessment

Public Consultation Centre #3 & Presentation
to Zorra Council, Council Chamber,
274620 27th Line, Township of Zorra
November 15, 2016

Why are we here?

- Oxford Road 16 has been identified by the County as an East-West transportation corridor across the County.

(Oxford Road 16 \longleftrightarrow Oxford Road 6 \longleftrightarrow Oxford Road 8)



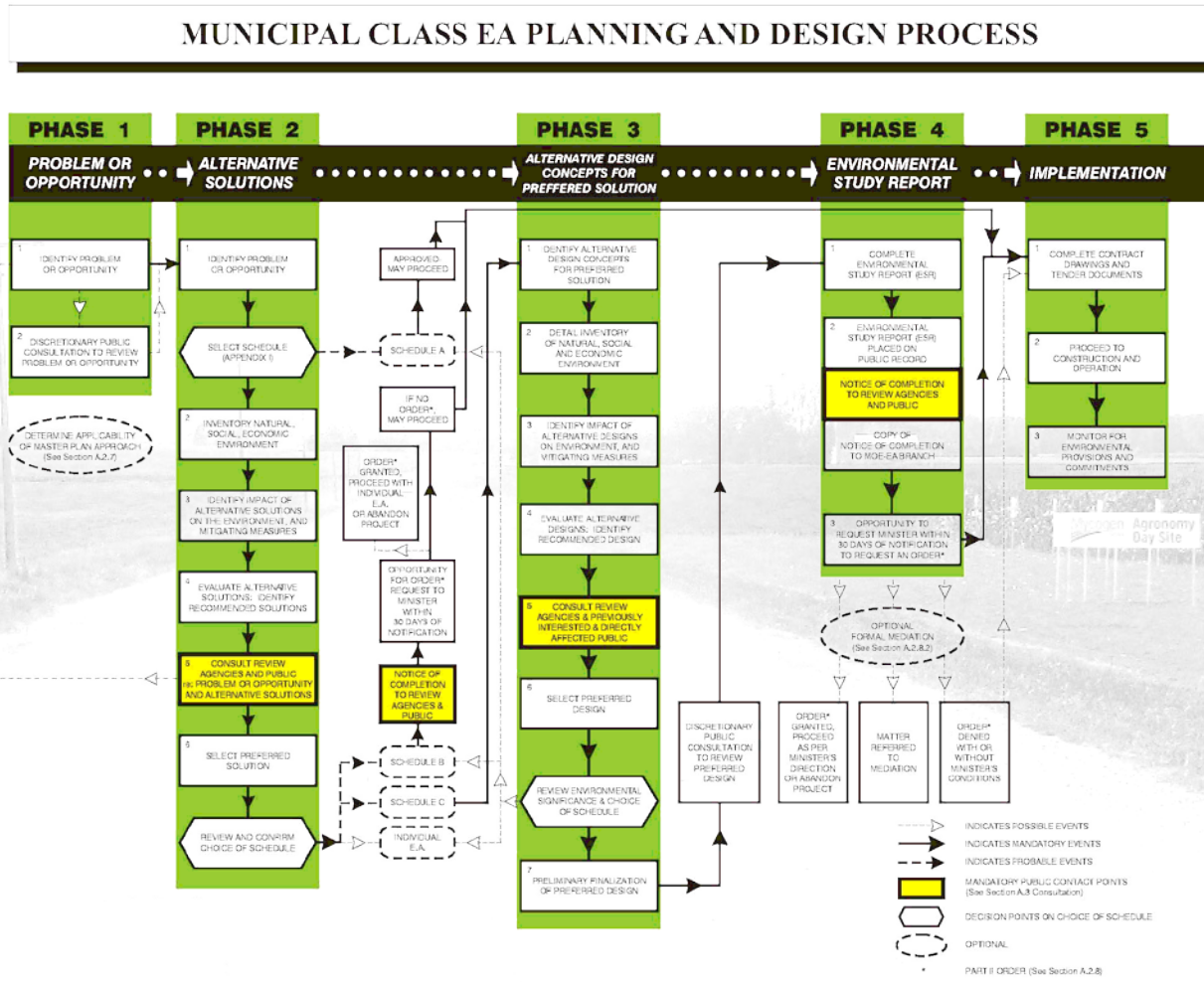
Study Area

- Oxford Road 16 has been identified by the County as an East-West transportation corridor across the County (Oxford Road 16 ↔ Oxford Road 6 ↔ Oxford Road 8)
- The County is looking at road improvements for safety and ease of maintenance.
- The purpose of this Public Consultation Centre is to gather input from the public, property owners and stakeholders for use in the planning process.



Purpose of Municipal Class EA

- Identify Problem or Opportunity
- Consult with Stakeholders
- Consider Alternative Solutions
- Assess impacts of alternative solutions on the environment,
- Determine a preferred solution.
- This project is following a 'Schedule C' Municipal Class EA (see figure).



Technical Information

The following technical information were used to assist with the evaluation of the alternative solutions and the selection of the 'preferred' solution:

Collision Reports

- Police collision records from 2006 to 2014 were reviewed. A summary of vehicle accidents/collisions were presented in the 2nd Public Consultation Centre in January, 2016.

Archaeological and Built Heritage Assessment

- The Stage 1 Archaeological assessment was completed by AMIK Consultants for the County. It was recommended to complete Stage 2 Archaeological Assessment if work will be done on the undisturbed areas of the Right-of-Way (ROW).

Drainage

- 5 municipal drains and one creek crossing were reviewed. Following the Borland and Ross Award drains meeting on September 30, 2016, the County submitted a Petition for drainage improvements to parts of Borland and Ross Award drains.

Technical Information (Cont'd)

Natural Environment Characterization Report

- Natural Resource Solutions Inc. completed the Natural Environment characterization for the County. The report listed measures to be implemented for the protection of natural features.

Geotechnical Investigation

- The report recommends improvement to the existing pavement structure to carry the current and future traffic loading.

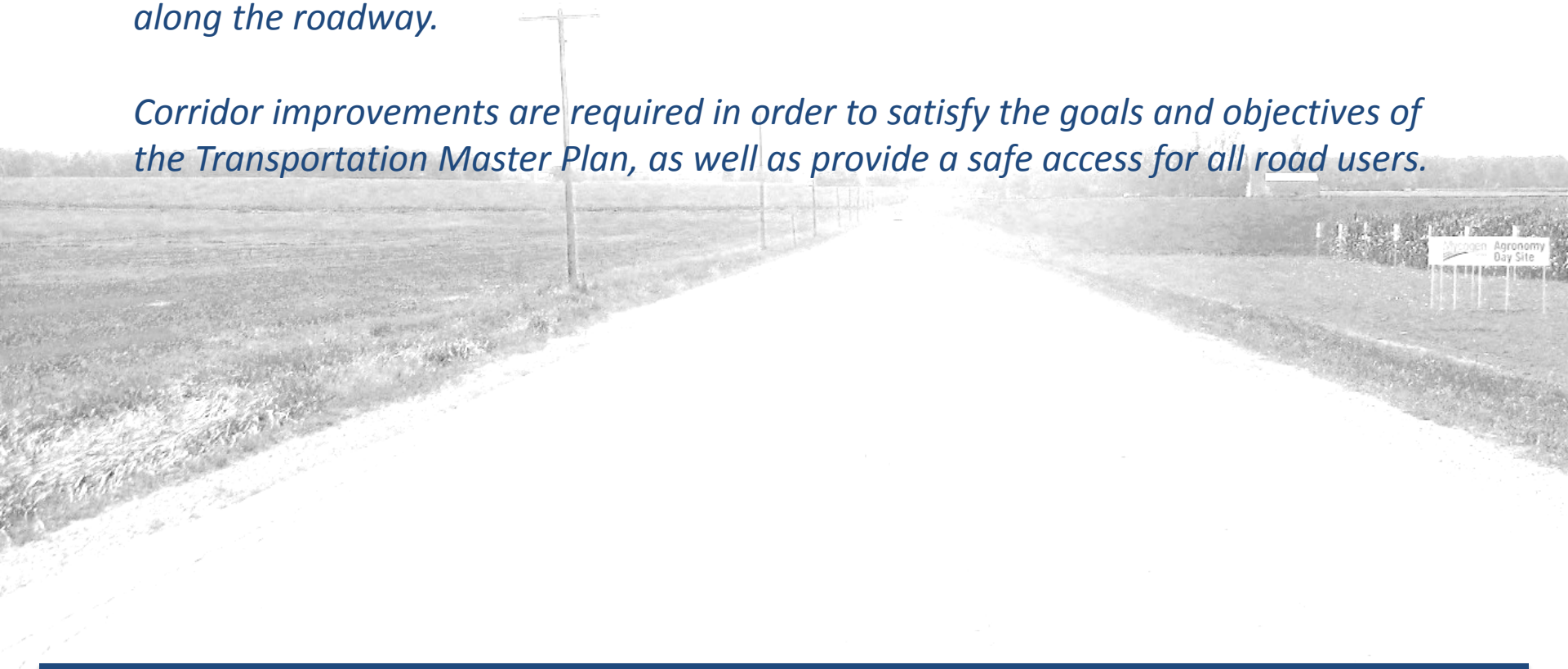
Traffic Volumes

- The traffic count in 2012/2013 was 2,483 vehicles per day. The updated traffic count in 2014/2015 was 2880.
- There are no apparent reasons for this increase in traffic but traffic counts can be influenced by local activities such as temporary detours, etc.
- The increase in traffic fits within the design parameters of the proposed improvements.

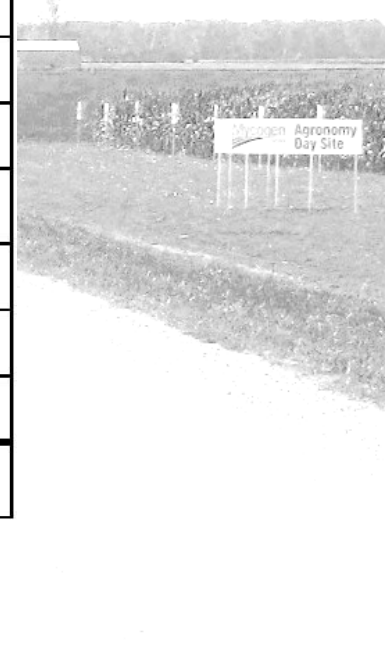
Problem/Opportunity Statement

There is a need for improved roadway and traffic operations throughout the Oxford Road 16 corridor in order to improve safety for all road users travelling along the roadway.

Corridor improvements are required in order to satisfy the goals and objectives of the Transportation Master Plan, as well as provide a safe access for all road users.



Evaluation Criteria and Sub-Factors		Part of Oxford Road 16 Improvements Class EA - Alternative Solutions			
		Alternative 1: Do Nothing	Alternative 2: Rehabilitate Existing Road Surface	Alternative 3: Reconstruct Road with no Re-alignment and Drainage Improvements	Alternative 4: Reconstruct Road with New Cross-Section including Alignment and Drainage Improvements
Transportation Environment	Traffic Operations				
	Safety				
	Road Geometry				
Social Environment	Impacts to Residential Properties				
	Impacts to Agricultural Properties				
Natural Environment	Impacts to Vegetation/Trees				
	Stormwater/ Drainage				
	Noise Impact				
Cost Estimate	Construction	\$0	\$3,500,000	\$3,900,000	\$5,000,000
	Maintenance				
Summary					



Design Concepts for Preferred Solution

The preferred solution is to improve the road to a wider two-lane rural cross section with 3.35m wide travel lanes, 1.0m wide paved shoulders and 2.0m wide gravel shoulders, ditches on both sides and new culverts. The existing pavement and underlying granular materials will be pulverized in-place and the pulverized materials will be used for roadwork.

The road improvement is proposed to be carried out in three phases as follows:

- Replacement of the drainage structure (bridge) at McCall-McCorquodale drain and Road improvement between Zorra 31st Line and Zorra 29th Line (these works are planned for 2017 following the completion of the Class EA);
- Road improvement from east limit of Kintore to Zorra 25th Line; and
- Road improvement from Zorra 25th Line to Zorra 29th Line.

Other recommended work to be carried out include:

- Replacement of the drainage structure (bridge) at Borland drain;
- Extend the current 60km/h speed zone eastward beyond the current location at the east end of Kintore;
- Install advance 'TRUCKS TURNING' signs to warn drivers of trucks slowing down to turn onto Zorra 31st Line.
- Improve sight line at the intersection of Oxford Road 16 and Zorra 29th Line.

The estimated capital construction cost is \$5,000,000 for the preferred solution.

Thank you for Attending

Please provide your comments by completing a comment sheet and returning it to us. You can also mail, fax, or email your comment sheet **by November 30, 2016.**

If you have any questions or comments, please contact:

Dadean Assam, P. Eng.
Manager of Construction
Oxford County
Public Works Department
21 Reeve Street, P.O. Box 1614
Woodstock, Ontario N4S 7Y3
Tel: 519-539-9800 Ext. 3117
Fax: 519-421-4711
dassam@oxfordcounty.ca



Questions & Comments -

Class Environmental Assessment - Oxford Road 16, from Kintore to Zorra 31st Line

Verbal comments at Public Consultation Centre #3 on November 15, 2016 are noted below:

Provide vehicle accidents information presented at PCC #2 to one Municipal Councilor;
Public concerned about speeding after road Improvements & how to Control/Enforce speeding?

Why private land is required at the horizontal curve just east of Kintore?

What is the status of the municipal Drains after the Drain meeting on September 30, 2016?

The County will submit the Environmental Study Report to County Council on Dec. 14, 2016.

What is the status of the drains petition submitted to the Township of Zorra?

Vehicular traffic will increase after the road improvements.

County will do traffic counts on section of Oxford Road 8 that was recently improved to compare the traffic before and after road improvements.

Is 1 metre (m) wide paved shoulder adequate as a cycling lane? 1.2m is the required minimum, but the 1m will help keep vehicles in the driving lane which would reduce regular maintenance of the gravel shoulders. Farm vehicles should be able to drive further away from the centre of the pavement to allow other vehicles to pass safely.

Need traffic calming to slow down vehicles through the Community of Kintore. Oxford County will install traffic calming in the Community of Plattsville and monitor its effectiveness.

A former Director of Public Works installed signs that change from 'green' to "red" when a vehicle exceeds the posted speed limit.

From: Muller, Joseph (MTCS) <Joseph.Muller@ontario.ca>
Sent: November-30-16 3:56 PM
To: Dadean Assam
Subject: Oxford Road 16 Improvements from Kintore to Zorra 31st Line

Hello Dadean Assam:

Thank-you for providing us with the PIC#3 notice and PIC materials online. I do not have any additional comments at this time, other than to keep circulating us on the file and keep us informed of when the Stage 2 archaeological assessment will be proceeding. Take care,

Joe

Joseph Muller, RPP, MCIP

Heritage Planner
Ministry of Tourism, Culture and Sport
Culture Division | Programs and Services Branch | Heritage Program Unit

401 Bay Street, Suite 1700
Toronto, Ontario M7A 0A7

Tel. 416.314.7145 | Fax. 416.212.1802

Figure 3(a) and (b): Proposed Construction Detour Routes

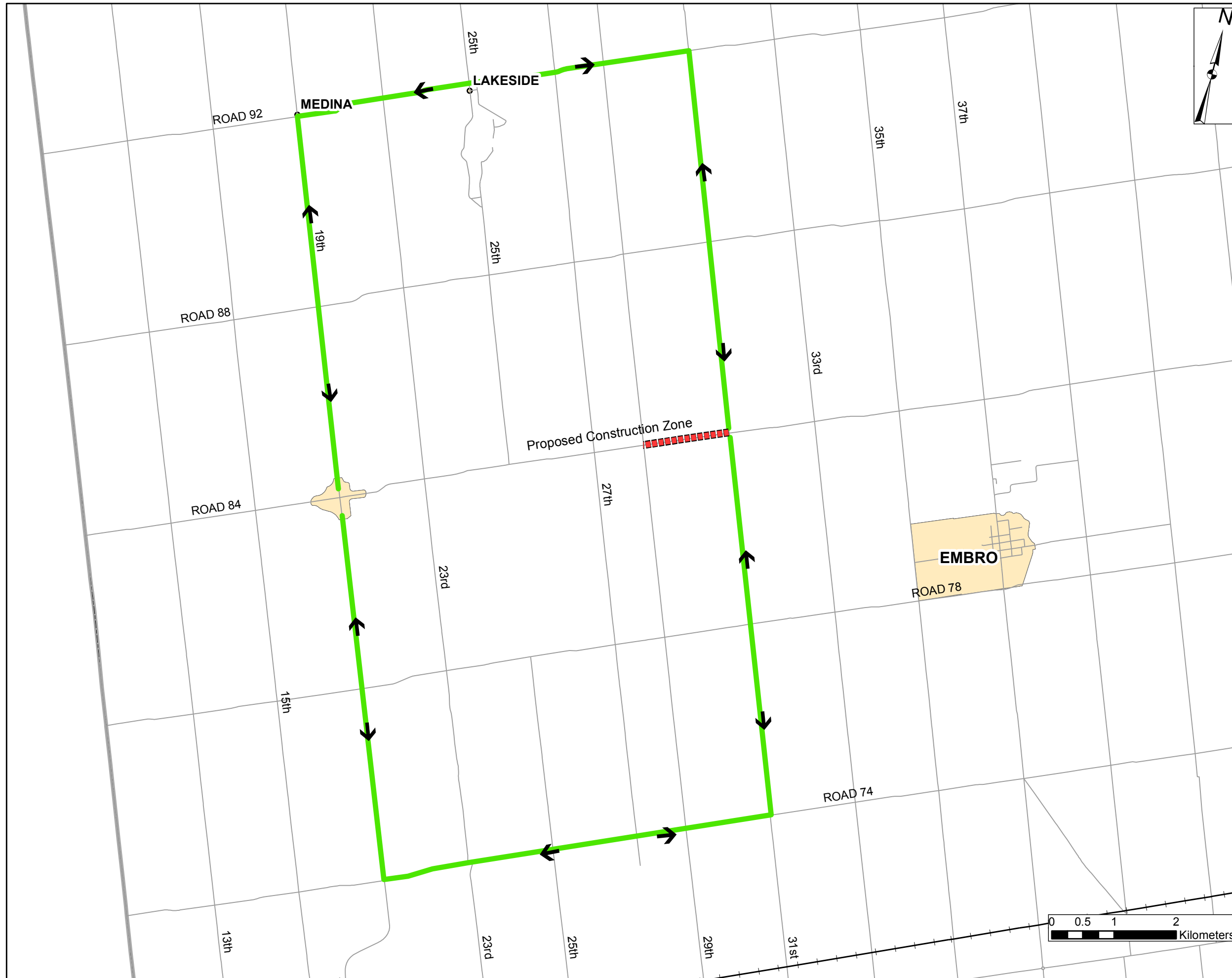
**Oxford Road 16
(Road 84)
Class EA**

Figure 3(a)

**Proposed
Construction Detour
Routes**

Legend

- Detour Route
- ▬▬▬▬▬ Proposed Construction Zone





**Oxford Road 16
(Road 84)
Class EA**

Figure 3(b)

**Proposed
Construction Detour
Routes**

Legend

-  Detour Route
-  Proposed Construction Zone

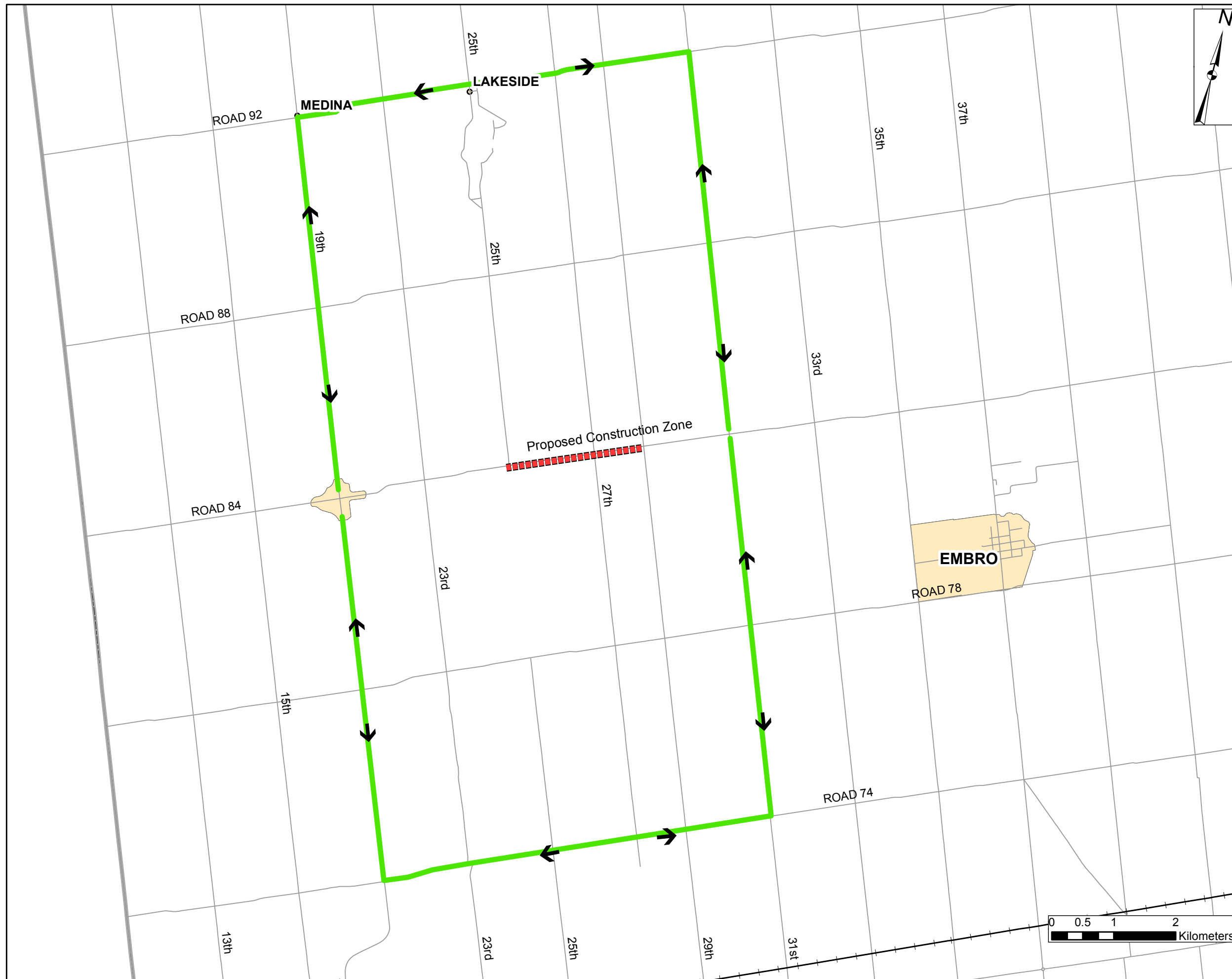
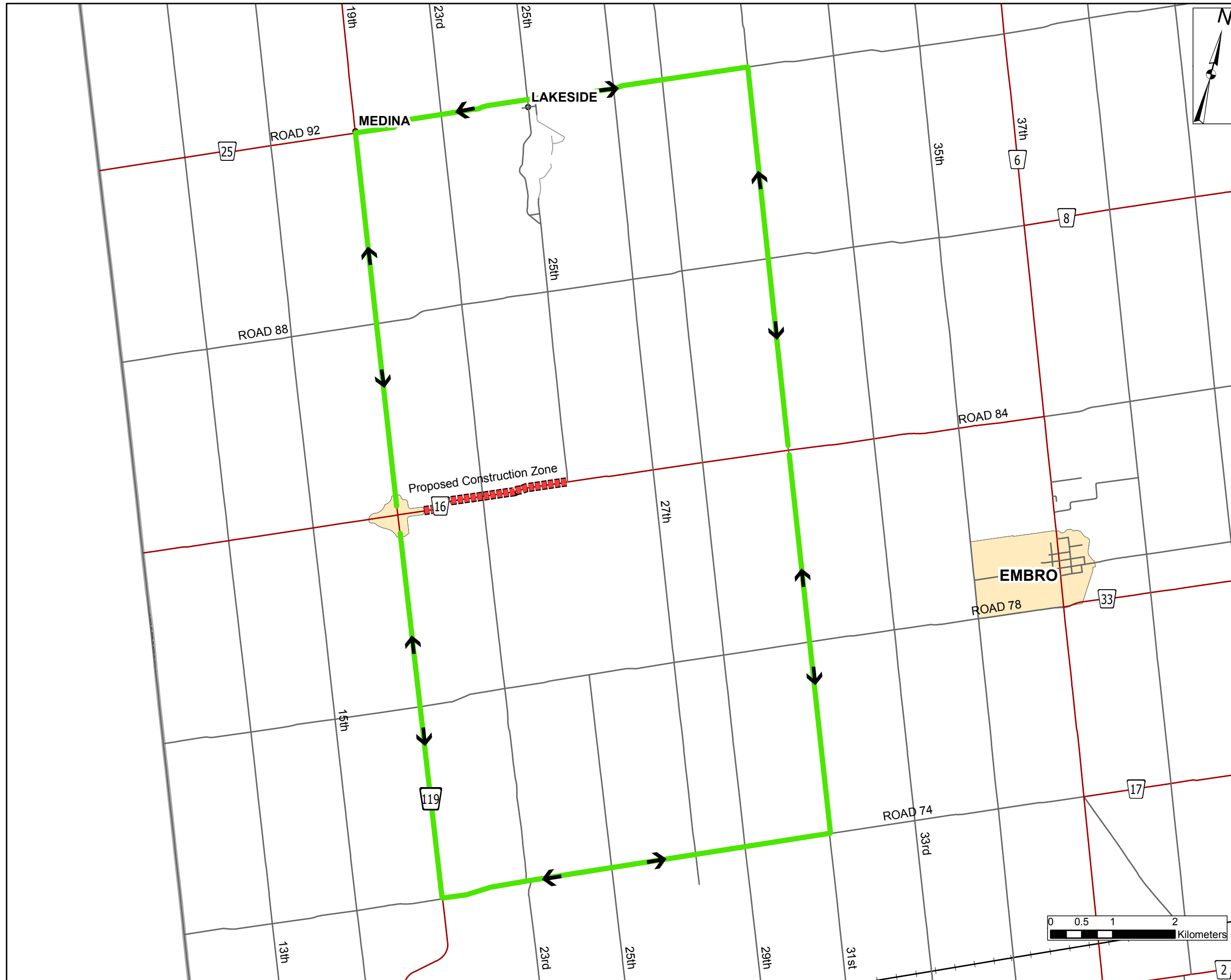


Figure 4: Proposed Construction Detour Routes

**Oxford Road 16
(Road 84)
Class EA**

Figure 4

**Proposed
Construction Detour
Routes**




Legend

- Proposed Construction Zone
- Detour Route

Figure 5: Proposed Widening & Property Acquisitions



Legend:
 LOCATION OF REQUIRED PROPERTY



General Notes:

Utility Note:
IT IS THE RESPONSIBILITY OF THE PLAN USER TO INFORM THEMSELVES OF THE EXACT LOCATION OF ALL POLES, LINES, CONDUITS, WATER MAINS, SEWERS, AND OTHER UNDERGROUND AND OVERHEAD UTILITIES AND STRUCTURES BEFORE COMMENCING WITH WORK. SUCH UTILITIES AND STRUCTURES ARE NOT NECESSARILY SHOWN ON THE DRAWINGS WHERE SHOWN THE ACCURACY OF THE POSITION IS NOT GUARANTEED. THE CONTRACTOR SHALL ASSUME LIABILITY FOR DAMAGES TO THE UTILITIES DURING CONSTRUCTION.

REVISIONS	No.	DATE	BY

Controlling B.M.

Consultant

Stamp: Stamp:

Design By: Drawn By: S.A.M.
 Approved By: Checked By: F.G.
 Date: AUGUST 2016 Hor: 1:1000
Scale: Vert.

PROPERTY ACQUISITION
OXFORD RD 16
PROPERTY #1

235923 23rd Line
P.I.N. 00197-0042

Stn: To:

Contract No:

Dwg No:

file: X:\Choi_3D\Projects\105-830016-8300-CR16 2012\Project Drawings\Legal Survey.dwg
 Date: 08/14/16
 User: dsquilliam

Legend:

General Notes:

Utility Note:

IT IS THE RESPONSIBILITY OF THE PLAN USER TO INFORM THEMSELVES OF THE EXACT LOCATION OF ALL POLES, LINES, CONDUITS, WATER MAINS, SEWERS, AND OTHER UNDERGROUND AND OVERHEAD UTILITIES AND STRUCTURES BEFORE COMMENCING WITH WORK. SUCH UTILITIES AND STRUCTURES ARE NOT NECESSARILY SHOWN ON THE DRAWINGS. WHERE SHOWN THE ACCURACY OF THE POSITION IS NOT GUARANTEED. THE CONTRACTOR SHALL ASSUME LIABILITY FOR DAMAGES TO THE UTILITIES DURING CONSTRUCTION.

REVISIONS	No.	DATE	BY

Controlling B.M.

Consultant

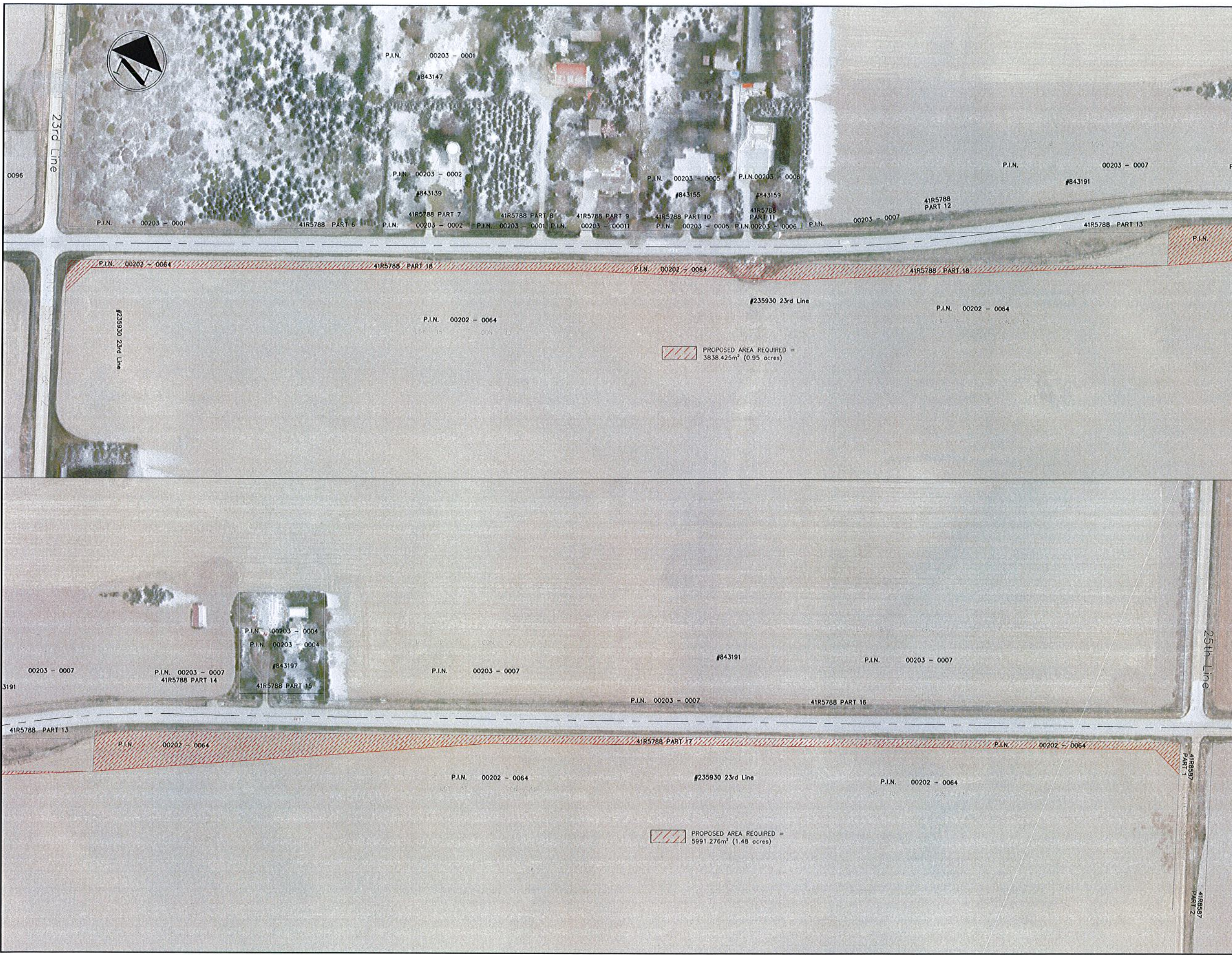
Stamp

Design By: _____ Drawn By: S.A.M.
Approved By: _____ Checked By: F.G.
Date: AUGUST 2016 Scale: Hor: 1:1000
Vert: _____

PROPERTY ACQUISITION
OXFORD RD 16
PROPERTY #2

235930 23rd Line
P.I.N. 00202-0064

Stn: _____ To: _____
Contract No: _____
Dwg No: _____



PROPOSED AREA REQUIRED = 3838.425m² (0.95 acres)

PROPOSED AREA REQUIRED = 5991.276m² (1.48 acres)

file: K:\Civi 3D Projects\105 930016 8300 CR16 2012\Project drawings\legal survey.dwg
User: f2105201 Date: 08/20/16 14:00

Legend:
 LOCATION OF REQUIRED PROPERTY

General Notes:

Utility Note:
 IT IS THE RESPONSIBILITY OF THE PLAN USER TO INFORM THEMSELVES OF THE EXACT LOCATION OF ALL POLES, LINES, CONDUITS, WATER MAINS, SEWERS, AND OTHER UNDERGROUND AND OVERHEAD UTILITIES AND STRUCTURES BEFORE COMMENCING WITH WORK. SUCH UTILITIES AND STRUCTURES ARE NOT NECESSARILY SHOWN ON THE DRAWINGS. WHERE SHOWN THE ACCURACY OF THE POSITION IS NOT GUARANTEED. THE CONTRACTOR SHALL ASSUME LIABILITY FOR DAMAGES TO THE UTILITIES DURING CONSTRUCTION.

REVISIONS	No.	DATE	BY

Controlling B.M.

Consultant:

Stamp

Design By: _____ Drawn By: S.A.M.
 Approved By: _____ Checked By: F.G.
 Date: AUGUST 2016 Scale: Hor: 1:1000
 Vert: _____

**PROPERTY ACQUISITION
 OXFORD RD 16
 PROPERTY #3**

**843282 Oxford Rd 16
 P.I.N. 00202-0020**

Stn: _____ To: _____

Contract No: _____

Dwg No: _____





Legend
 LOCATION OF REQUIRED PROPERTY

General Notes

Utility Note
 IT IS THE RESPONSIBILITY OF THE PLAN USER TO INFORM THEMSELVES OF THE EXACT LOCATION OF ALL POLES, LINES, CONDUITS, WATER MAINS, SEWERS, AND OTHER UNDERGROUND AND OVERHEAD UTILITIES AND STRUCTURES BEFORE COMMENCING WITH WORK. SUCH UTILITIES AND STRUCTURES ARE NOT NECESSARILY SHOWN ON THE DRAWINGS. WHERE SHOWN THE ACCURACY OF THE POSITION IS NOT GUARANTEED. THE CONTRACTOR SHALL ASSUME LIABILITY FOR DAMAGES TO THE UTILITIES DURING CONSTRUCTION.

REVISIONS	No.	DATE	BY

Controlling B.M.

Consultant

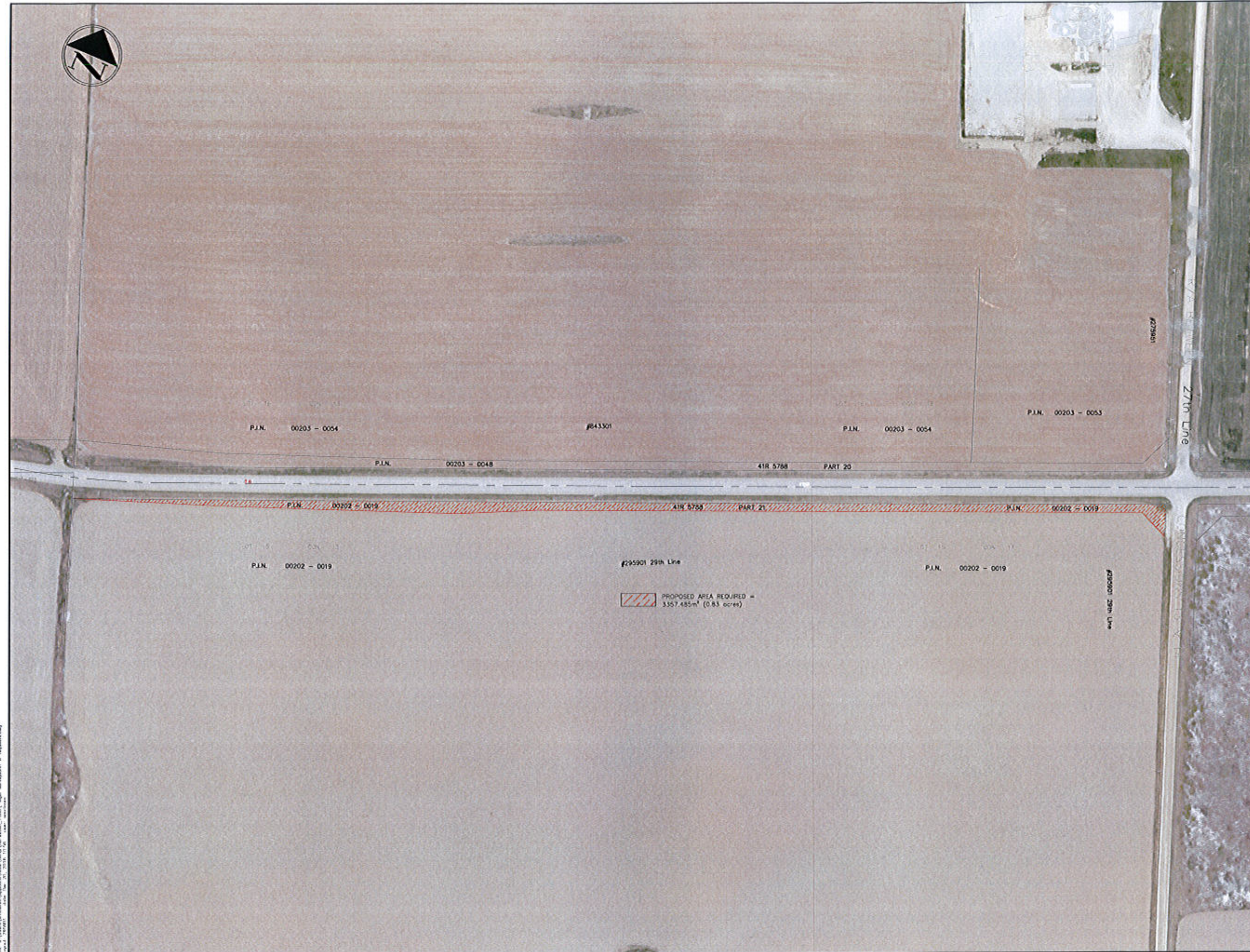
Stamp	Stamp

Drawn By	Drawn By S.A.M.
Checked By	Checked By F.G.
Date	Date AUGUST 2016
Scale	Scale Hor 1:1000 Vert

PROPERTY ACQUISITION
OXFORD RD 16
PROPERTY #4

295901 29th Line
P.I.N. 00202-0019

Sta. To:
Contract No.
Dwg No.



File: C:\Users\jvancura\Documents\Projects\Oxford\OXFORD_16\OXFORD_16_P04.dwg
 Date: 2016-08-11 10:10:10 AM
 User: jvancura

Legend:
 LOCATION OF REQUIRED PROPERTY

General Notes:

Utility Note:
 IT IS THE RESPONSIBILITY OF THE PLAN USER TO INFORM THEMSELVES OF THE EXACT LOCATION OF ALL POLES, LINES, CONDUITS, WATER MAINS, SEWERS, AND OTHER UNDERGROUND AND OVERHEAD UTILITIES AND STRUCTURES BEFORE COMMENCING WITH WORK. SUCH UTILITIES AND STRUCTURES ARE NOT NECESSARILY SHOWN ON THE DRAWINGS. WHERE SHOWN THE ACCURACY OF THE POSITION IS NOT GUARANTEED. THE CONTRACTOR SHALL ASSUME LIABILITY FOR DAMAGES TO THE UTILITIES DURING CONSTRUCTION.

REVISIONS	No.	DATE	BY

Controlling B.M.

Consultant

Stamp: Stamp:

Design By: Drawn By: S.A.M.
 Approved By: Checked By: F.G.
 Date: AUGUST 2016 Scale: Hbr: 1:500
Vert:

**PROPERTY ACQUISITION
 OXFORD RD 16
 PROPERTY #6**

**843540 Oxford Rd 16
 P.I.N. 00211-0015**

Stn: To:

Contract No:

Dwg No:



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 User: fgraham



Legend:

 LOCATION OF REQUIRED PROPERTY

General Notes:

Utility Note:

IT IS THE RESPONSIBILITY OF THE PLAN USER TO INFORM THEMSELVES OF THE EXACT LOCATION OF ALL POLES, LINES, CONDUITS, WATER MAINS, SEWERS, AND OTHER UNDERGROUND AND OVERHEAD UTILITIES AND STRUCTURES BEFORE COMMENCING WITH WORK. SUCH UTILITIES AND STRUCTURES ARE NOT NECESSARILY SHOWN ON THE DRAWINGS. WHERE SHOWN THE ACCURACY OF THE POSITION IS NOT GUARANTEED. THE CONTRACTOR SHALL ASSUME LIABILITY FOR DAMAGES TO THE UTILITIES DURING CONSTRUCTION.

REVISIONS	No.	DATE	BY

Controlling B.M.

Consultant

Stamp

Design By: Drawn By: S.A.M.

Approved By: Checked By: F.G.

Date: AUGUST 2016 Scale: Hor: 1500
Vert:

PROPERTY ACQUISITION
OXFORD RD 16
PROPERTY #7

843544 Oxford Rd 16
P.I.N. 00211-0014

Stn: To:

Contract No:

Dwg No:





Legend:

 LOCATION OF REQUIRED PROPERTY

General Notes:

Utility Note:

IT IS THE RESPONSIBILITY OF THE PLAN USER TO INFORM THEMSELVES OF THE EXACT LOCATION OF ALL POLES, LINES, CONDUITS, WATER MAINS, SEWERS, AND OTHER UNDERGROUND AND OVERHEAD UTILITIES AND STRUCTURES BEFORE COMMENCING WITH WORK. SUCH UTILITIES AND STRUCTURES ARE NOT NECESSARILY SHOWN ON THE DRAWINGS. WHERE SHOWN THE ACCURACY OF THE POSITION IS NOT GUARANTEED. THE CONTRACTOR SHALL ASSUME LIABILITY FOR DAMAGES TO THE UTILITIES DURING CONSTRUCTION.

REVISIONS	No.	DATE	BY

Controlling B.M.

Consultant

Stamp

Design By: Drawn By: S.A.M.

Approved By: Checked By: F.G.

Date: AUGUST 2016 Scale: Hor: 1:1000
Vert:


PROPERTY ACQUISITION
OXFORD RD 16
PROPERTY #9

843301 Oxford Rd 16
P.I.N. 00203-0025

Stn: To:

Contract No:

Dwg No:

 PROPOSED AREA REQUIRED =
3165.374m² (0.78 acres)

P.I.N. 00203 - 0025

#843301

P.I.N. 00203 - 0025

P.I.N. 00203 - 0025

P.I.N. 00203 - 0025

P.I.N. 00202 - 0020

P.I.N. 00202 - 0020

#843282

P.I.N. 00202 - 0020

25th Line

41R5787 PART 1

41R5787 PART 2

41R5788 PART 23

LOT 12 COY. 11



Legend:

 LOCATION OF REQUIRED PROPERTY

General Notes:

Utility Note:

IT IS THE RESPONSIBILITY OF THE PLAN USER TO INFORM THEMSELVES OF THE EXACT LOCATION OF ALL POLES, LINES, CONDUITS, WATER MAINS, SEWERS, AND OTHER UNDERGROUND AND OVERHEAD UTILITIES AND STRUCTURES BEFORE COMMENCING WITH WORK. SUCH UTILITIES AND STRUCTURES ARE NOT NECESSARILY SHOWN ON THE DRAWINGS. WHERE SHOWN, THE ACCURACY OF THE POSITION IS NOT GUARANTEED. THE CONTRACTOR SHALL ASSUME LIABILITY FOR DAMAGES TO THE UTILITIES DURING CONSTRUCTION.

REVISIONS	No.	DATE	BY

Controlling B.M.

Consultant

Stamp

Design By: Drawn By: S.A.M.

Approved By: Checked By: F.G.

Date: AUGUST 2016 Scale: Hor: 1:1000
Vert:

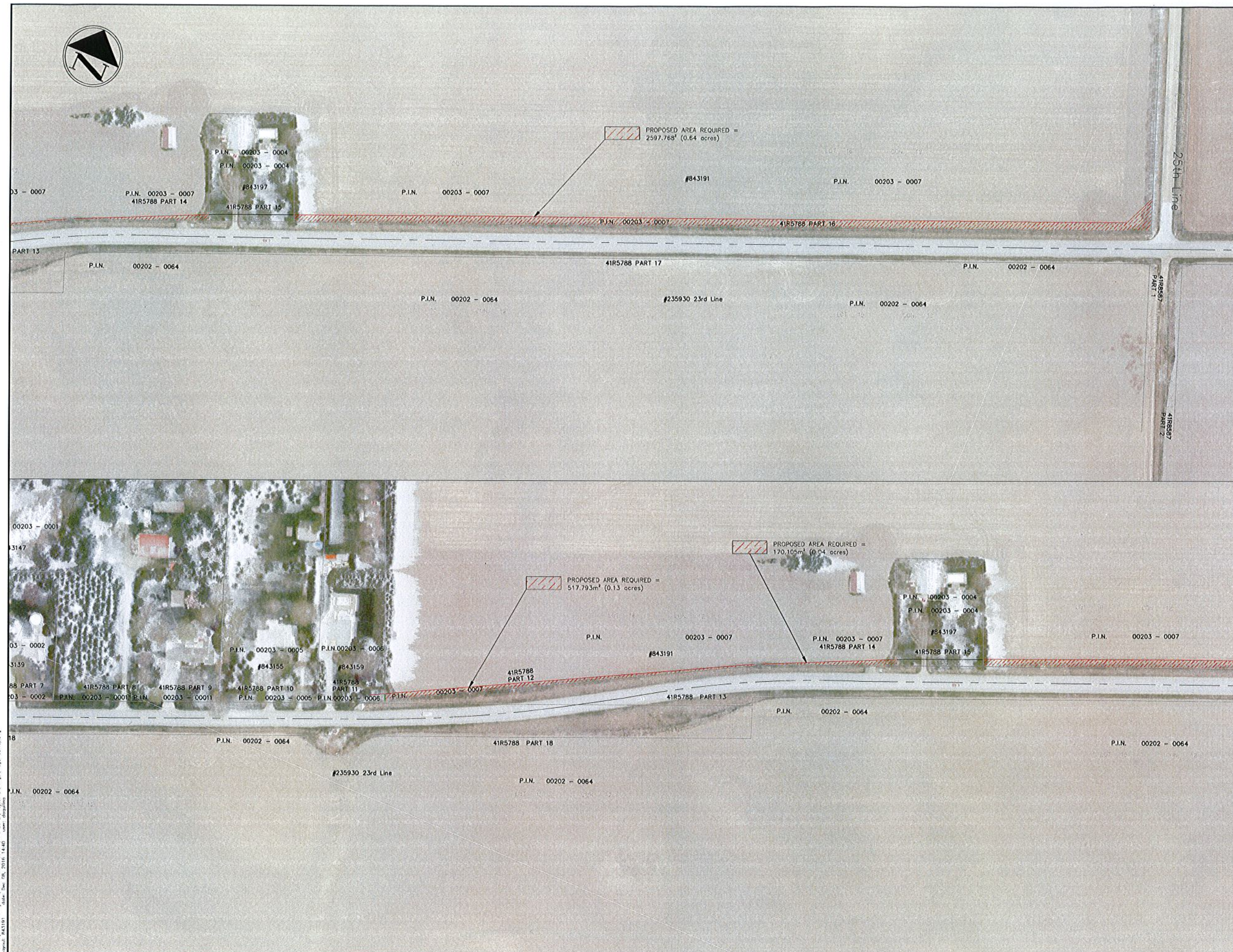
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OXFORD RD 16
PROPERTY #10**

**843191 Oxford Rd 16
P.I.N. 00203-0007**

Stn: To:

Contract No:

Dwg No:



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User: S.A.M.
Date: 08/20/2016 14:41



Legend:

 LOCATION OF REQUIRED PROPERTY

General Notes:

Utility Note:

IT IS THE RESPONSIBILITY OF THE PLAN USER TO INFORM THEMSELVES OF THE EXACT LOCATION OF ALL POLES, LINES, CONDUITS, WATER MAINS, SEWERS, AND OTHER UNDERGROUND AND OVERHEAD UTILITIES AND STRUCTURES BEFORE COMMENCING WITH WORK. SUCH UTILITIES AND STRUCTURES ARE NOT NECESSARILY SHOWN ON THE DRAWINGS, WHERE SHOWN THE ACCURACY OF THE POSITION IS NOT GUARANTEED. THE CONTRACTOR SHALL ASSUME LIABILITY FOR DAMAGES TO THE UTILITIES DURING CONSTRUCTION.

REVISIONS	No.	DATE	BY

Controlling B.M.

Consultant

Stamp: Stamp:

Design By: Drawn By: S.A.M.
 Approved By: Checked By: F.G.
 Date: AUGUST 2016 Scale: Hor: 1:500
Vert:

PROPERTY ACQUISITION
OXFORD RD 16
PROPERTY #11

843197 Oxford Rd 16
P.I.N. 00203-0004

Stn: To:

Contract No:

Dwg No:

00203 - 0007


#843191

P.I.N. 00203 - 0007
41R5788 PART 14

P.I.N. 00203 - 0004

P.I.N. 00203 - 0004

#843197

 PROPOSED AREA REQUIRED =
217,543m² (0.05 acres)
41R5788 PART 15

P.I.N. 00203 - 0007

41R5788 PART 13

P.I.N. 00202 - 0064

P.I.N. 00202 - 0064

Legend:
 LOCATION OF REQUIRED PROPERTY

General Notes

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Utility Note:
#8

REVISIONS	No.	DATE	BY

Controlling B.M.

Consultant

Stamp: Stamp:

Design By: Drawn By: S.A.M.

Approved By: Checked By: F.G.

Date: AUGUST 2016 Scale: Hor: 1:500
Vert:

**PROPERTY ACQUISITION
OXFORD RD 16
PROPERTY #12**

843159 Oxford Rd 16
P.I.N. 00203-0006

Stn: To:

Contract No:

Dwg No:



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User: gregg

Legend:
 LOCATION OF REQUIRED PROPERTY

General Notes:

Utility Note:
 IT IS THE RESPONSIBILITY OF THE PLAN USER TO INFORM THEMSELVES OF THE EXACT LOCATION OF ALL POLES, LINES, CONDUITS, WATER MAINS, SEWERS, AND OTHER UNDERGROUND AND OVERHEAD UTILITIES AND STRUCTURES BEFORE COMMENCING WITH WORK. SUCH UTILITIES AND STRUCTURES ARE NOT NECESSARILY SHOWN ON THE DRAWINGS. WHERE SHOWN THE ACCURACY OF THE POSITION IS NOT GUARANTEED. THE CONTRACTOR SHALL ASSUME LIABILITY FOR DAMAGES TO THE UTILITIES DURING CONSTRUCTION.

REVISIONS	No.	DATE	BY

Controlling B.M.

Consultant

Stamp	Stamp

Design By:	Drawn By: S.A.M.
Approved By:	Checked By: F.G.
Date: AUGUST 2016	Scale: Hor: 1:750 Vert:

**PROPERTY ACQUISITION
OXFORD RD 16
PROPERTY #13**

843147 Oxford Rd 16
P.I.N. 00203-0001

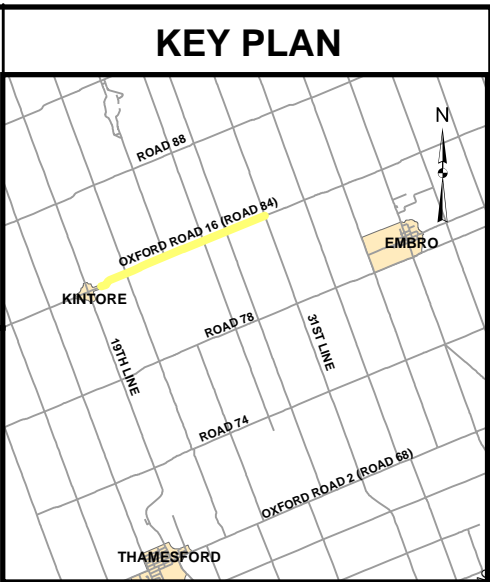
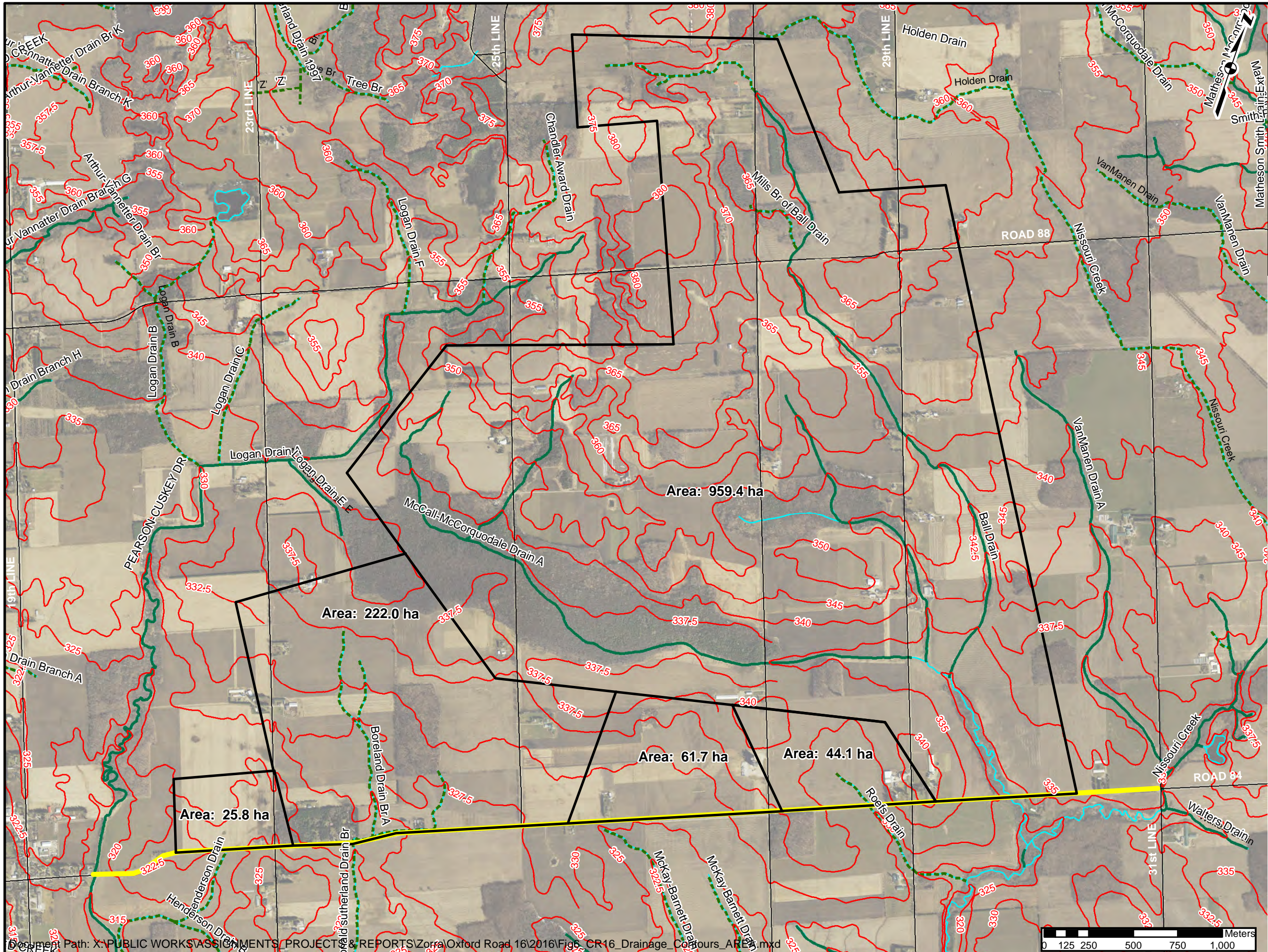
Stn: To:

Contract No:

Dwg No:



Figure 6: Assumed 'Surface' Drainage Areas



LEGEND

- Contours
- Open Drains
- - - Closed/Tiled Drains
- Waterways
- Study Area

**Oxford Road 16
(Road 84)
Class EA**

Figure 6

**Assumed Drainage
Areas Map Derived
from Existing Contour
Drawings**



Project / Contract Number

Scale: As Shown

Date: June 16, 2016

Prepared By: LM

