

Prepared By:



Bruce County Road 33 Re-Alignment - Project File

Schedule B Municipal Class Environmental Assessment

GMBP File: 217127

April, 2018



Be an explorer.



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SCHEDULE B MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

BRUCE COUNTY ROAD 33 RE-ALIGNMENT - PROJECT FILE

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1. INTRODUCTION

The County of Bruce (County), as the proponent, is the operating authority for Bruce Roads 25 and 33 (BR25 & BR33) in the central area of the Town of Saugeen Shores (Town). The County has identified that surface asphalt and drainage deficiencies exist with each road and that, prior to undertaking minor repairs and in consideration of future plans, a comprehensive review of road and drainage systems within a broader context and Study Area was in order. The Town, as a principle partner in this undertaking, has identified future developments, which would extend three streets southerly to new intersections with BR25. One of those streets, Bruce Street, is intended as a collector road, which would parallel Goderich Street (Highway 21) from BR25 in the south to Concession Road 10 in the north.

In September, 2015, the County initiated a Master Plan study, under the Municipal Class Environmental Assessment (EA) process, appropriately to plan various road and drainage undertakings within the Study Area in a comprehensive manner. The intention of the Master Plan is to establish an overall context and to assist with the planning of individual projects toward an appropriate overall development strategy within the Study Area. The **Notice of Study Completion for the Master Plan, issued May 9, 2017**, identified the re-alignment of BR33 to intersect with BR25 at the future Bruce Street alignment as a Schedule B project, which may proceed, following an EA process, using the Master Plan as a basis.

The purpose of this Project File is to document a Schedule B EA process to verify the direction envisioned in the Master Plan and to document the *Preferred Solution* for the BR33 re-alignment, as outlined on **Figure 1**.

This Project File is updated from the original Project File, dated November, 2017, to include not only the original description of the project and its purpose, existing conditions, the range of alternative solutions considered, anticipated environmental effects and proposed mitigation, the assessment and evaluation of alternative solutions, but also to include consideration of comments received through the process, and the rationale for the selection of the *Preferred Solution* by County Council.

2. MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT PLANNING PROCESS

Municipal infrastructure projects are subject to the Ontario Environmental Assessment Act (EA Act). The Class Environmental Assessment (Class EA) is an approved self-assessment process under the EA Act for a specific group or “class” of projects. Projects are considered approved subject to compliance with an approved Class EA process. The Municipal Class EA (Municipal Engineers Association October 2000, as amended in 2007, 2011 and 2015) applies to municipal infrastructure projects including roads, water and wastewater.

The Municipal Class EA outlines a comprehensive planning process (illustrated in **Figure 2**) that provides a rational approach to consider the environmental and technical advantages and disadvantages of alternatives and their trade-offs in order to determine a preferred alternative for addressing the problem (or opportunity), as well as consultation with agencies, directly affected stakeholders and the public throughout the process. The key principles of successful environmental assessment planning include:

- Consultation;
- Consideration of a reasonable range of alternatives;
- Consideration of effects on natural, social, cultural, and economic environments and technical components;
- Systematic evaluation;
- Clear documentation; and
- Traceable decision making.

The classification of projects and activities under the Municipal Class EA is as follows:

Schedule A: Includes normal or emergency operational and maintenance activities, which are limited in scale and have minimal adverse environmental effects. These undertakings are pre-approved and the proponent can proceed without further assessment and approval.

Schedule A+: Introduced in 2007, these minor projects are pre-approved. The public is to be advised prior to the implementation of the project.

Schedule B: Includes projects which have the potential for adverse environmental effects. This includes improvements and minor expansions of existing facilities. These projects are approved subject to a screening process which includes consulting with stakeholders who may be directly affected and relevant review agencies.

Schedule C: Includes the construction of new facilities and major expansions to existing facilities. These undertakings have the potential for significant environmental effects and must proceed under the planning and documentation procedures outlined in the Municipal Class EA document.

The Schedule ‘B’ process, is in accordance with the requirements of the Municipal Class EA process and includes Phases 1 and 2, depicted on **Figure 2**:

- Phase 1 consists of identifying the problem or opportunity, and optional (discretionary) public consultation if deemed suitable.
- Phase 2 involves identifying reasonable alternatives to the problem or opportunity, compiling an inventory of the natural, social and economic environment, evaluating each alternative and recommending a preferred alternative that will address the problem, and provide any measures necessary to mitigate potential environmental impacts. Public and agency consultation is required at this stage before the preferred solution is selected to ensure all possible impacts are identified, and assessed, as part of the evaluation process.

For Schedule B projects, the preferred solution is selected and confirmed by Council, the entire process is documented in a Project File report that is made available for public review during a 30-calendar day period. A Notice of Completion is submitted to review agencies and the public at this time.

For Schedule B projects, if concerns are raised during the 30 calendar-day review period that cannot be resolved through discussions with the Municipality, then members of the public, interested groups or technical agencies may request the Minister of the Environment and Climate Change to issue a Part II Order for the project, thereby requiring an elevated scope of study. A Part II Order request requires submission of a written request to the Minister of the Environment and Climate Change, prior to the end of the 30-calendar day review period, outlining the unresolved issue and requesting the Minister to review the matter.

Part II Order requests are submitted to:

Minister
Ministry of the Environment and Climate Change
77 Wellesley St. W., Floor 11
Toronto, ON M7A 2T5
Fax: 416-314-8452
Email: minister.moecc@ontario.ca

Copies of the request must also be sent to the Director of the Environmental Approvals Branch at the MOECC and the County of Bruce at the addresses below:

Director, Environmental Approvals Branch
Ministry of the Environment and Climate Change
135 St. Clair Avenue W, 1st Floor
Toronto, ON M4V 1L5
EAASIBgen@ontario.ca

County of Bruce
Attn: Kerri Meier – Env. Coordinator
PO Box 398, 30 Park Street,
Walkerton, ON N0G 2G0
kmeier@brucecounty.on.ca

The decision whether or not a Part II Order is appropriate or necessary rests with the Minister of the Environment and Climate Change. If no Part II Order request is outstanding by the end of the 30-calendar day review period, the project is considered to have met the requirements of the Class EA, and the Municipality may proceed to design and construct the project subject to resolving any commitments documented in this Project File during the subsequent design phases and obtaining any other outstanding environmental approvals.

For further information regarding Part II Order requests and process, please refer to:

<https://www.ontario.ca/environment-and-energy/class-environmental-assessments-part-ii-order>

3. BACKGROUND

BR25 is a two lane rural road section, which extends from a signalized intersection at Goderich Street westerly to Lake Huron. The existing BR33 (Lake Range Road) is also a two lane rural road section, which extends from a stop-controlled “tee” intersection with BR25, southerly beyond the limits of the Study Area. BR33 was previously up-loaded from the Town to the County and is used by many residents of the Town to access the neighbouring Bruce Power site. Currently, the road surfaces are in a deteriorated condition, with maintenance scheduled within the County’s 5-year plan. The “tee” intersection of Lake Range Road with BR25 is located near the top of a bluff, and sight lines do not meet current design criteria for a secondary highway, although the intersection is adequate for local road service.

The County considers that current traffic volumes would justify neither a need for additional lanes nor an urbanized cross section on either of BR25 or BR33. However, the Town’s Local Official Plan identifies future residential lands uses in the area, which would extend Stickel Street, Bruce Street, and Ridge Street southerly to intersect with BR25. The Town’s Local Official Plan further considers the future extension of Bruce Street northerly through the former Town of Port Elgin (from BR25 northerly to Concession Road 10), as a secondary major traffic route parallel to Goderich Street (Highway 21 Connecting Link). Consequently, there could be a change in traffic flow patterns and a significant impact on the traffic volume on BR25, between BR33 and Goderich Street, which may require additional lanes and/or traffic signals. Further, the Town is planning to extend water and sanitary sewer services, and to create an urban cross section along BR25. The ultimate cross section needs to be planned appropriately, in consideration of potential future lane requirements and a multi-purpose recreational path planned by the Town along the BR25 corridor.

The County as proponent, with the Town as a principle partner, completed a Master Plan for Roads and Drainage to establish appropriate direction for this infrastructure within the broader Study Area. The Master Plan process followed Phases 1 and 2 of the project planning process as outlined in the Municipal Class Environmental Assessment Manual, prepared by the Municipal Engineers Association (2015). The Master Plan process included a Phase 1 “Discretionary” public consultation, a Phase 2 “Mandatory” public consultation and a “Mandatory” **Notice of Completion (May 2017)**. Copies of these Notices are provided in **Appendix “A”**. Additional consultation information during the Master Plan process is provided in the Master Plan documentation, available on the County’s and Town’s websites, and at the Town municipal office.

The Master Plan documentation includes much of the supporting information for this BR33 re-alignment Schedule B EA process. A summary of the Preferred Set of Alternative Solutions including a preferred BR33 re-alignment is provided in **Figure 3**. Additional information in support of this Schedule B EA process is provided herein.

A Bruce County Committee Report, dated February 15, 2018, provided in **Appendix “C”**, includes a summary of the Master Plan results and an intended implementation schedule for individual projects identified within the Master Plan. The intended implementation schedule is summarized as follows:

Phase 1 – Schedule A (2019): Bruce Road 25 – Trunk storm sewer from Lake Ridge Estates to Lake Huron, including a full urbanized road section from Shipley Avenue to Saugeen Beach Road.

Phase 2 – Schedule A (2019): Two lane urbanized road section from Shipley Avenue to Bruce Street, including the local storm sewer.

Phase 3 – Schedule B (2020): Four lane urbanized cross section from Bruce Street to Goderich Street, including municipal services.

Phase 4 – Schedule B (2021): Construction of the new Bruce Road 33 realignment and rehabilitation of current Bruce Road 33 (new Lake Range Road).

A “Phase 5” may also be considered separately by the Town to include installation of a storm sewer system within the Baker Subdivision, to coincide with sanitary sewer and pumping station installation, at a yet to be determined date.

4. PROBLEM / OPPORTUNITY – PROJECT STATEMENT

The County has identified a need to advance specific project planning for the re-alignment of BR33, as identified in the Master Plan for Roads and Drainage (2017). The basic intentions of this project are outlined in the Master Plan.

The Schedule B EA planning process is project specific but follows the same process as for the more general Master Plan. Considering the significant degree of overlap between the Master Plan and this specific Schedule B EA, the following Project Statement is adapted from the Master Plan for this project specific Schedule B EA process.

The Project Statement for this Schedule B EA is as follows:

“The proponent intends to plan safe and efficient road infrastructure, and to support the Town’s transportation initiatives with regard to planned development, within the settlement area boundary, by advancing the preferred BR33 re-alignment initiative, as documented in the Master Plan for Roads and Drainage (May 2017).”

The County is, therefore, undertaking this Schedule B EA process under the Municipal Class Environmental Assessment to ensure that this project is planned appropriately, and to verify that the preferred solution identified in the more general Master Plan remains appropriate for this specific BR33 re-alignment initiative.

5. ALTERNATIVE SOLUTIONS – SCHEDULE “B” EA

The Master Plan considered the following alternative solutions for Roads:

- i) Do Nothing / Existing Conditions,
- ii) Intersection and Capacity Improvements on BR25,
- iii) Re-Align BR33 to Intersect BR25 at Future Bruce Street Intersection Location.

The BR33 re-alignment alternative was considered in the Master Plan as having the following environmental impacts:

Social

Usage of the Built Facility

- Maintenance of access to existing residences would remain. Driveway entrances and a connection of Baker Road to the new re-aligned BR33 would need to be resolved in the design phase.
- Land acquisition for additional right-of-way would be necessary for the BR33 re-alignment route.
- The design requirements and route selection for a re-aligned BR33 can accommodate preferences for the road to not cross noted properties.
- The design requirements and route selection for a re-aligned BR33 can avoid the the north westerly corner of an agricultural designation. A future review of the Town's Official Plan can re-consider this designation, as appropriate.
- Active transportation opportunities could be accommodated in this area, including an east/west multi-purpose trail along BR25, and provision for bicycles southerly along BR33.

Governance

- The County could divest the portion of BR25 from the planned BR33 intersection (at Bruce Street) westerly to Saugeen Beach Road to the Town.
- The County could divest the portion of BR33 (Lake Range Road) from BR25 southerly to the planned BR33 re-alignment location (at Baker Road) to the Town.

Cultural

- Once a BR33 route is selected, a Stage 2 archeological investigation for the subject lands should be completed to confirm there would be no effect on the Cultural environment, or if mitigation measures would be necessary.

Natural

- An EIS would be necessary to further inform the EA for the BR33 re-alignment, and to confirm there would be no effect on the natural environment, or if mitigation measures would be necessary.

Technical

- The existing intersection of BR25 and Lake Range Road would remain as a local road standard.
- Future traffic levels would be fully supported by the proposed lanes. A 4-lane urban cross section is considered preferable by both the Town and the County on BR25 between Goderich Street and Bruce Street, narrowing to a 2-lane urban cross section west of Bruce Street.
- Safety and efficiency of movement for the driving and pedestrian public would be accommodated as planned Town roads are extended from the north to BR25.

- Stop-controlled “Tee” intersections would be planned at each of the Stickel Street, Ridge Street and Lake Range Road intersections with BR25.
- A traffic signal is considered appropriate at the planned BR25 / BR33 intersection for pedestrian safety.
- Project constructability would follow conventional road construction processes.
- Generally, the design speed for a re-aligned BR33 would be 10 km/hr greater than the legal posted speed. There are several alignment options for BR33, but the minimum horizontal radius is 420 metres for a 100 km/hr design speed (80 km/hr posted speed), and 190 metres for a 70 km/hr design speed (50 km/hr posted speed); for normal cross fall. A 70 km/hr design speed would produce an alignment, which would avoid properties, the owners of which indicated a preference to not be impacted. Other alignment options are shown in **Figure No. 4**.
- The extension of Baker Road easterly to the re-aligned BR33 should be considered.
- The connection of Lake Range Road to the re-aligned BR33 should be considered.
- Maintenance issues would be typical.
- Planning and design for BR25, between Goderich Street and planned Bruce Street/ re-aligned BR33, would require a Schedule “B” EA. Construction of a new BR33 would require a Schedule “B” EA if less than \$2.4M.

Economic

- This alternative would be the most costly in terms of capital cost, but would mitigate long-term costs associated with traffic inefficiencies, which are difficult to quantify.

Upon evaluation of all Roads alternatives within the Master Plan, Alternative #3 – Re-alignment of BR33 to intersect BR25 at the future Bruce Street intersection location is the Preferred Roads Solution to the Master Plan. The Master Plan notes that additional background studies would be necessary fully to assess potential impacts on the Cultural and Natural environments. A summary of these additional studies is provided in **Section 6**.

The Master Plan also noted that a further Schedule B Environmental Assessment process would be necessary, appropriately to plan the BR33 project. Additional public and agency consultation is part of that process, which is documented in **Section 8**.

6. INVENTORY OF ENVIRONMENTS

6.1 Social Environment

The predominant Social issue related to the proposed BR33 re-alignment is impact to property. The County continues discussions with the directly affected land owners. At a Stakeholder’s meeting on October 25, 2017, all parties generally agreed with the project direction and approach to land purchase for the new right-of-way. An independent assessor will be retained by the County to establish fair market value for the proposed road allowance lands, for consideration by the land owners.

6.2 Natural Environment

A Species at Risk (SAR) study was completed by AWS Environmental Consulting Inc. (July 2017) to establish presence or absence of SAR within the proposed road allowance. The report concludes that, since the lands are currently cultivated, the potential for SAR species is low. Should the land use change from active cultivation to fallow prior to road construction, then an updated SAR review may be necessary to support the construction phase. The County is considering arrangements with land owners to continue to cultivate the road allowance lands until the road is built. A copy of the Species at Risk report is provided in **Appendix "B"**.

Recent amendments to the MEA Class EA require proponents to consider whether or not the project is located within a Source Water Protection Vulnerable Area and, if so, to document whether or not any project activities are a prescribed drinking water threat. The Source Water Protection Area for the Saugeen Shores drinking water system is provided in **Figure 5**. The area is around the water intake for the Southampton Water Treatment Plant. The Study Area is beyond the vulnerable area mapping.

The natural environment also includes potential impacts of the project on Climate Change, and of Climate Change on the project. The project intends to reduce travel time and improve traffic safety, which would result in reduced greenhouse gas emissions relative to a "Do Nothing" alternative. The proposed BR33 re-alignment is across lands, which currently are cropped. In consideration of public comments received, the proponent has committed to a landscaping plan that will introduce trees along the new alignment to provide shade and snow screening.

6.3 Cultural Environment

6.3.1 Archaeology

A Stage 1 & 2 Archeological Assessment was completed by Scarlett Janusas Archaeology Inc. (June 2017). A copy of that report is provided in **Appendix "B"**. The report generally concludes that no additional assessment is required for the subject lands. The archaeological assessment was conducted under the 2011 Standards and Guidelines for Consultant Archaeologists (Ministry of Tourism, Culture and Sport (MTCS), 2011). In a letter dated June 30, 2017, MTCS confirmed the entry of the Stage 1 Assessment Report into the Ontario Public Register of Archaeological Reports (Master Plan **Appendix "B"**).

The need for a Cultural Heritage assessment was screened out using the MTCS screening tool, as provided in **Appendix "B"**.

6.4 Technical Environment

6.4.1 Traffic Studies

Traffic studies are referenced in the Master Plan for Roads and Drainage.

6.4.2 Road Design Parameters

The following are the basic road design parameters:

- i) Minimum Travelled Lane Width = 3.5m
- ii) Minimum Shoulder Width = 1.0m
- iii) Minimum Available Horizontal Curve Radius = 310.0m
- iv) Right-of-way Width: 30 metres

Detailed road design would be prepared during the design phase of the project, using MTO and/or TAC design parameters.

6.4.3 Geotechnical / Environmental Screening

Field work for the geotechnical investigation was completed during the week of November 20th, 2017, following crop removal. Borehole data was referenced to confirm sub-surface soil and groundwater conditions. No geotechnical or environmental issues were identified that would affect the proposed construction. The geotechnical report is provided in **Appendix "B"**.

6.4.4 Surface Water Management Planning

The intended BR33 re-alignment will introduce a new impervious surface to a currently pervious area, which will increase the rate of runoff from that surface. Further, runoff from road surfaces may contain contaminants, which could adversely affect the natural environment. A preliminary stormwater management report was prepared, which describes generally how stormwater quantity and quality will be addressed with the construction of BR33. The proposed BR33 alignment would cross a drainage divide, which separates drainage northerly to BR25 and drainage southerly to Baker Road. The basis for drainage planning is to maintain surface drainage within the originating catchment area, as resolved through the Master Plan process.

Drainage northerly is proposed to be collected in the planned BR25 storm sewer system, which is intended to be constructed as Phase 1 of the Master Plan implementation schedule. The design of the BR25 storm sewer includes provisions for runoff quantity and quality from the northerly catchment area along re-aligned BR33. The BR25 storm sewer project is being advanced under a Schedule A EA process (pre-approved under the EAA). The project is currently in the design phase. The preliminary design has been reviewed by the County, Town, SVCA and MOECC. Detailed design is advancing with construction currently planned to begin in Spring 2019. Any design details which evolve from the Phase 1 design of BR25 would, therefore, be incorporated into the Phase 4 detailed design of BR33, prior to its construction, such that no additional changes would be required to BR25.

Drainage southerly along re-aligned BR33 is intended to be directed to a new SWM pond about the intersection of re-aligned BR33 and Baker Road. At this planning stage, the conceptual design considers a volume of storage required and land area requirements sufficiently to accommodate the SWM facility. Detailed design of the SWM facility would advance as the BR33 re-alignment project moves to construction as Phase 4 in the Master Plan implementation schedule. Since right-of-way lands would be acquired for the BR33 re-alignment under this Schedule B EA process, implementation of the proposed SWM Pond would proceed as a Schedule A EA activity as long as no additional property is required.

The preliminary stormwater management report is provided in **Appendix "B"**.

6.4.5 Water and Sanitary Sewer Service Planning

The Town is considering pre-servicing with watermain and sanitary sewer along the new BR33 re-alignment to support Planned Development lands along the route. Since BR33 may be constructed in advance of land development activities, the Town is considering front-ending, and later recovering those servicing costs from the developers, when the lands are developed.

The watermain could complete a loop connection from the BR25 / BR33 intersection to the BR33 / Lake Range Road intersection; tying into the existing watermain on Lake Range Road at Baker Road. Based on the Master Servicing plan, a 250 mm diameter watermain is planned.

Sanitary sewers could service two separate catchments.

- One sewer would achieve gravity drainage from about Sta. 0+260 northerly along BR33 to a planned gravity sewer on BR25, then westerly on BR25 to a planned northerly connection along Ridge Street to existing. This sewer would provide service to lands within the easterly portion of Lot 29, south of BR25.

- South and west of Sta. 0+260, the land is too low to achieve gravity drainage northerly and, therefore, a second planned sanitary sewer would drain southwesterly along re-aligned BR33 to Lake Range Road; ultimately to drain to a pumping station below the bluff. Based on the Master Servicing Plan, 200mmØ to 250 mmØ sewers are planned. Actual sewer sizing will be resolved during the detailed design phase for BR33.

6.5 Economic Environment

The Master Plan identified the re-alignment of BR33 as the most costly road alternative in terms of capital cost, but would mitigate long-term costs associated with traffic inefficiencies, which are difficult to quantify. The County and Town have considered cost sharing and budgets to address the project costs.

A preliminary project construction cost is provided in **Appendix "B"**. Meeting Minutes, dated August 11, 2017 outline intended project cost sharing between the County and the Town for various projects outlined in the Master Plan, including for the planned BR33 re-alignment.

Additional project costs for land acquisition, Ontario Land Survey, easement registration, utility relocation, HST and other professional fees are not included in the estimated construction cost.

7. IMPACT, ASSESSMENT AND EVALUATION OF ALTERNATIVES

The Master Plan process identified and evaluated alternative solutions, with the re-alignment of BR33 confirmed as the Preferred Solution. Additional background studies were completed to address project specific requirements in support of this Schedule B EA process. None of the additional background studies identifies potential impacts that would alter the assessment or evaluation of the re-alignment alternative.

8. CONSULTATION

Consultation early in and throughout the process is a key feature of environmental assessment planning. The Schedule B Municipal Class EA process has two mandatory points of contact; the Notice of Project Initiation (Consultation – Phase 2) and the Notice of Completion.

8.1 Master Plan Notifications

The Master Plan process included a Notice of Project Initiation, dated September 22, 2015, followed by a Discretionary Public Information Centre, held on October 7, 2015. A Phase 2 Public Information Centre was advertised on May 2, 2016, and was held on May 18, 2016. A Notice of Completion for the Master Plan process was issued May 9, 2017.

8.2 Notice of Project Initiation: Schedule “B” EA

A Notice of Project Initiation was prepared and first issued on January 9, 2018. The Notice was advertised in the Shoreline Beacon Newspaper on January 9, 2018 and January 16, 2018.

The Notice was also mailed to directly affected property owners within the Study Area, as well as to individuals engaged in previous project planning, on January 9, 2018. A copy of the Notice and a Figure outlining the Notification Area is provided in **Appendix “A”**.

The Notice of Project Initiation invites the Public, Agency groups and First Nation groups to review the Project File and to comment on the Recommended Solution.

Upon receipt of comments, any new information is incorporated into the review and assessment of alternatives. The Project File is updated and a Preferred Solution is presented for consideration and acceptance by Council.

The Notice of Completion is issued following acceptance by Council. The Notice of Completion initiates a 30-day review period, during which time the Minister may be requested to issue a Part II Order to the municipality to complete further study, as outlined in **Section 2**.

8.3 First Nations Consultation

First Nations groups were contacted during the Master Plan process and during this Schedule B EA process. Documentation of the correspondence provided is included in **Appendix “C”**. No response was received from any of the First Nation groups circulated with the initial Project File.

8.4 Public and Stakeholder Consultation

Public Feedback Received Prior to Commencement of the Class EA

Public feedback received prior to commencement of the Class EA process is documented in the Master Plan Report.

Public Feedback Received During this Process

With the circulation of the previous version of this Schedule B EA Project File, the public was invited to provide comments regarding the Recommended Solution for Bruce Road 33. Comments received from the public are documented in **Appendix “C”**, and are summarized below in **Table 2**. Upon receipt and review of all comments, the review of alternatives is re-visited and any new information is incorporated into the assessment of the *Recommended Preferred Solution*, for consideration and acceptance by County Council.

TABLE 2 – Summary of Public Comments Received

	Comment / Issue	Response / Discussion	Action / Commitment
1	Consider the need for Baker Road to connect with the re-aligned BR33	This connection is included in the Town's Local Official Plan.	A tee intersection is intended to be included in the design of the BR33 project, with stop-control.
2	Consider a roundabout (traffic circle) at the intersection of BR25 and re-aligned BR33	The Master Plan considered an ultimate 4-way intersection with traffic signal control as "preferred" due to an expected high volume of both vehicular and pedestrian traffic, specifically across the north leg (Bruce Street) of that intersection. It is anticipated that the extension of Bruce Street southerly to BR25 may not occur within the foreseeable future. Therefore, the Project Team recommends that this issue be re-visited at the time the 4-way intersection is to be completed. A south bound stop-controlled tee intersection would be appropriate until that time.	Re-consider the ultimate 4-way intersection at BR25 and Bruce Street/BR33, when Bruce Street is constructed. A north bound stop-controlled tee intersection would be appropriate, on BR33 until Bruce Street is constructed.
3	Governance (Who will own the roads)	The Project File indicates that BR25 west of Bruce Street to Saugeen Beach Road, and BR33 south of BR25 to Baker Road would be divested from the County to the Town.	Project implementation
4	Consider landscaping along re-aligned BR33, including for winter safety	The County is planning to permit landowners to continue to crop through the road allowance, once established, until the road is built. Timing for tree planting will need to be resolved with the landowners but the importance of starting early to promote tree growth as a snow screen is acknowledged.	A landscape plan will be prepared in the project design phase.
5	Consider drainage and stormwater management	The direction for area drainage was resolved through the Master Plan process. Details of the drainage and stormwater management design will be resolved with the regulatory agencies through the design process. The direction of the Master Plan is to maintain flows within the originating catchment areas.	Generally, follow Master Plan and implementation Phasing. Specifically, develop details during the design phase.
6	Consider future land use planning on remnant parcels	The Town has had a long range focus that Bruce Street might be extended through the property north of BR25 and would offer a 'collector' road parallel to Highway 21. Remnant parcels might be developed in a variety of manners some of which might require planning applications to change OP's and zoning. Lots 28 and 29 are owned by the same individual. There may be an opportunity to look in the future if there is potential for an urban area expansion. The development community may have innovative ideas for land use on their lands.	Land use will be reviewed under individual Planning Act applications.

	Comment / Issue	Response / Discussion	Action / Commitment
		The road geometry is based on a design speed approaching 90 kph in order to thread the needle of constraints. At this time we expect the posted speed to be 60 kph. This may allow flexibility concerning the location of side roads. For lands north of BR25, the local official plan and current draft approved plans clearly imply the collector nature of Bruce Street.	
7	Consider alternate intersection location at Ridge Street at BR25	The Bruce Street intersection location is identified in the Town's Official Plan. Bruce Street is the intended collector road through Port Elgin and traffic planning is in keeping with development plans currently underway for lands north of BR25.	Follow direction of Master Plan
8	Reconsider Speed Limit on re-aligned BR33	The planned BR33 alignment would accommodate a "design speed" of 90 km/hr. The County plans to provide a "posted speed" of 60 km/hr	Provide a "posted speed" of 60 km/hr.
9	Driveway re-alignments	The County will be contacting affected landowners as the design process evolves.	County to discuss with landowners.
10	Provision of bike lanes on BR33	The County intends to provide a widened paved surface (2 x 4m lanes) on BR33, to accommodate cyclists. A formal bike lane is not intended.	Provide sufficient paved lane width to accommodate cyclists.
11	Provision of Municipal Services	Water and sanitary sewer services are identified in the Towns Master Plan for these services. The Town intends to install these services with the construction of BR33 to service Planned Development lands.	Water and sewer servicing design will be included in the BR33 project design phase.

Stakeholder Feedback Received During this Process

A Stakeholder meeting was held on October 25, 2017. The purpose of the Stakeholder meeting was to update Stakeholders regarding project planning, land purchase considerations, and to provide opportunity to raise any questions regarding the project direction and the process moving forward.

8.5 Agency Consultation

Agencies with a regulatory role that may require future permits/approvals, or may have a direct interest in the study, were contacted during the process to invite feedback. The previous version of this Schedule B EA Project File was circulated to selected key agencies/groups on January 9th, 2018 to solicit agency comments and feedback, to be incorporated into the assessment of the *Recommended Preferred Solution* for consideration and acceptance by County Council.

A complete List of Agencies contacted is provided in **Appendix "C"**, but they include the following:

- Saugeen Valley Conservation Authority (SVCA)
- Ministry of the Environment and Climate Change
- Utilities

Comments received from the agency groups are provided in **Appendix “C”** and are summarized below in **Table 3**.

TABLE 3 – Summary of Agency Comments Received

Agency	Comment	Discussion
SVCA	<ul style="list-style-type: none"> • Review larger runoff events • BR25 drainage interaction • Water quality provisions • Design details 	<ul style="list-style-type: none"> • The Project Team met with SVCA staff to discuss preliminary comments received, the Master Plan and the intended implementation Phasing. The SVCA was generally satisfied with the direction for BR25 and with the planning level of effort for BR33. Additional surface water management details will be developed through a subsequent design phase for the BR33 project. • A permit application will be prepared as necessary at the design phase.
MOECC	<ul style="list-style-type: none"> • Noted: "...the failure to comply with the Environmental Assessment Act, the provisions of the Class EA, and failure to implement the Project in the manner described in the planning documents, are contraventions of the act..." • Noted: MOECC "... don't have any surface water concerns about the conceptual design of the stormwater outlet structure at the beach – a headwall/plunge pool feature." 	<ul style="list-style-type: none"> • The County intends to implement the direction of the Master Plan in Phases. • The BR25 storm sewer is intended to be constructed as Phase 1 of the Master Plan implementation plan, and will receive runoff from the northerly end of re-aligned BR33, when it is built as Phase 4.
Utilities	<ul style="list-style-type: none"> • No comments further to the Master Plan were received. 	<ul style="list-style-type: none"> • Utilities will be contacted at the design stage.

8.6 Summary of Consultation

This Schedule B EA process intends to address the problem statement, which relates to the potential re-alignment of BR33 as envisioned and documented in the Master Plan. The process included the completion of additional background studies to better inform the process, the preparation of a Project File to document the process, and the issuing of a Notice of Project Initiation to invite comments from the public, with regard to the subject project statement.

Several comments were received through this BR33 Re-Alignment - Schedule B EA process, which relate to a drainage solution along BR25. The BR25 drainage solution is considered a separate project since it intends to address a separate problem and project statement. Comments received during this BR33 process, which relate to the BR25 project, are documented under separate cover.

Based on the comments received, and discussions provided in Tables 1, 2, and 3 above, no new information was received through the process that would suggest a change to the direction of the Master Plan.

9. RECOMMENDED PREFERRED SOLUTION

Based on the identified Project Statement, the process completed for the Master Plan for Roads and Drainage, and this Schedule B EA process, the Recommended Preferred Solution is Alternative #3; to Re-Align BR33 to Intersect BR25 at Future Bruce Street Intersection Location.

Remaining issues identified through the Schedule B EA process, which are to be addressed during the design process include the following:

- i) Provide a stop-controlled tee intersection on Baker Road at BR33
- ii) Re-consider the ultimate 4-way arrangement of the BR25 and BR33/Bruce Street intersection when Bruce Street is constructed. Including roundabout analysis.
- iii) Provide a landscaping plan at the design phase
- iv) Provide SWM details at the design phase, generally to follow the Master Plan.
- v) Provide a "posted speed" of 60 km/hr.
- vi) County to discuss driveway re-alignments with affected landowners.
- vii) Provide sufficient paved lane width to accommodate cyclists.
- viii) Incorporate municipal water and sanitary sewer services into the project design.

A Transportation and Environmental Services Committee Report, dated April 19, 2018 recommended that the Preferred Solution be approved, which was carried by the Committee (**Appendix 'C'**).

10. NOTICE OF COMPLETION

The Notice of Completion is dated May 1, 2018. It was advertised in issues of the Shoreline Beacon newspaper and sent to members of the public, First Nations groups, and Agencies.

11. NEXT STEPS

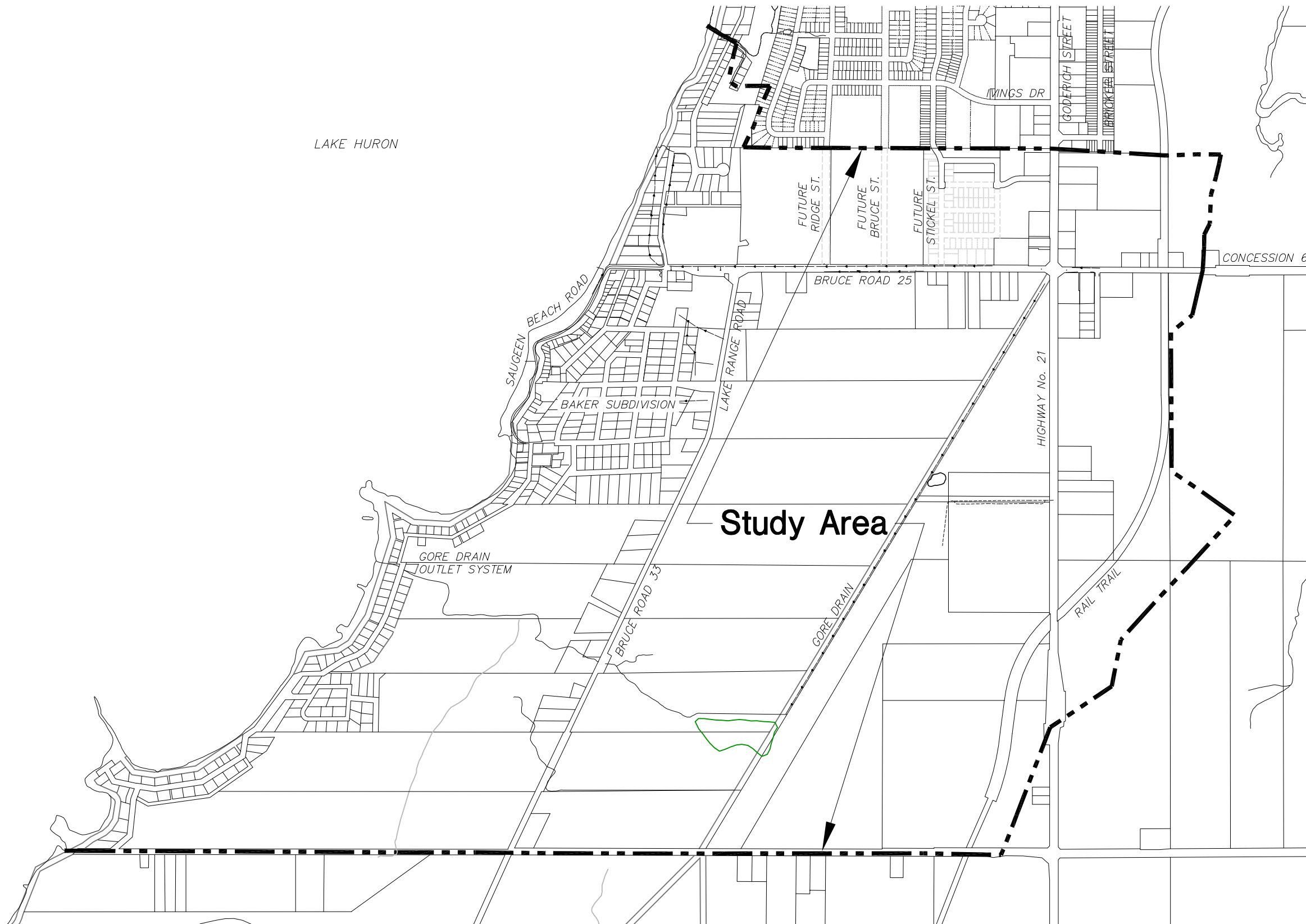
The next steps in this process are summarized as follows:

- i) Address 30-day public review period.
- ii) If a Part II Order request is not made during the 30-day public review period, the *Preferred Solution* to the Schedule B EA processes may proceed to design and construction.

All of which is respectfully submitted,
GM BLUEPLAN ENGINEERING LIMITED

FIGURES:

M-1552
Master Plan
Town of Saugeen Shores



NOT TO SCALE
JULY 2016

STUDY AREA

Figure No. 1

EXHIBIT A.2

MUNICIPAL CLASS EA PLANNING AND DESIGN PROCESS

NOTE: This flow chart is to be read in conjunction with Part A of the Municipal Class EA

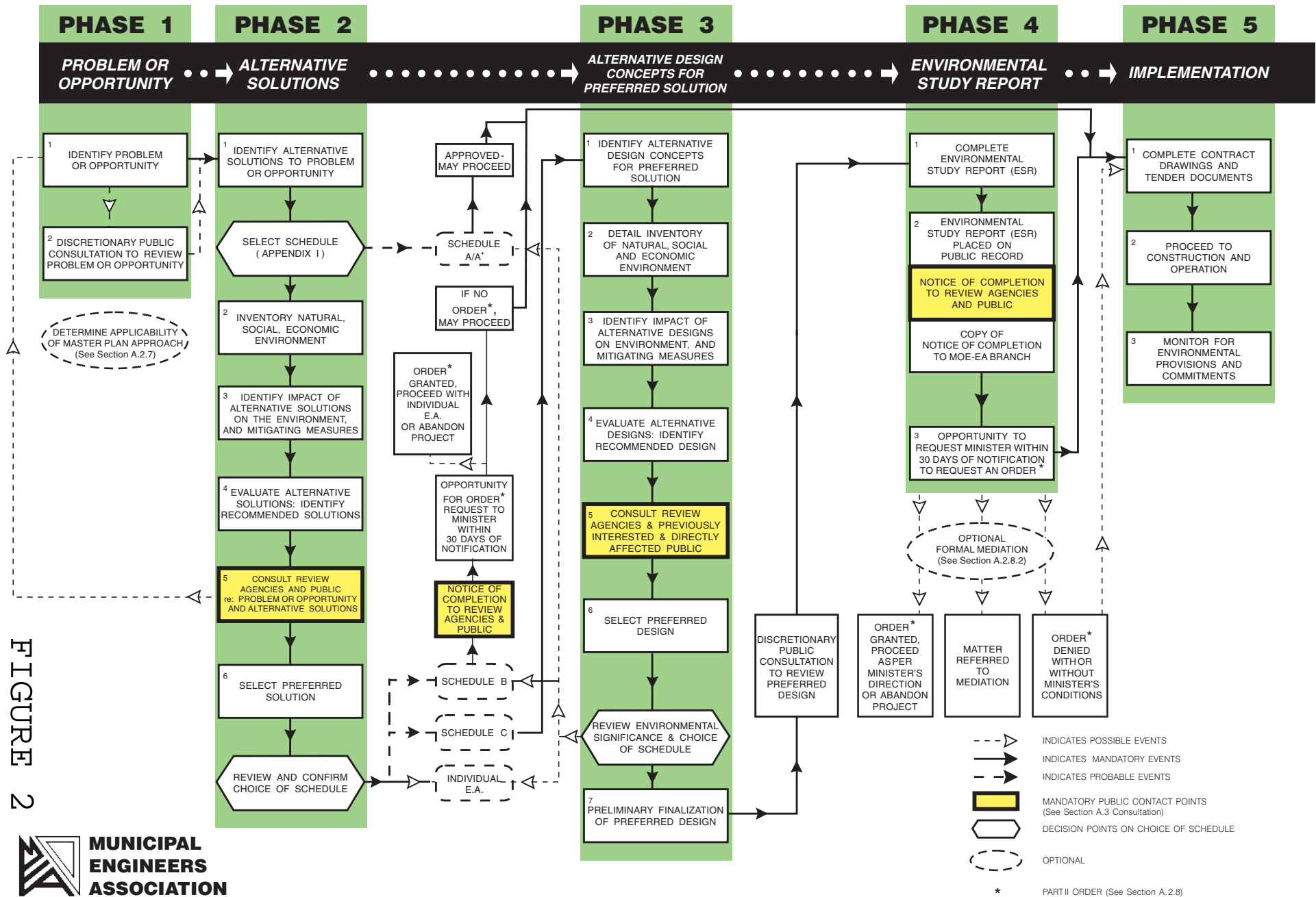
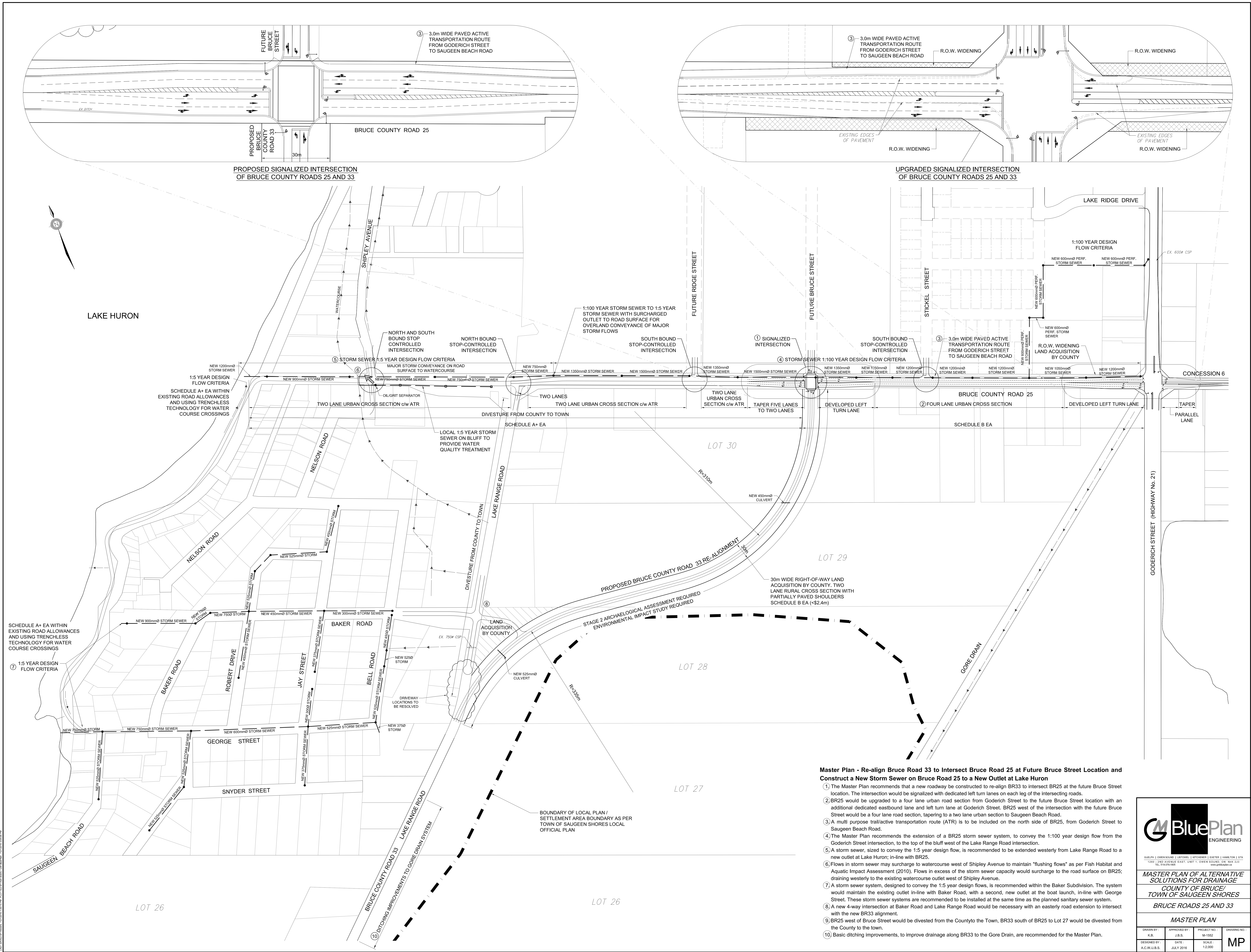
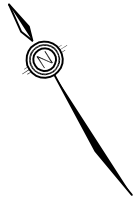


FIGURE 2



M-1552
Bruce County Road 25 Reconstruction
Town of Saugeen Shores



LEGEND

- 80 km/h POSTED SPEED LIMIT
- 60 km/h POSTED SPEED LIMIT
- 50 km/h POSTED SPEED LIMIT
- 80 km/h POSTED SPEED LIMIT
TRANSITIONING TO
50 km/h POSTED SPEED LIMIT

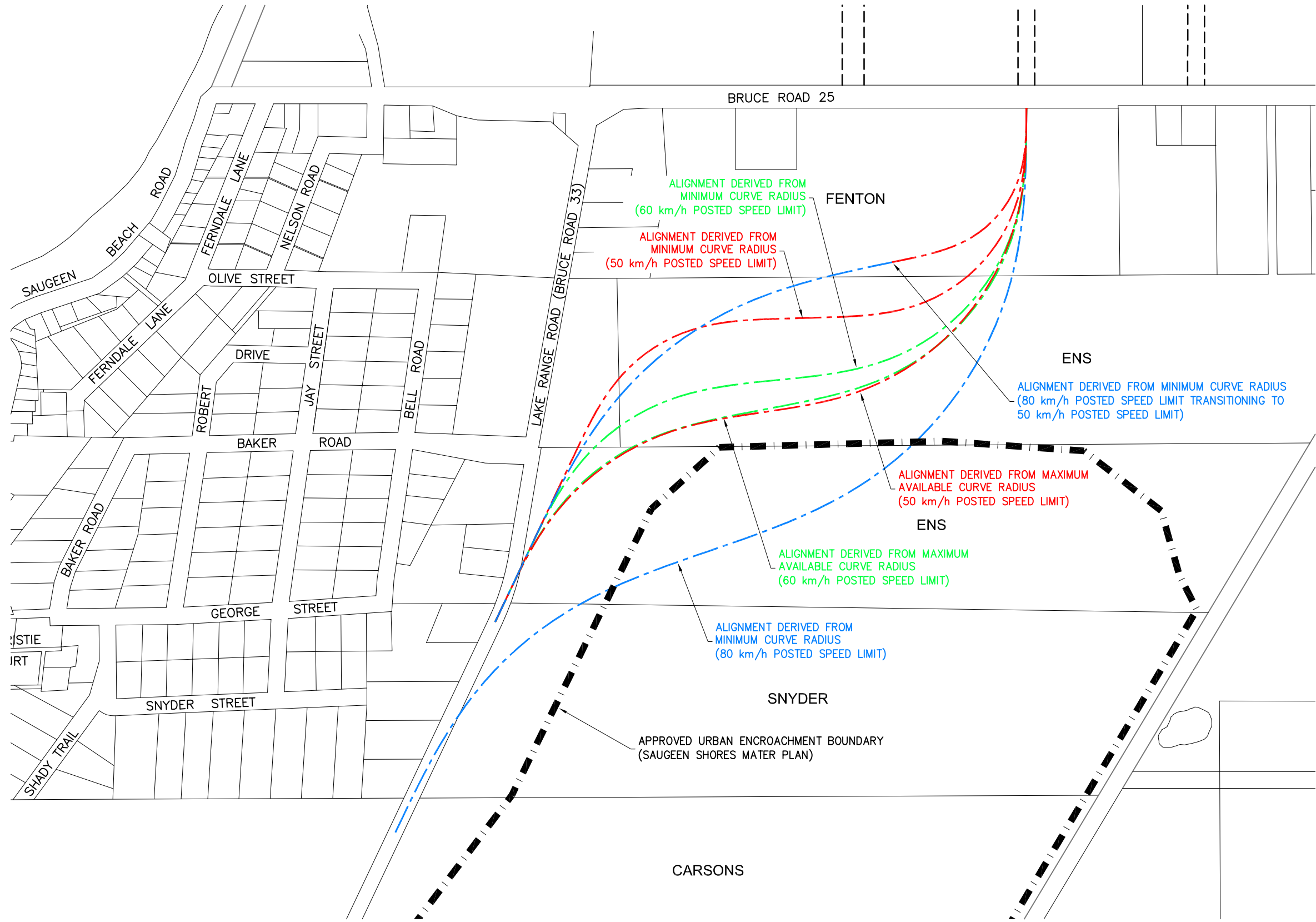
SCALE = 1:5,000
OCTOBER 2015

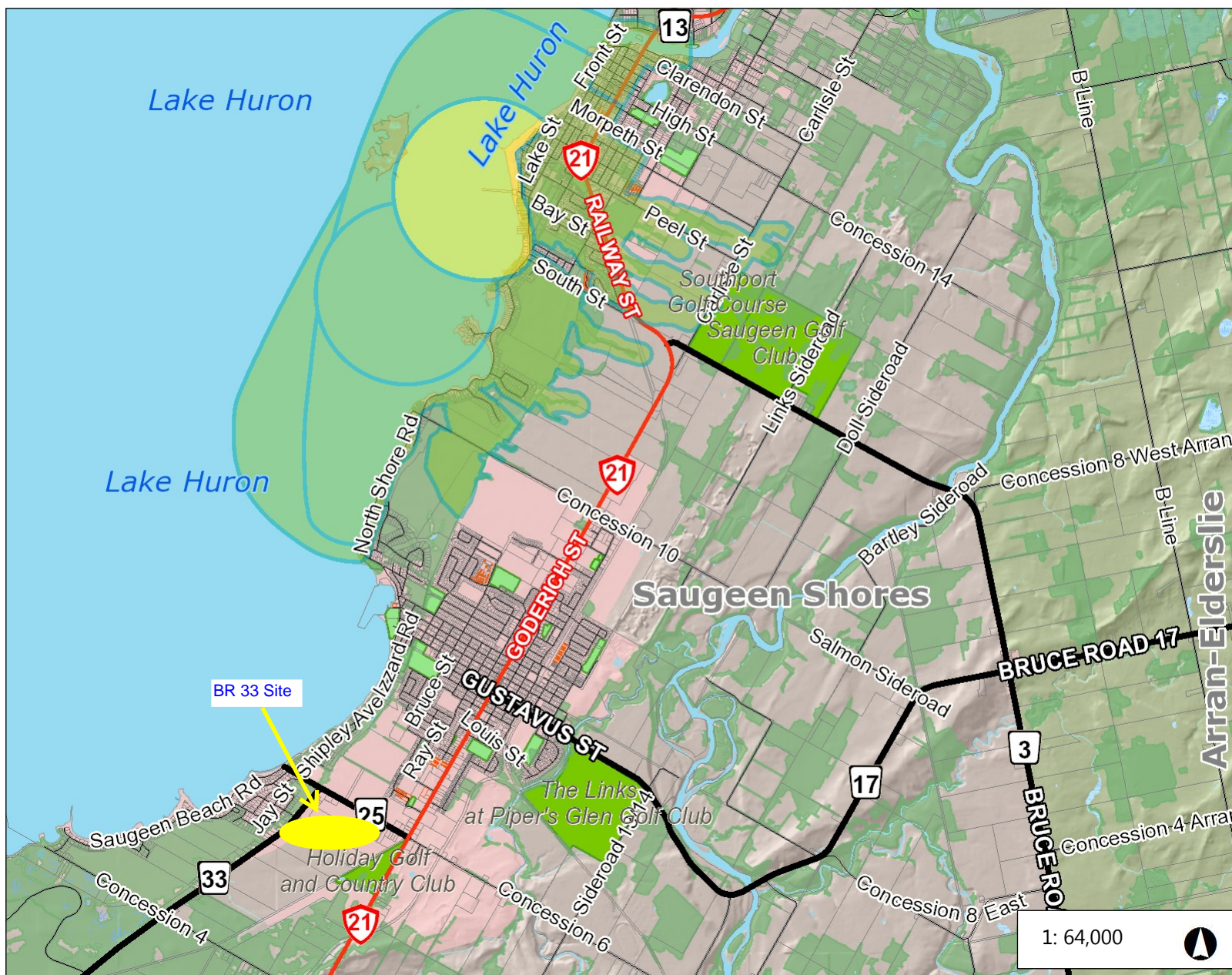
Bruce County Road 33
Realignment
Conceptual Alignment Layouts
for Varying Posted Speeds

Figure #1



FILE: \\os-2k8\users\private\winning\Documents\Drawings\M1552-CountyRd33.dwg LAYOUT: Layout1
LAST SAVED BY: Ewinning, 10/23/2015 12:10:35 PM PLOTTED BY: Ed Twining - GM BluePlan 10/23/2015 12:21:37 PM





Legend

Intake Protection Zone

- 4 - 5.9
- 6 - 7.9
- 8 - 9.9
- 10

Wellhead Protection Area Boundaries

- Zone A - 100m Buffer
- Zone B - 2 yr ToT
- Zone C - 10 yr ToT
- Zone D - 25 yr ToT

- Ferry
- Provincial Highway
- County Road
- Property Parcel
 - Assessment Parcel
 - Condominium Unit or Common Element
 - First Nation Parcel
- Body of Water
- Evaluated Wetland
- Fathom Five Boundary
- Fathom Five
- National Park Land Tenure
 - Parks Canada Owned or Managed
 - Park Unopened Road Allowance or
 - Private Land
- County Forest Boundary

1: 64,000



3.3 0 1.63 3.3 Kilometers

NAD_1983_UTM_Zone_17N
© 2018 County of Bruce

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Notes

Figure 5

APPENDIX A: NOTICES



**MASTER PLAN FOR ROADS AND DRAINAGE
BRUCE COUNTY ROADS 25 AND 33
NOTICE OF PROJECT INITIATION
DISCRETIONARY PUBLIC INFORMATION CENTRE**

The County of Bruce as Proponent, with the Town of Saugeen Shores, is studying road and drainage alternatives in the area of Bruce County Roads 25 and 33 (BR25 & BR33), located centrally in Saugeen Shores, and is inviting interested members of the public to attend an Information Centre.

The County has identified various deficiencies with its road and drainage infrastructure within the Study Area. Through initial discussions with the Town, other related issues having a broader scope have emerged which the County wishes to consider at a Master Planning level to ensure individual projects are completed in context with an appropriate overall plan. The purpose of the Discretionary Public Information Centre is to describe the identified issues within the Study Area and to receive input from the public on the issues as well as potential alternative solutions.

Issues related to roads include deteriorated travelled surfaces, poor sight lines at the intersection of BR25 and BR33, and planned future intersections at Stickel, Bruce and Ridge Streets. Preliminary Alternatives for Road Works include; Do Nothing but resurfacing, Re-align the BR33 intersection with the future Ridge Street intersection, or Re-align the BR33 intersection the with the future Bruce Street intersection.

Issues related to drainage include limited capacity along BR25, poor drainage through the Baker Subdivision, and inadequate drainage outlets within the Study Area. Preliminary Alternatives for Drainage works include; Do Nothing, Improve an outlet westerly on BR25 to Lake Huron, Divert flows from BR25 southerly along BR33 to a new constructed outlet westerly across Lot 26 to the existing Gore Drain outlet below Saugeen Beach Road, or Divert flows southerly along BR33 to the existing Gore Drain outlet below Lake Range Road (BR33)..

The Master Plan is being conducted under the **Municipal Class Environmental Assessment (EA)** project planning process and is intended to follow, as a minimum, Phases 1 and 2 of the EA Process, in support of Schedule B and/or Schedule C projects, which may be identified for implementation through the process.

As part of this process a Phase I – Discretionary **Public Information Centre** is planned at the Town of **Saugeen Shores Rotary Hall on October 7th, 2015 at 7:00 p.m. – 9:00 p.m.**, at which time project information will be displayed and the Project Team will be available for discussions.

The public is invited to provide written comments for incorporation into the planning considerations for this project. A future Public Information Centre, planned as part of the process, will be scheduled at a future date at which time a Problem / Opportunity Statement and Alternative Solutions will be more fully developed. Additional information is provided on the municipal web sites.

This Notice issued September 22nd, 2015.

The County of Bruce
Mr. Brian Knox, P.Eng.
Box 398, 30 Park St.
Walkerton, ON N0G 2V0
Tel: (519) 881-2400
www.brucecounty.on.ca

The Town of Saugeen Shores
Mr. Dave Burnside
600 Tomlinson Drive
P.O. Box 820
Port Elgin, ON N0H 2C0
Tel: (519) 832-2008
www.saugeenshores.ca

GM BluePlan Engineering Limited
Consulting Professional Engineers
Mr. John Slocombe, P.Eng.
1260 2nd Avenue East, Unit 1
Owen Sound, ON N4K 2J3
Tel: (519) 376-1805
www.gmbblueplan.ca



April 12, 2016
Our File: M-1552

Via Email: craig.newton@ontario.ca

Ministry of Environment and Climate Change
Southwestern Region
London Regional Office
733 Exeter Road, 2nd Floor
London, ON N6E 1L3

Attention: Mr. Craig Newton
Environmental Planner

Re: Bruce County Road 25 and 33
Master Plan for Roads and Drainage

Dear Mr. Newton,

The County of Bruce is embarking on a Master Planning process, as outlined in Approach #1 in the Municipal Class Environmental Assessment Planning Manual (MEA – Amended 2011).

Early stages of the process included the preparation of many background studies and several points of contact with potentially directly affected landowners. More recently, a Notice of Project Initiation was advertised (attached) and a Discretionary Phase 1 Public Information Centre (PIC) was held (October 7th, 2015 – Information Panels attached). A specific invitation was sent to the Saugeen Ojibway Nation (SON), offering a specific meeting to this First Nation Community, but no response was received.

Since that time, assessment tables and evaluation tables have been prepared for 3 Roads System and 7 Drainage System Alternatives.

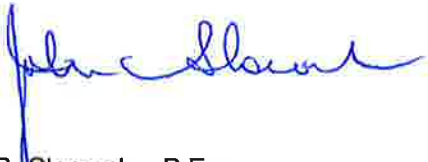
The intention is to host a Phase 2 PIC about mid-May, including an additional direct contact with SON, the Historic Saugeen Metis, and the Great Lakes Metis, after which the assessments and evaluations will be completed and the Master Plan documentation consolidated. The Master Plan will identify several individual projects, some of which will require additional detailed investigations to support Schedule 'B' or 'C' EA processes prior to project implementation. The Master Plan will be posted for a 30-day public review period prior to presentation to Council for approval.

We are forwarding this contact to the EAA Branch for early discussion purposes. We would appreciate any comments you may have.

Yours truly,

GM BLUEPLAN ENGINEERING LIMITED

Per:

A handwritten signature in blue ink, appearing to read 'John B. Slocombe'.

John B. Slocombe, P.Eng.

JBS/mz

Encl.

cc: Brian Knox, P.Eng., via Email – bknox@brucecounty.on.ca
Larry Allison, via Email – allisonl@saugeenshores.ca
Len Perdue, via Email – perduel@saugeenshores.ca
File No. M-1552



**MASTER PLAN FOR ROADS AND DRAINAGE
BRUCE COUNTY ROADS 25 AND 33
NOTICE OF PHASE 2
PUBLIC INFORMATION CENTRE**

The County of Bruce as Proponent, with the Town of Saugeen Shores, is studying road and drainage alternatives in the area of Bruce County Roads 25 and 33 (BR25 & BR33), located centrally in Saugeen Shores, and is inviting interested members of the public to attend an Information Centre.

The County has identified various deficiencies with its road and drainage infrastructure within the Study Area. Through initial discussions with the Town, other related issues having a broader scope have emerged which the County wishes to consider at a Master Planning level to ensure individual projects are completed in context with an appropriate overall plan. The purpose of the Phase 2 Public Information Centre is to describe the identified issues within the Study Area and to receive input from the public on the evaluation of alternative solutions to the identified problems.

Issues related to roads include deteriorated travelled surfaces, poor sight lines at the intersection of BR25 and BR33, and planned future intersections at Stickel, Bruce and Ridge Streets. Alternatives for Road Systems include; Do Nothing but resurfacing, Re-align the BR33 intersection with the future Ridge Street intersection, or Re-align the BR33 intersection the with the future Bruce Street intersection.

Issues related to drainage include limited capacity along BR25, poor drainage through the Baker Subdivision, and inadequate drainage outlets within the Study Area. Alternatives for Drainage systems include; Do Nothing, Improve Existing Conditions, Construct a new outlet westerly on BR25 to Lake Huron, Divert flows northerly to the existing South End Drain Outlet, Divert flows from BR25 southerly along BR33 to a new constructed outlet westerly through the Baker Subdivision, Divert flows from BR25 southerly along BR33 to a new constructed outlet across Lot 26 to the existing Gore Drain outlet below Saugeen Beach Road, or Divert flows southerly along BR33 to the existing Gore Drain outlet below Lake Range Road (BR33).

The Master Plan is being conducted under the **Municipal Class Environmental Assessment (EA)** project planning process and is intended to follow, as a minimum, Phases 1 and 2 of the EA Process, in support of Schedule B and/or Schedule C projects, which may be identified for further study and implementation through the process.

As part of this process a Phase 2 **Public Information Centre** is planned at the Town of **Saugeen Shores Rotary Hall on Wednesday, May 18th, 2016 at 7:00 p.m. – 9:00 p.m.**, at which time project information will be displayed and a recommended solution presented. The Project Team will be available for discussions.

The public is invited to provide written comments for incorporation into the planning considerations for this project. Upon receipt of comments from the public, a Project File will consolidate the Master Planning process and a Preferred Solution will be recommended for acceptance by County and Town Councils. Additional information is provided on the municipal web sites.

This Notice issued May 2nd, 2016.

The County of Bruce
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Box 398, 30 Park St.
Walkerton, ON N0G 2V0
Tel: (519) 881-2400
www.brucecounty.on.ca

The Town of Saugeen Shores
Mr. Len Perdue
600 Tomlinson Drive
P.O. Box 820
Port Elgin, ON N0H 2C0
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WELCOME

Bruce County Roads 25 & 33

**Master Plan
For
Roads and Drainage
Public Information Centre**



WELCOME

Bruce County Roads 25 & 33

**Master Plan
For
Roads and Drainage
Public Information Centre**





Master Plan - Roads and Drainage

Bruce County Roads 25 & 33

County of Bruce, Town of Saugeen Shores

PHASE 2 PUBLIC INFORMATION CENTRE – May 18th, 2016 – 7:00 PM TO 9:00 PM

SIGN-IN SHEET

Name	Address	Postal Code	Phone	Email

Please complete the above sign-in information if you wish to be included on the project notification list.



MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT NOTICE OF STUDY COMPLETION

COUNTY OF BRUCE BRUCE COUNTY ROADS 25 AND 33 MASTER PLAN FOR ROADS AND DRAINAGE

RECOMMENDED MASTER PLAN

The County of Bruce as Proponent, with the Town of Saugeen Shores, have prepared a Master Plan, following Phases 1 and 2 of the Municipal Class Environmental Assessment, for the area of Bruce County Road 25 and 33, located centrally in the Town of Saugeen Shores.

Based on the study findings and input from technical agencies and the public, the Master Plan accepted by Councils is as shown on the attached Key Plan. The Master Plan identifies the recommended infrastructure to service the future growth of the Town while minimizing environmental impacts. The recommended Master Plan incorporates the comments received from the public and agencies during the course of the study. The main components are listed below. While the Master Plan addresses need and justification at a broad level, more detailed studies for each of the projects included in the Master Plan will be done at a later date following the Municipal Class EA.

TYPE OF PROJECT

DESCRIPTION

Schedule B Projects - Roads

- Re-align Bruce Road 33 to intersect Bruce Road 25 at future Bruce Street alignment.
- Provide additional lanes on Bruce Road 25 between future Bruce Street intersection to Goderich Street (4-lane urban cross-section).
- While the Master Plan addresses Phases 1 and 2 of the Municipal Class EA, additional investigations will be carried out at a later date.

Schedule A Projects – Drainage

- Construct new storm sewer along Bruce Road 25 including outfall to Lake Huron.
- Construct local storm sewer system within Baker Subdivision to coincide with sanitary sewer installation.

The Master Plan is available for review at the following locations:

Saugeen Shores Municipal Office, Bruce County

This Notice issued Tuesday May 9, 2017.

The County of Bruce
Mr. Brian Knox, P.Eng.
Box 70, 30 Park St.
Walkerton, Ontario N0G 2V0
Tel: (519) 881-2400

The Town of Saugeen Shores
600 Tomlinson Drive
P.O. Box 820
Port Elgin, ON N0H 2C0
Tel: (519) 832-2008

GM BluePlan Engineering Limited
Mr. John Slocombe, P.Eng.
1260 2nd Avenue East, Unit 1
Owen Sound, ON N4K 2J3
Tel: (519) 376-1805



**SCHEDULE B MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT
BRUCE COUNTY ROAD 33 RE-ALIGNMENT
NOTICE OF PROJECT INITIATION**

The County of Bruce as Proponent, with the Town of Saugeen Shores, having recently completed a Master Plan for Roads and Drainage for the general Study Area, is advancing project specific planning for the re-alignment of Bruce Road 33 (BR33), located centrally in Saugeen Shores.

The County has identified various deficiencies with road and drainage infrastructure within the Study Area. Issues related to roads include deteriorated travelled surfaces, poor sight lines at the intersection of B25 and BR33, and planned future intersections at Sitckel, Bruce, and Ridge Streets. The Master Plan process reviewed alternative solutions for roads including;

- i) Do nothing but resurfacing,
- ii) Intersection and Capacity Improvements on BR25, and
- iii) Re-align the BR33 intersection with the future Bruce Street intersection.

Through the Master Plan process, the re-alignment of BR33 to intersect with BR25 at a future Bruce Street alignment location was identified as the preferred solution to address the issues identified.

Project specific planning for the re-alignment of BR33 is being conducted as a Schedule B activity under the **Municipal Class Environmental Assessment (EA)**. Project planning is intended to follow, as a minimum, Phases 1 and 2 of the EA Process. The Schedule B EA process is project specific to the re-alignment of Bruce Road 33 and is intended to update and verify the direction resolved through the more general Master Plan process.

Both the Master Plan Report and the Schedule B EA Project File are available on the County and Town websites at the addresses noted below.

The public is invited to review the documentation and to provide written comments for incorporation into the planning considerations for the Bruce Road 33 re-alignment project. Comments may be directed to any one of the contacts listed below, and should be received by **February 6, 2018**.

This Notice first issued on January 9, 2018.

The County of Bruce
Mr. Brian Knox, P.Eng.
30 Park Street
Box 398
Walkerton, ON N0G 2V0
bknox@brucecounty.on.ca
Tel: 519-881-2400
www.brucecounty.on.ca

The Town of Saugeen Shores
Ms. Amanda Froese, P. Eng.
600 Tomlinson Drive
P.O. Box 820
Port Elgin, ON N0H 2C0
amanda.froese@saugeenshores.ca
Tel: 519-832-2008
www.saugeenshores.ca

GM BluePlan Engineering Limited
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1260-2nd Avenue East, Unit 1
Owen Sound, ON N4K 2J3
john.slocombe@gmblueplan.ca
Tel: 519-376-1805
www.gmblueplan.ca

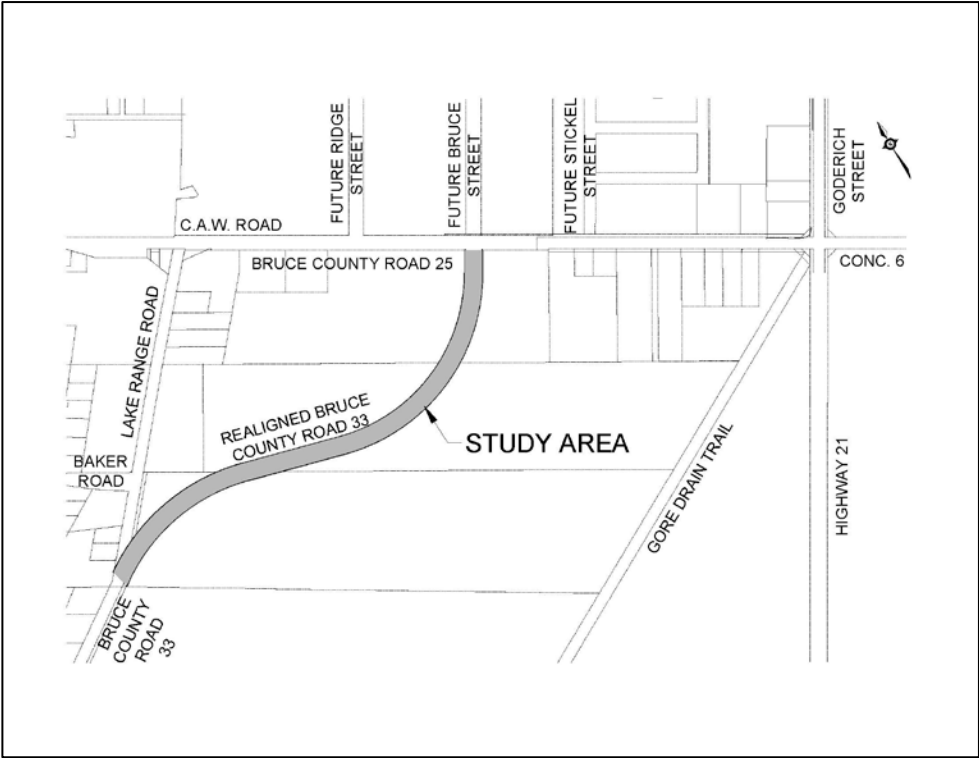
SCHEDULE B MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT
BRUCE COUNTY ROAD 33 RE-ALIGNMENT
NOTICE OF STUDY COMPLETION

The County of Bruce as Proponent, with the Town of Saugeen Shores, having recently completed a Master Plan for the general Study Area, is advancing project specific planning for the re-alignment of Bruce Road 33 (BR33), located where shown on the accompanying map. Issues related to roads include deteriorated travelled surfaces, poor sight lines and planned future intersections at Stickel, Bruce, and Ridge Streets. The Master Plan process reviewed alternative solutions for roads including;

- i) Do nothing but resurfacing,
- ii) Intersection and Capacity Improvements on BR25, and
- iii) Re-align the BR33 intersection with the future Bruce Street intersection.

Through the Master Plan process, the re-alignment of BR33 to intersect with BR25 at a future Bruce Street alignment location was identified as the preferred solution to address the issues identified.

Project specific planning for the re-alignment of BR33 is being conducted as a Schedule B activity under the **Municipal Class Environmental Assessment (EA)**. The Schedule B EA process is project specific to the re-alignment of Bruce Road 33 and is intended to update and verify the direction resolved through the more general Master Plan process. A Notice of Project Initiation was issued on **January 9, 2018**. Based on the study findings and comments, the BR33 re-alignment alternative, as described in the Master Plan, is adopted by Council as the Preferred Solution to this Schedule B EA process. Both the Master Plan Report and the Schedule B EA Project File are available on the County and Town websites at the addresses noted below.



Interested parties should provide written comments to the County of Bruce, at the address noted below, within 30 calendar days from the date of this Notice. If concerns arise regarding this project, which cannot be resolved in discussion with the County, a person or party may request the Minister of the Environment and Climate Change to order a change in the project status and require a higher level of assessment under an individual Environmental Assessment process (referred to as a Part II Order). Reasons must be provided for the request. Requests must be received by the Minister within 30 calendar days of this Notice.

Part II Order requests are to be submitted to:

Minister Ministry of the Environment and Climate Change 77 Wellesley St. W., Floor 11 Toronto, ON M7A 2T5 Fax: 416-314-8452	Director Environmental Assessment & Permissions Branch Ministry of the Environment and Climate Change 135 St. Clair Avenue W, 1 st Floor Toronto, ON M4V 1L5
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A copy of the request should also be sent to the following:

The County of Bruce Ms. Kerri Meier 30 Park Street, Box 398 Walkerton, ON N0G 2V0 kmeier@brucecounty.on.ca Tel: 519-881-2400 www.brucecounty.on.ca	The Town of Saugeen Shores Ms. Amanda Froese, P. Eng. 600 Tomlinson Drive , P.O. Box 820 Port Elgin, ON N0H 2C0 amanda.froese@saugeenshores.ca Tel: 519-832-2008 www.saugeenshores.ca	GM BluePlan Engineering Limited Consulting Professional Engineers Mr. John Slocombe, P.Eng. 1260-2 nd Avenue East, Unit 1 Owen Sound, ON N4K 2J3 john.slocombe@gmblueplan.ca Tel: 519-376-1805 www.gmblueplan.ca
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Legend

- Local OP SPA labels (BR)
- Ferry
- Provincial Highway
- County Road
- Municipal or Other Road
- OBM Building Location
- OBM Building Footprint
- Building Footprint
- Body of Water
- Evaluated Wetland
- Watercourse
 - Permanent Stream
 - Intermittent Stream
- Wetland
- Built-up area

Notes

0.8 0 0.41 0.8 Kilometers

NAD_1983_UTM_Zone_17N
© 2017 County of Bruce

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

APPENDIX B: BACKGROUND STUDIES

**Criteria for Evaluating Potential
for Built Heritage Resources and
Cultural Heritage Landscapes**
A Checklist for the Non-Specialist

The **purpose of the checklist** is to determine:

- if a property(ies) or project area:
 - is a recognized heritage property
 - may be of cultural heritage value
- it includes all areas that may be impacted by project activities, including – but not limited to:
 - the main project area
 - temporary storage
 - staging and working areas
 - temporary roads and detours

Processes covered under this checklist, such as:

- *Planning Act*
- *Environmental Assessment Act*
- *Aggregates Resources Act*
- *Ontario Heritage Act* – Standards and Guidelines for Conservation of Provincial Heritage Properties

Cultural Heritage Evaluation Report (CHER)

If you are not sure how to answer one or more of the questions on the checklist, you may want to hire a qualified person(s) (see page 5 for definitions) to undertake a cultural heritage evaluation report (CHER).

The CHER will help you:

- identify, evaluate and protect cultural heritage resources on your property or project area
- reduce potential delays and risks to a project

Other checklists

Please use a separate checklist for your project, if:

- you are seeking a Renewable Energy Approval under Ontario Regulation 359/09 – [separate checklist](#)
- your Parent Class EA document has an approved screening criteria (as referenced in Question 1)

Please refer to the Instructions pages for more detailed information and when completing this form.

Project or Property Name
Bruce County Road 33 Re-Alignment

Project or Property Location (upper and lower or single tier municipality)
County of Bruce / Saugeen Shores

Proponent Name
County of Bruce

Proponent Contact Information
Kerri Meier

Screening Questions

	Yes	No
1. Is there a pre-approved screening checklist, methodology or process in place?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If Yes, please follow the pre-approved screening checklist, methodology or process.

If No, continue to Question 2.

Part A: Screening for known (or recognized) Cultural Heritage Value

	Yes	No
2. Has the property (or project area) been evaluated before and found not to be of cultural heritage value?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If Yes, do **not** complete the rest of the checklist.

The proponent, property owner and/or approval authority will:

- summarize the previous evaluation and
- add this checklist to the project file, with the appropriate documents that demonstrate a cultural heritage evaluation was undertaken

The summary and appropriate documentation may be:

- submitted as part of a report requirement
- maintained by the property owner, proponent or approval authority

If No, continue to Question 3.

	Yes	No
3. Is the property (or project area):		
a. identified, designated or otherwise protected under the <i>Ontario Heritage Act</i> as being of cultural heritage value?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. a National Historic Site (or part of)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. designated under the <i>Heritage Railway Stations Protection Act</i> ?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. designated under the <i>Heritage Lighthouse Protection Act</i> ?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. identified as a Federal Heritage Building by the Federal Heritage Buildings Review Office (FHBRO)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. located within a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If Yes to any of the above questions, you need to hire a qualified person(s) to undertake:

- a Cultural Heritage Evaluation Report, if a Statement of Cultural Heritage Value has not previously been prepared or the statement needs to be updated

If a Statement of Cultural Heritage Value has been prepared previously and if alterations or development are proposed, you need to hire a qualified person(s) to undertake:

- a Heritage Impact Assessment (HIA) – the report will assess and avoid, eliminate or mitigate impacts

If No, continue to Question 4.

Part B: Screening for Potential Cultural Heritage Value

	Yes	No
4. Does the property (or project area) contain a parcel of land that:		
a. is the subject of a municipal, provincial or federal commemorative or interpretive plaque?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. has or is adjacent to a known burial site and/or cemetery?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. is in a Canadian Heritage River watershed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. contains buildings or structures that are 40 or more years old?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Part C: Other Considerations

	Yes	No
5. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area):		
a. is considered a landmark in the local community or contains any structures or sites that are important in defining the character of the area?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. has a special association with a community, person or historical event?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. contains or is part of a cultural heritage landscape?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If Yes to one or more of the above questions (Part B and C), there is potential for cultural heritage resources on the property or within the project area.

You need to hire a qualified person(s) to undertake:

- a Cultural Heritage Evaluation Report (CHER)

If the property is determined to be of cultural heritage value and alterations or development is proposed, you need to hire a qualified person(s) to undertake:

- a Heritage Impact Assessment (HIA) – the report will assess and avoid, eliminate or mitigate impacts

If No to all of the above questions, there is low potential for built heritage or cultural heritage landscape on the property.

The proponent, property owner and/or approval authority will:

- summarize the conclusion
- add this checklist with the appropriate documentation to the project file

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g. under the *Environmental Assessment Act*, *Planning Act* processes
- maintained by the property owner, proponent or approval authority

Instructions

Please have the following available, when requesting information related to the screening questions below:

- a clear map showing the location and boundary of the property or project area
 - large scale and small scale showing nearby township names for context purposes
- the municipal addresses of all properties within the project area
- the lot(s), concession(s), and parcel number(s) of all properties within a project area

For more information, see the Ministry of Tourism, Culture and Sport's [Ontario Heritage Toolkit](#) or [Standards and Guidelines for Conservation of Provincial Heritage Properties](#).

In this context, the following definitions apply:

- **qualified person(s)** means individuals – professional engineers, architects, archaeologists, etc. – having relevant, recent experience in the conservation of cultural heritage resources.
- **proponent** means a person, agency, group or organization that carries out or proposes to carry out an undertaking or is the owner or person having charge, management or control of an undertaking.

1. Is there a pre-approved screening checklist, methodology or process in place?

An existing checklist, methodology or process may already be in place for identifying potential cultural heritage resources, including:

- one endorsed by a municipality
- an environmental assessment process e.g. screening checklist for municipal bridges
- one that is approved by the Ministry of Tourism, Culture and Sport (MTCS) under the Ontario government's [Standards & Guidelines for Conservation of Provincial Heritage Properties](#) [s.B.2.]

Part A: Screening for known (or recognized) Cultural Heritage Value

2. Has the property (or project area) been evaluated before and found not to be of cultural heritage value?

Respond 'yes' to this question, if all of the following are true:

A property can be considered not to be of cultural heritage value if:

- a Cultural Heritage Evaluation Report (CHER) - or equivalent - has been prepared for the property with the advice of a qualified person and it has been determined not to be of cultural heritage value and/or
- the municipal heritage committee has evaluated the property for its cultural heritage value or interest and determined that the property is not of cultural heritage value or interest

A property may need to be re-evaluated, if:

- there is evidence that its heritage attributes may have changed
- new information is available
- the existing Statement of Cultural Heritage Value does not provide the information necessary to manage the property
- the evaluation took place after 2005 and did not use the criteria in Regulations 9/06 and 10/06

Note: Ontario government ministries and public bodies [prescribed under Regulation 157/10] may continue to use their existing evaluation processes, until the evaluation process required under section B.2 of the [Standards & Guidelines for Conservation of Provincial Heritage Properties](#) has been developed and approved by MTCS.

To determine if your property or project area has been evaluated, contact:

- the approval authority
- the proponent
- the Ministry of Tourism, Culture and Sport

3a. Is the property (or project area) identified, designated or otherwise protected under the *Ontario Heritage Act* as being of cultural heritage value e.g.:

i. designated under the *Ontario Heritage Act*

- individual designation (Part IV)
- part of a heritage conservation district (Part V)

Individual Designation – Part IV

A property that is designated:

- by a municipal by-law as being of cultural heritage value or interest [s.29 of the *Ontario Heritage Act*]
- by order of the Minister of Tourism, Culture and Sport as being of cultural heritage value or interest of provincial significance [s.34.5]. **Note:** To date, no properties have been designated by the Minister.

Heritage Conservation District – Part V

A property or project area that is located within an area designated by a municipal by-law as a heritage conservation district [s. 41 of the *Ontario Heritage Act*].

For more information on Parts IV and V, contact:

- municipal clerk
- [Ontario Heritage Trust](#)
- local land registry office (for a title search)

ii. subject of an agreement, covenant or easement entered into under Parts II or IV of the *Ontario Heritage Act*

An agreement, covenant or easement is usually between the owner of a property and a conservation body or level of government. It is usually registered on title.

The primary purpose of the agreement is to:

- preserve, conserve, and maintain a cultural heritage resource
- prevent its destruction, demolition or loss

For more information, contact:

- [Ontario Heritage Trust](#) - for an agreement, covenant or easement [clause 10 (1) (c) of the *Ontario Heritage Act*]
- municipal clerk – for a property that is the subject of an easement or a covenant [s.37 of the *Ontario Heritage Act*]
- local land registry office (for a title search)

iii. listed on a register of heritage properties maintained by the municipality

Municipal registers are the official lists - or record - of cultural heritage properties identified as being important to the community.

Registers include:

- all properties that are designated under the *Ontario Heritage Act* (Part IV or V)
- properties that have not been formally designated, but have been identified as having cultural heritage value or interest to the community

For more information, contact:

- municipal clerk
- municipal heritage planning staff
- municipal heritage committee

iv. subject to a notice of:

- intention to designate (under Part IV of the *Ontario Heritage Act*)
- a Heritage Conservation District study area bylaw (under Part V of the *Ontario Heritage Act*)

A property that is subject to a **notice of intention to designate** as a property of cultural heritage value or interest and the notice is in accordance with:

- section 29 of the *Ontario Heritage Act*
- section 34.6 of the *Ontario Heritage Act*. **Note:** To date, the only applicable property is Meldrum Bay Inn, Manitoulin Island. [s.34.6]

An area designated by a municipal by-law made under section 40.1 of the *Ontario Heritage Act* as a **heritage conservation district study area**.

For more information, contact:

- municipal clerk – for a property that is the subject of notice of intention [s. 29 and s. 40.1]
- [Ontario Heritage Trust](#)

v. included in the Ministry of Tourism, Culture and Sport's list of provincial heritage properties

Provincial heritage properties are properties the Government of Ontario owns or controls that have cultural heritage value or interest.

The Ministry of Tourism, Culture and Sport (MTCS) maintains a list of all provincial heritage properties based on information provided by ministries and prescribed public bodies. As they are identified, MTCS adds properties to the list of provincial heritage properties.

For more information, contact the MTCS Registrar at registrar@mtc.gov.on.ca.

3b. Is the property (or project area) a National Historic Site (or part of)?

National Historic Sites are properties or districts of national historic significance that are designated by the Federal Minister of the Environment, under the *Canada National Parks Act*, based on the advice of the Historic Sites and Monuments Board of Canada.

For more information, see the [National Historic Sites website](#).

3c. Is the property (or project area) designated under the *Heritage Railway Stations Protection Act*?

The *Heritage Railway Stations Protection Act* protects heritage railway stations that are owned by a railway company under federal jurisdiction. Designated railway stations that pass from federal ownership may continue to have cultural heritage value.

For more information, see the [Directory of Designated Heritage Railway Stations](#).

3d. Is the property (or project area) designated under the *Heritage Lighthouse Protection Act*?

The *Heritage Lighthouse Protection Act* helps preserve historically significant Canadian lighthouses. The Act sets up a public nomination process and includes heritage building conservation standards for lighthouses which are officially designated.

For more information, see the [Heritage Lighthouses of Canada website](#).

3e. Is the property (or project area) identified as a Federal Heritage Building by the Federal Heritage Buildings Review Office?

The role of the Federal Heritage Buildings Review Office (FHBRO) is to help the federal government protect the heritage buildings it owns. The policy applies to all federal government departments that administer real property, but not to federal Crown Corporations.

For more information, contact the [Federal Heritage Buildings Review Office](#).

See a [directory of all federal heritage designations](#).

3f. Is the property (or project area) located within a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site?

A UNESCO World Heritage Site is a place listed by UNESCO as having outstanding universal value to humanity under the Convention Concerning the Protection of the World Cultural and Natural Heritage. In order to retain the status of a World Heritage Site, each site must maintain its character defining features.

Currently, the Rideau Canal is the only World Heritage Site in Ontario.

For more information, see Parks Canada – [World Heritage Site website](#).

Part B: Screening for potential Cultural Heritage Value

4a. Does the property (or project area) contain a parcel of land that has a municipal, provincial or federal commemorative or interpretive plaque?

Heritage resources are often recognized with formal plaques or markers.

Plaques are prepared by:

- municipalities
- provincial ministries or agencies
- federal ministries or agencies
- local non-government or non-profit organizations

For more information, contact:

- [municipal heritage committees](#) or local heritage organizations – for information on the location of plaques in their community
- Ontario Historical Society's [Heritage directory](#) – for a list of historical societies and heritage organizations
- Ontario Heritage Trust – for a [list of plaques](#) commemorating Ontario's history
- Historic Sites and Monuments Board of Canada – for a [list of plaques](#) commemorating Canada's history

4b. Does the property (or project area) contain a parcel of land that has or is adjacent to a known burial site and/or cemetery?

For more information on known cemeteries and/or burial sites, see:

- Cemeteries Regulations, Ontario Ministry of Consumer Services – for a [database of registered cemeteries](#)
- Ontario Genealogical Society (OGS) – to [locate records of Ontario cemeteries](#), both currently and no longer in existence; cairns, family plots and burial registers
- Canadian County Atlas Digital Project – to [locate early cemeteries](#)

In this context, adjacent means contiguous or as otherwise defined in a municipal official plan.

4c. Does the property (or project area) contain a parcel of land that is in a Canadian Heritage River watershed?

The Canadian Heritage River System is a national river conservation program that promotes, protects and enhances the best examples of Canada's river heritage.

Canadian Heritage Rivers must have, and maintain, outstanding natural, cultural and/or recreational values, and a high level of public support.

For more information, contact the [Canadian Heritage River System](#).

If you have questions regarding the boundaries of a watershed, please contact:

- your conservation authority
- municipal staff

4d. Does the property (or project area) contain a parcel of land that contains buildings or structures that are 40 or more years old?

A 40 year 'rule of thumb' is typically used to indicate the potential of a site to be of cultural heritage value. The approximate age of buildings and/or structures may be estimated based on:

- history of the development of the area
- fire insurance maps
- architectural style
- building methods

Property owners may have information on the age of any buildings or structures on their property. The municipality, local land registry office or library may also have background information on the property.

Note: 40+ year old buildings or structure do not necessarily hold cultural heritage value or interest; their age simply indicates a higher potential.

A building or structure can include:

- residential structure
- farm building or outbuilding
- industrial, commercial, or institutional building
- remnant or ruin
- engineering work such as a bridge, canal, dams, etc.

For more information on researching the age of buildings or properties, see the Ontario Heritage Tool Kit Guide [Heritage Property Evaluation](#).

Part C: Other Considerations

5a. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area) is considered a landmark in the local community or contains any structures or sites that are important to defining the character of the area?

Local or Aboriginal knowledge may reveal that the project location is situated on a parcel of land that has potential landmarks or defining structures and sites, for instance:

- buildings or landscape features accessible to the public or readily noticeable and widely known
- complexes of buildings
- monuments
- ruins

5b. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area) has a special association with a community, person or historical event?

Local or Aboriginal knowledge may reveal that the project location is situated on a parcel of land that has a special association with a community, person or event of historic interest, for instance:

- Aboriginal sacred site
- traditional-use area
- battlefield
- birthplace of an individual of importance to the community

5c. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area) contains or is part of a cultural heritage landscape?

Landscapes (which may include a combination of archaeological resources, built heritage resources and landscape elements) may be of cultural heritage value or interest to a community.

For example, an Aboriginal trail, historic road or rail corridor may have been established as a key transportation or trade route and may have been important to the early settlement of an area. Parks, designed gardens or unique landforms such as waterfalls, rock faces, caverns, or mounds are areas that may have connections to a particular event, group or belief.

For more information on Questions 5.a., 5.b. and 5.c., contact:

- Elders in Aboriginal Communities or community researchers who may have information on potential cultural heritage resources. Please note that Aboriginal traditional knowledge may be considered sensitive.
- [municipal heritage committees](#) or local heritage organizations
- Ontario Historical Society's "[Heritage Directory](#)" - for a list of historical societies and heritage organizations in the province

An internet search may find helpful resources, including:

- historical maps
- historical walking tours
- municipal heritage management plans
- cultural heritage landscape studies
- municipal cultural plans

Information specific to trails may be obtained through [Ontario Trails](#).

Ministry of Tourism, Culture and Sport

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Programs and Services Branch
Culture Division
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Archaeology@ontario.ca

Ministère du Tourisme, de la Culture et du Sport

Unité des programmes d'archéologie
Direction des programmes et des services
Division de culture
401, rue Bay, bureau 1700
Toronto ON M7A 0A7
Archaeology@ontario.ca



Jun 30, 2017

Scarlett Janusas (P027)
Scarlett Janusas Archaeology Inc.
PO BOX none Tobermory ON N0H 2R0

RE: Entry into the Ontario Public Register of Archaeological Reports: Archaeological Assessment Report Entitled, "STAGE 2 ARCHAEOLOGICAL ASSESSMENT REGIONAL ROAD #33 RE-ALIGNMENT PART LOTS 27, 28, 29 & 30, LAKE RANGE MUNICIPALITY OF SAUGEEN SHORES FORMER GEOGRAPHIC TOWNSHIP OF SAUGEEN BRUCE COUNTY, ONTARIO ORIGINAL REPORT ", Dated Jun 1, 2017, Filed with MTCS Toronto Office on N/A, MTCS Project Information Form Number P027-0306-2017, MTCS File Number 41RD006

Dear Ms. Janusas:

The above-mentioned report, which has been submitted to this ministry as a condition of licensing in accordance with Part VI of the Ontario Heritage Act, R.S.O. 1990, c 0.18, has been entered into the Ontario Public Register of Archaeological Reports without technical review.¹

Please note that the ministry makes no representation or warranty as to the completeness, accuracy or quality of reports in the register.

Should you require further information, please do not hesitate to send your inquiry to Archaeology@Ontario.ca

cc. Archaeology Licensing Officer
Kerri Meier, County of Bruce
Kerri Meier, County of Bruce

¹In no way will the ministry be liable for any harm, damages, costs, expenses, losses, claims or actions that may result: (a) if the Report(s) or its recommendations are discovered to be inaccurate, incomplete, misleading or fraudulent; or (b) from the issuance of this letter. Further measures may need to be taken in the event that additional artifacts or archaeological sites are identified or the Report(s) is otherwise found to be inaccurate, incomplete, misleading or fraudulent.

**STAGE 2 ARCHAEOLOGICAL ASSESSMENT
REGIONAL ROAD #33 RE-ALIGNMENT
PART LOTS 27, 28, 29 & 30, LAKE RANGE
MUNICIPALITY OF SAUGEEN SHORES
FORMER GEOGRAPHIC TOWNSHIP OF SAUGEEN
BRUCE COUNTY, ONTARIO
SUPPLEMENTARY DOCUMENTATION
INDIGENOUS ENGAGEMENT**

Prepared for

**County of Bruce
and
Ministry of Tourism, Culture and Sport**

**SCARLETT JANUSAS ARCHAEOLOGY INC.
269 Cameron Lake Road
Tobermory, Ontario N0H 2R0
phone 519-596-8243 cell 519-374-1119
jscarlett@amtelecom.net
www.actionarchaeology.ca**



**License # P027, PIF #P027-0306-2017
June 1st, 2017**

©

Reply Reply All Forward



Fri 5/12/2017 9:23 AM

Scarlett Janusas <jscarlett@amtelecom.net>

Regional Road 33 Realignment - Archaeology

To 'Doran Ritchie'

This message was sent with High importance.

Message

letter to Doran Ritchie requesting input from SON dated May 12 2017.pdf (548 KB)

Archaeological Assessment Bruce Road 25 Re-Alignment.pdf (795 KB)

Good morning Doran:

I'm attaching a letter with a request for input from SON regarding the Regional Road 33 realignment. We would welcome input from SON, and if you would like a monitor to be present, please send the agreement directly to me.

If you have any questions regarding the project - happy to assist. A Stage 1 assessment has been done already by another firm. I attach it here for you as well.

Regards
Scarlett

Scarlett Janusas, BA, MA
Member CAHP, APA, SHA
President, Scarlett Janusas Archaeology Inc.
269 Cameron Lake Road
Tobermory, ON N0H 2R0
Office 519-596-8243
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jscarlett@amtelecom.net
www.actionarchaeology.ca

Reply Reply All Forward



Fri 5/12/2017 9:23 AM

Scarlett Janusas <jscarlett@amtelecom.net>

Regional Road 33

To 'Doran Ritchie'

Message

letter to Doran Ritchie requesting input from SON dated May 12 2017.pdf (725 KB)

Apologies - I am reattaching the letter, without reference to Stage 1 - we are only doing the Stage 2 assessment.

Regards
Scarlett

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May 12, 2017

Mr. Doran Ritchie
Environmental Office
Saugeen Ojibway Nation

Via email: d.ritchie@saugeenojibwaynation.ca

Dear Doran:

Re: **Stage 2 Archaeological Resource Assessment**
Regional Road 33 Realignment, Port Elgin
Town of Saugeen Shores

SJAI has been retained by our client to conduct the Stage 2 archaeological assessment of an area of approximately 5.3 acres in Port Elgin for the realignment of Regional Road 33. The area has been staked out in the field and we hope to have the area ploughed within the next week, and following appropriate weathering of the fields, to conduct field work.

SON's input into the project is valued. Would you please provide us (please direct all communication to myself) with of any specific concerns with regards to the project, and if you would like to have a monitor accompany SJAI on the project.

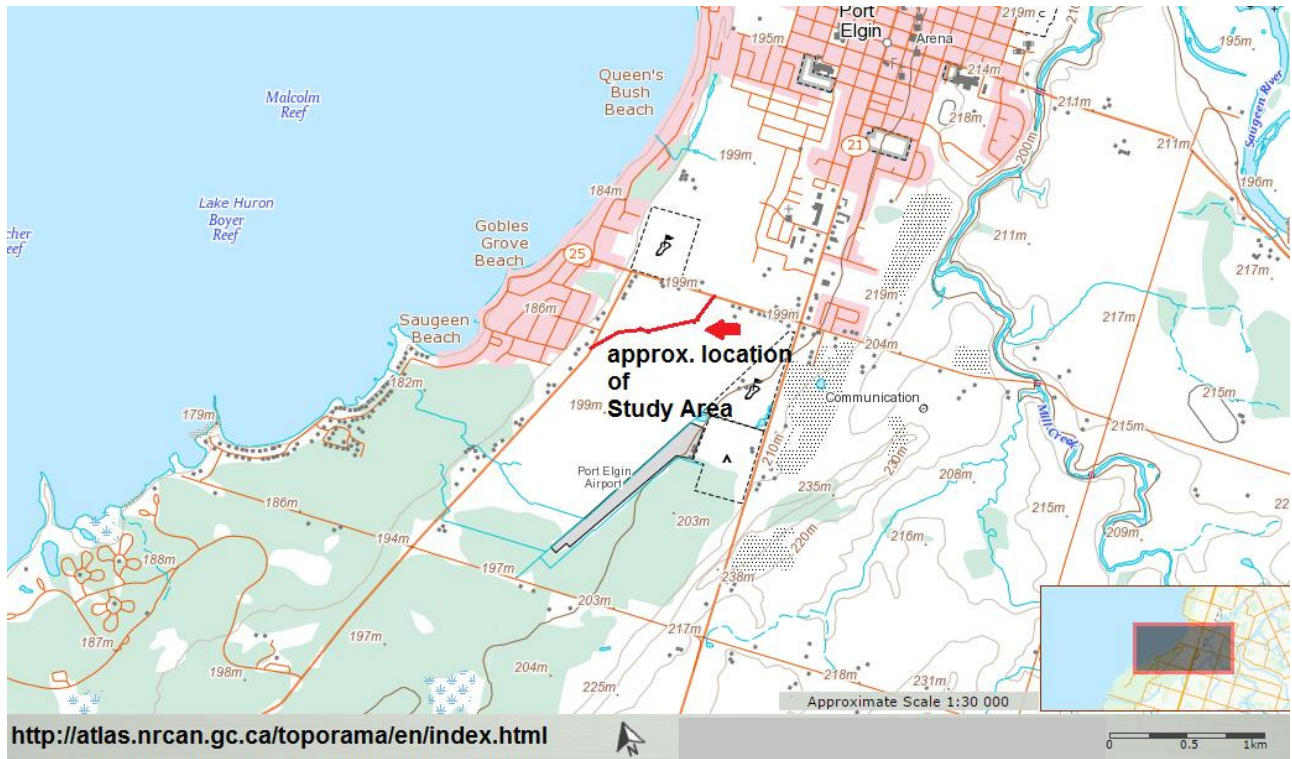
The property is located on Part Lots 27 – 30, Lake Range, in Port Elgin, Town of Saugeen Shores. I am attaching the site plan for the realignment and a google earth map which shows the location of the project.




Any concerns that SON may have with regards to the archaeology of the project would be gratefully accepted before May 20th, 2017.

Regards

A handwritten signature in blue ink that reads "Scarlett Janusas". The signature is fluid and cursive.

Scarlett E. Janusas, BA, MA, CAHP
President, SJAI
Member, APA, CNEHA, OMHC, SHA



 Reply  Reply All  Forward




Fri 5/12/2017 9:28 AM

Doran Ritchie <d.ritchie@saugeenojibwaynation.ca>

Re: Regional Road 33




To Scarlett Janusas

 You forwarded this message on 5/12/2017 11:31 AM.
We removed extra line breaks from this message.

Hello Scarlett,

Thank you for the letter, I will review the info and get back to you asap on any comments or any potential SON Involvement.

Mligwetch,
Doran

 Reply  Reply All  Forward




Wed 5/24/2017 8:37 AM

Doran Ritchie <d.ritchie@saugeenojibwaynation.ca>

Re: Regional Road 33, Port Elgin

To Scarlett Janusas

 You replied to this message on 5/24/2017 1:58 PM.
We removed extra line breaks from this message.

Hello scarlett,

Can I call you in the next hour? Can you send me your number?

Mligwetch,
Doran

Sent from my iPhone

> On May 24, 2017, at 08:23, Scarlett Janusas <jscarlett@amtelecom.net> wrote:
>
> Morning Doran - checked the weather, and it looks like rain tomorrow
> in Port Elgin. I'm now aiming for Friday. Can you send out an
> agreement and monitor for the project, or do you not feel it necessary?
>
> Regards
> Scarlett




Wed 5/24/2017 3:16 PM

Doran Ritchie <d.ritchie@saugeenojibwaynation.ca>

Re: Regional Road 33, Port Elgin

To Scarlett Janusas

Cc Pete Demarte; Adrienne Brennan; dr_dig@xplornet.com

 We removed extra line breaks from this message.

Hello Scarlett and Pete,

I just touched base with Adrienne Brennan and she's available to attend the site on Friday.

Pete, would you mind connecting with Adrienne and fill her in on a meeting place and time?

Mligwetch,
Doran

Sent from my iPhone

> On May 24, 2017, at 15:09, Scarlett Janusas <jscarlett@amtelecom.net> wrote:

>

> Hi Doran - cc'ing Pete Demarte on this one. He will be the Field Director.

> Thanks.

>

> Hope you have a pleasant evening.

>

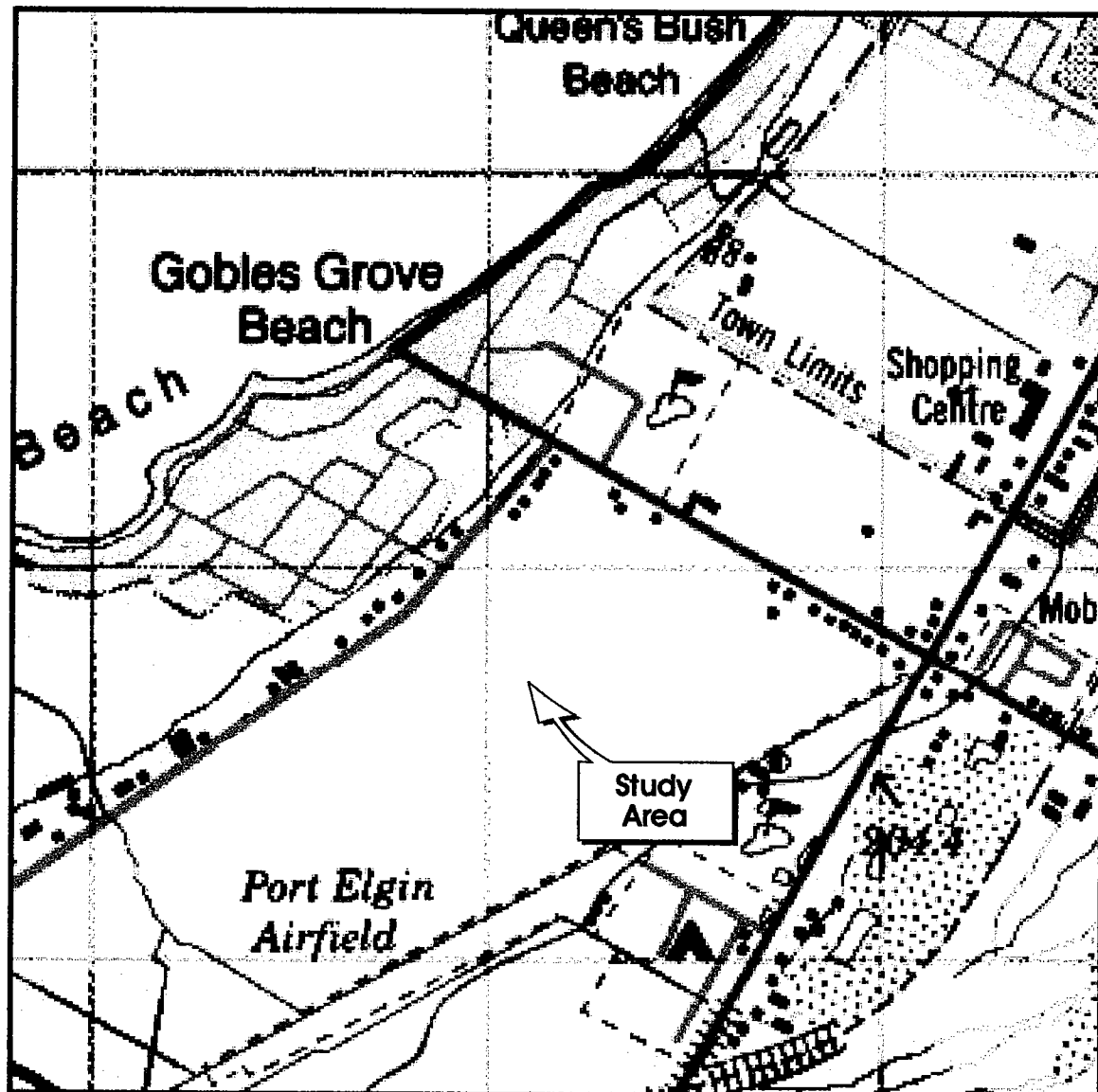
> Regards

> Scarlett

>

Adrienne Brennan attended the site with the crew for the entire project.

Archaeological Assessment (Stages 1)
Bruce County Road 25, Re-Alignment,
Port Elgin, Ontario



Mayer
Heritage
Consultants Inc.

Cultural Heritage Assessments and Archaeological Mitigative Excavations

**Archaeological Assessment (Stage 1)
Bruce County Road 25 Re-Alignment,
Port Elgin, Ontario**

Submitted to

**Gamsby and Mannerow Limited
1260 Second Avenue East, Unit 1
Owen Sound, Ontario
N4K 2J3
Fax: (519) 376-8977**

and

The Ontario Ministry of Culture

Prepared by

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**Archaeological Consulting Licence Number P040
Contract Information Form Number P040-313-2010
Corporate Project Number 10-003**

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any means without the prior written consent of Mayer Heritage Consultants Inc.**

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Project Personnel

Project Manager	Paul J. C. O'Neal
Report Preparation	Paul J. C. O'Neal Becky Jones
Field Director	Paul J. C. O'Neal

Acknowledgments

Preparation of this report was facilitated by the assistance of the following individuals and their agencies:

- ***John Slocombe, Gamsby and Mannerow***
- ***Robert von Bitter***, Archaeological Data Co-ordinator, Ontario Ministry of Culture.

Archaeological Assessment (Stage 1)

Bruce County Road 25 Re-Alignment, Port Elgin, Ontario

Introduction

Among other matters, the *Planning Act R.S.O. 1990*, establishes that the protection of features of archaeological interest is a matter of provincial concern. As such, an archaeological resource assessment (Stage 1 background research) was conducted to determine whether further investigation, in the form of test-pitting or monitoring of future construction, would be required as a standard condition of approval for the proposed re-alignment of Bruce County Road 25 located in Port Elgin, Ontario (Figure 1).

This assessment was further conducted in order to determine if any direct and/or indirect impacts might occur by proposed construction activities on archaeological resources that might be present. Archaeological resources consist of artifacts (Aboriginal stone tools, pottery and subsistence remains as well as Euro-Canadian objects), subsurface settlement patterns and cultural features (post moulds, trash pits, privies, and wells), and sites (temporary camps and special purpose activity areas, plus more permanent settlements such as villages, homesteads, grist mills and industrial structures).

Stage 1 Background Research

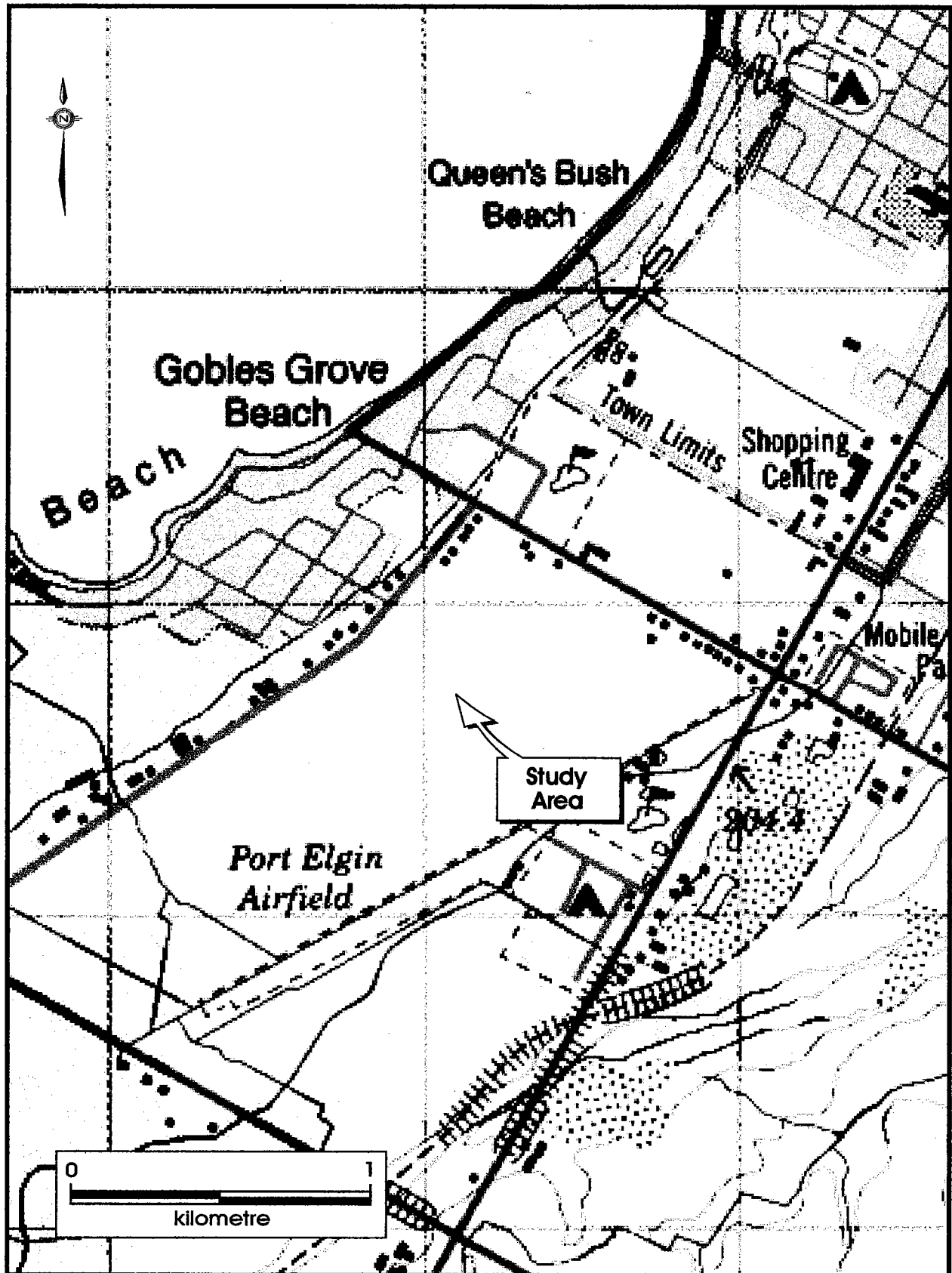
Stage 1 background research was conducted in order to complete the following tasks:

- amass all of the readily available information on any previous archaeological surveys in the area;
- determine the locations of any registered and unregistered sites; and
- develop an historical framework for assigning levels of potential significance to any new sites discovered during fieldwork.

The framework for assigning levels of potential archaeological significance is drawn from provincial guidelines (Weiler 1980). The necessary information includes the identification and evaluation of any feature that has one or more of the following attributes:

- *it has the potential through archaeological exploration, survey or fieldwork to provide answers to substantive questions (i.e. relate to particular times and places) about events and processes that occurred in the past and therefore add to our knowledge and appreciation of history;*
- *it has the potential through archaeological exploration, survey and fieldwork to contribute to testing the validity of general anthropological principles, cultural change and ecological adaptation, and therefore to the understanding and appreciation of our man-made heritage;*
or
- *it is probable that various technical, methodological, and theoretical advances are likely to occur during archaeological investigation of a feature, alone or in association with other features, and therefore contribute to the development of better scientific means of understanding and appreciating our man-made heritage (Weiler 1980:8).*

Figure 1: Location of the Study Area.



Natural Environment

The study area is within the Huron Slope (Chapman and Putnam 1984). The *Soil Survey of Bruce County* (Hoffman and Richards, 1954) indicates the dominant surface soil type to be sandy loam with imperfect drainage and a smooth, very gentle sloping topography.

Potential for Archaeological Resources

Archaeological potential is defined as the likelihood of finding archaeological sites within a study area. For planning purposes, determining archaeological potential provides a preliminary indication that significant sites might be found within the study area, and consequently, that it may be necessary to allocate time and resources for archaeological survey and mitigation. In predicting the locations of archaeological sites, the *Primer on Archaeology, Land Use Planning and Development in Ontario* (Ministry of Culture 1997:12-13) states that undisturbed lands, or those with minimal disturbance, such as cultivated fields, within 300 metres of a primary water source or 200 metres of a secondary or tertiary water source are considered to have archaeological potential. Other criteria can include location on elevated ground or near distinctive or unusual landforms, and the presence of well-drained sandy soils. These were all taken into account during the preparation of the Windsor Archaeological Master Plan (CRM Group, 2005), which indicated that the entire Riverfront of Windsor had high potential for archaeological resources.

Based upon a published synthesis of Aboriginal cultural occupations (Wright 1968), Table 1 is a general outline of the cultural history of Southwestern Ontario that is applicable to the study area. Ellis and Ferris (1990) provide greater detail of the distinctive characteristics of each time period and cultural group. The Ministry of Culture archaeological database coordinator (von Bitter 2005) indicated that there are no previously registered archaeological sites within 2,000 metres of the study area.

Table 1: General Cultural Chronology for Southwestern Ontario.

PERIOD	GROUP	TIME RANGE	COMMENTS
Early Paleo-Indian	Fluted Projectiles	9500 - 8500 B.C.	big game hunters
Late Paleo-Indian	Hi-Lo Projectiles	8500 - 7500 B.C.	small nomadic groups
Early Archaic	---	7800 - 6000 B.C.	nomadic hunters and gatherers
Middle Archaic	Laurentian	6000 - 2000 B.C.	territorial settlements
Late Archaic	Lamoka	2500 - 1700 B.C.	polished ground stone tools
"	Broadpoint	1800 - 1400 B.C.	---
"	Crawford Knoll	1500 - 500 B.C.	---
"	Glacial Kame	circa 1000 B.C.	burial ceremonialism
Early Woodland	Meadowood	1000 - 400 B.C.	introduction of pottery
"	Red Ochre	1000 - 500 B.C.	---
Middle Woodland	Western Basin/Saugeen	400 B.C. - A.D. 500	long distance trade networks
"	Princess Point	A.D. 500 - 800	incipient agriculture
Late Woodland	Glen Meyer	A.D. 800 - 1300	transition to village life
"	Uren	A.D. 1300 - 1350	large villages with palisades
"	Middleport	A.D. 1300 - 1400	wide distribution of ceramic styles
"	Neutral/Huron	A.D. 1400 - 1650	tribal warfare
Early Contact	Mississauga plus others	A.D. 1700 - 1875	tribal displacement
Late Contact	Euro-Canadian	A.D. 1800 - present	European settlement

Figure 2: Study Area, Facing South from Existing County Road 25

7



Figure 3: Study Area, Facing Northeast from Lake Range Road



Figure 4: Site Location on Historic Atlas

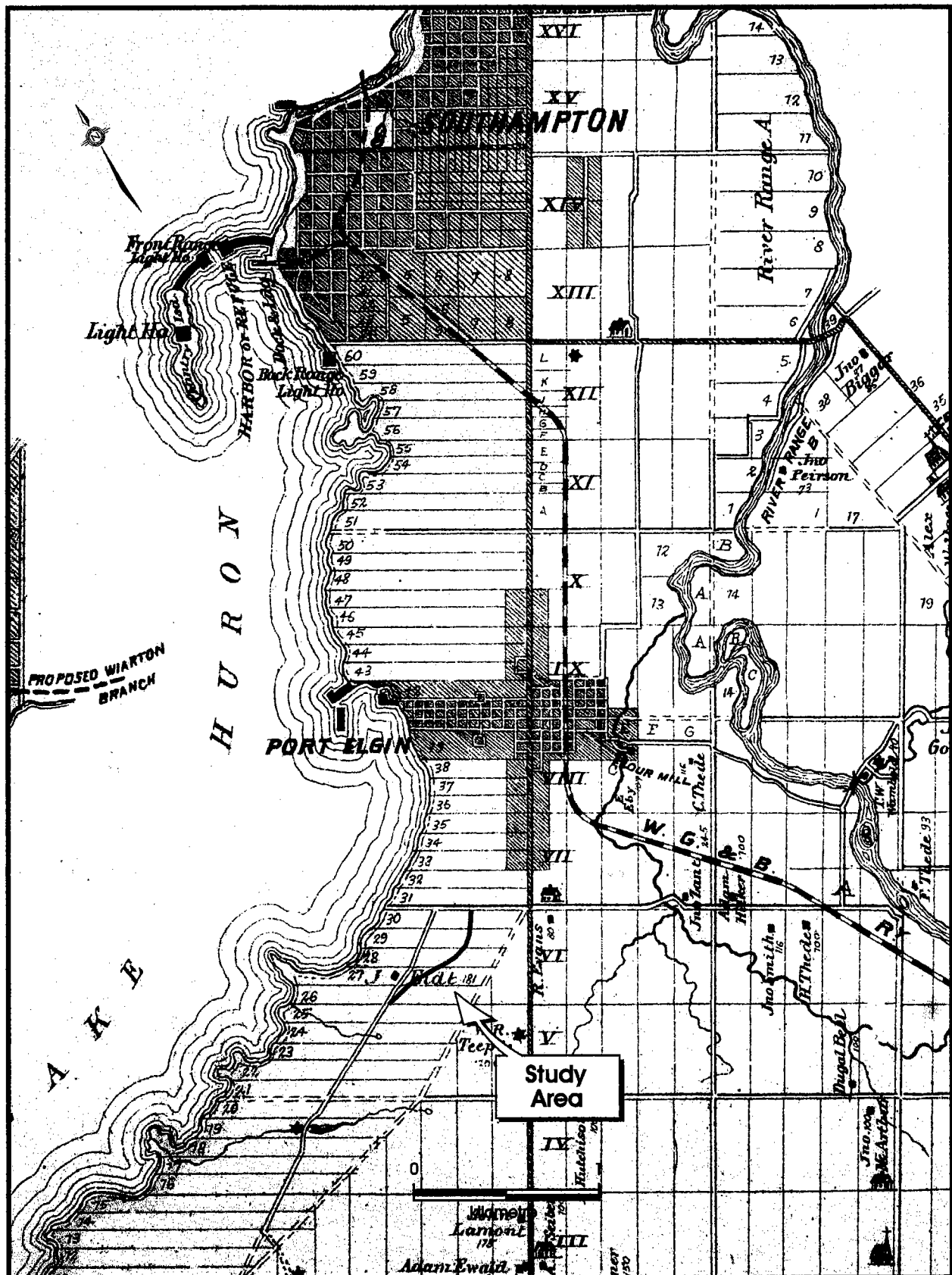
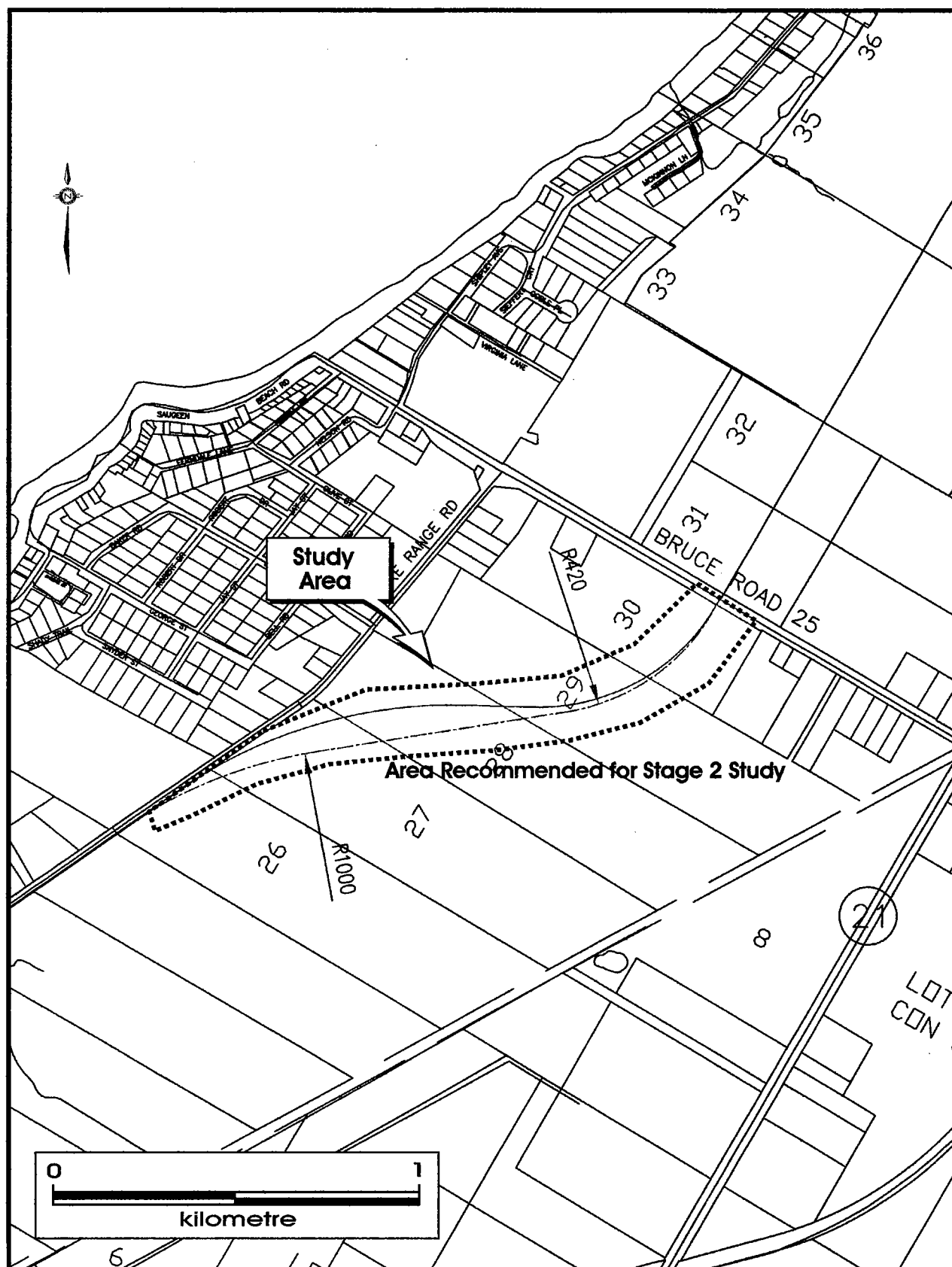


Figure 5: Site Map Showing Stage 2 Results



Over their thousands of years of occupation in the general region, Aboriginal people, have left behind, to a greater or lesser degree, physical evidence of their lifeway activities and settlements at many locations. The earliest possible human occupation was during the Paleo-Indian period (*circa* 9000 to 7000 B.C.) wherein small groups of nomadic peoples hunted big game along the shorelines of glacial lakes. These people were few in number and their small, temporary campsites are relatively rare.

People during the Archaic period (*circa* 7000 to 1000 B.C.) were still primarily nomadic hunters but also established territorial settlements, gathered seasonally available resources, and introduced burial ceremonialism. Late Archaic period sites are more numerous and can be quite large due to repeated annual visits.

Sites of the Woodland period (*circa* 1000 B.C. to A.D. 1650) are usually the most numerous because the population levels in Southwestern Ontario had significantly increased. The manufacture of ceramic pottery vessels for storage and cooking was introduced along with the establishment of long distance trading networks, horticulture, warfare and large palisaded villages.

Sites of the Contact period (*circa* A.D. 1650 to 1900) include Aboriginal and Euro-Canadian residences and industries. Belden's 1880 *Historic Atlas of Grey and Bruce Counties, Ontario* indicates the study area traverses a piece of property that was once owned by a "J. Eidt". No other owners for the surrounding areas are shown and no structures are shown within the study area. The absence of structures on this map however, does not necessarily mean that one or more structures were not present at that time earlier or later.

Based upon the soil and topography suitable for human habitation, the proximity to water and the historic significance of the geographic region, a Stage 1 visual assessment was done to determine the potential for the discovery of pre-contact Aboriginal and Euro-Canadian archaeological resources.

Stage 1 Visual Assessment

A visual assessment of the fields that the proposed road re-alignment will impact, was conducted on February 9, 2010 a clear and sunny day. Although snow covered the field, it appeared to have been undisturbed except by ploughing and other normal farming activities. Therefore, it is reasonable that any archaeological resources previously deposited would still be present. Therefore, we recommend a Stage 2 Archaeological Assessment, consisting of a pedestrian survey of the ploughed field, prior to any excavation or other ground disturbing construction activities take place.

RECOMMENDATIONS

The following recommendations are provided for consideration by Gamsby and Mannerow and by the Ministry of Culture:

1. Additional assessment (Stage 2) is warranted because there is moderate to good potential for archaeological resources and there is no evidence that the area has been significantly disturbed.. The Ministry of Culture is requested to issue a letter concurring with these recommendations.
2. The above recommendations are subject to concurrence by the Ministry of Culture. It is an offence to destroy or alter an archaeological site without approval from the Ministry of Culture. No landscaping, grading or other activities that may result in the destruction or disturbance of any of the archaeological sites documented in this report is permitted prior to the Ministry of Culture's approval.
3. Although every reasonable effort was made to locate all archaeological resources, it is possible that some remain to be discovered within the study area. Should deeply buried archaeological material be found during construction, the Ministry of Culture in London (519-675-7742) and Mayer Heritage Consultants Inc. in London (519-652-1818 or 800-465-9990) should be immediately notified.
4. As on virtually any property in southern Ontario, it is possible that Aboriginal or Euro-Canadian burials could be present within the study area. In the event that human remains are encountered during construction, the proponent should immediately contact both the Ministry of Culture, and the Cemeteries Regulation Unit of the Ontario Ministry of Consumer and Commercial Relations in Toronto (416-326-8392), as well as the appropriate municipal police, the local coroner, and Mayer Heritage Consultants Inc.
5. The licensee shall keep in safekeeping all artifacts and records of archaeological fieldwork carried out under this licence, except where those artifacts and records are transferred to by the licensee to Her Majesty the Queen in right of Ontario or the licensee is directed to deposit them in a public institution in accordance with subsection 66(1) of the Act.

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**STAGE 2 ARCHAEOLOGICAL ASSESSMENT
REGIONAL ROAD #33 RE-ALIGNMENT
PART LOTS 27, 28, 29 & 30, LAKE RANGE
MUNICIPALITY OF SAUGEEN SHORES
FORMER GEOGRAPHIC TOWNSHIP OF SAUGEEN
BRUCE COUNTY, ONTARIO
ORIGINAL REPORT**

Prepared for

**County of Bruce
and
Ministry of Tourism, Culture and Sport**

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**License # P027, PIF #P027-0306-2017
June 1st, 2017**

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Executive Summary

The proponent retained the services of Scarlett Janusas Archaeology Inc. (SJA) to conduct a Stage 2 archaeological resource assessment on the property affected by the realignment of Regional Road #33.

Permission to access the property and to conduct all activities associated with the Stage 2 archaeological assessment was provided by the landowner. The property is an agricultural field. The study area is located on part of lots 27, 28, 29 and 30, Lake Range, in the geographic Township of Saugeen, Municipality of Saugeen Shores, in the County of Bruce. The study property is approximately 2.75 hectares in size.

The County of Bruce required an archaeological assessment of the property. The archaeological assessment was triggered by the Environmental Assessment Act..

Background indicated that there are no registered archaeological sites within one kilometer of the study area. There are no extant buildings on the property, and the property consists ploughed and weathered agricultural fields.

Belden's *1880 Historic Atlas of Grey and Bruce Counties* shows Lot 27, of the Lake Range concession as being under the ownership of J. Eidt.

Soils are identified as sandy loam with imperfect drainage. Field observations noted that the topography of the project area was relatively level with a range in elevation from 195-198 meters.

The Stage 2 archaeological assessment of the study property was conducted under license P027 (Scarlett Janusas, PIF #P027-0306-2017) on May 26th, 2017 under good assessment weather conditions. No archaeological sites were located.

Based upon the background research of past and present conditions, and the Stage 2 archaeological assessment the following is recommended:

- No further archaeological assessment is required for this property.
- Compliance legislation must be adhered to in the event of discovery of deeply buried cultural material or features.

This archaeological assessment has been conducted under the 2011 Standards and Guidelines for Consultant Archaeologists (Ministry of Tourism, Culture and Sport, 2011).

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Project Personnel

Project Manager
Principal Archaeologist

Scarlett Janusas (P027)

Report Preparation

Scarlett Janusas (P027)
Chelsea Robert (R403)

Field Director

Pete Demarte (R1073)

Field Crew

Chelsea Robert (R403)
Pete Demarte (R1073)

Graphics

Chelsea Robert

Saugeen Ojibway Nation
Representatives

Adrienne Brennan

**STAGE 1 AND 2 ARCHAEOLOGICAL ASSESSMENT
REGIONAL ROAD #33 REALIGNMENT
PART LOT 37, 38, 39 & 30, LAKE RANGE
MUNICIPALITY OF SAUGEEN SHORES
FORMER GEOGRAPHIC TOWNSHIP OF SAUGEEN
BRUCE COUNTY, ONTARIO
ORIGINAL REPORT**

1.0 PROJECT CONTEXT

1.1 Development Context

The proponent retained the services of Scarlett Janusas Archaeology Inc. (SJA) to conduct a Stage 2 archaeological resource assessment on property where the Regional Road #33 realignment will be occurring. The project area underwent an archaeological assessment by Mayer Heritage in 2010 under Project Information Form Number (PIF #) P040-313-2010.

Permission to access the property and to conduct all activities associated with the Stage 2 archaeological assessment was provided by the landowner. The property is ploughed field. The property is located on part of lots 28, 29 and 30, Lake Range, Municipality of Saugeen Shores, in the geographic township of Saugeen, the County of Bruce. The study area is approximately 2.75 hectares in size (Maps 1 – 4).

The archaeological assessment was triggered by the Environmental Assessment Act. The County of Bruce required an archaeological assessment of the property.

This archaeological assessment has been conducted under the 2011 Standards and Guidelines for Consultant Archaeologists (Ministry of Tourism, Culture and Sport, 2011).

1.2 Indigenous Engagement

Saugeen Ojibway Nation (SON) was contacted by SJA regarding input and/or presence of monitors for the project on behalf of the client. The client entered into an agreement with SON and monitors were present during the entirety of the project. The Supplementary Documentation provides additional details regarding engagement.

1.3 Historical Context

The historical context describes the past and present land use and the settlement history, and other relevant historical information from previous archaeological work.

1.3.1 Stage 1 Land Use History

The Stage 1 archaeological assessment licence report for the project area was produced by Mayer Heritage Consulting (MHC) in 2010 (P040-313-2010) including a visual assessment conducted in February of 2010.

O'Neal (2010:10), who authored the report, indicated that the 1880 Historic Atlas of Grey and Bruce shows part of the property in the ownership of J. Eidt. There are no structures on the map, but this does not mean there were no structures or owners, as this is a subscriber based atlas. There is no other land use history provided by O'Neal.

1.4 Archaeological Context

1.4.1 Previously Known Archaeological Resources/Assessments

The Ministry of Tourism, Culture and Sport PastPortal site (2017) indicated there are no sites located within one kilometer of the study area. The Stage 1 archaeological assessment was conducted by MHC and was entitled *Archaeological Assessment (Stage 1) Bruce County Road 25, Re-Alignment, Port Elgin, Ontario* (Mayer Heritage Consultants Inc. 2010) under PIF# P040-313- 2010.

1.4.2 Current Environment

The study area consists of a ploughed agricultural field located on Lots 27, 28, 29 and 30 Lake Range in the municipality of Saugeen Shores, county of Bruce. There are no extant structures or ruins located on the property. The study area runs on a diagonal from Regional Road #33 north-east to Bruce Road 25 and is approximately 917 m long by 50 m wide. It is approximately 4.58 ha in area. There are no water sources located directly on the property.

1.4.3. Summary of Stage 1 Archaeological Assessment

The Stage 1 archaeological assessment (MHC 2010) recommended Stage 2 archaeological assessment based on the property's soil, topography, proximity to water, and undisturbed nature.

The study area was identified as being located in the Huron Slope physiographic region, soils were identified as sandy loam with imperfect drainage and topography smooth to very gently sloping (ibid: 6). At the time of the Stage 1 assessment, the consultant reported that there were no registered sites within two kilometres of the study area.

Based on all background research and a property visit (windshield), Stage 2 archaeological assessment was recommended for the property (ibid: 11).

2.0 FIELD METHODOLOGY

2.1 Stage 2 (Archaeological Assessment)

The Stage 2 archaeological assessment was conducted on May 26th, 2017 under overcast skies and a high of 11 degrees Celsius.

As per the Ministry of Tourism, Culture and Sports' Standards and Guidelines (2011: Section 2.1, Standard 3) the fieldwork was conducted under the appropriate lighting and weather conditions.

There are no unusual physical features affecting fieldwork.

The following table identifies the standard within the Ministry of Tourism, Culture and Sports' Standards and Guidelines document (2011) and how they were met with respect to Stage 2 Field Assessment.

Standard Section	Standard	Action
Property Survey		
2.1, Standard 1	Survey the entire property, including lands immediately adjacent to built structures (both intact and ruins), excepting those areas identified by Section 2.1, Standard 2	Done
2.1, Standard 2a	Survey is not required where: a. lands are evaluated as having no or low potential based on the Stage 2 identification of physical features of no or low archaeological potential, including but not limited to: permanently wet areas, exposed bedrock, steep slopes (greater than 20°) except in locations likely to contain pictographs or petroglyphs b. lands are evaluated as having no or low potential based on the Stage 2 identification of extensive and deep land alteration that has severely damaged the integrity of archaeological resources c. lands have been recommended to not require Stage 2 assessment by a Stage 1 report, where the ministry has accepted the Stage 1 report into the Ontario Public Register of Archaeological Reports d) lands are designated for forest management activity without potential for impacts to archaeological sites, as determined through the Stage 1 forest management plans process (see section 1.4.3) e) lands are formally prohibited from alteration such as areas in an environmental easement,	Not Applicable

Standard Section	Standard	Action
	restrictive setback, or prohibitive zoning, where the constraint prohibits any form of soil disturbance. (Open space and other designations where allowable uses include land alterations must be surveyed.) f) it has been confirmed that the lands are being transferred to a public land-holding body, e.g., municipality, conservation authority, provincial agency. (This does not apply to lands for which a future transfer is contemplated but not yet confirmed.)	
2.1, Standard 3	Survey the property when weather and lighting conditions permit good visibility of land features	May 26 th , 2017. Overcast skies, high of 11°C
2.1, Standard 4	Using the Global Positioning System (GPS) according to the requirements set out in section 5, record the locations of the following: all diagnostic artifacts, sufficient artifacts to provide an estimate of the limits of the archaeological site, and all fixed reference landmarks	Done. Site marked with survey stakes which are based on site plan. GPS: GPSMap60Cx Accuracy: ±2m
2.1, Standard 5	Map all field activities (e.g., extent and location of survey methods, survey intervals) in reference to fixed landmarks, survey stakes and development markers. Mapping must be accurate to 5 m or to the best scale available. Use any mapping system that achieves this accuracy.	Done
2.1, Standard 6	Photo-document examples of all field conditions encountered	Done
2.1, Standard 7	Do not use heavy machinery (e.g., gas-powered augers, backhoes) to remove soil, except when removing sterile or recent fill covering areas where it has been determined that there is the potential for deeply buried or sealed archaeological sites	Done – no use of heavy machinery
Pedestrian Survey		
2.1.1, Standard 1	Actively or recently cultivated agricultural land must be subject to pedestrian survey.	Done
2.1.1., Standard 2	Land to be surveyed must be recently ploughed. Use of chisel ploughs is not acceptable. In heavy clay soils ensure furrows are disked after ploughing to break them up further.	Done
2.1.1, Standard 3	Land to be surveyed must be weathered by one heavy rainfall or several light rains to improve the visibility of archaeological resources.	Done

Standard Section	Standard	Action
2.1.1, Standard 4	Provide direction to the contractor undertaking the ploughing to plough deep enough to provide total topsoil exposure, but not deeper than previous ploughing.	Done
2.1.1, Standard 5	At least 80% of the ploughed ground surface must be visible. If surface visibility is below 80% (e.g., due to crop stubble, weeds, young crop growth), ensure the land is re-ploughed and weathered before surveying.	Done
2.1.1, Standard 6	Space survey transects at maximum intervals of 5 m	Done
2.1.1, Standard 7	When archaeological resources are found, decrease survey transects to 1 m intervals over a minimum of a 20 m radius around the find to determine whether it is an isolated find or part of a larger scatter. Continue working outward at this interval until the full extent of the surface scatter has been defined.	Not applicable
2.1.1, Standard 8	Collect all formal artifact types and diagnostic categories. For 19th century archaeological sites, also collect all refined ceramic sherds (or, for larger sites collect a sufficient sample to form the basis for accurate dating).	Not applicable
2.1.1, Standard 9	Based on professional judgment, strike a balance between gathering enough artifacts to document the archaeological site and leaving enough in place to relocate the site if it is necessary to conduct further assessment	Not applicable
Test Pit Survey		Not applicable
2.1.2, Standard 1	Test pit survey only on terrain where ploughing is not possible or viable, as in the following examples: wooded areas, pasture with high rock content abandoned farmland with heavy brush and weed growth, orchards and vineyards that cannot be strip ploughed (planted in rows 5 m apart or less), gardens, parkland or lawns, any of which will remain in use for several years after the survey properties where existing landscaping or infrastructure would be damaged. The presence of such obstacles must be documented in sufficient detail to demonstrate that ploughing or cultivation is not viable.	Not applicable
2.1.2, Standard 2	Test pits were spaced at maximum intervals of 5 m (400 test pits per hectare) in areas less than 300 m from any feature of archaeological potential.	Not applicable

Standard Section	Standard	Action
2.1.2, Standard 3	Space test pits at maximum intervals of 10 m (100 test pits per hectare) in areas more than 300 m from any feature of archaeological potential	Not applicable
2.1.2, Standard 4	Test pit to within 1 m of built structures (both intact and ruins), or until test pits show evidence of recent ground disturbance	Not applicable
2.1.2, Standard 5	Ensure that test pits are at least 30 cm in diameter.	Not applicable
2.1.2, Standard 6	Excavate each test pit, by hand, into the first 5 cm of subsoil and examine the pit for stratigraphy, cultural features, or evidence of fill.	Not applicable
2.1.2 Standard 7	Screen soil through mesh no greater than 6 mm.	Not applicable
2.1.2 Standard 8	Collect all artifacts according to their associated test pit	Not applicable
2.1.2 Standard 9	Backfill all test pits unless instructed not to by the landowner.	Not applicable

Map 4 illustrates the plan of survey for the property. Map 5 illustrates the images taken of the archaeological assessment (Images 1 - 5), Map 5 illustrates the archaeological potential of the property, and, Map 7 illustrates assessment methodology.

One hundred percent of the property was subject to Stage 2 archaeological assessment using a pedestrian transect methodology. No cultural materials or features were located in the study area.

Section 2.2 of the Standards and Guidelines (MTC 2011) sets out standards to determine the need for Stage 3 archaeological assessment.

Standard Section	Standard	Action
Section 2.2, Analysis, Determining Requirement for Stage 3 Assessment		
2.2, Standard 1	Artifacts, groups of artifacts or archaeological sites meeting the following criteria require Stage 3 assessment	
2.2, Standard 1a	Pre-contact diagnostic artifacts or a concentration of artifacts (or both)	Not applicable
2.2, Standard 1a, i	Within a 10 x 10 m pedestrian survey area	
2.2, Standard 1a, i, (1)	At least one diagnostic artifact or fire cracked rock in addition to two or more non-diagnostic artifacts	Not applicable

Standard Section	Standard	Action
2.2, Standard 1a, i, (2)	In areas east or north of the Niagara Escarpment, at least five non-diagnostic artifacts	Not applicable
2.2, Standard 1a, i, (3)	In areas west of the Niagara Escarpment, at least 10 non-diagnostic artifacts	Not applicable
2.2, Standard 1a, ii	Within a 10 x 10 m test pitting area	
2.2, Standard 1a, ii, (1)	At least one diagnostic artifact from combined test pit and test unit excavations	Not applicable
2.2, Standard 1a, ii, (2)	At least five non-diagnostic artifacts from combined test pit and test unit excavations.	Not applicable
2.2, Standard 1b	Single examples of artifacts of special interest	Not applicable
2.2, Standard 1b, i	Aboriginal ceramics	Not applicable
2.2, Standard 1b, ii	Exotic or period specific cherts	Not applicable
2.2, Standard 1b, iii	An isolated Paleo-Indian or Early Archaic diagnostic artifact	Not applicable
2.2, Standard 1c	Post-contact archaeological sites containing at least 20 artifacts that date the period of use to before 1900.	Not applicable
2.2, Standard 1d	Twentieth century archaeological sites, where background documentation or archaeological features indicate possible cultural heritage value or interest	Not applicable
2.2, Standard 1e	The presence of human remains	Not applicable

No cultural materials or features were located in the study area, hence, there is no requirement to conduct Stage 3 archaeological assessment of the study area.

3.0 RESULTS

3.1 Stage 2 Archaeological Assessment

According to Standard 7.8.2 (MTC 2011) the following is required and has been satisfied or found to be non-applicable.

Standard	Detail	Action
7.8.2 Standard 1a	A general description of the types of artifacts and features that were identified.	Not applicable
7.8.2, Standard 1b	A general description of the area within which artifacts and features were identified including the spatial extent of the area and any relative variations in artifact density	Not applicable
7.8.2, Standard 1c	A catalogue and description of all artifacts retained.	Not applicable
7.8.2, Standard 1d	A description of the artifacts and features left in the field, nature of material, frequency, other notable traits.	Not applicable
7.8.2, Standard 2	Provide an inventory of the documentary record generated in the field.	Digital Photographs of field conditions and site. Field notes of field conditions and site. Daily Record Log of personnel, weather conditions, hours, field conditions (see Section 3.4)
7.8.2, Standard 3	Submit information detailing exact site locations on the property, separately from the project report.	Not applicable
7.8.2, Standard 3a	A table of GPS readings for locations of all archaeological sites	Not applicable
7.8.2, Standard 3b	Maps showing detailed site location information	Not applicable

3.2 Summary of Finds

No cultural material or features were located during the Stage 2 archaeological assessment.

3.3 Inventory of Documentary Records Made In Field

Documents made in the field include:

- Daily record log and field notes – 2 pages
- Photograph log – 1 page
- Digital photographs – 5 photographs
- Field map showing location and orientation of photos taken.

4.0 ANALYSIS AND CONCLUSIONS

The following illustrates the standards and actions regarding analysis and conclusions.

Standard	Description	Action
7.8.3 (Analysis and Conclusions) Standard 1	Summarize all findings from the Stage 2 survey, or state that no archaeological sites were identified.	No sites were identified
7.8, Standard 2	For each archaeological site, provide the following analysis and conclusions:	
7.8, Standard 2a	A preliminary determination, to the degree possible, of the age and cultural affiliation of any archaeological sites identified	Not Applicable
7.8, Standard 2b	A comparison against the criteria in 2 Stage 2: Property Assessment to determine whether further assessment is necessary.	Not Applicable
7.8, Standard 2c	A preliminary determination regarding whether any archaeological sites identified in Stage 2 show evidence of a high level of cultural heritage value or interest and will thus require Stage 4 mitigation.	Not Applicable

One hundred percent of the study area was subject to Stage 2 archaeological assessment.

No cultural material or features were located during the Stage 2 archaeological assessment.

Based on Section 2.2 of the Standards and Guidelines, no further archaeological assessment is required for this property.

5.0 RECOMENDATIONS

Standard	Description	Compliance
7.8.4 (General Recommendations)	For each archaeological site, provide a statement of the following:	
7.8.4, Standard 1a	Borden No. or other identifying number	Not applicable
7.8.4, Standard 1b	Whether or not it is of further cultural heritage or interest.	Not applicable
7.8.4, Standard 1c	Where it is of further cultural heritage or interest, appropriate Stage 3 assessment strategies	Not applicable
7.8.4, Standard 2	Make recommendations only regarding archaeological matters.	Not applicable
7.8.4, Standard 3	If the Stage 2 survey did not identify any archaeological sites requiring further assessment or mitigation of impacts, recommend that no further archaeological assessment of the property be required.	Recommend that no further archaeological assessment of the property is required
7.8.5 Recommendations for Partial Clearance		
7.8.5 Standard 1	A recommendation for partial clearance may only be made if all of the following conditions have been met:	Not applicable
7.8.5, Standard 1a	Stage 2 archaeological fieldwork has been completed within the entire project limits (Archaeological sites are present that still require Stage 3, and possibly Stage 4, archaeological fieldwork))	Not applicable
7.8.5, Standard 1b	The recommendation forms part of a final report on the Stage 2 work.	Not applicable
7.8.5, Standard 1c	The recommendation includes a request for the ministry to provide a letter confirming that there are no further concerns with regard to alterations to archaeological sites for some specified part of the project area.	Not applicable
7.8.5, Standard 1d	The Stage 2 report includes recommendations for further archaeological fieldwork for all sites that meet the criteria requiring Stage 3 archaeological field assessment.	Not applicable
7.8.5, Standard 1e Include the following documentation in the report package		

Standard	Description	Compliance
7.8.5, Standard 1 e, i	Development map showing the location and extent of all archaeological sites for which Stage 3 archaeological assessment is recommended, including a 20 m protective buffer zone for each site, and a 50 m monitoring zone for each site.	Not applicable
7.8.5, Standard 1 e, ii	Detailed avoidance strategy, and written confirmation from the proponent regarding the proponent's commitment to implementing the strategy and confirmation that ground alterations (e.g. servicing, landscaping) will avoid archaeological sites with outstanding concerns and their buffer areas	Not applicable
7.8.5, Standard 1 e, iii	Construction monitoring schedule, and written confirmation from the proponent that a licensed consultant archaeologist will monitor construction in areas within the 50 m monitoring buffer zone, and that the consultant archaeologist is empowered to stop construction if there is a concern for impact to an archaeological site	Not applicable
7.8.5, Standard 1 e, iv	Timeline for completing remaining archaeological fieldwork.	Not applicable

It is recommended that no further archaeological assessment of the property is required.

6.0 ADVICE ON COMPLIANCE WITH LEGISLATION

According to the 2011 Standards and Guidelines (Section 7.5.9) the following must be stated within this report:

This report is submitted to the Minister of Tourism, Culture and Sport 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 that are 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, Culture and Sport, 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.

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.

Should previously undocumented archaeological resources be discovered, they may be an 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 consultant archaeologist to carry out archaeological fieldwork, in compliance with sec. 48 (1) of the Ontario Heritage Act.

The Cemeteries Act, R.S.O. 1990 c. C.4 and the Funeral, Burial and Cremation Services Act, 2002, S.O. 2002, c.33 require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services.

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 license.

7.0 BIBLIOGRAPHY AND SOURCES

Government of Ontario

1990a **The Ontario Heritage Act R.S.O. 1990.** Ontario Regulation 9/06, made under the Ontario Heritage Act. Criteria for Determining Cultural Heritage Value or Interest. Queen's Printer, Toronto.

1990b **The Planning Act. R.S.O. 1990**

Ministry of Tourism and Culture

2011 **Standards and Guidelines for Consulting Archaeologists.** Ministry of Tourism, Culture and Sport

Natural Resources Canada

n.d. Toporama – Topographic Maps. Accessed May 24 2017. On line

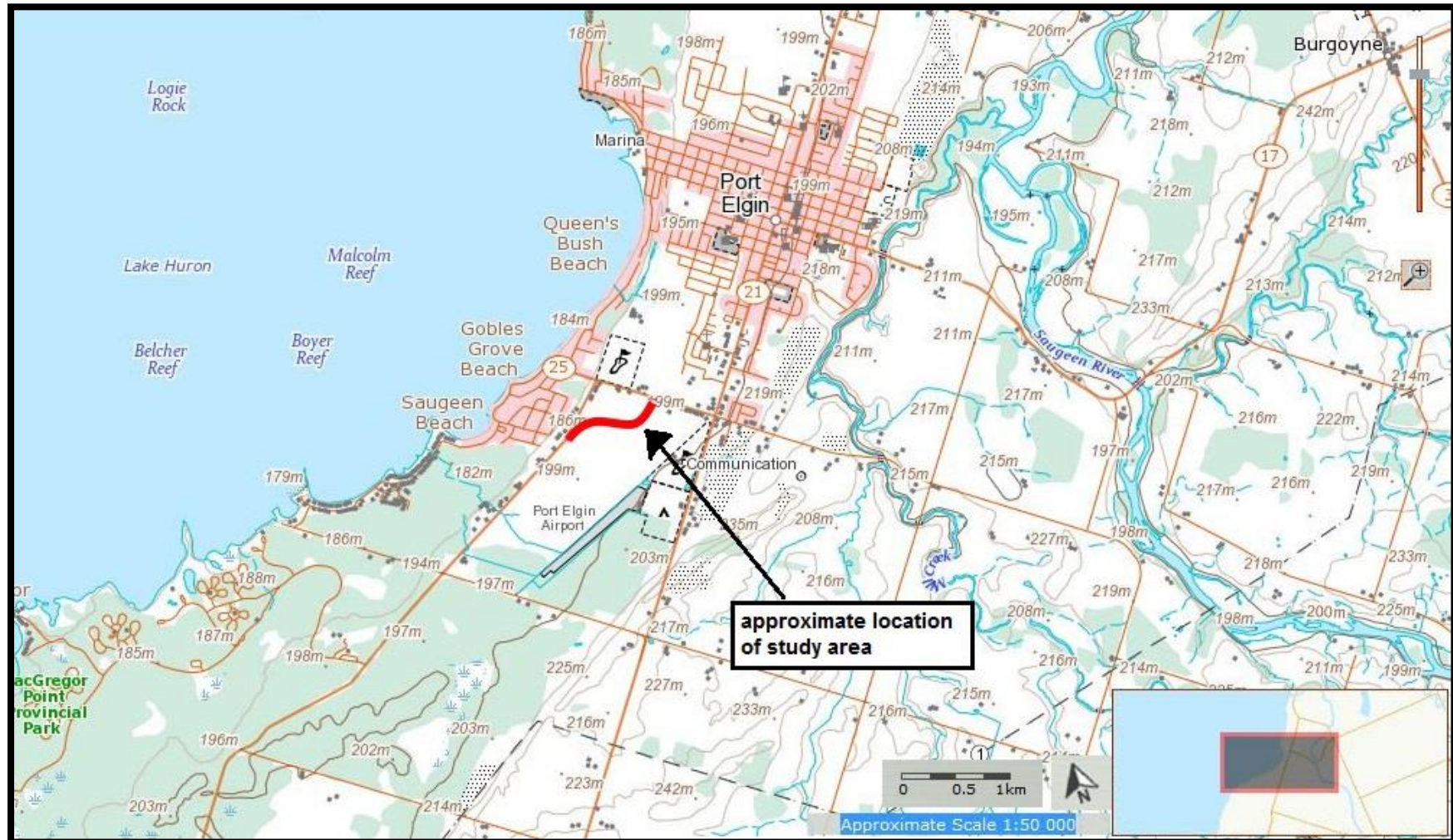
On Line and Other Sources

Bruce County Interactive Mapping
www.Brucecounty.on.ca/map

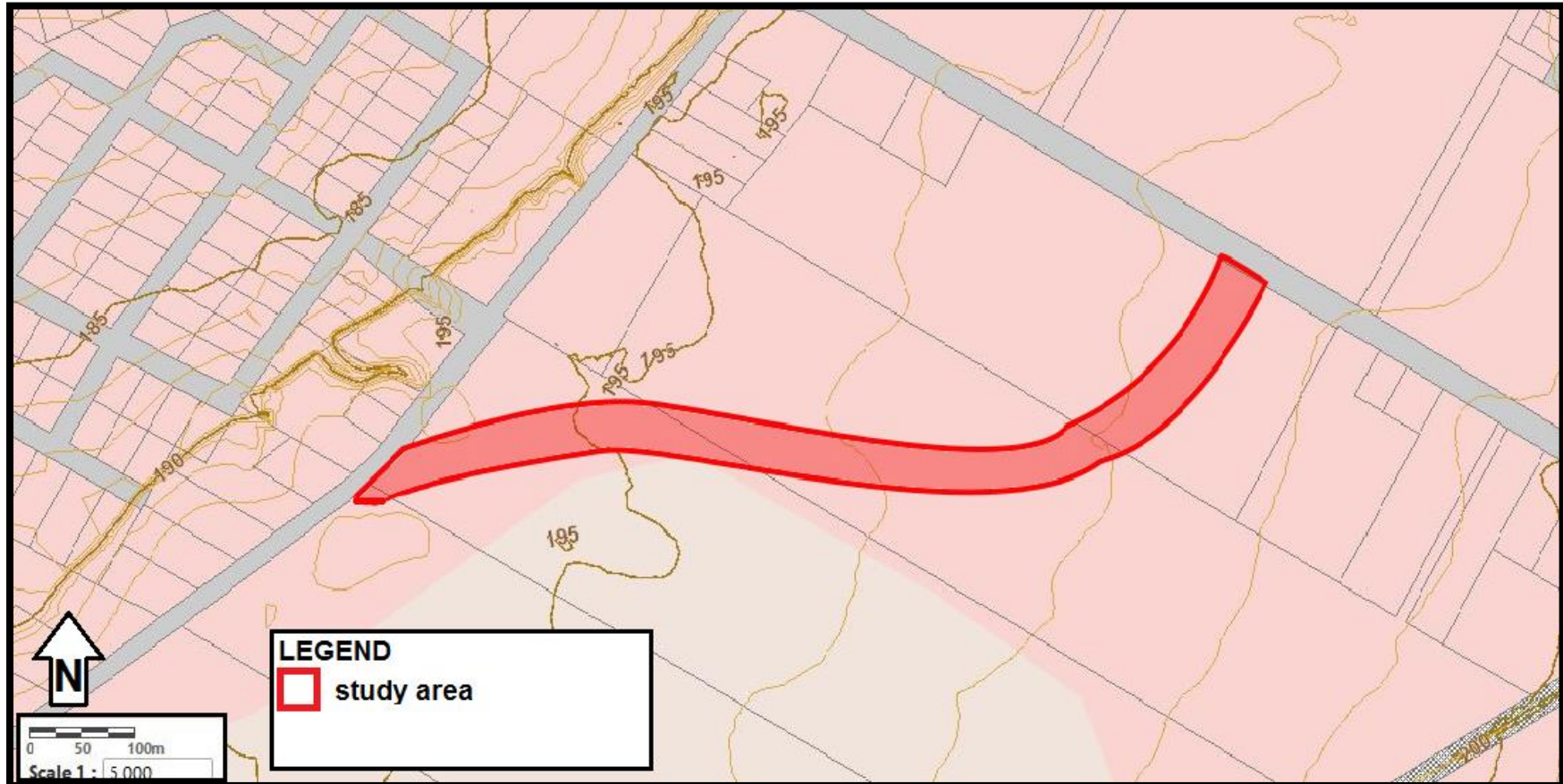
Topographic Mapping
www.atlas.nrcan.gc.ca

MAPS

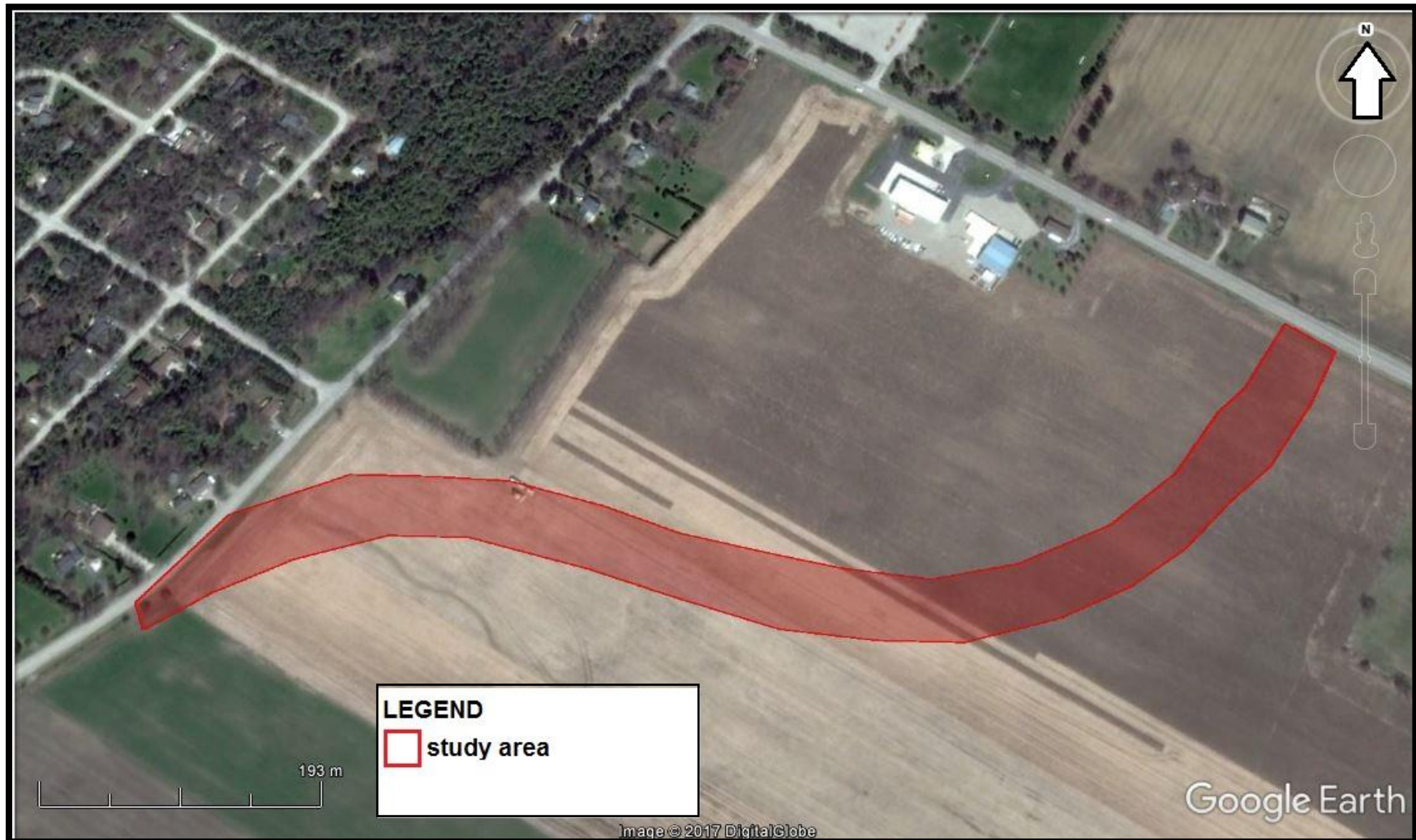
Map 1: Regional Location of Study Area (Toporama 2017)



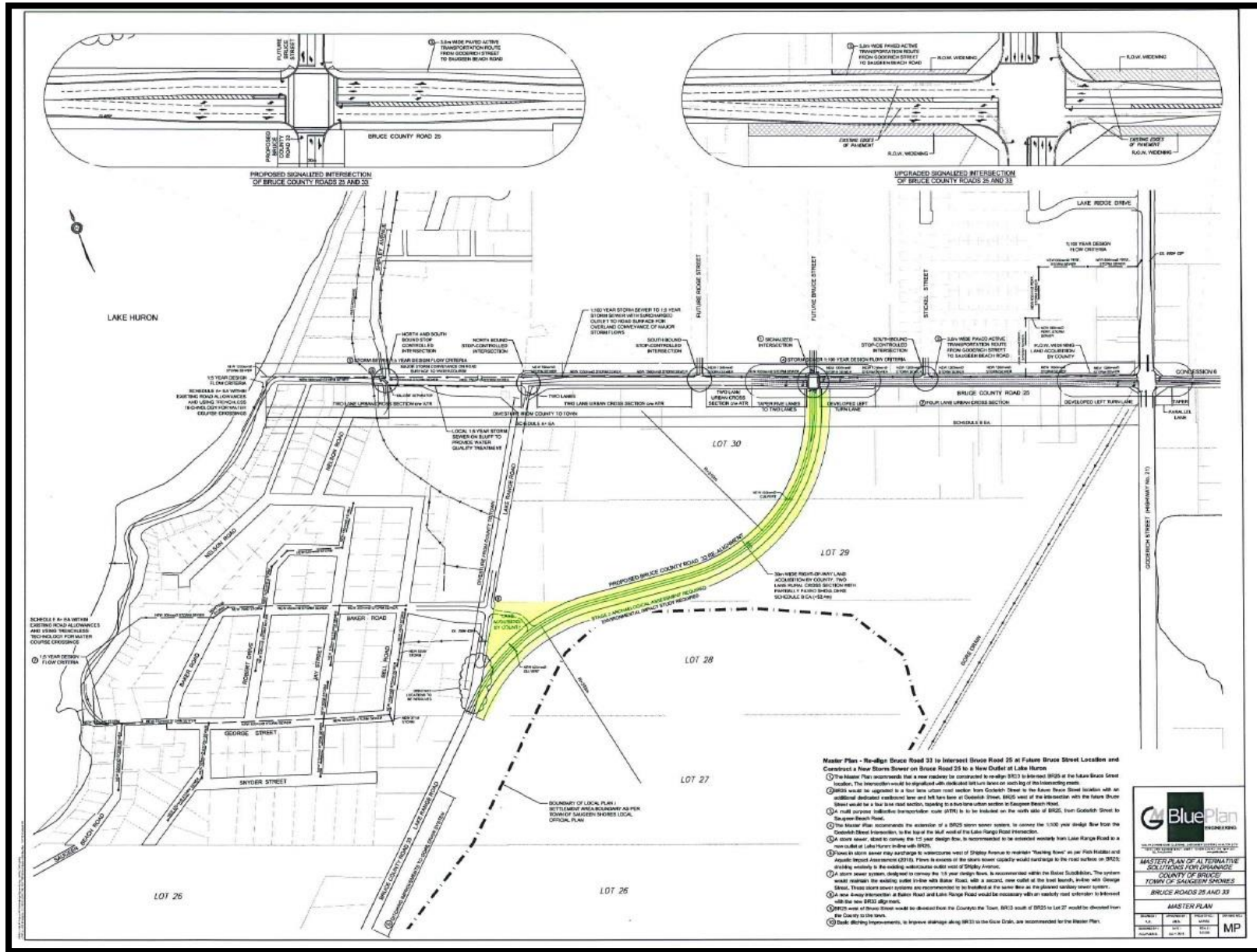
Map 2: Topographic Map of Study Area (Bruce County Mapping 2017)



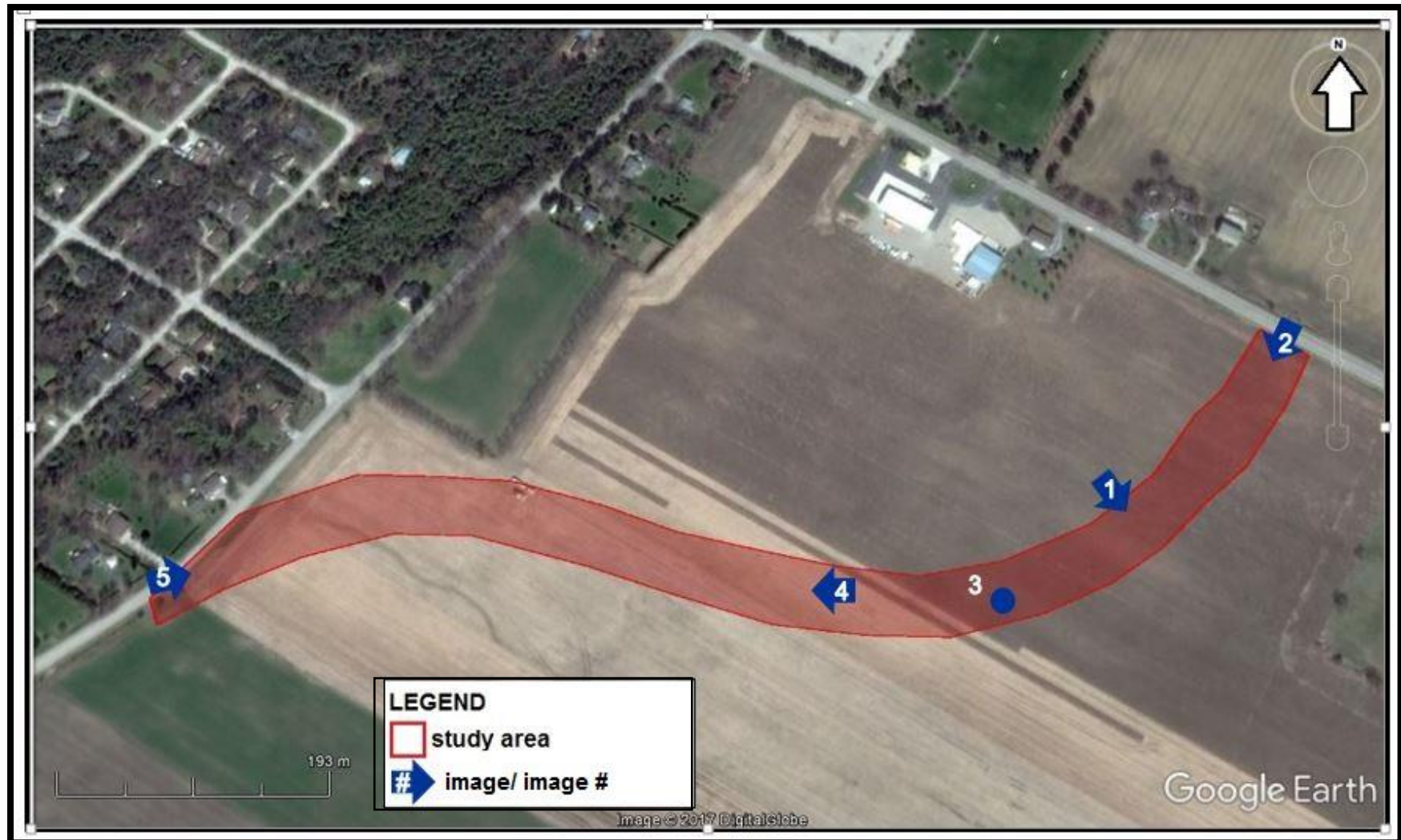
Map 3: Aerial of Study Property (Bruce County Mapping 2015)



Map 4: Regional Road 33 Concept Plan



Map 5: Location & Direction of Photographs



Map 6: Area of Archaeological Potential



Map 7: Assessment Methodology



IMAGES

Image 1: Pedestrian survey of study area (facing SE)



Image 2: Study area from northeast end (facing SW)



Image 3: Good visibility (over 80%) for soil conditions (facing SW)



Image 4: Pedestrian survey of study area (facing W)



Image 5: Study area from southwest end (facing NE)



APPENDIXES

APPENDIX A – Photo Log

Image #	Direction	Description
1	SE	Pedestrian survey
2	SW	Study area from N side of property
3	SW	Good visibility (over 80%) for soil conditions
4	W	Pedestrian survey
5	NE	Study area from W side of property

PHASE 4
PRELIMINARY (CLASS D) CONSTRUCTION COST ESTIMATE
CONSTRUCTION OF BRUCE COUNTY ROAD 33
FROM STA. 0+000 to STA. 0+935
250m WEST OF RIDGE STREET TO HIGHWAY No. 21
OCTOBER, 2017

File No. 217127

Item No.	Description	Qty.	Unit of Measure	Unit Price	Total Price
Road Works					
1	Clearing and grubbing	100%	L.S.	10,000.00	10,000.00
2	Removal of bituminous surfaces	1,200	m ²	5.00	6,000.00
3	Earth Excavation	2,000	m ³	7.50	15,000.00
4	Topsoil Stripping	8,500	m ³	3.00	25,500.00
5	Granular "B"	20,000	tonne	15.00	300,000.00
6	Granular "A"	6,000	tonne	20.00	120,000.00
7	Hot mix asphalt	2,700	tonne	95.00	256,500.00
8	Landscaping, topsoil, seed and mulch	10,000	m ²	5.00	50,000.00
9	Signage	100%	L.S.	2,500.00	2,500.00
10	Traffic control	100%	L.S.	10,000.00	10,000.00
11	Pavement markings	100%	L.S.	10,000.00	10,000.00
Subtotal for Road Works					805,500.00
Storm Sewers					
12	Removal of culverts	30	m	20.00	600.00
13	525 Ø Culverts	45	m	200.00	9,000.00
14	450mm Ø storm sewers	60	m	155.00	9,300.00
15	Headwall	1	each	20,000.00	20,000.00
16	SWM Pond allowance	100%	L.S.	150,000.00	150,000.00
17	Rip-rap with filter fabric	100	m ²	35.00	3,500.00
Subtotal for Storm Sewers					192,400.00
Sanitary Sewers					
18	1200 mm Ø sanitary manholes	4	each	4,500.00	18,000.00
19	250 mm Ø sanitary sewers (incl. plugs)	375	m	200.00	75,000.00
Subtotal for Sanitary Sewers					93,000.00
Watermains					
20	250 mm Ø watermain	950	m	235.00	223,250.00
21	250 mm Ø valves	12	each	2,300.00	27,600.00
22	250 mm Ø bends	8	each	475.00	3,800.00
23	250 mm Ø plugs	2	each	250.00	500.00
24	Fire hydrants	9	each	5,000.00	45,000.00
Subtotal for Watermains					300,150.00
PROJECT SUBTOTAL					\$ 1,391,050.00
Contingencies @ 15%					\$ 208,657.50
Engineering @ 15%					\$ 208,657.50
PROJECT TOTAL					1,808,365.00



AWS Environmental Consulting Inc.
(Operating as Aquatic and Wildlife Services)

**242090 Concession Rd. 3 Keppel,
R.R. # 1, Shallow Lake, Ontario, Canada, N0H 2K0**

Office: 519-372-2303, Email: aws@gbtel.ca

Web site: www.awsenvironmental.ca

July 26, 2017

GM BluePlan Engineering Limited
1260 2nd Avenue East
Owen Sound, ON
N4K 2J3

Attention: Mr. John Slocombe, Project Manager

Re: Natural Heritage Environmental Impact Assessment
Bruce County Road 33 Realignment-Port Elgin Area
Municipal Class Environmental Assessment/Municipal Infrastructure Project

Dear Mr. Slocombe

Attached is the Environmental Impact Assessment letter report scoped to 'Species-At-Risk' , for the subject County Road 33 realignment proposed works near Port Elgin.

Respectfully Submitted

John Morton
President, AWS Environmental Consulting Inc.

cc The Town of Saugeen Shores

Attachment: EIS-SAR letter report

Bruce County Road 33 Realignment
Scoped Natural Heritage Environmental Impact Study

1. Introduction

The County of Bruce as Proponent, with the Town of Saugeen Shores has proposed a realignment to a portion of Bruce Road 33 at its intersection with Bruce Road 25, near the settlement of Port Elgin, Ontario.

To aid in addressing environmental concerns under the Municipal Class Environmental Assessment process, a Natural Heritage Feature review and 'Species-At-Risk' survey with impact assessment has been completed in support of the recommended alternative design found within the Master Plan.

2. Study and Site Lands

The Study Lands are defined as those lands assessed in the field where the road construction works to Bruce Rd 33 are to be realigned and its immediate adjacent 25m lands.

The Site Lands are defined as the road realignment lands plus the surrounding 120m lands, for natural heritage feature and historical records background review, as per the 2014 Provincial Policy Statement for Natural Heritage.

Appendix No. 1 shows the Master Plan site plan design of the Bruce Road 33 realignment by GM BluePlan Engineering Ltd.

Figure No. 1 outlines the EIS Study and Site Lands on a July 2015 air photo, based on the Master Plan design.

3. Background Review

i. Natural Heritage Features

Figure No. 2, shows no significant Natural Heritage features or environmental constraints documented within the Bruce County Official Plan (OP) to the Site Lands. Similarly Figure No. 3 shows no Provincially Significant Natural Heritage features, sourced from the Ministry of Natural Resources and Forestry (MNRF) web site mapping to the Site Lands.

ii. Historical Records

Table No. 2: MNRF Significant Flora & Fauna Records within 5km's to the Study Lands

- Excluding fauna within Lake Huron or Saugeen River waters

Common Name	Scientific Name	Status	Last Recorded in Search Area	Habitat & Impact Concerns
Butternut	Juglans Cinerea	Ranking = S2 Status = Endangered	2008	Potential along field edge
Small White Lady's-slipper	Cypripedium candidum	Ranking = S1 Status= Endangered	1903	No suitable habitat, no concerns
Bobolink	Dolichonyx oryzivorus	Ranking = S4 Status= Threatened	2003	Potential nesting habitat
Eastern Meadowlark	Stunella magna	Ranking = S4 Status = Threatened	2003	Potential nesting habitat
Northern Map Turtle	Graptemys geographica	Ranking = S3 Status = Special Concern	1981	No suitable habitat, no concerns
Snapping Turtle	Chelydra serpentina	Ranking = S3 Status = Special Concern	2003	No suitable habitat, no concerns
Dwarf Lake Iris	Iris lacustris	Ranking = S3 Status = Special Concern	1952	No suitable habitat, no concerns
Eastern Ribbonsnake	Thamnophis sauritus	Ranking = S3 Status = Special Concern	1981	No suitable habitat, no concerns
Eastern Milksnake	Lampropeltis triangulum	Ranking = S3 Status = Special Concern	1973	Potential along field edge

- Through the above historical records check and the Site Lands preliminary habitat assessment through air photo interpretation, field survey works were focused on: Butternut investigations, Breeding Bird survey works and Snake activity. Though observations of any significant flora and fauna within the Study Lands investigations would be recorded.

4. Survey Dates and Weather Conditions

Table No. 1: Field Survey Dates and Conditions, to Provincial Protocol Standards

Date	Time	Weather	Focused Survey Works
May 12, 2017	1000-1030	Temp. = 11.5C Wind = 6-11 km/hour Precipitation = 0	Hydrology, Snake hibernation emergence activity period
May 31, 2017	0700-0730	Temp. =14.5C Wind = 12-19 km/hour Precipitation = 0	Breeding Birds
June 10, 2017	0745-0800	Temp. = 18C Wind = 6-11 km/hour Precipitation = 0	Breeding Birds
June 28, 2017	0800-0830	Temp. = 15C Wind = 6-11 km/hour Precipitation = 0	Breeding Birds, Flora

5. Flora Findings

No Butternut or any significant flora species were identified within the Study Lands. The field environment was in active agricultural cash crop production, with soy beans planted in 2017. The road allowance ditch - field edge were primarily grasses with patches of weeds (non- native) and scattered immature Sugar Maple and Spruce trees.

6. Fauna Findings

With no water courses or surface water features within the Study Lands it has been confirmed in the field that there is no Fish Habitat. Site investigations did not record any mammals, reptiles or amphibians within the Study Lands during the site investigations. Additionally, no critical habitat for amphibian breeding, reptile hibernation or gestation, mammal roosting or rearing was identified within the Study Lands, to provincial habitat descriptions.

No SAR snakes (Milksnake) or suitable critical habitat that could support hibernation or gestation activity was identifiable to provincial habitat criteria, within the Study Lands. No critical roosting or rearing habitat for SAR Bats was identified within the Study Lands to provincial habitat criteria.

Breeding bird survey works recorded the following species and numbers:

- Killdeer, 1
- White -throated Sparrow, 3
- Blue Jay, 1
- Brown-headed Cowbird, 2
- House Finch, 1
- American Goldfinch, 4

All of the observed bird species are considered 'common' with no significance status or regulatory requirements.

No, SAR Birds were recorded within the Study Lands investigations, nor observed within the immediate surrounding field environments to the Study Lands.

7. Impact Assessment

Site investigations of 2017 confirmed that no At Risk Species occur within the Study Lands. As such, the proposed road construction activities would be in compliance with the Provincial Endangered Species Act and the Federal Species At Risk Act.

8. Recommended Mitigation

On-site investigations confirmed that a few locally common bird species utilized the road allowance-field edge habitat for nesting, rearing activity.

As such, if no construction site preparation works are undertaken, it is recommended that no Tree cutting or vegetation removal should occur within the construction limits from May 1 to August 31 in compliance with the Federal Migratory Birds Act.

Alternatively, if construction work is proposed to be undertaken during this nesting/rearing period the following activities are recommended to discourage bird nesting activity, but the proponents should be aware that construction activity may not be in compliance with the Migratory Birds Act:

- Site preparation works for tree/shrub removal be completed outside the bird nesting/rearing period.
- The field environment should be maintained, in a non-grass environment (i.e. in cash crop soy beans, corn, canola etc.) to discourage grassland nesting birds. If this field environment supports grasses at the time of construction, additional SAR bird survey works would be required in that year and may require application/permitting under the Provincial Endangered Species Act if SAR birds are confirmed that year.
- Site preparation works along the road allowance pre-construction activity, should include road allowance grass mowing/cutting, so that ground flora does not exceed 4cm height.
- Prior to construction related site alterations commencing, the construction zone area shall be field checked by a qualified person for breeding bird activity with any identified nesting sites mapped and no disturbances to those immediate nests for non-SAR bird species.
- Respectfully Submitted

Respectfully Submitted



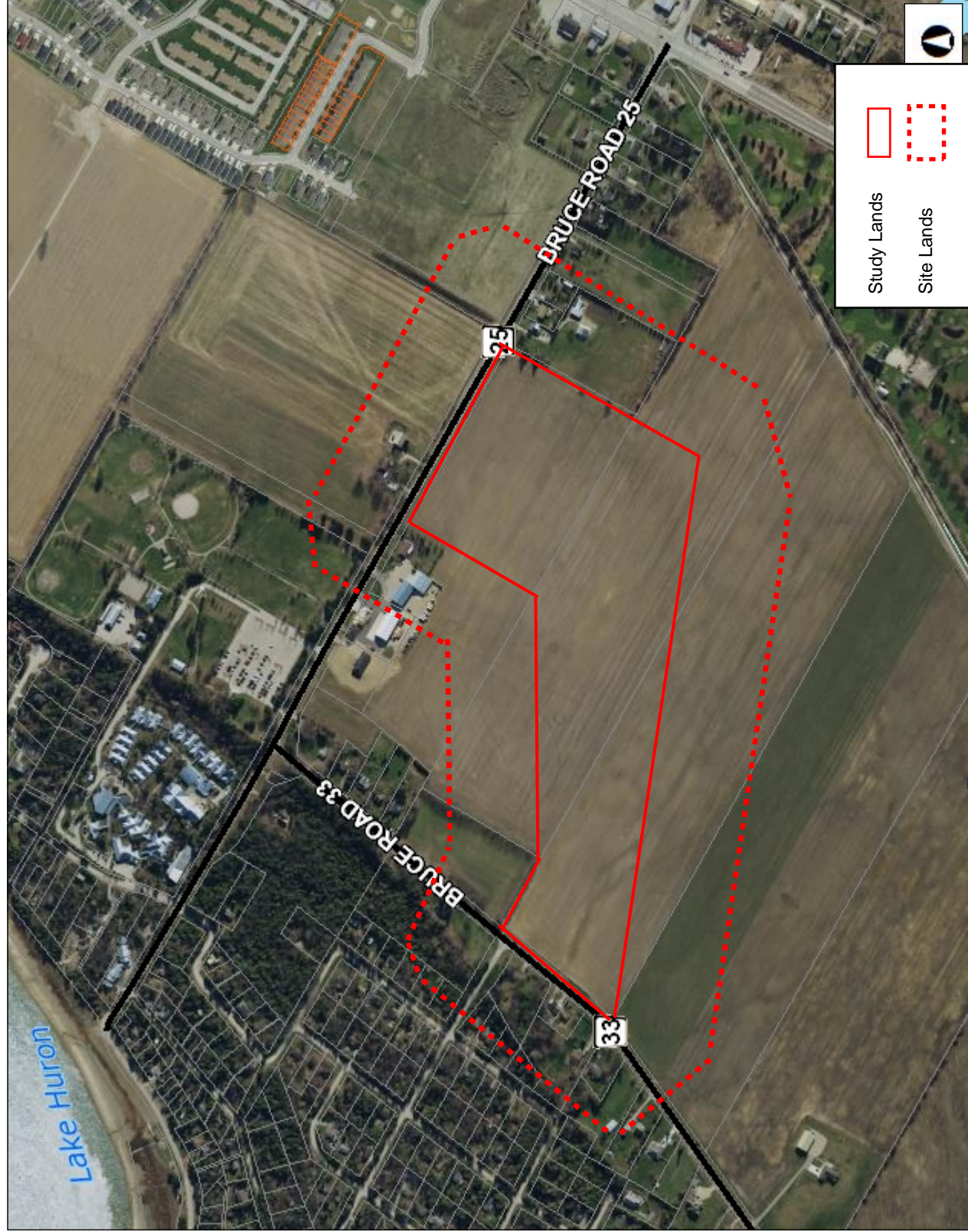
John Morton

President, AWS Environmental Consulting Inc.

cc Brian Knox, Bruce County Highway Department
Town of Saugeen Shores

Figures

- 1) Study and Site Lands shown on June 2015 air photo
- 2) Study Lands and Bruce County Official Plan- Environmental Constraint Mapping
 - No Natural Features or Environmental Constraints identified
- 3) Study Lands on Ministry of Natural Resources and Forestry- Significant Natural Features Mapping
 - No Natural Features or Environmental Constraints identified
- 4) Study Lands and 1km UTM Grid on Ministry of Natural Resources – Significant Flora and Fauna Records Search Area, 5 km's to the Study Lands.
 - See Table No. 1



0.4 0 0.20 0.4 Kilometers

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

NAD_1983_UTM_Zone_17N
© 2017 County of Bruce



Legend

- County Road
- Property Parcel
- Assessment Parcel
- Condominium Unit or Common Element
- First Nation Parcel
- Body of Water
- Watercourse
- Permanent Stream
- Intermittent Stream
- Wetland
- Body of Water
- Stream
- Built-up area
- Adjacent County

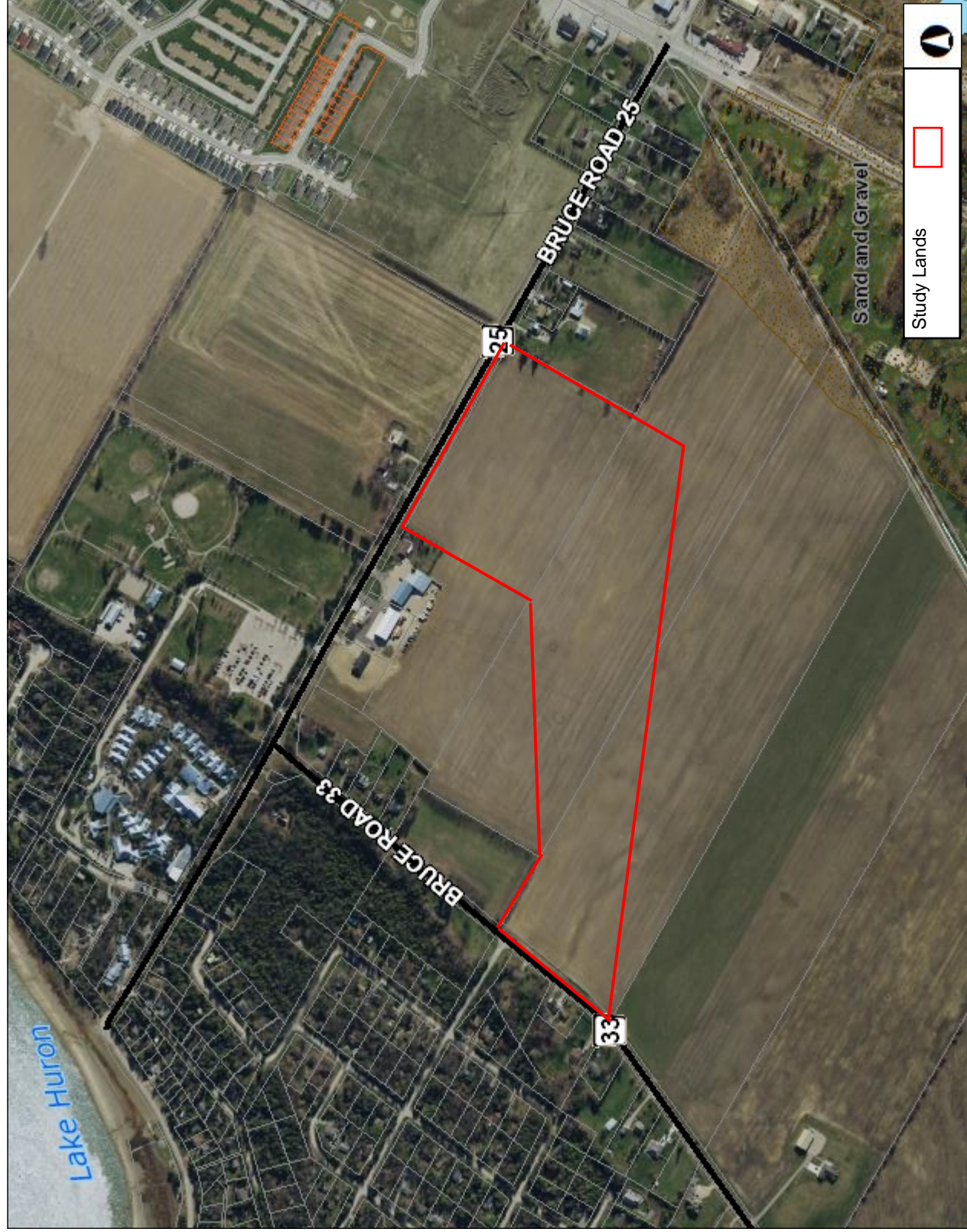
Notes

Bruce Road 33 Realignment



County of Bruce

Figure No. 2: County OP, Environmental Constraints



0.4 0 0.20 0.4 Kilometers

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

NAD_1983_UTM_Zone_17N
© 2017 County of Bruce



Legend

- County Road
- Property Parcel
- Assessment Parcel
- Condominium Unit or Common Element
- First Nation Parcel
- Body of Water
- Watercourse
- Permanent Stream
- Intermittent Stream
- Closed Landfill
- Active Landfill
- Karst
- Mineral Resource Area
- Significant Wetland
- Provincially Significant Wetland
- Locally Significant Wetland
- Area of Natural and Scientific Interest
- Wetland
- Body of Water
- Stream
- Built-up area
- Adjacent County

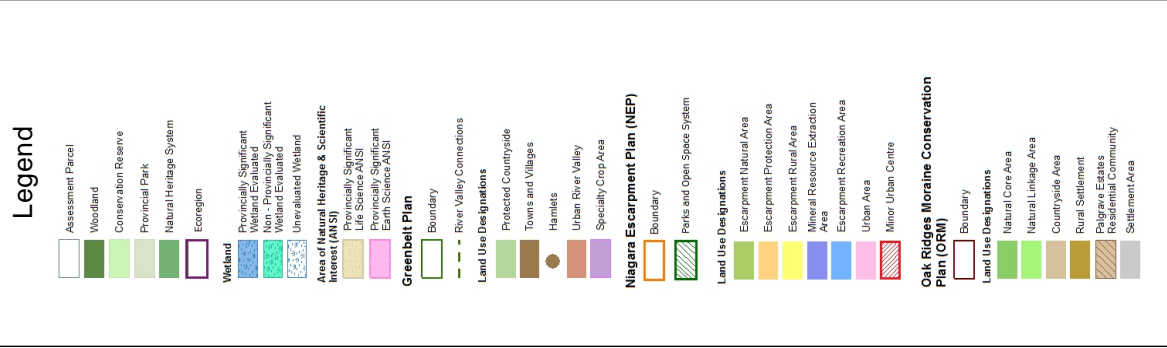
Notes

Bruce Road 33 Realignment



Figure No. 3: Provincial Natural Heritage Feature Review

Notes: Bruce County Road 33 Realignment-EIS



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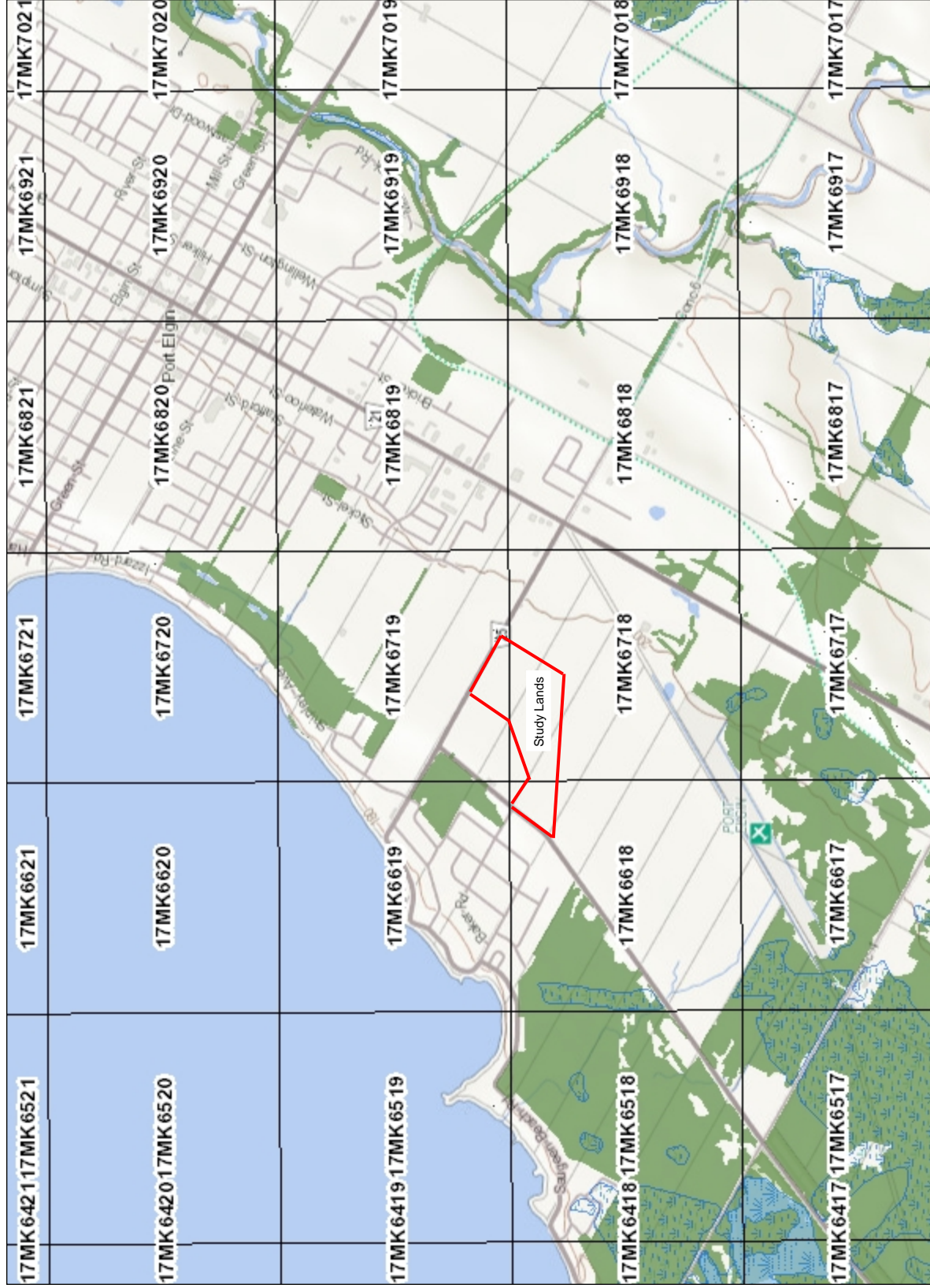
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Figure No. 4: Historical Records for Significant Flora and Fauna

Notes: Bruce County Road 33 Realignment-EIS



Legend

- Assessment Parcel
- Woodland
- Conservation Reserve
- Provincial Park
- Natural Heritage System
- Ecoregion
- Wetland
 - Provincially Significant Wetland Evaluated
 - Non-Provincially Significant Wetland Evaluated
 - Unrated Wetland
- Area of Natural Heritage & Scientific Interest (ANHS)
 - Provincially Significant Life Science ANHS
 - Provincially Significant Earth Science ANHS
- Greenbelt Plan
 - Boundary
 - River Valley Connections
- Land Use Designations
 - Protected Countryside
 - Towns and Villages
 - Hamlets
 - Urban River Valley
 - Specialty Crop Area
- Niagara Escarpment Plan (NEP)
 - Boundary
 - Parks and Open Space System
- Land Use Designations
 - Escarpment Natural Area
 - Escarpment Protection Area
 - Escarpment Rural Area
 - Mineral Resource Extraction Area
 - Escarpment Recreation Area
 - Urban Area
 - Minor Urban Centre
- Oak Ridges Moraine Conservation Plan (ORM)
 - Boundary
- Land Use Designations
 - Natural Core Area
 - Natural Linkage Area
 - Countryside Area
 - Rural Settlement
 - Palgrave Estates
 - Residential Community
 - Settlement Area



Scale: 1 : 36,111

1.8 Kilometers



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Appendix

- 1) GM BluePlan Engineering, Master Plan- Site Plan Design
- 2) Site Photos, Spring of 2017

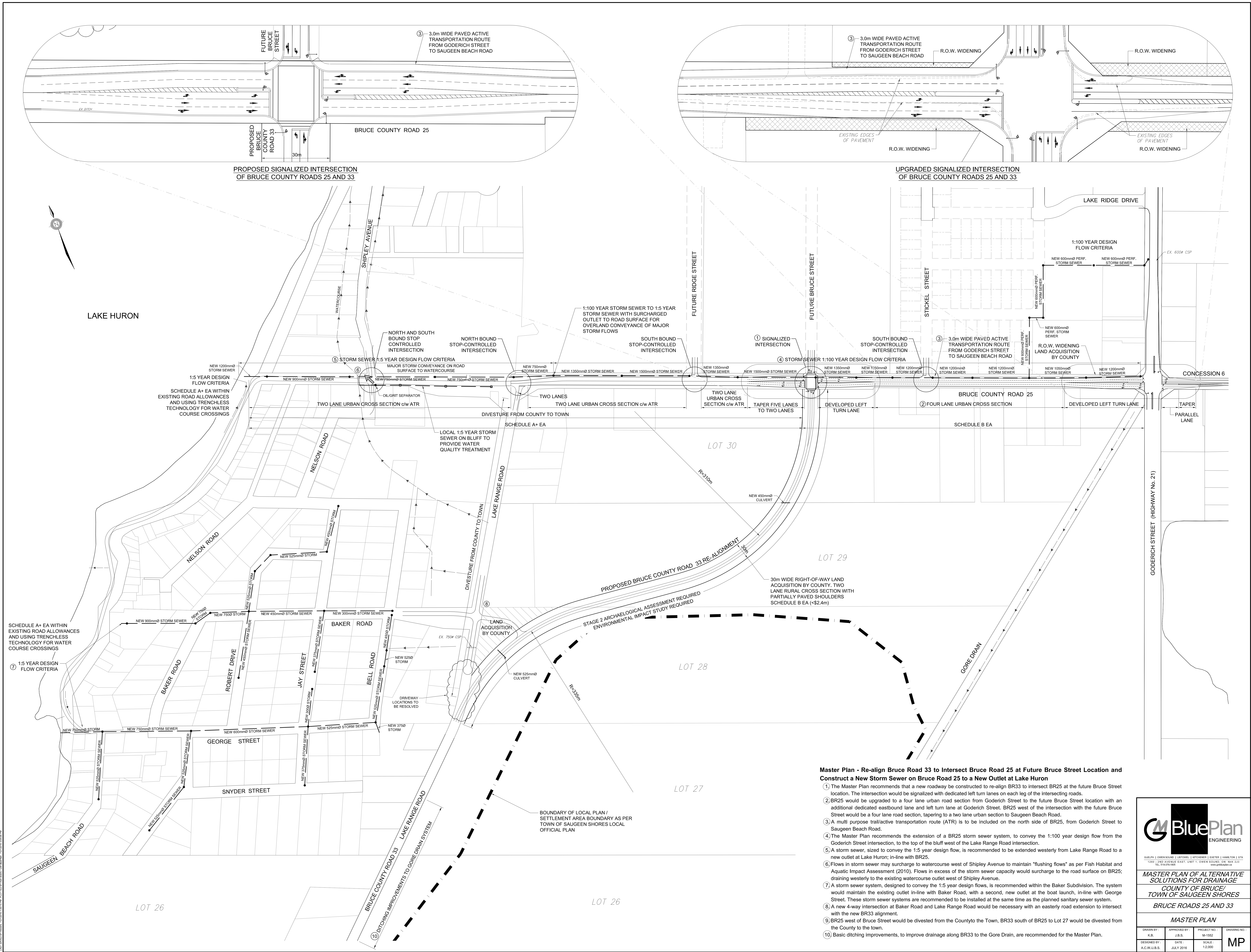




Photo No. 1: North end looking east along Bruce Rd 25

Photo No. 2: North end looking south from Bruce Road 25





Photo No. 3: South end looking north along Bruce Road 33

Photo No. 4: South end looking northeast from Bruce Road 33





CHUNG & VANDER DOELEN
ENGINEERING LTD.

**GEOTECHNICAL INVESTIGATION
ROAD RECONSTRUCTION/REALIGNMENT PROJECTS
BRUCE COUNTY ROADS 25 AND 33
SAUGEEN SHORES, ONTARIO**

Submitted to:

GM BluePlan Engineering Limited
1260 - 2nd Avenue East
Owen Sound, Ontario
N4K 2J3

Attention:

Mr. John Slocombe, P. Eng.



CHUNG & VANDER DOELEN
ENGINEERING LTD.

311 VICTORIA STREET NORTH
KITCHENER / ONTARIO / N2H 5E1
519-742-8979

January 30, 2018

File No.: G17496

GM BluePlan Engineering Limited
1260 - 2nd Avenue East
Owen Sound, Ontario
N4K 2J3

Attention: Mr. John Slocombe, P. Eng.

Re: GEOTECHNICAL INVESTIGATION
ROAD RECONSTRUCTION/REALIGNMENT PROJECTS
BRUCE COUNTY ROADS 25 AND 33
SAUGEE SHORES, ONTARIO

We take pleasure in enclosing one (1) copy of our Geotechnical Investigation Report carried out at the above-mentioned location and we will be glad to discuss any questions arising from this work.

Soil samples will be retained for a period of three (3) months and will thereafter be disposed of unless we are otherwise instructed.

We thank you for giving us this opportunity to be of service to you.

Yours truly,

CHUNG & VANDER DOELEN ENGINEERING LTD.

Robert Vander Doelen, P. Eng.
Senior Engineer

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LIST OF APPENDICES AND ENCLOSURES

Appendix "A"	Limitations of Report
Appendix "B"	Soil Chemistry Results
Appendix "C"	Comparison of Soil Chemistry Results to the Applicable Regulatory Criteria
Enclosures 1 to 25	Borehole Log Sheets
Enclosures 26 to 37	Grain Size Distribution Charts
Enclosures 38 to 40	Standard Proctor Test Results
Drawing No. 1	Borehole Location Plan



1.0 INTRODUCTION

CHUNG & VANDER DOELEN ENGINEERING LTD. (CVD) has been retained by GM BluePlan Engineering Limited (GMBP) to conduct a geotechnical investigation for the proposed reconstruction of Bruce County Road 25 and the proposed realignment of Bruce County Road 33 in the Town of Saugeen Shores, Ontario.

It is understood that Bruce County Road 25 will be reconstructed between Highway 21 and Saugeen Beach Road. Bruce County Road 33 will be realigned approximately between Baker Road and the future Bruce Street. The particulars of the project sections are as follows:

- Approximate length of the two roadway sections is $2500\pm$ m ($1600\pm$ m on Bruce County Road 25 and $900\pm$ m on Bruce County Road 33)
- Bruce County Road 25 involves the installation of underground sewer and watermain servicing (storm sewer upto 1.5 m diameter) and full reconstruction of the roadway. Servicing depths will be in the order of 4 to 5 m below grade.
- Horizontal direction drilling (HDD) is expected to be utilized at the west end of the project section where a water course crossing exists
- Bruce County Road 33 will be realigned through an existing farm field approximately between Baker Road and the future Bruce Street. The future roadway profile will be raised between 0 and $1\pm$ m above existing grades and be constructed with roadside ditching. Municipal servicing ($3\pm$ m deep) is planned along the new realignment from Bruce County Road 25 to $250\pm$ m south of Bruce County Road 25

The purpose of this investigation has been to determine the existing pavement structure and underlying soil and groundwater conditions. Geotechnical recommendations for the following aspects are to be provided:

- Replacement and construction of underground servicing including method of excavation, horizontal directional drilling, groundwater control, trench backfill, compaction requirements, suitability of reuse of existing granular base materials and insitu soils
- Recommendation for design and construction of a suitable flexible pavement structure
- Construction concerns including any required specification and provisions for materials and specialized construction activities, and recommendations for methods of overcoming anticipated construction problems, in particular, those relating to dewatering, classification of soils as per OHSA Reg. 213/91 and the stability of the excavations



- Estimates of percolation rates of the soils encountered between Sta 1+700 and Sta 2+300 on Bruce County Road 25 (approximately between the existing Bruce Road 33 intersection to the proposed Bruce Road 33 intersection)
- Handling of surplus soil materials. Specifically, any potential for encountering contamination during construction, as well as methodology for handling contaminated substances in accordance with current MOE regulations and guidelines, and the implications on the construction of the project will be addressed

2.0 FIELD AND LABORATORY WORK

The field work was conducted between November 20 and 23, 2017 and consisted of drilling and sampling twenty-five (25) boreholes extending to depths between 3.51 and 6.55 m below existing grades.

The boreholes were located in the field by CVD staff and their locations are illustrated on Drawing No. 1. The borehole locations and associated ground surface elevations at the borehole locations were surveyed and supplied to CVD by GMBP.

The field work for this project was carried out under the supervision of a member of our engineering team who logged the subsurface conditions encountered in the field, effected the subsurface sampling and testing, and monitored the groundwater conditions. Traffic control was provided during drilling operations where necessary and the underground utilities were located prior to drilling of the boreholes. A road occupancy permit was issued by the County of Bruce for the period of the field investigation program.

The boreholes were advanced to the sampling depths using a power auger drilling rig, equipped with continuous flight augers and standard soil sampling equipment. Standard penetration tests were carried out at frequent intervals of depth and the results are shown on the Borehole Log Sheets as penetration resistance or "N" values. The compactness condition or consistency of the soil strata has been inferred from these test results.

Groundwater conditions were monitored in the boreholes during and following withdrawal of the drilling augers at each borehole location. 50 mm diameter monitoring wells with flush-mount protective covers were installed at Boreholes 2, 7, 11 and 15 under the direction of the GMBP's hydrogeologist. The groundwater levels were measured on December 5, 2017 by GMBP and provided to CVD.



Samples obtained from the in situ tests were examined in the field and subsequently taken to our laboratory for detailed description and moisture content determinations.

Additional geotechnical laboratory testing included twelve (12) gradational analyses and three (3) Standard Proctor Maximum Dry Density (SPMDD) relationship tests which were conducted on representative soil samples collected during the field work program.

Six (6) soil samples were submitted to ALS Laboratory Group of Waterloo, Ontario for analysis of metals, inorganics (including electrical conductivity and sodium adsorption ratio), petroleum hydrocarbons (PHCs F1-F4), and volatile organic compounds (VOCs). Chemical testing conducted on the soil samples was to assess the environmental quality of excess soil which may potentially be removed off-site during construction.

3.0 SITE CONDITION

The two (2) project sections are generally considered as two (2) urban roadways in low density residential, commercial, and agricultural land use settings. It is understood that a former fuel station existed at the northeast corner of Highway 21 and Bruce Road 25.

4.0 SUBSURFACE CONDITION

The conditions encountered in the boreholes are detailed on the Borehole Log Sheets, Enclosures 1 to 25 of this report. The following notes are intended to amplify and comment on the subsurface data.

The stratigraphic boundaries shown on the borehole logs are inferred from non-continuous sampling conducted during advancement of the borehole drilling procedures and, therefore, represent transitions between soil types rather than exact planes of geologic change. The subsurface conditions will vary between and beyond the borehole locations.

4.1 Pavement

The existing pavement structure components and their associated thicknesses were measured during the advancement of Boreholes 1 to 16 along the existing Bruce County Road 25 project section. The findings are summarized in the table below:



Borehole No.	Asphaltic Concrete (mm)	Granular Base (mm)	Underlying Subgrade Soil Type
1	110	590	sand, some silt, trace gravel
2	110	-	silty sand fill, trace to some gravel
3	100	-	silty sand fill, trace gravel and clay
4	50	-	sand fill, trace to some silt and gravel
5	50	-	sand fill, trace to some silt and gravel
6	50	-	sand fill, some silt and gravel
7	40	-	sand fill, some silt, trace gravel
8	50	-	sand fill, some silt, some gravel
9	50	-	sand fill, some silt and gravel
10	40	-	sand fill, some silt, trace gravel
11	50	-	sand fill, some silt, trace gravel
12	75	-	sand fill, some silt and gravel
13	50	-	sand fill, some silt , trace to some gravel
14	40	-	sand fill, some silt , trace gravel
15	100	-	sand fill, some silt and gravel
16	60	330	sand, some silt

A grain size distribution analysis was performed on a sample of the granular base collected from Borehole 16 beneath the surficial asphalt and the results are presented graphically on Enclosure 26 of this report. The sample failed the gradational requirements of OPSS Granular "B" Type I with 10.5% passing the #200 sieve (8% maximum is specified).



4.2 Fill

The pavement materials at Boreholes 2 to 15 were underlain by brown sand fill with varying percentages of silt and gravel which extended to depths between 0.5 and 2.1 m below existing grades. Four (4) grain size distribution analyses were conducted on representative samples of the sand fill collected from Boreholes 3, 6, 9 and 12 and the results are graphically presented on Enclosures 27 to 30.

Standard penetration testing in the fill at Boreholes 13 and 15 yielded “N”-values between 6 and 47 blows per 300 mm, indicating a variable loose to dense compactness condition. Natural moisture contents were measured between 6 and 13%, indicating a damp to moist moisture condition. Elevated moisture contents may be related to the presence of organics.

4.3 Topsoil

The ground surface at Boreholes 17 to 25 and the fill at Boreholes 2 to 11 and 13 to 15 were underlain by topsoil typically measuring between 150 and 600 mm thick.

The buried topsoil at Boreholes 2 to 11, 14 and 15 extended to depths between 0.74 and 1.8 m below existing grades. The buried topsoil (possible fill) at Borehole 13 is $1.7\pm$ m thick and extends to a depth of $3.8\pm$ m below existing grade.

Standard penetration testing in the topsoil yielded “N”-values between 6 and 25 blows per 300 mm, indicating a variable loose to compact compactness condition.

4.4 Native Soil Deposits

The above-described pavement and soil materials were underlain by native deposits of sand and gravel, sand, silty sand, sand and silt, silt and clayey silt. Occasional to frequent lenses/seams of silt and clayey silt were observed within the sand and silty sand deposits while occasional lenses/seams of sand were observed within the finer grained silt and clayey silt deposits. All twenty-five (25) boreholes were terminated within the various native deposits at depths between 3.51 and 6.55 m below existing grades.

Seven (7) grain size distribution analyses were conducted on representative samples of the native deposits collected from Boreholes 1, 2, 8, 12, 15, 18 and 23 and the results are graphically presented on Enclosures 31 to 37.



Standard penetration testing in the native deposits yielded “N”-values generally between 4 and 55 blows per 300 mm, indicating a variable loose to very dense compactness condition. Natural moisture contents were measured between 4 and 27%, indicating variable damp to saturated moisture conditions.

Three (3) laboratory Standard Proctor tests were conducted on bulk samples of the native deposits collected at Boreholes 5, 10 and 21 and the results are presented on Enclosures 38 to 40. The density-moisture relationship test derived maximum dry densities between 1925 and 2090 kg/m³ with corresponding optimum moisture contents of 8.9 and 12.2%.

4.5 Groundwater Condition

Groundwater conditions were monitored during advancement of borehole augering and immediately following withdrawal of the drilling augers at each borehole location.

Water levels were measured (and estimated) at depths between 1.8± and 4.7± m below existing grades at Boreholes 1 to 20 at the time of auger withdrawal. Dry borehole cave-in above the groundwater level occurred at Boreholes 9, 10 and 13 following withdrawal of the drilling augers. Boreholes 21 to 25 remained dry and open to their full investigation depths at withdrawal of the drilling augers.

50 mm diameter monitoring wells were installed to depths between 4.4 and 6.1 m below existing grades at Boreholes 2, 7, 11 and 15 to enable measurement of groundwater levels over the long term (if required). The following table provides the water levels measured on November 23 and December 5, 2017 at the four monitoring wells.

Location	Ground Surface Elevation (m)	Water Depth (m)		Water Elevation (m)	
		Nov 23, 2017	Dec 5, 2017	Nov 23, 2017	Dec 5, 2017
Borehole 2	201.80	4.02	4.34	197.78	197.46
Borehole 7	198.75	3.91	3.93	194.84	194.82
Borehole 11	196.06	4.72	4.72	191.34	191.34
Borehole 15	182.20	1.47	1.46	180.73	180.74

It is noted that the groundwater table will fluctuate seasonally and in response to major weather events.



4.6 Soil Chemistry

Six (6) soil samples were submitted to ALS Laboratory Group of Waterloo, Ontario for analysis of metals, inorganics (including electrical conductivity and sodium adsorption ratio), petroleum hydrocarbons (PHCs F1-F4), and volatile organic compounds (VOCs). Chemical testing conducted on the soil samples was to assess the environmental quality of excess soil which may potentially be removed off-site during construction.

The following table presents the location, depth, description and parameters analyzed for each soil sample collected and submitted.

Sample I.D.	Sample Depth	Sample Description	Parameters Analysed
BH1-SA2	0.75 to 1.22 mbeg	sand	metals, inorganics, PHCs (F1-F4), VOCs
BH2-SA5	3.05 to 3.51 mbeg	silt, some sand and clay	metals, inorganics, PHCs (F1-F4), VOCs
BH5-SA1	0.15 to 0.30 mbeg	sand fill	metals, inorganics, PHCs (F1-F4), VOCs
BH9-SA2	0.75 to 1.22 mbeg	sand	metals, inorganics, PHCs (F1-F4), VOCs
BH13-SA1	0.15 to 0.30 mbeg	sand fill	metals, inorganics, PHCs (F1-F4), VOCs
BH16-SA2	0.75 to 1.22 mbeg	sand	metals, inorganics, PHCs (F1-F4), VOCs

The laboratory certificates of chemical analysis and results of the soil samples submitted to ALS Laboratory Group of Waterloo are enclosed in Appendix B.



5.0 DISCUSSION AND RECOMMENDATIONS

5.1 Pavement

Full roadway reconstruction will occur along the project section of Bruce County Road 25 due to underground infrastructure replacement and construction. Full roadway construction will occur along the project section of Bruce County Road 33 due to the realignment of the roadway.

5.1.1 Pavement Structure Consideration

The earth subgrade soil is expected to vary between clayey silt and sand with varying percentages of silt. Using tables in the Pavement Design and Rehabilitation Manual (1990), MTO Granular Base Equivalency (GBE) calculations and subgrade type obtained from the boreholes at the site, traffic loading and judgement and experience, the following flexible pavement structure is considered applicable for urban roadway sections.

Pavement Component	Component Thickness
HL3 Surface Asphaltic Concrete	40 mm
HL8 Binder Asphaltic Concrete	60 mm
Granular "A" Base Course	150 mm
Granular "B" Type II Sub-base Course ²	450 mm
Pavement Thickness	700 mm
Granular Base Equivalency (GBE) ¹	650 mm

Note:

1. GBE denotes Granular Base Equivalency which is calculated using factors of 2 for asphaltic concrete, 1 for Granular "A" base and 0.67 for Granular "B" sub-base
2. OPSS Granular "B" Type II

Longitudinal sub-drains with positive drainage outlets are recommended to be installed at the subgrade level along the edges of the roadway reconstruction to enhance the performance of the pavement. Systematic drainage of the granular base materials will promote the longevity of the pavement structure.

Elimination of the recommended sub-drains may be reviewed at the time of reconstruction and should be dependent on inspection of the exposed and underlying subgrade soil condition.



5.1.2 Pavement Construction

All topsoil/organic soil should be removed during preparation of the roadway subgrade if exposed at the prepared earth subgrade level or if it lies within 0.6 m of the prepared earth subgrade level. It is anticipated that a sufficient thickness of non-organic sand fill will remain over the thick buried topsoil layer at Borehole 13, however, further investigation of the vertical/lateral extent and stability of the topsoil layer is recommended.

The exposed inorganic earth subgrade should be recompacted from the surface with a minimum 10 tonne vibratory compactor to a density of no less than 95% Standard Proctor Maximum Dry Density (SPMDD) prior to placement of the Granular "B" (OPSS Granular "B" Type II). Any soft or otherwise incompactible areas detected should be removed and replaced with approved granular materials and should also be compacted to no less than 95% SPMDD.

The pavement design considers that road construction will be carried out during the drier time of the year and that the subgrade is stable, not heaving under construction equipment traffic. If the subgrade is wet or unstable, additional granular sub-base may be required.

The Granular "A" and Granular "B" (OPSS Granular "B" Type II) should be compacted to 100% SPMDD. Current testing of the existing granular base materials indicate non-compliance to the gradational requirements of OPSS Granular "B" and, therefore, are not suitable to be reused as Granular "B" sub-base materials. However, a more thorough review and additional sample testing of the existing granular base materials may reveal the potential for reuse of some portion of the existing granular base materials.

The asphaltic concrete should be placed and compacted in accordance with OPSS Form 310 and to at least 92% of the Marshall Density (MRD). Performance Grade Asphalt Cement (PGAC) 58-28 should be utilized in the hot mix asphalt.

The surface course of the asphaltic concrete should be placed at least one (1) year after base course is placed to allow minor settlements of the trench backfill to complete. The incomplete pavement structure may not be capable of supporting the anticipated traffic. Consequently, minor repairs of the sub-base, base and asphaltic concrete may be required prior to paving the surface course asphaltic concrete.

Frequent in situ density testing by this office should be carried out to verify that the specified degree of compaction is being achieved and maintained.



Vibration could be generated from various construction equipment, such as compactors and rollers which could be harmful to surrounding structures and buildings during construction. Peak Particle Velocity (PPV) of ground motion is widely accepted as the best descriptor of potential for vibration damage to structures. The safe vibration limit can be set to 10 to 20 mm/s PPV, depending on the sensitivity of surrounding structures to vibration.

Vibration monitoring can be carried out to measure the PPV of ground motion from vibration generated from typical compaction equipment at the beginning of the project in the potentially critical areas. This will set criteria and establish the type of equipment to be used for this project. It is also recommended that a pre-construction condition survey be conducted to document the condition of the existing structures within the possible zone of influence.

5.2 Underground Services Installation

Installation of municipal sewer and watermain servicing (storm sewer upto 1.5 m diameter) is proposed along Bruce County Road 25. Servicing depths will be in the order of 4 to 5 m below grade. Horizontal direction drilling (HDD) is expected to be utilized at the west end of the project section where a water coarse crossing exists.

Municipal servicing is also proposed along the new realignment of Bruce County Road 33 from Bruce County Road 25 to 250± m south of Bruce County Road 25. Servicing depths will be in the order of 3 m below grade.

The following table summarizes the observed groundwater elevations, the proposed deepest sewer invert elevations along Bruce County Road 25 and the 250 m northmost portion of Bruce County Road 33, and the anticipated depth of excavation below the observed groundwater table at each of the relevant boreholes drilled during the investigation.

The proposed service trench invert elevations presented in the table below assume that 300 mm of granular bedding will be provided below the future sewer service.

Borehole	Observed Groundwater Elevation (m)	Proposed Deepest Service Trench Invert Elevation (m)	Depth of Excavation Below Observed Groundwater Table (m)
2	197.78	198.30	-0.52
3*	198.45	197.00	1.45
4*	197.31	196.40	0.91



Borehole	Observed Groundwater Elevation (m)	Proposed Deepest Service Trench Invert Elevation (m)	Depth of Excavation Below Observed Groundwater Table (m)
5*	195.83	195.60	0.23
6*	195.50	195.30	0.20
7	194.84	194.70	0.14
8*	195.56	194.00	1.56
9*	193.15	193.30	-0.15
10*	192.45	193.40	-0.95
11	191.34	192.60	-1.26
12*	190.25	190.70	-0.55
13*	186.29	186.70	-0.41
14*	182.65	182.20	0.45
15	180.74	179.00	1.74
16*	179.65	177.80	1.85
17*	194.51	194.30	0.21
18*	194.40	194.60	-0.20
19*	194.17	195.00	-0.83

* denotes borehole without monitoring well and the groundwater elevation presented is based upon the level measured during or following completion of the borehole (i.e., measured groundwater level may not have properly stabilized and may not be accurate)



5.2.1 Groundwater Control

The groundwater table will be encountered during the underground servicing installation works. The groundwater levels drop from 198.0± m at Borehole 2 (near Highway 21) to 179.5± m at Borehole 16 (near Saugeen Beach Road) as well as from 194.5± m at Borehole 17 (near Bruce County Road 25) to 194.0± m at Borehole 19 (250 m south of Bruce County Road 25). It should be noted that the groundwater table can be expected to fluctuate seasonally and with major weather events.

CVD recommends that test pits be dug during the tendering stage of the project, so that the potential contractors can examine the groundwater and soil conditions and arrive at suitable methods of excavation, groundwater control and backfilling based on their experience and plant.

Where the exposed base subgrade and sidewall soils of the excavation are comprised of saturated granular deposits, it is recommended that groundwater be lowered and controlled to at least 0.6 m below the base of excavations to create and maintain a stable subgrade condition to facilitate pipe laying and backfilling operations, and to ensure cut slope stability.

In general, groundwater is expected to be controllable by pumping from several filtered sump pits (possibly together with intercept ditching) if the water table at the time of construction is located within 0.6 m above the required excavation level. If the water table at the time of construction is located higher than 0.6 m above the required excavation level, it is expected that pre-lowering of the groundwater table will be required prior to excavation. This may require the use of well points or other suitable means.

As the amount of groundwater to be pumped is expected to exceed 50,000 Litres/day, this pumping is considered to be a “water taking” by the Ministry of Environment and Climate Change (MOECC) and is subject to the Ministry’s “Permit To Take Water (PTTW)” requirements. In March 2016, the Ministry provided an exemption from the permitting requirements for “construction-only” water takings that do not exceed 400,000 L/day. For these modest “construction-only” water takings, the water taking must still be “registered” on the MOECC “Environmental Activity and Sector Registry (EASR)”, but nevertheless a quicker and less formal process is now available to allow pumping to proceed. In addition, the Ministry has clarified that surface water from rainfall is not included in the water quantity and there is no time limitation for these regulated water takings, although a qualified person (QP) must still evaluate the water taking for all the same environmental impact issues and then indicate this through the on-line registration procedure. For all other water takings and construction water takings exceeding 400,000 L/day, a PTTW is still required along with a 90-day review process.

A more detailed assessment by a QP is required to determine if the water taking at this site is likely to exceed 400,000 L/day (278 L/min). Thereafter, the need for either EASR registration or a PTTW can be determined.



5.2.2 Trenching

The excavations will generally penetrate loose to dense fill and competent native granular and cohesive soil deposits. The fill and native soil deposits will generally provide suitable subgrade support at the pipe founding levels. Any loose, unstable and/or organic soils encountered at the pipe invert should be sub-excavated and replaced with well compacted Granular "A" (or clean crushed gravel wrapped in non-woven geotextile) which should be placed in 150 mm thick layers and compacted to at least 95% Standard Proctor Maximum Dry Density (SPMDD). The support of pipes in these areas can also be achieved with non-shrinkable fill, if poor soil is encountered at the subgrade level and fully removed.

The soil materials are generally considered to be Type 3 Soils in accordance with the latest Occupational Health and Safety Act, provided that groundwater is adequately controlled by suitable means. Trenches can be cut to 1H to 1V throughout provided groundwater is being suitably controlled. Otherwise, the side slopes should be cut to 3H : 1V or flatter. The side slopes should be suitably protected from erosion processes.

The geotechnical engineer should be retained to examine and inspect cut slopes to ensure construction safety.

It may be necessary to provide support for nearby services if they are located within the influence zone of 45 degrees to the vertical.

The use of trench liner box or timber lagging can be considered to support the trench side walls and adjacent foundations, structures or utilities.

5.2.3 Bedding

Any unstable soils exposed at the pipe subgrade should be sub-excavated and replaced with imported Granular "A", placed in thin layers and compacted to at least 95% SPMDD, or can be removed and supported on non-shrinkable fill as previously described in Section 5.2.2.

The bedding requirements for the services should be in accordance with Ontario Provincial Standard Drawings OPSD - 802 for flexible and rigid pipes provided that the groundwater table is adequately controlled and the pipe subgrade is stable. The bedding shall be a Class "B" and consist of at least 150 mm (to a maximum of 300 mm) thick Granular "A" or clean crushed gravel wrapped in geotextile compacted to 95% SPMDD.



Clear crushed stone bedding can be used to replace Granular "A" bedding if the subgrade is unstable and saturated, and compacting the Granular "A" bedding layer is not practical. The clear crushed stone will need to be suitably densified and wrapped with a non-woven filter cloth (Terrafix 270R or equivalent) to prevent migration of fine soil particles (silt) into the crushed stone mattress and prevent the loss of subgrade support for the pipes.

Granular "A" or clean crushed gravel wrapped in geotextile should be used to backfill around the pipe to at least 150 mm above the top of the pipe. This backfill should be placed in thin layers and each layer compacted to at least 95% SPMDD. Recycled asphalt will not be allowed to be used in Granular "A" bedding material.

5.2.4 Backfill

In general, the excavated soils are considered suitable for reuse as trench backfill. If the excavated materials are allowed to dry too much during summer construction, judicious addition of water may be required to facilitate compaction. Mixing drier and wetter excavated soils may be feasible to arrive at a more compactable moisture content.

The backfill should be placed in thin layers, 300 mm thick or less dependant on the demonstrated success of compaction based on in-situ density test results. Other types of materials such as organic soils, overly wet soils, boulders and frozen materials (if work is carried out in the winter months) should not be used for backfilling. All backfill should be compacted to at least 95% SPMDD.

Backfilling operations should follow closely after excavation so that only a minimal length of trench slope is exposed at any one time so as to minimize potential problems. This will potentially minimize over-wetting of the subgrade material. Particular attention should be given to make sure frozen material is not used as backfill should construction extend into the winter season.

It has been our experience that excavated cohesive soils should be broken into smaller pieces (less than 150 mm diameter) before returning into the trench as backfill. This will eliminate "wedging" problems and reduce long term settlement. Particular attention must be made to backfilling the laterals where the trenches are narrow and against the manholes and catch-basins. Thinner lifts and additional compaction must be applied.

Frequent inspection by experienced geotechnical personnel should be carried out to examine and approve backfill material, to carefully inspect placement, and to verify that the specified degree of compaction has been obtained by in situ density testing.



5.2.5 Horizontal Directional Drilling

Horizontal directional drilling techniques are being considered to install 48 m of 750 mm diameter HDPE storm sewer and 45.5 m of 450 mm diameter HDPE storm sewer near the intersection of Bruce County Road 25 and Nelson Road.

The saturated deposit of fine sand encountered at Boreholes 14 and 15 is considered suitable for sewer installation using horizontal directional drilling methods. It should be noted that the Saugeen Shores area has been subjected to glaciation. Although not encountered during the drilling of the boreholes, cobbles or boulders could be present within the various deposits. Consequently, potential obstructions to the advancement of directional drilling may occur.

It is noted that the selection of directional drilling method(s) are normally the responsibility of the contractor.

Bentonite and/or polymer drilling mud slurry is used as a coolant, counteracting fluid pressure and lubricant in the drilling process. The slurry pressure should be controlled so as not to hydraulically fracture the soil which may result in release of slurry to the ground surface.

6.0 GEO-ENVIRONMENTAL CONSIDERATIONS

It is our understanding that excess soils may potentially be removed off-site during construction. CVD recommends that a soil management plan be established to manage the quantity, as well as where and how the excess soils can be disposed of off-site.

The analytical results and environmental assessment findings must be disclosed to the receiving site owner(s) and approval by the receiving site owner(s) be obtained prior to exporting/transferring the materials. It is noted that the soils condition may differ between and beyond the sampled locations. If any impacted soils are discovered during construction, CVD should be contacted for further sampling and testing to determine the limit of the impacted soils.

Transportation of excess soils from the source site to the receiving site(s) should be carried out in accordance with the MOECC document entitled "Management of Excess Soil - A Guide for Best Management Practices" dated January 2014. Additional soil sampling and analysis may be required as per the above-noted MOECC document and/or as per the requirement of the receiving site owner(s), depending on the volume of excess soil generated during construction.



Any soils identified during construction to have been environmentally impacted are to be separately stockpiled and analysed to determine the appropriate measures for handling and disposal. Waste characterization testing (TCLP) to classify the material for disposal as prescribed in Ontario Regulation 558 is required.

6.1 Applicable Regulatory Standards

The Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act established in accordance with the amended Ontario Regulation 153/04 (April 15, 2011) was consulted in the assessment of the soil at the project site. The analytical results were compared to the following “applicable regulatory standards”:

- Table 1 (Full Depth Background Site Condition Standards) for Agricultural or Other Property Use
- Table 1 (Full Depth Background Site Condition Standards) for Residential/Institutional/Parkland/Industrial/Commercial/Community Property Use
- Table 2 (Full Depth Generic Site Condition Standards in a Potable Ground Water Condition) for Residential/Parkland/Institutional Property Use for coarse textured soil
- Table 2 (Full Depth Generic Site Condition Standards in a Potable Ground Water Condition) for Industrial/Commercial/Community Property Use for coarse textured soil

The project site exists as a public transportation corridor. Neighbouring rural properties to the site rely on groundwater as a source of potable water. The site is not located within 30 m of an area of natural significance and is not a shallow soil property. The soil results were therefore compared to the Ministry of the Environment & Climate Change (MOECC) Table 2, Full Depth Generic Site Condition Standards in a Potable Ground Water Condition for Industrial/Commercial/Community Property Use for coarse textured soil.

Table 1 for Full Depth Background Standards for Agricultural or Other Property Use and Residential/Institutional/Parkland/Industrial/Commercial/Community Use would apply for off site disposal of soil and reuse with no environmental restrictions.

6.2 Analytical Results and Considerations

Six (6) soil samples were submitted to ALS Laboratory Group of Waterloo, Ontario for analysis of metals, inorganics (including electrical conductivity and sodium adsorption ratio), petroleum hydrocarbons (PHCs F1-F4), and volatile organic compounds (VOCs). The chemical testing was



conducted to assess the environmental quality of excess soil which may potentially be removed off-site during construction. The laboratory certificates of chemical analysis and results provided by ALS Laboratory Group of Waterloo are enclosed in Appendix B. A comparison of the soil chemistry results to the applicable regulatory standards is enclosed in Appendix C.

The SAR and EC parameter values from five (5) of the six (6) samples submitted have concentrations above Table 1 standards. The SAR values from two (2) of the six (6) samples submitted exceed Table 2 standards for Industrial/Commercial/Community Property Use. Since the elevated SAR values are related to salt use for pavement de-icing purposes, it is not considered to be an exceedance to the site regulatory standard in accordance with Regulation 153/04. The excavated soil can be removed to a similar municipally owned road site where continued de-icing salt application will likely occur. Alternatively, the excess soil may be received by a holder of an appropriate certificate of approval.

The analytical results from the soil samples selected for metals analysis indicate that all analysed metals parameters were below all four applicable regulatory standards.

The analytical results from the soil samples selected for petroleum hydrocarbons analysis (PHCs, F1-F4) indicate that four (4) of six (6) samples tested have concentrations exceeding Table 1 (Full Depth Background Site Condition Standards) for Residential/Institutional/Parkland/Industrial/Commercial/Community Property Use, however, the results were below both Table 2 standards for Residential/Parkland/Institutional Property Use and Industrial/Commercial/Community Property Use.

The analytical results from the soil samples selected for VOCs analysis indicate that all analysed parameters were below all four applicable regulatory standards.

Further sampling and testing to determine the limit of impacted soil within the project work area is recommended. Impacted soil is to be separately stockpiled and analysed to determine the appropriate measures for handling and disposal.



7.0 CLOSURE

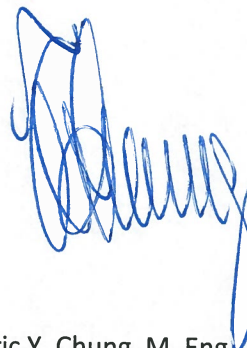
The Limitations of Report, as quoted in Appendix "A", is an integral part of this report.

We trust that the information presented in this report is complete within our terms of reference. If there are any further questions concerning this report, please do not hesitate to contact our office.

Yours truly,
CHUNG & VANDER DOELEN ENGINEERING LTD.



Robert Vander Doelen, P. Eng.
Senior Engineer



Eric Y. Chung, M. Eng., P. Eng.
Principal Engineer



APPENDIX “A”

Limitations of Report



APPENDIX “A”

LIMITATIONS OF REPORT

The conclusions and recommendations given in this report are based on information determined at the testhole locations. Subsurface and groundwater conditions between and beyond the testholes may differ from those encountered at the testhole locations, and conditions may become apparent during construction which could not be detected or anticipated at the time of the site investigation. It is recommended practice that the Soils Engineer be retained during construction to confirm that the subsurface conditions throughout the site do not deviate materially from those encountered in the testholes.

The comments made in this report on potential construction problems and possible methods are intended only for the guidance of the designer. The number of testholes may not be sufficient to determine all the factors that may affect construction methods and costs. For example, the thickness of surficial topsoil or fill layers may vary markedly and unpredictably. The contractors bidding on this project or undertaking the construction should, therefore, make their own interpretation of the factual information presented and draw their own conclusion as to how the subsurface conditions may affect their work.

The benchmark and elevations mentioned in this report were obtained strictly for use in the geotechnical design of the project and by this office only, and should not be used by any other parties for any other purposes.

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. CHUNG & VANDER DOELEN ENGINEERING LIMITED accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

This report does not reflect the environmental issues or concerns unless otherwise stated in the report. The design recommendations given in this report are applicable only to the project described in the text and then only if constructed substantially in accordance with the details stated in this report. Since all details of the design may not be known, we recommend that we be retained during the final design stage to verify that the design is consistent with our recommendations, and that assumptions made in our analysis are valid.



APPENDIX “B”

Soil Chemistry Results





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Date Received: 01-DEC-17
Report Date: 30-JAN-18 07:48 (MT)
Version: FINAL REV. 2

Client Phone: 519-742-8979

Certificate of Analysis

Lab Work Order #: L2030089
Project P.O. #: NOT SUBMITTED
Job Reference: G17496
C of C Numbers: 14-460142
Legal Site Desc:

Mary-Lynn Pike
Client Services Supervisor

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ANALYTICAL GUIDELINE REPORT

G17496

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits			
Grouping	Analyte						#1	#2	#3	#4
L2030089-1	BH1-SA2									
Sampled By:	Client on 20-NOV-17									
Matrix:	SOIL									
Physical Tests										
Conductivity		0.266		0.0040	mS/cm	07-DEC-17	0.47	0.57	1.4	0.7
% Moisture		16.1		0.10	%	04-DEC-17				
pH		7.63		0.10	pH units	05-DEC-17				
Cyanides										
Cyanide, Weak Acid Diss		<0.050		0.050	ug/g	05-DEC-17	0.051	0.051	0.051	0.051
Saturated Paste Extractables										
SAR		1.78		0.10	SAR	07-DEC-17	*1	2.4	12	5
Calcium (Ca)		9.0		1.0	mg/L	07-DEC-17				
Magnesium (Mg)		1.5		1.0	mg/L	07-DEC-17				
Sodium (Na)		21.9		1.0	mg/L	07-DEC-17				
Metals										
Antimony (Sb)		<1.0		1.0	ug/g	07-DEC-17	1	1.3	40	7.5
Arsenic (As)		3.1		1.0	ug/g	07-DEC-17	11	18	18	18
Barium (Ba)		16.8		1.0	ug/g	07-DEC-17	210	220	670	390
Beryllium (Be)		<0.50		0.50	ug/g	07-DEC-17	2.5	2.5	8	4
Boron (B)		5.3		5.0	ug/g	07-DEC-17	36	36	120	120
Boron (B), Hot Water Ext.		0.25		0.10	ug/g	08-DEC-17	36	36	2	1.5
Cadmium (Cd)		<0.50		0.50	ug/g	07-DEC-17	1	1.2	1.9	1.2
Chromium (Cr)		16.0		1.0	ug/g	07-DEC-17	67	70	160	160
Cobalt (Co)		3.3		1.0	ug/g	07-DEC-17	19	21	80	22
Copper (Cu)		6.9		1.0	ug/g	07-DEC-17	62	92	230	140
Lead (Pb)		13.6		1.0	ug/g	07-DEC-17	45	120	120	120
Mercury (Hg)		0.0371		0.0050	ug/g	07-DEC-17	0.16	0.27	3.9	0.27
Molybdenum (Mo)		<1.0		1.0	ug/g	07-DEC-17	2	2	40	6.9
Nickel (Ni)		6.7		1.0	ug/g	07-DEC-17	37	82	270	100
Selenium (Se)		<1.0		1.0	ug/g	07-DEC-17	1.2	1.5	5.5	2.4
Silver (Ag)		<0.20		0.20	ug/g	07-DEC-17	0.5	0.5	40	20
Thallium (Tl)		<0.50		0.50	ug/g	07-DEC-17	1	1	3.3	1
Uranium (U)		<1.0		1.0	ug/g	07-DEC-17	1.9	2.5	33	23
Vanadium (V)		27.9		1.0	ug/g	07-DEC-17	86	86	86	86
Zinc (Zn)		29.2		5.0	ug/g	07-DEC-17	290	290	340	340
Speciated Metals										
Chromium, Hexavalent		0.21		0.20	ug/g	07-DEC-17	0.66	0.66	8	8
Volatile Organic Compounds										
Acetone		<0.50	VOCJ	0.50	ug/g	06-DEC-17	0.5	0.5	16	16
Benzene		<0.0068	VOCJ	0.0068	ug/g	06-DEC-17	0.02	0.02	0.32	0.21
Bromodichloromethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	1.5	1.5
Bromoform		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.61	0.27
Bromomethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.05	0.05
Carbon tetrachloride		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.21	0.05
Chlorobenzene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	2.4	2.4
Dibromochloromethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	2.3	2.3
Chloroform		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.47	0.05
1,2-Dibromoethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.05	0.05
1,2-Dichlorobenzene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	1.2	1.2

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - ON-511-T1/T2-SOIL-AG+RPIICC/RPI-ICC-C

#1: T1-Soil-Agricultural or Other Property Use

#2: T1-Soil-Res/Park/Inst/Ind/Com/Comm Property Use

#3: T2-Soil-Ind/Com/Comm Property Use (Coarse)

#4: T2-Soil-Res/Park/Inst. Property Use (Coarse)



ANALYTICAL GUIDELINE REPORT

G17496

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits			
Grouping	Analyte						#1	#2	#3	#4
L2030089-1	BH1-SA2									
Sampled By:	Client on 20-NOV-17									
Matrix:	SOIL									
Volatile Organic Compounds										
1,3-Dichlorobenzene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	9.6	4.8
1,4-Dichlorobenzene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.2	0.083
Dichlorodifluoromethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	16	16
1,1-Dichloroethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.47	0.47
1,2-Dichloroethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.05	0.05
1,1-Dichloroethylene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.064	0.05
cis-1,2-Dichloroethylene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	1.9	1.9
trans-1,2-Dichloroethylene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	1.3	0.084
Methylene Chloride		<1.0	RRR	1.0	ug/g	06-DEC-17	**0.05	**0.05	1.6	**0.1
1,2-Dichloropropane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.16	0.05
cis-1,3-Dichloropropene		<0.030	VOCJ	0.030	ug/g	06-DEC-17				
trans-1,3-Dichloropropene		<0.030	VOCJ	0.030	ug/g	06-DEC-17				
1,3-Dichloropropene (cis & trans)		<0.042		0.042	ug/g	06-DEC-17	0.05	0.05	0.059	0.05
Ethylbenzene		<0.018	VOCJ	0.018	ug/g	06-DEC-17	0.05	0.05	1.1	1.1
n-Hexane		<0.10	RRR	0.10	ug/g	06-DEC-17	**0.05	**0.05	46	2.8
Methyl Ethyl Ketone		<0.50	VOCJ	0.50	ug/g	06-DEC-17	0.5	0.5	70	16
Methyl Isobutyl Ketone		<0.50	VOCJ	0.50	ug/g	06-DEC-17	0.5	0.5	31	1.7
MTBE		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	1.6	0.75
Styrene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	34	0.7
1,1,1,2-Tetrachloroethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.087	0.058
1,1,2,2-Tetrachloroethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.05	0.05
Tetrachloroethylene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	1.9	0.28
Toluene		<0.080	VOCJ	0.080	ug/g	06-DEC-17	0.2	0.2	6.4	2.3
1,1,1-Trichloroethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	6.1	0.38
1,1,2-Trichloroethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.05	0.05
Trichloroethylene		<0.010	VOCJ	0.010	ug/g	06-DEC-17	0.05	0.05	0.55	0.061
Trichlorofluoromethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.25	4	4
Vinyl chloride		<0.020	VOCJ	0.020	ug/g	06-DEC-17	0.02	0.02	0.032	0.02
o-Xylene		<0.020	VOCJ	0.020	ug/g	06-DEC-17				
m+p-Xylenes		<0.030	VOCJ	0.030	ug/g	06-DEC-17				
Xylenes (Total)		<0.050		0.050	ug/g	06-DEC-17	0.05	0.05	26	3.1
Surrogate: 4-Bromofluorobenzene		103.4		50-140	%	06-DEC-17				
Surrogate: 1,4-Difluorobenzene		105.4		50-140	%	06-DEC-17				
Hydrocarbons										
F1 (C6-C10)		<5.0	VOCJ	5.0	ug/g	06-DEC-17	17	25	55	55
F1-BTEX		<5.0		5.0	ug/g	11-DEC-17	17	25	55	55
F2 (C10-C16)		<10		10	ug/g	11-DEC-17	10	10	230	98
F3 (C16-C34)		71		50	ug/g	11-DEC-17	240	240	1700	300
F4 (C34-C50)		121		50	ug/g	11-DEC-17	*120	*120	3300	2800
Total Hydrocarbons (C6-C50)		192		72	ug/g	11-DEC-17				
Chrom. to baseline at nC50		YES			No Unit	11-DEC-17				
Surrogate: 2-Bromobenzotrifluoride		82.9		60-140	%	11-DEC-17				
Surrogate: 3,4-Dichlorotoluene		76.8		60-140	%	06-DEC-17				

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

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Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - ON-511-T1/T2-SOIL-AG+RPIICC/RPI-ICC-C

#1: T1-Soil-Agricultural or Other Property Use

#2: T1-Soil-Res/Park/Inst/Ind/Com/Commu Property Use

#3: T2-Soil-Ind/Com/Commu Property Use (Coarse)

#4: T2-Soil-Res/Park/Inst. Property Use (Coarse)



ANALYTICAL GUIDELINE REPORT

G17496

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits			
Grouping	Analyte						#1	#2	#3	#4
L2030089-2	BH2-SA5									
Sampled By:	Client on 20-NOV-17									
Matrix:	SOIL									
Physical Tests										
Conductivity		0.843		0.0040	mS/cm	07-DEC-17	*0.47	*0.57	1.4	*0.7
% Moisture		16.9		0.10	%	04-DEC-17				
pH		7.78		0.10	pH units	05-DEC-17				
Cyanides										
Cyanide, Weak Acid Diss		<0.050		0.050	ug/g	05-DEC-17	0.051	0.051	0.051	0.051
Saturated Paste Extractables										
SAR		17.6	SAR:M	0.10	SAR	07-DEC-17	*1	*2.4	*12	*5
Calcium (Ca)		5.4		1.0	mg/L	07-DEC-17				
Magnesium (Mg)		<1.0		1.0	mg/L	07-DEC-17				
Sodium (Na)		148		1.0	mg/L	07-DEC-17				
Metals										
Antimony (Sb)		<1.0		1.0	ug/g	07-DEC-17	1	1.3	40	7.5
Arsenic (As)		1.9		1.0	ug/g	07-DEC-17	11	18	18	18
Barium (Ba)		15.6		1.0	ug/g	07-DEC-17	210	220	670	390
Beryllium (Be)		<0.50		0.50	ug/g	07-DEC-17	2.5	2.5	8	4
Boron (B)		8.6		5.0	ug/g	07-DEC-17	36	36	120	120
Boron (B), Hot Water Ext.		<0.10		0.10	ug/g	08-DEC-17	36	36	2	1.5
Cadmium (Cd)		<0.50		0.50	ug/g	07-DEC-17	1	1.2	1.9	1.2
Chromium (Cr)		8.5		1.0	ug/g	07-DEC-17	67	70	160	160
Cobalt (Co)		3.0		1.0	ug/g	07-DEC-17	19	21	80	22
Copper (Cu)		7.7		1.0	ug/g	07-DEC-17	62	92	230	140
Lead (Pb)		2.5		1.0	ug/g	07-DEC-17	45	120	120	120
Mercury (Hg)		<0.0050		0.0050	ug/g	07-DEC-17	0.16	0.27	3.9	0.27
Molybdenum (Mo)		<1.0		1.0	ug/g	07-DEC-17	2	2	40	6.9
Nickel (Ni)		6.2		1.0	ug/g	07-DEC-17	37	82	270	100
Selenium (Se)		<1.0		1.0	ug/g	07-DEC-17	1.2	1.5	5.5	2.4
Silver (Ag)		<0.20		0.20	ug/g	07-DEC-17	0.5	0.5	40	20
Thallium (Tl)		<0.50		0.50	ug/g	07-DEC-17	1	1	3.3	1
Uranium (U)		<1.0		1.0	ug/g	07-DEC-17	1.9	2.5	33	23
Vanadium (V)		12.5		1.0	ug/g	07-DEC-17	86	86	86	86
Zinc (Zn)		13.3		5.0	ug/g	07-DEC-17	290	290	340	340
Speciated Metals										
Chromium, Hexavalent		<0.20		0.20	ug/g	07-DEC-17	0.66	0.66	8	8
Volatile Organic Compounds										
Acetone		<0.50	VOCJ	0.50	ug/g	06-DEC-17	0.5	0.5	16	16
Benzene		<0.0068	VOCJ	0.0068	ug/g	06-DEC-17	0.02	0.02	0.32	0.21
Bromodichloromethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	1.5	1.5
Bromoform		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.61	0.27
Bromomethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.05	0.05
Carbon tetrachloride		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.21	0.05
Chlorobenzene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	2.4	2.4
Dibromochloromethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	2.3	2.3
Chloroform		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.47	0.05
1,2-Dibromoethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.05	0.05
1,2-Dichlorobenzene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	1.2	1.2

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - ON-511-T1/T2-SOIL-AG+RPIICC/RPI-ICC-C

#1: T1-Soil-Agricultural or Other Property Use

#2: T1-Soil-Res/Park/Inst/Ind/Com/Commu Property Use

#3: T2-Soil-Ind/Com/Commu Property Use (Coarse)

#4: T2-Soil-Res/Park/Inst. Property Use (Coarse)



ANALYTICAL GUIDELINE REPORT

G17496

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits			
Grouping	Analyte						#1	#2	#3	#4
L2030089-2	BH2-SA5									
Sampled By:	Client on 20-NOV-17									
Matrix:	SOIL									
Volatile Organic Compounds										
1,3-Dichlorobenzene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	9.6	4.8
1,4-Dichlorobenzene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.2	0.083
Dichlorodifluoromethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	16	16
1,1-Dichloroethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.47	0.47
1,2-Dichloroethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.05	0.05
1,1-Dichloroethylene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.064	0.05
cis-1,2-Dichloroethylene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	1.9	1.9
trans-1,2-Dichloroethylene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	1.3	0.084
Methylene Chloride		<2.0	RRR	2.0	ug/g	06-DEC-17	**0.05	**0.05	**1.6	**0.1
1,2-Dichloropropane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.16	0.05
cis-1,3-Dichloropropene		<0.030	VOCJ	0.030	ug/g	06-DEC-17				
trans-1,3-Dichloropropene		<0.030	VOCJ	0.030	ug/g	06-DEC-17				
1,3-Dichloropropene (cis & trans)		<0.042		0.042	ug/g	06-DEC-17	0.05	0.05	0.059	0.05
Ethylbenzene		<0.018	VOCJ	0.018	ug/g	06-DEC-17	0.05	0.05	1.1	1.1
n-Hexane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	46	2.8
Methyl Ethyl Ketone		<0.50	VOCJ	0.50	ug/g	06-DEC-17	0.5	0.5	70	16
Methyl Isobutyl Ketone		<0.50	VOCJ	0.50	ug/g	06-DEC-17	0.5	0.5	31	1.7
MTBE		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	1.6	0.75
Styrene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	34	0.7
1,1,1,2-Tetrachloroethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.087	0.058
1,1,2,2-Tetrachloroethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.05	0.05
Tetrachloroethylene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	1.9	0.28
Toluene		<0.080	VOCJ	0.080	ug/g	06-DEC-17	0.2	0.2	6.4	2.3
1,1,1-Trichloroethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	6.1	0.38
1,1,2-Trichloroethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.05	0.05
Trichloroethylene		<0.010	VOCJ	0.010	ug/g	06-DEC-17	0.05	0.05	0.55	0.061
Trichlorofluoromethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.25	4	4
Vinyl chloride		<0.020	VOCJ	0.020	ug/g	06-DEC-17	0.02	0.02	0.032	0.02
o-Xylene		<0.020	VOCJ	0.020	ug/g	06-DEC-17				
m+p-Xylenes		<0.030	VOCJ	0.030	ug/g	06-DEC-17				
Xylenes (Total)		<0.050		0.050	ug/g	06-DEC-17	0.05	0.05	26	3.1
Surrogate: 4-Bromofluorobenzene		99.6		50-140	%	06-DEC-17				
Surrogate: 1,4-Difluorobenzene		101.2		50-140	%	06-DEC-17				
Hydrocarbons										
F1 (C6-C10)		<5.0	VOCJ	5.0	ug/g	06-DEC-17	17	25	55	55
F1-BTEX		<5.0		5.0	ug/g	08-DEC-17	17	25	55	55
F2 (C10-C16)		<10		10	ug/g	08-DEC-17	10	10	230	98
F3 (C16-C34)		<50		50	ug/g	08-DEC-17	240	240	1700	300
F4 (C34-C50)		<50		50	ug/g	08-DEC-17	120	120	3300	2800
Total Hydrocarbons (C6-C50)		<72		72	ug/g	08-DEC-17				
Chrom. to baseline at nC50		YES			No Unit	08-DEC-17				
Surrogate: 2-Bromobenzotrifluoride		84.9		60-140	%	08-DEC-17				
Surrogate: 3,4-Dichlorotoluene		69.4		60-140	%	06-DEC-17				

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

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Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - ON-511-T1/T2-SOIL-AG+RPIICC/RPI-ICC-C

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#3: T2-Soil-Ind/Com/Commu Property Use (Coarse)

#4: T2-Soil-Res/Park/Inst. Property Use (Coarse)



ANALYTICAL GUIDELINE REPORT

G17496

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits			
Grouping	Analyte						#1	#2	#3	#4
L2030089-3	BH5-SA1									
Sampled By:	Client on 21-NOV-17									
Matrix:	SOIL									
Physical Tests										
Conductivity		0.361		0.0040	mS/cm	07-DEC-17	0.47	0.57	1.4	0.7
% Moisture		6.52		0.10	%	04-DEC-17				
pH		8.16		0.10	pH units	05-DEC-17				
Cyanides										
Cyanide, Weak Acid Diss		<0.050		0.050	ug/g	06-DEC-17	0.051	0.051	0.051	0.051
Saturated Paste Extractables										
SAR		7.49		0.10	SAR	07-DEC-17	*1	*2.4	12	*5
Calcium (Ca)		2.2		1.0	mg/L	07-DEC-17				
Magnesium (Mg)		1.5		1.0	mg/L	07-DEC-17				
Sodium (Na)		59.2		1.0	mg/L	07-DEC-17				
Metals										
Antimony (Sb)		<1.0		1.0	ug/g	07-DEC-17	1	1.3	40	7.5
Arsenic (As)		1.9		1.0	ug/g	07-DEC-17	11	18	18	18
Barium (Ba)		8.0		1.0	ug/g	07-DEC-17	210	220	670	390
Beryllium (Be)		<0.50		0.50	ug/g	07-DEC-17	2.5	2.5	8	4
Boron (B)		6.9		5.0	ug/g	07-DEC-17	36	36	120	120
Boron (B), Hot Water Ext.		<0.10		0.10	ug/g	08-DEC-17	36	36	2	1.5
Cadmium (Cd)		<0.50		0.50	ug/g	07-DEC-17	1	1.2	1.9	1.2
Chromium (Cr)		6.2		1.0	ug/g	07-DEC-17	67	70	160	160
Cobalt (Co)		2.0		1.0	ug/g	07-DEC-17	19	21	80	22
Copper (Cu)		6.3		1.0	ug/g	07-DEC-17	62	92	230	140
Lead (Pb)		2.2		1.0	ug/g	07-DEC-17	45	120	120	120
Mercury (Hg)		0.0056		0.0050	ug/g	07-DEC-17	0.16	0.27	3.9	0.27
Molybdenum (Mo)		<1.0		1.0	ug/g	07-DEC-17	2	2	40	6.9
Nickel (Ni)		4.1		1.0	ug/g	07-DEC-17	37	82	270	100
Selenium (Se)		<1.0		1.0	ug/g	07-DEC-17	1.2	1.5	5.5	2.4
Silver (Ag)		<0.20		0.20	ug/g	07-DEC-17	0.5	0.5	40	20
Thallium (Tl)		<0.50		0.50	ug/g	07-DEC-17	1	1	3.3	1
Uranium (U)		<1.0		1.0	ug/g	07-DEC-17	1.9	2.5	33	23
Vanadium (V)		11.1		1.0	ug/g	07-DEC-17	86	86	86	86
Zinc (Zn)		11.7		5.0	ug/g	07-DEC-17	290	290	340	340
Speciated Metals										
Chromium, Hexavalent		<0.20		0.20	ug/g	07-DEC-17	0.66	0.66	8	8
Volatile Organic Compounds										
Acetone		<0.50	VOCJ	0.50	ug/g	06-DEC-17	0.5	0.5	16	16
Benzene		<0.0068	VOCJ	0.0068	ug/g	06-DEC-17	0.02	0.02	0.32	0.21
Bromodichloromethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	1.5	1.5
Bromoform		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.61	0.27
Bromomethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.05	0.05
Carbon tetrachloride		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.21	0.05
Chlorobenzene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	2.4	2.4
Dibromochloromethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	2.3	2.3
Chloroform		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.47	0.05
1,2-Dibromoethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.05	0.05
1,2-Dichlorobenzene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	1.2	1.2

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - ON-511-T1/T2-SOIL-AG+RPIICC/RPI-ICC-C

#1: T1-Soil-Agricultural or Other Property Use

#2: T1-Soil-Res/Park/Inst/Ind/Com/Comm Property Use

#3: T2-Soil-Ind/Com/Comm Property Use (Coarse)

#4: T2-Soil-Res/Park/Inst. Property Use (Coarse)



ANALYTICAL GUIDELINE REPORT

G17496

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits			
Grouping	Analyte						#1	#2	#3	#4
L2030089-3	BH5-SA1									
Sampled By:	Client on 21-NOV-17									
Matrix:	SOIL									
Volatile Organic Compounds										
1,3-Dichlorobenzene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	9.6	4.8
1,4-Dichlorobenzene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.2	0.083
Dichlorodifluoromethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	16	16
1,1-Dichloroethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.47	0.47
1,2-Dichloroethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.05	0.05
1,1-Dichloroethylene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.064	0.05
cis-1,2-Dichloroethylene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	1.9	1.9
trans-1,2-Dichloroethylene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	1.3	0.084
Methylene Chloride		<0.50	RRR	0.50	ug/g	06-DEC-17	**0.05	**0.05	1.6	**0.1
1,2-Dichloropropane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.16	0.05
cis-1,3-Dichloropropene		<0.030	VOCJ	0.030	ug/g	06-DEC-17				
trans-1,3-Dichloropropene		<0.030	VOCJ	0.030	ug/g	06-DEC-17				
1,3-Dichloropropene (cis & trans)		<0.042		0.042	ug/g	06-DEC-17	0.05	0.05	0.059	0.05
Ethylbenzene		<0.018	VOCJ	0.018	ug/g	06-DEC-17	0.05	0.05	1.1	1.1
n-Hexane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	46	2.8
Methyl Ethyl Ketone		<0.50	VOCJ	0.50	ug/g	06-DEC-17	0.5	0.5	70	16
Methyl Isobutyl Ketone		<0.50	VOCJ	0.50	ug/g	06-DEC-17	0.5	0.5	31	1.7
MTBE		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	1.6	0.75
Styrene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	34	0.7
1,1,1,2-Tetrachloroethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.087	0.058
1,1,2,2-Tetrachloroethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.05	0.05
Tetrachloroethylene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	1.9	0.28
Toluene		<0.080	VOCJ	0.080	ug/g	06-DEC-17	0.2	0.2	6.4	2.3
1,1,1-Trichloroethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	6.1	0.38
1,1,2-Trichloroethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.05	0.05
Trichloroethylene		<0.010	VOCJ	0.010	ug/g	06-DEC-17	0.05	0.05	0.55	0.061
Trichlorofluoromethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.25	4	4
Vinyl chloride		<0.020	VOCJ	0.020	ug/g	06-DEC-17	0.02	0.02	0.032	0.02
o-Xylene		<0.020	VOCJ	0.020	ug/g	06-DEC-17				
m+p-Xylenes		<0.030	VOCJ	0.030	ug/g	06-DEC-17				
Xylenes (Total)		<0.050		0.050	ug/g	06-DEC-17	0.05	0.05	26	3.1
Surrogate: 4-Bromofluorobenzene		103.9		50-140	%	06-DEC-17				
Surrogate: 1,4-Difluorobenzene		106.4		50-140	%	06-DEC-17				
Hydrocarbons										
F1 (C6-C10)		<5.0	VOCJ	5.0	ug/g	06-DEC-17	17	25	55	55
F1-BTEX		<5.0		5.0	ug/g	13-DEC-17	17	25	55	55
F2 (C10-C16)		<20	DLM	20	ug/g	12-DEC-17	**10	**10	230	98
F3 (C16-C34)		300	DLM	100	ug/g	12-DEC-17	*240	*240	1700	300
F4 (C34-C50)		340	DLM	100	ug/g	12-DEC-17	*120	*120	3300	2800
F4G-SG (GHH-Silica)		1420		250	ug/g	08-DEC-17	*120	*120	3300	2800
Total Hydrocarbons (C6-C50)		640		140	ug/g	13-DEC-17				
Chrom. to baseline at nC50		NO			No Unit	12-DEC-17				
Surrogate: 2-Bromobenzotrifluoride		90.9		60-140	%	12-DEC-17				
Surrogate: 3,4-Dichlorotoluene		69.5		60-140	%	06-DEC-17				

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

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Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - ON-511-T1/T2-SOIL-AG+RPIICC/RPI-ICC-C

#1: T1-Soil-Agricultural or Other Property Use

#2: T1-Soil-Res/Park/Inst/Ind/Com/Commu Property Use

#3: T2-Soil-Ind/Com/Commu Property Use (Coarse)

#4: T2-Soil-Res/Park/Inst. Property Use (Coarse)



ANALYTICAL GUIDELINE REPORT

G17496

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits			
Grouping	Analyte						#1	#2	#3	#4
L2030089-4	BH9-SA2									
Sampled By:	Client on 21-NOV-17									
Matrix:	SOIL									
Physical Tests										
Conductivity		0.337		0.0040	mS/cm	07-DEC-17	0.47	0.57	1.4	0.7
% Moisture		6.43		0.10	%	04-DEC-17				
pH		7.66		0.10	pH units	05-DEC-17				
Cyanides										
Cyanide, Weak Acid Diss		<0.050		0.050	ug/g	06-DEC-17	0.051	0.051	0.051	0.051
Saturated Paste Extractables										
SAR		8.19	SAR:M	0.10	SAR	07-DEC-17	*1	*2.4	12	*5
Calcium (Ca)		3.5		1.0	mg/L	07-DEC-17				
Magnesium (Mg)		<1.0		1.0	mg/L	07-DEC-17				
Sodium (Na)		55.3		1.0	mg/L	07-DEC-17				
Metals										
Antimony (Sb)		<1.0		1.0	ug/g	07-DEC-17	1	1.3	40	7.5
Arsenic (As)		2.1		1.0	ug/g	07-DEC-17	11	18	18	18
Barium (Ba)		14.0		1.0	ug/g	07-DEC-17	210	220	670	390
Beryllium (Be)		<0.50		0.50	ug/g	07-DEC-17	2.5	2.5	8	4
Boron (B)		<5.0		5.0	ug/g	07-DEC-17	36	36	120	120
Boron (B), Hot Water Ext.		<0.10		0.10	ug/g	11-DEC-17	36	36	2	1.5
Cadmium (Cd)		<0.50		0.50	ug/g	07-DEC-17	1	1.2	1.9	1.2
Chromium (Cr)		12.2		1.0	ug/g	07-DEC-17	67	70	160	160
Cobalt (Co)		2.9		1.0	ug/g	07-DEC-17	19	21	80	22
Copper (Cu)		5.4		1.0	ug/g	07-DEC-17	62	92	230	140
Lead (Pb)		2.5		1.0	ug/g	07-DEC-17	45	120	120	120
Mercury (Hg)		0.0277		0.0050	ug/g	07-DEC-17	0.16	0.27	3.9	0.27
Molybdenum (Mo)		<1.0		1.0	ug/g	07-DEC-17	2	2	40	6.9
Nickel (Ni)		5.6		1.0	ug/g	07-DEC-17	37	82	270	100
Selenium (Se)		<1.0		1.0	ug/g	07-DEC-17	1.2	1.5	5.5	2.4
Silver (Ag)		<0.20		0.20	ug/g	07-DEC-17	0.5	0.5	40	20
Thallium (Tl)		<0.50		0.50	ug/g	07-DEC-17	1	1	3.3	1
Uranium (U)		<1.0		1.0	ug/g	07-DEC-17	1.9	2.5	33	23
Vanadium (V)		21.0		1.0	ug/g	07-DEC-17	86	86	86	86
Zinc (Zn)		12.3		5.0	ug/g	07-DEC-17	290	290	340	340
Speciated Metals										
Chromium, Hexavalent		0.48		0.20	ug/g	07-DEC-17	0.66	0.66	8	8
Volatile Organic Compounds										
Acetone		<0.50	VOCJ	0.50	ug/g	07-DEC-17	0.5	0.5	16	16
Benzene		<0.0068	VOCJ	0.0068	ug/g	07-DEC-17	0.02	0.02	0.32	0.21
Bromodichloromethane		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	1.5	1.5
Bromoform		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	0.61	0.27
Bromomethane		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	0.05	0.05
Carbon tetrachloride		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	0.21	0.05
Chlorobenzene		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	2.4	2.4
Dibromochloromethane		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	2.3	2.3
Chloroform		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	0.47	0.05
1,2-Dibromoethane		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	0.05	0.05
1,2-Dichlorobenzene		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	1.2	1.2

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - ON-511-T1/T2-SOIL-AG+RPIICC/RPI-ICC-C

#1: T1-Soil-Agricultural or Other Property Use

#2: T1-Soil-Res/Park/Inst/Ind/Com/Commu Property Use

#3: T2-Soil-Ind/Com/Commu Property Use (Coarse)

#4: T2-Soil-Res/Park/Inst. Property Use (Coarse)



ANALYTICAL GUIDELINE REPORT

G17496

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits			
Grouping	Analyte						#1	#2	#3	#4
L2030089-4	BH9-SA2									
Sampled By:	Client on 21-NOV-17									
Matrix:	SOIL									
Volatile Organic Compounds										
	1,3-Dichlorobenzene	<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	9.6	4.8
	1,4-Dichlorobenzene	<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	0.2	0.083
	Dichlorodifluoromethane	<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	16	16
	1,1-Dichloroethane	<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	0.47	0.47
	1,2-Dichloroethane	<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	0.05	0.05
	1,1-Dichloroethylene	<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	0.064	0.05
	cis-1,2-Dichloroethylene	<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	1.9	1.9
	trans-1,2-Dichloroethylene	<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	1.3	0.084
	Methylene Chloride	<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	1.6	0.1
	1,2-Dichloropropane	<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	0.16	0.05
	cis-1,3-Dichloropropene	<0.030	VOCJ	0.030	ug/g	07-DEC-17				
	trans-1,3-Dichloropropene	<0.030	VOCJ	0.030	ug/g	07-DEC-17				
	1,3-Dichloropropene (cis & trans)	<0.042		0.042	ug/g	07-DEC-17	0.05	0.05	0.059	0.05
	Ethylbenzene	<0.018	VOCJ	0.018	ug/g	07-DEC-17	0.05	0.05	1.1	1.1
	n-Hexane	<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	46	2.8
	Methyl Ethyl Ketone	<0.50	VOCJ	0.50	ug/g	07-DEC-17	0.5	0.5	70	16
	Methyl Isobutyl Ketone	<0.50	VOCJ	0.50	ug/g	07-DEC-17	0.5	0.5	31	1.7
	MTBE	<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	1.6	0.75
	Styrene	<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	34	0.7
	1,1,1,2-Tetrachloroethane	<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	0.087	0.058
	1,1,2,2-Tetrachloroethane	<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	0.05	0.05
	Tetrachloroethylene	<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	1.9	0.28
	Toluene	<0.080	VOCJ	0.080	ug/g	07-DEC-17	0.2	0.2	6.4	2.3
	1,1,1-Trichloroethane	<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	6.1	0.38
	1,1,2-Trichloroethane	<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	0.05	0.05
	Trichloroethylene	<0.010	VOCJ	0.010	ug/g	07-DEC-17	0.05	0.05	0.55	0.061
	Trichlorofluoromethane	<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.25	4	4
	Vinyl chloride	<0.020	VOCJ	0.020	ug/g	07-DEC-17	0.02	0.02	0.032	0.02
	o-Xylene	<0.020	VOCJ	0.020	ug/g	07-DEC-17				
	m+p-Xylenes	<0.030	VOCJ	0.030	ug/g	07-DEC-17				
	Xylenes (Total)	<0.050		0.050	ug/g	07-DEC-17	0.05	0.05	26	3.1
	Surrogate: 4-Bromofluorobenzene	104.1		50-140	%	07-DEC-17				
	Surrogate: 1,4-Difluorobenzene	109.7		50-140	%	07-DEC-17				
Hydrocarbons										
	F1 (C6-C10)	<5.0	VOCJ	5.0	ug/g	07-DEC-17	17	25	55	55
	F1-BTEX	<5.0		5.0	ug/g	13-DEC-17	17	25	55	55
	F2 (C10-C16)	15		10	ug/g	12-DEC-17	*10	*10	230	98
	F3 (C16-C34)	194		50	ug/g	12-DEC-17	240	240	1700	300
	F4 (C34-C50)	53		50	ug/g	12-DEC-17	120	120	3300	2800
	F4G-SG (GHH-Silica)	270		250	ug/g	08-DEC-17	*120	*120	3300	2800
	Total Hydrocarbons (C6-C50)	263		72	ug/g	13-DEC-17				
	Chrom. to baseline at nC50	NO			No Unit	12-DEC-17				
	Surrogate: 2-Bromobenzotrifluoride	90.2		60-140	%	12-DEC-17				
	Surrogate: 3,4-Dichlorotoluene	93.7		60-140	%	07-DEC-17				

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - ON-511-T1/T2-SOIL-AG+RPIICC/RPI-ICC-C

#1: T1-Soil-Agricultural or Other Property Use

#2: T1-Soil-Res/Park/Inst/Ind/Com/Commu Property Use

#3: T2-Soil-Ind/Com/Commu Property Use (Coarse)

#4: T2-Soil-Res/Park/Inst. Property Use (Coarse)



ANALYTICAL GUIDELINE REPORT

G17496

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits			
Grouping	Analyte						#1	#2	#3	#4
L2030089-5	BH13-SA1									
Sampled By:	Client on 22-NOV-17									
Matrix:	SOIL									
Physical Tests										
Conductivity		0.340		0.0040	mS/cm	07-DEC-17	0.47	0.57	1.4	0.7
% Moisture		5.00		0.10	%	05-DEC-17				
pH		8.13		0.10	pH units	05-DEC-17				
Cyanides										
Cyanide, Weak Acid Diss		<0.050		0.050	ug/g	06-DEC-17	0.051	0.051	0.051	0.051
Saturated Paste Extractables										
SAR		5.48		0.10	SAR	07-DEC-17	*1	*2.4	12	*5
Calcium (Ca)		3.4		1.0	mg/L	07-DEC-17				
Magnesium (Mg)		2.8		1.0	mg/L	07-DEC-17				
Sodium (Na)		56.4		1.0	mg/L	07-DEC-17				
Metals										
Antimony (Sb)		<1.0		1.0	ug/g	07-DEC-17	1	1.3	40	7.5
Arsenic (As)		1.8		1.0	ug/g	07-DEC-17	11	18	18	18
Barium (Ba)		7.8		1.0	ug/g	07-DEC-17	210	220	670	390
Beryllium (Be)		<0.50		0.50	ug/g	07-DEC-17	2.5	2.5	8	4
Boron (B)		5.2		5.0	ug/g	07-DEC-17	36	36	120	120
Boron (B), Hot Water Ext.		<0.10		0.10	ug/g	11-DEC-17	36	36	2	1.5
Cadmium (Cd)		<0.50		0.50	ug/g	07-DEC-17	1	1.2	1.9	1.2
Chromium (Cr)		5.8		1.0	ug/g	07-DEC-17	67	70	160	160
Cobalt (Co)		1.8		1.0	ug/g	07-DEC-17	19	21	80	22
Copper (Cu)		5.8		1.0	ug/g	07-DEC-17	62	92	230	140
Lead (Pb)		2.0		1.0	ug/g	07-DEC-17	45	120	120	120
Mercury (Hg)		0.0056		0.0050	ug/g	07-DEC-17	0.16	0.27	3.9	0.27
Molybdenum (Mo)		<1.0		1.0	ug/g	07-DEC-17	2	2	40	6.9
Nickel (Ni)		3.8		1.0	ug/g	07-DEC-17	37	82	270	100
Selenium (Se)		<1.0		1.0	ug/g	07-DEC-17	1.2	1.5	5.5	2.4
Silver (Ag)		<0.20		0.20	ug/g	07-DEC-17	0.5	0.5	40	20
Thallium (Tl)		<0.50		0.50	ug/g	07-DEC-17	1	1	3.3	1
Uranium (U)		<1.0		1.0	ug/g	07-DEC-17	1.9	2.5	33	23
Vanadium (V)		9.8		1.0	ug/g	07-DEC-17	86	86	86	86
Zinc (Zn)		9.8		5.0	ug/g	07-DEC-17	290	290	340	340
Speciated Metals										
Chromium, Hexavalent		<0.20		0.20	ug/g	07-DEC-17	0.66	0.66	8	8
Volatile Organic Compounds										
Acetone		<0.50	VOCJ	0.50	ug/g	06-DEC-17	0.5	0.5	16	16
Benzene		<0.0068	VOCJ	0.0068	ug/g	06-DEC-17	0.02	0.02	0.32	0.21
Bromodichloromethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	1.5	1.5
Bromoform		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.61	0.27
Bromomethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.05	0.05
Carbon tetrachloride		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.21	0.05
Chlorobenzene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	2.4	2.4
Dibromochloromethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	2.3	2.3
Chloroform		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.47	0.05
1,2-Dibromoethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.05	0.05
1,2-Dichlorobenzene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	1.2	1.2

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - ON-511-T1/T2-SOIL-AG+RPIICC/RPI-ICC-C

#1: T1-Soil-Agricultural or Other Property Use

#2: T1-Soil-Res/Park/Inst/Ind/Com/Commu Property Use

#3: T2-Soil-Ind/Com/Commu Property Use (Coarse)

#4: T2-Soil-Res/Park/Inst. Property Use (Coarse)



ANALYTICAL GUIDELINE REPORT

G17496

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits			
Grouping	Analyte						#1	#2	#3	#4
L2030089-5	BH13-SA1									
Sampled By:	Client on 22-NOV-17									
Matrix:	SOIL									
Volatile Organic Compounds										
1,3-Dichlorobenzene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	9.6	4.8
1,4-Dichlorobenzene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.2	0.083
Dichlorodifluoromethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	16	16
1,1-Dichloroethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.47	0.47
1,2-Dichloroethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.05	0.05
1,1-Dichloroethylene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.064	0.05
cis-1,2-Dichloroethylene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	1.9	1.9
trans-1,2-Dichloroethylene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	1.3	0.084
Methylene Chloride		<0.50	RRR	0.50	ug/g	06-DEC-17	**0.05	**0.05	1.6	**0.1
1,2-Dichloropropane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.16	0.05
cis-1,3-Dichloropropene		<0.030	VOCJ	0.030	ug/g	06-DEC-17				
trans-1,3-Dichloropropene		<0.030	VOCJ	0.030	ug/g	06-DEC-17				
1,3-Dichloropropene (cis & trans)		<0.042		0.042	ug/g	06-DEC-17	0.05	0.05	0.059	0.05
Ethylbenzene		<0.018	VOCJ	0.018	ug/g	06-DEC-17	0.05	0.05	1.1	1.1
n-Hexane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	46	2.8
Methyl Ethyl Ketone		<0.50	VOCJ	0.50	ug/g	06-DEC-17	0.5	0.5	70	16
Methyl Isobutyl Ketone		<0.50	VOCJ	0.50	ug/g	06-DEC-17	0.5	0.5	31	1.7
MTBE		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	1.6	0.75
Styrene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	34	0.7
1,1,1,2-Tetrachloroethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.087	0.058
1,1,2,2-Tetrachloroethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.05	0.05
Tetrachloroethylene		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	1.9	0.28
Toluene		<0.080	VOCJ	0.080	ug/g	06-DEC-17	0.2	0.2	6.4	2.3
1,1,1-Trichloroethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	6.1	0.38
1,1,2-Trichloroethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.05	0.05	0.05
Trichloroethylene		<0.010	VOCJ	0.010	ug/g	06-DEC-17	0.05	0.05	0.55	0.061
Trichlorofluoromethane		<0.050	VOCJ	0.050	ug/g	06-DEC-17	0.05	0.25	4	4
Vinyl chloride		<0.020	VOCJ	0.020	ug/g	06-DEC-17	0.02	0.02	0.032	0.02
o-Xylene		<0.020	VOCJ	0.020	ug/g	06-DEC-17				
m+p-Xylenes		<0.030	VOCJ	0.030	ug/g	06-DEC-17				
Xylenes (Total)		<0.050		0.050	ug/g	06-DEC-17	0.05	0.05	26	3.1
Surrogate: 4-Bromofluorobenzene		107.9		50-140	%	06-DEC-17				
Surrogate: 1,4-Difluorobenzene		108.9		50-140	%	06-DEC-17				
Hydrocarbons										
F1 (C6-C10)		<5.0	VOCJ	5.0	ug/g	06-DEC-17	17	25	55	55
F1-BTEX		<5.0		5.0	ug/g	12-DEC-17	17	25	55	55
F2 (C10-C16)		<10		10	ug/g	11-DEC-17	10	10	230	98
F3 (C16-C34)		55		50	ug/g	11-DEC-17	240	240	1700	300
F4 (C34-C50)		82		50	ug/g	11-DEC-17	120	120	3300	2800
Total Hydrocarbons (C6-C50)		137		72	ug/g	12-DEC-17				
Chrom. to baseline at nC50		YES			No Unit	11-DEC-17				
Surrogate: 2-Bromobenzotrifluoride		71.5		60-140	%	11-DEC-17				
Surrogate: 3,4-Dichlorotoluene		73.3		60-140	%	06-DEC-17				

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#1: T1-Soil-Agricultural or Other Property Use

#2: T1-Soil-Res/Park/Inst/Ind/Com/Comm Property Use

#3: T2-Soil-Ind/Com/Comm Property Use (Coarse)

#4: T2-Soil-Res/Park/Inst. Property Use (Coarse)



ANALYTICAL GUIDELINE REPORT

G17496

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits			
Grouping	Analyte						#1	#2	#3	#4
L2030089-7	BH16-SA2									
Sampled By:	Client on 22-NOV-17									
Matrix:	SOIL									
Physical Tests										
Conductivity		0.588		0.0040	mS/cm	07-DEC-17	*0.47	*0.57	1.4	0.7
% Moisture		3.96		0.10	%	05-DEC-17				
pH		8.27		0.10	pH units	05-DEC-17				
Cyanides										
Cyanide, Weak Acid Diss		<0.050		0.050	ug/g	06-DEC-17	0.051	0.051	0.051	0.051
Saturated Paste Extractables										
SAR		13.7		0.10	SAR	07-DEC-17	*1	*2.4	*12	*5
Calcium (Ca)		2.6		1.0	mg/L	07-DEC-17				
Magnesium (Mg)		1.0		1.0	mg/L	07-DEC-17				
Sodium (Na)		103		1.0	mg/L	07-DEC-17				
Metals										
Antimony (Sb)		<1.0		1.0	ug/g	07-DEC-17	1	1.3	40	7.5
Arsenic (As)		1.1		1.0	ug/g	07-DEC-17	11	18	18	18
Barium (Ba)		4.2		1.0	ug/g	07-DEC-17	210	220	670	390
Beryllium (Be)		<0.50		0.50	ug/g	07-DEC-17	2.5	2.5	8	4
Boron (B)		<5.0		5.0	ug/g	07-DEC-17	36	36	120	120
Boron (B), Hot Water Ext.		<0.10		0.10	ug/g	11-DEC-17	36	36	2	1.5
Cadmium (Cd)		<0.50		0.50	ug/g	07-DEC-17	1	1.2	1.9	1.2
Chromium (Cr)		5.1		1.0	ug/g	07-DEC-17	67	70	160	160
Cobalt (Co)		1.2		1.0	ug/g	07-DEC-17	19	21	80	22
Copper (Cu)		1.1		1.0	ug/g	07-DEC-17	62	92	230	140
Lead (Pb)		<1.0		1.0	ug/g	07-DEC-17	45	120	120	120
Mercury (Hg)		<0.0050		0.0050	ug/g	07-DEC-17	0.16	0.27	3.9	0.27
Molybdenum (Mo)		<1.0		1.0	ug/g	07-DEC-17	2	2	40	6.9
Nickel (Ni)		2.5		1.0	ug/g	07-DEC-17	37	82	270	100
Selenium (Se)		<1.0		1.0	ug/g	07-DEC-17	1.2	1.5	5.5	2.4
Silver (Ag)		<0.20		0.20	ug/g	07-DEC-17	0.5	0.5	40	20
Thallium (Tl)		<0.50		0.50	ug/g	07-DEC-17	1	1	3.3	1
Uranium (U)		<1.0		1.0	ug/g	07-DEC-17	1.9	2.5	33	23
Vanadium (V)		7.2		1.0	ug/g	07-DEC-17	86	86	86	86
Zinc (Zn)		5.3		5.0	ug/g	07-DEC-17	290	290	340	340
Speciated Metals										
Chromium, Hexavalent		<0.20		0.20	ug/g	07-DEC-17	0.66	0.66	8	8
Volatile Organic Compounds										
Acetone		<0.50	VOCJ	0.50	ug/g	07-DEC-17	0.5	0.5	16	16
Benzene		<0.0068	VOCJ	0.0068	ug/g	07-DEC-17	0.02	0.02	0.32	0.21
Bromodichloromethane		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	1.5	1.5
Bromoform		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	0.61	0.27
Bromomethane		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	0.05	0.05
Carbon tetrachloride		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	0.21	0.05
Chlorobenzene		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	2.4	2.4
Dibromochloromethane		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	2.3	2.3
Chloroform		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	0.47	0.05
1,2-Dibromoethane		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	0.05	0.05
1,2-Dichlorobenzene		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	1.2	1.2

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#1: T1-Soil-Agricultural or Other Property Use

#2: T1-Soil-Res/Park/Inst/Ind/Com/Comm Property Use

#3: T2-Soil-Ind/Com/Comm Property Use (Coarse)

#4: T2-Soil-Res/Park/Inst. Property Use (Coarse)



ANALYTICAL GUIDELINE REPORT

G17496

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits			
Grouping	Analyte						#1	#2	#3	#4
L2030089-7	BH16-SA2									
Sampled By:	Client on 22-NOV-17									
Matrix:	SOIL									
Volatile Organic Compounds										
1,3-Dichlorobenzene		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	9.6	4.8
1,4-Dichlorobenzene		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	0.2	0.083
Dichlorodifluoromethane		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	16	16
1,1-Dichloroethane		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	0.47	0.47
1,2-Dichloroethane		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	0.05	0.05
1,1-Dichloroethylene		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	0.064	0.05
cis-1,2-Dichloroethylene		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	1.9	1.9
trans-1,2-Dichloroethylene		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	1.3	0.084
Methylene Chloride		<0.15	RRR	0.15	ug/g	07-DEC-17	**0.05	**0.05	1.6	**0.1
1,2-Dichloropropane		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	0.16	0.05
cis-1,3-Dichloropropene		<0.030	VOCJ	0.030	ug/g	07-DEC-17				
trans-1,3-Dichloropropene		<0.030	VOCJ	0.030	ug/g	07-DEC-17				
1,3-Dichloropropene (cis & trans)		<0.042		0.042	ug/g	07-DEC-17	0.05	0.05	0.059	0.05
Ethylbenzene		<0.018	VOCJ	0.018	ug/g	07-DEC-17	0.05	0.05	1.1	1.1
n-Hexane		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	46	2.8
Methyl Ethyl Ketone		<0.50	VOCJ	0.50	ug/g	07-DEC-17	0.5	0.5	70	16
Methyl Isobutyl Ketone		<0.50	VOCJ	0.50	ug/g	07-DEC-17	0.5	0.5	31	1.7
MTBE		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	1.6	0.75
Styrene		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	34	0.7
1,1,1,2-Tetrachloroethane		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	0.087	0.058
1,1,2,2-Tetrachloroethane		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	0.05	0.05
Tetrachloroethylene		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	1.9	0.28
Toluene		<0.080	VOCJ	0.080	ug/g	07-DEC-17	0.2	0.2	6.4	2.3
1,1,1-Trichloroethane		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	6.1	0.38
1,1,2-Trichloroethane		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.05	0.05	0.05
Trichloroethylene		<0.010	VOCJ	0.010	ug/g	07-DEC-17	0.05	0.05	0.55	0.061
Trichlorofluoromethane		<0.050	VOCJ	0.050	ug/g	07-DEC-17	0.05	0.25	4	4
Vinyl chloride		<0.020	VOCJ	0.020	ug/g	07-DEC-17	0.02	0.02	0.032	0.02
o-Xylene		<0.020	VOCJ	0.020	ug/g	07-DEC-17				
m+p-Xylenes		<0.030	VOCJ	0.030	ug/g	07-DEC-17				
Xylenes (Total)		<0.050		0.050	ug/g	07-DEC-17	0.05	0.05	26	3.1
Surrogate: 4-Bromofluorobenzene		104.2		50-140	%	07-DEC-17				
Surrogate: 1,4-Difluorobenzene		106.3		50-140	%	07-DEC-17				
Hydrocarbons										
F1 (C6-C10)		<5.0	VOCJ	5.0	ug/g	07-DEC-17	17	25	55	55
F1-BTEX		<5.0		5.0	ug/g	12-DEC-17	17	25	55	55
F2 (C10-C16)		<10		10	ug/g	12-DEC-17	10	10	230	98
F3 (C16-C34)		56		50	ug/g	12-DEC-17	240	240	1700	300
F4 (C34-C50)		129		50	ug/g	12-DEC-17	*120	*120	3300	2800
F4G-SG (GHH-Silica)		510		250	ug/g	07-DEC-17	*120	*120	3300	2800
Total Hydrocarbons (C6-C50)		186		72	ug/g	12-DEC-17				
Chrom. to baseline at nC50		NO			No Unit	12-DEC-17				
Surrogate: 2-Bromobenzotrifluoride		70.7		60-140	%	12-DEC-17				
Surrogate: 3,4-Dichlorotoluene		74.2		60-140	%	07-DEC-17				

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#3: T2-Soil-Ind/Com/Commu Property Use (Coarse)

#4: T2-Soil-Res/Park/Inst. Property Use (Coarse)

Reference Information

Qualifiers for Sample Submission Listed:

Qualifier	Description
VOCC	Soil jar was submitted as VOC sample container. VOC results may be biased low, and do not meet federal (CCME) or provincial requirements (for BC, AB-Tier1, MB, ON, SK).

Sample Parameter Qualifier key listed:

Qualifier	Description
SAR:M	Reported SAR represents a maximum value. Actual SAR may be lower if both Ca and Mg were detectable.
G	QC result did not meet ALS DQO. Refer to narrative comments for further information.
VOCJ	Soil jar was submitted as VOC sample container. VOC results may be biased low, and do not meet federal (CCME) or provincial requirements (for BC, AB-Tier1, MB, ON, SK).
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
RRR	Refer to Report Remarks for issues regarding this analysis

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference***
B-HWS-R511-WT	Soil	Boron-HWE-O.Reg 153/04 (July 2011)	HW EXTR, EPA 6010B

A dried solid sample is extracted with calcium chloride, the sample undergoes a heating process. After cooling the sample is filtered and analyzed by ICP/OES.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

CN-WAD-R511-WT	Soil	Cyanide (WAD)-O.Reg 153/04 (July 2011)	MOE 3015/APHA 4500CN I-WAD
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The sample is extracted with a strong base for 16 hours, and then filtered. The filtrate is then distilled where the cyanide is converted to cyanogen chloride by reacting with chloramine-T, the cyanogen chloride then reacts with a combination of barbituric acid and isonicotinic acid to form a highly colored complex.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

CR-CR6-IC-WT	Soil	Hexavalent Chromium in Soil	SW846 3060A/7199
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This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

EC-WT	Soil	Conductivity (EC)	MOEE E3138
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A representative subsample is tumbled with de-ionized (DI) water. The ratio of water to soil is 2:1 v/w. After tumbling the sample is then analyzed by a conductivity meter.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

Reference Information

F1-F4-511-CALC-WT Soil F1-F4 Hydrocarbon Calculated CCME CWS-PHC, Pub #1310, Dec 2001-S
Parameters

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

Hydrocarbon results are expressed on a dry weight basis.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT Soil F1-O.Reg 153/04 (July 2011) E3398/CCME TIER 1-HS

Fraction F1 is determined by extracting a soil or sediment sample as received with methanol, then analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT Soil F2-F4-O.Reg 153/04 (July 2011) CCME Tier 1

Petroleum Hydrocarbons (F2-F4 fractions) are extracted from soil with 1:1 hexane:acetone using a rotary extractor. Extracts are treated with silica gel to remove polar organic interferences. F2, F3, & F4 are analyzed by GC-FID. F4G-sg is analyzed gravimetrically.

Notes:

1. F2 (C10-C16): Sum of all hydrocarbons that elute between nC10 and nC16.
2. F3 (C16-C34): Sum of all hydrocarbons that elute between nC16 and nC34.
3. F4 (C34-C50): Sum of all hydrocarbons that elute between nC34 and nC50.
4. F4G: Gravimetric Heavy Hydrocarbons
5. F4G-sg: Gravimetric Heavy Hydrocarbons (F4G) after silica gel treatment.
6. Where both F4 (C34-C50) and F4G-sg are reported for a sample, the larger of the two values is used for comparison against the relevant CCME guideline for F4.
7. F4G-sg cannot be added to the C6 to C50 hydrocarbon results to obtain an estimate of total extractable hydrocarbons.
8. This method is validated for use.
9. Data from analysis of validation and quality control samples is available upon request.
10. Reported results are expressed as milligrams per dry kilogram, unless otherwise indicated.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F4G-ADD-511-WT Soil F4G SG-O.Reg 153/04 (July 2011) MOE DECPH-E3398/CCME TIER 1

F4G, gravimetric analysis, is determined if the chromatogram does not return to baseline at or before C50. A soil sample is extracted with a solvent mix, the solvent is evaporated and the weight of the residue is determined.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

HG-200.2-CVAA-WT Soil Mercury in Soil by CVAAS EPA 200.2/1631E (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVAAS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

Reference Information

MET-200.2-CCMS-WT Soil Metals in Soil by CRC ICPMS EPA 200.2/6020A (mod)

This method uses a heated strong acid digestion with HNO3 and HCl and is intended to liberate metals that may be environmentally available. Silicate minerals are not solubilized. Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. Analysis is by Collision/Reaction Cell ICPMS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

MOISTURE-WT	Soil	% Moisture	Gravimetric: Oven Dried
PH-WT	Soil	pH	MOEE E3137A

A minimum 10g portion of the sample is extracted with 20mL of 0.01M calcium chloride solution by shaking for at least 30 minutes. The aqueous layer is separated from the soil and then analyzed using a pH meter and electrode.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

SAR-R511-WT Soil SAR-O.Reg 153/04 (July 2011) SW846 6010C

A dried, disaggregated solid sample is extracted with deionized water, the aqueous extract is separated from the solid, acidified and then analyzed using a ICP/OES. The concentrations of Na, Ca and Mg are reported as per CALA requirements for calculated parameters. These individual parameters are not for comparison to any guideline.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

VOC-1,3-DCP-CALC-WT	Soil	Regulation 153 VOCs	SW8260B/SW8270C
VOC-511-HS-WT	Soil	VOC-O.Reg 153/04 (July 2011)	SW846 8260 (511)

Soil and sediment samples are extracted in methanol and analyzed by headspace-GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT	Soil	Sum of Xylene Isomer Concentrations	CALCULATION
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Total xylenes represents the sum of o-xylene and m&p-xylene.

*** ALS test methods may incorporate modifications from specified reference methods to improve performance.

Chain of Custody numbers:

14-460142

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA		

Reference Information

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg ww - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information.



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311 VICTORIA ST. N.
KITCHENER ON N2H 5E1

Contact: JOE VANDERZALM

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
B-HWS-R511-WT		Soil						
Batch	R3907291							
WG2680136-4	DUP	L2029486-16						
Boron (B), Hot Water Ext.		<0.10	<0.10	RPD-NA	ug/g	N/A	30	08-DEC-17
WG2680136-2	IRM	HOTB-SAL_SOIL5						
Boron (B), Hot Water Ext.			112.7		%		70-130	08-DEC-17
WG2680136-3	LCS							
Boron (B), Hot Water Ext.			98.9		%		70-130	08-DEC-17
WG2680136-1	MB							
Boron (B), Hot Water Ext.			<0.10		ug/g		0.1	08-DEC-17
Batch	R3909311							
WG2681347-4	DUP	L2031924-14						
Boron (B), Hot Water Ext.		0.27	0.29		ug/g	5.3	30	11-DEC-17
WG2681347-2	IRM	HOTB-SAL_SOIL5						
Boron (B), Hot Water Ext.			91.5		%		70-130	11-DEC-17
WG2681347-3	LCS							
Boron (B), Hot Water Ext.			112.5		%		70-130	11-DEC-17
WG2681347-1	MB							
Boron (B), Hot Water Ext.			<0.10		ug/g		0.1	11-DEC-17
Batch	R3909327							
WG2681348-4	DUP	L2027735-1						
Boron (B), Hot Water Ext.		<0.10	<0.10	RPD-NA	ug/g	N/A	30	11-DEC-17
WG2681348-2	IRM	HOTB-SAL_SOIL5						
Boron (B), Hot Water Ext.			123.1		%		70-130	11-DEC-17
WG2681348-3	LCS							
Boron (B), Hot Water Ext.			106.8		%		70-130	11-DEC-17
WG2681348-1	MB							
Boron (B), Hot Water Ext.			<0.10		ug/g		0.1	11-DEC-17
CN-WAD-R511-WT		Soil						
Batch	R3905832							
WG2677409-3	DUP	L2030089-1						
Cyanide, Weak Acid Diss		<0.050	<0.050	RPD-NA	ug/g	N/A	35	05-DEC-17
WG2677409-2	LCS							
Cyanide, Weak Acid Diss			97.1		%		80-120	05-DEC-17
WG2677409-1	MB							
Cyanide, Weak Acid Diss			<0.050		ug/g		0.05	05-DEC-17
WG2677409-4	MS	L2030089-1						
Cyanide, Weak Acid Diss			95.0		%		70-130	05-DEC-17



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Client: CHUNG AND VANDER DOELEN
311 VICTORIA ST. N.
KITCHENER ON N2H 5E1

Contact: JOE VANDERZALM

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F1-HS-511-WT		Soil						
Batch	R3905063							
WG2676849-4	DUP	WG2676849-3						
F1 (C6-C10)		<5.0	<5.0	RPD-NA	ug/g	N/A	30	06-DEC-17
WG2676849-2	LCS							
F1 (C6-C10)			96.5		%		80-120	05-DEC-17
WG2676849-1	MB							
F1 (C6-C10)			<5.0		ug/g		5	05-DEC-17
Surrogate: 3,4-Dichlorotoluene			86.8		%		60-140	05-DEC-17
WG2676849-7	MS	WG2676849-6						
F1 (C6-C10)			93.9		%		60-140	05-DEC-17
F2-F4-511-WT		Soil						
Batch	R3907630							
WG2677118-4	DUP	WG2677118-3						
F2 (C10-C16)		<10	<10	RPD-NA	ug/g	N/A	30	08-DEC-17
F3 (C16-C34)		<50	<50	RPD-NA	ug/g	N/A	30	08-DEC-17
F4 (C34-C50)		<50	<50	RPD-NA	ug/g	N/A	30	08-DEC-17
WG2677118-2	LCS							
F2 (C10-C16)			143.3	LCS-H	%		80-120	08-DEC-17
F3 (C16-C34)			139.0	LCS-H	%		80-120	08-DEC-17
F4 (C34-C50)			139.8	LCS-H	%		80-120	08-DEC-17
WG2677118-1	MB							
F2 (C10-C16)			<10		ug/g		10	08-DEC-17
F3 (C16-C34)			<50		ug/g		50	08-DEC-17
F4 (C34-C50)			<50		ug/g		50	08-DEC-17
Surrogate: 2-Bromobenzotrifluoride			36.8	MBS	%		60-140	08-DEC-17
WG2677118-5	MS	WG2677118-3						
F2 (C10-C16)			110.7		%		60-140	08-DEC-17
F3 (C16-C34)			109.3		%		60-140	08-DEC-17
F4 (C34-C50)			110.1		%		60-140	08-DEC-17
Batch	R3909909							
WG2680759-4	DUP	WG2680759-3						
F2 (C10-C16)		<10	<10	RPD-NA	ug/g	N/A	30	11-DEC-17
F3 (C16-C34)		70	52	J	ug/g	19	100	11-DEC-17
F4 (C34-C50)		67	<50	RPD-NA	ug/g	N/A	30	11-DEC-17
WG2680759-2	LCS							
F2 (C10-C16)			106.1		%		80-120	11-DEC-17
F3 (C16-C34)			102.8		%		80-120	11-DEC-17



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Client: CHUNG AND VANDER DOELEN
311 VICTORIA ST. N.
KITCHENER ON N2H 5E1

Contact: JOE VANDERZALM

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT	Soil							
Batch	R3912368							
WG2682137-2	LCS							
F2 (C10-C16)			111.4		%		80-120	12-DEC-17
F3 (C16-C34)			101.9		%		80-120	12-DEC-17
F4 (C34-C50)			105.2		%		80-120	12-DEC-17
WG2682137-1	MB							
F2 (C10-C16)			<10		ug/g		10	12-DEC-17
F3 (C16-C34)			<50		ug/g		50	12-DEC-17
F4 (C34-C50)			<50		ug/g		50	12-DEC-17
Surrogate: 2-Bromobenzotrifluoride			101.9		%		60-140	12-DEC-17
WG2682137-5	MS	WG2682137-3						
F2 (C10-C16)			101.6		%		60-140	12-DEC-17
F3 (C16-C34)			113.2		%		60-140	12-DEC-17
F4 (C34-C50)			N/A	MS-B	%		-	12-DEC-17
F4G-ADD-511-WT	Soil							
Batch	R3912041							
WG2682950-2	LCS							
F4G-SG (GHH-Silica)			104.0		%		60-140	07-DEC-17
WG2682950-1	MB							
F4G-SG (GHH-Silica)			<250		ug/g		250	07-DEC-17
Batch	R3912660							
WG2683652-3	DUP	L2030089-3						
F4G-SG (GHH-Silica)		1420	990		ug/g	36	40	08-DEC-17
WG2683652-2	LCS							
F4G-SG (GHH-Silica)			83.0		%		60-140	08-DEC-17
WG2683652-1	MB							
F4G-SG (GHH-Silica)			<250		ug/g		250	08-DEC-17
HG-200.2-CVAA-WT	Soil							
Batch	R3906456							
WG2679203-2	CRM	WT-CANMET-TILL1						
Mercury (Hg)			111.5		%		70-130	07-DEC-17
WG2679203-6	DUP	WG2679203-5						
Mercury (Hg)		0.0114	0.0115		ug/g	1.2	40	07-DEC-17
WG2679203-3	LCS							
Mercury (Hg)			113.5		%		80-120	07-DEC-17
WG2679203-1	MB							
Mercury (Hg)			<0.0050		mg/kg		0.005	07-DEC-17
MET-200.2-CCMS-WT	Soil							

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311 VICTORIA ST. N.
KITCHENER ON N2H 5E1

Contact: JOE VANDERZALM

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-WT		Soil						
Batch	R3907089							
WG2679203-2	CRM	WT-CANMET-TILL1						
Antimony (Sb)			92.5		%		70-130	07-DEC-17
Arsenic (As)			114.6		%		70-130	07-DEC-17
Barium (Ba)			117.6		%		70-130	07-DEC-17
Beryllium (Be)			111.6		%		70-130	07-DEC-17
Boron (B)			4.0		mg/kg		0-8.2	07-DEC-17
Cadmium (Cd)			108.8		%		70-130	07-DEC-17
Chromium (Cr)			114.3		%		70-130	07-DEC-17
Cobalt (Co)			112.8		%		70-130	07-DEC-17
Copper (Cu)			114.2		%		70-130	07-DEC-17
Lead (Pb)			102.7		%		70-130	07-DEC-17
Molybdenum (Mo)			106.0		%		70-130	07-DEC-17
Nickel (Ni)			111.5		%		70-130	07-DEC-17
Selenium (Se)			0.34		mg/kg		0.11-0.51	07-DEC-17
Silver (Ag)			0.22		mg/kg		0.13-0.33	07-DEC-17
Thallium (Tl)			0.120		mg/kg		0.077-0.18	07-DEC-17
Uranium (U)			101.9		%		70-130	07-DEC-17
Vanadium (V)			112.9		%		70-130	07-DEC-17
Zinc (Zn)			111.5		%		70-130	07-DEC-17
WG2679203-6	DUP	WG2679203-5						
Antimony (Sb)		<0.10	<0.10	RPD-NA	ug/g	N/A	30	07-DEC-17
Arsenic (As)		2.57	2.56		ug/g	0.3	30	07-DEC-17
Barium (Ba)		71.1	75.0		ug/g	5.3	40	07-DEC-17
Beryllium (Be)		0.49	0.51		ug/g	3.0	30	07-DEC-17
Boron (B)		12.9	13.6		ug/g	5.6	30	07-DEC-17
Cadmium (Cd)		0.119	0.115		ug/g	3.4	30	07-DEC-17
Chromium (Cr)		18.3	18.9		ug/g	3.2	30	07-DEC-17
Cobalt (Co)		6.68	6.74		ug/g	0.9	30	07-DEC-17
Copper (Cu)		17.0	17.0		ug/g	0.3	30	07-DEC-17
Lead (Pb)		11.4	11.4		ug/g	0.3	40	07-DEC-17
Molybdenum (Mo)		0.20	0.19		ug/g	5.7	40	07-DEC-17
Nickel (Ni)		15.1	15.1		ug/g	0.1	30	07-DEC-17
Selenium (Se)		<0.20	<0.20	RPD-NA	ug/g	N/A	30	07-DEC-17
Silver (Ag)		<0.10	<0.10	RPD-NA	ug/g	N/A	40	07-DEC-17

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Client: CHUNG AND VANDER DOELEN
311 VICTORIA ST. N.
KITCHENER ON N2H 5E1

Contact: JOE VANDERZALM

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-WT		Soil						
Batch	R3907089							
WG2679203-6	DUP	WG2679203-5						
Thallium (Tl)		0.096	0.094		ug/g	1.7	30	07-DEC-17
Uranium (U)		0.462	0.478		ug/g	3.4	30	07-DEC-17
Vanadium (V)		28.4	28.5		ug/g	0.4	30	07-DEC-17
Zinc (Zn)		53.9	53.4		ug/g	1.0	30	07-DEC-17
WG2679203-4	LCS							
Antimony (Sb)			99.1		%		80-120	07-DEC-17
Arsenic (As)			109.2		%		80-120	07-DEC-17
Barium (Ba)			109.4		%		80-120	07-DEC-17
Beryllium (Be)			99.9		%		80-120	07-DEC-17
Boron (B)			97.4		%		80-120	07-DEC-17
Cadmium (Cd)			100.7		%		80-120	07-DEC-17
Chromium (Cr)			107.9		%		80-120	07-DEC-17
Cobalt (Co)			105.7		%		80-120	07-DEC-17
Copper (Cu)			104.0		%		80-120	07-DEC-17
Lead (Pb)			104.4		%		80-120	07-DEC-17
Molybdenum (Mo)			101.5		%		80-120	07-DEC-17
Nickel (Ni)			105.2		%		80-120	07-DEC-17
Selenium (Se)			101.6		%		80-120	07-DEC-17
Silver (Ag)			97.1		%		80-120	07-DEC-17
Thallium (Tl)			107.8		%		80-120	07-DEC-17
Uranium (U)			98.6		%		80-120	07-DEC-17
Vanadium (V)			109.2		%		80-120	07-DEC-17
Zinc (Zn)			99.8		%		80-120	07-DEC-17
WG2679203-1	MB							
Antimony (Sb)			<0.10		mg/kg		0.1	07-DEC-17
Arsenic (As)			<0.10		mg/kg		0.1	07-DEC-17
Barium (Ba)			<0.50		mg/kg		0.5	07-DEC-17
Beryllium (Be)			<0.10		mg/kg		0.1	07-DEC-17
Boron (B)			<5.0		mg/kg		5	07-DEC-17
Cadmium (Cd)			<0.020		mg/kg		0.02	07-DEC-17
Chromium (Cr)			<0.50		mg/kg		0.5	07-DEC-17
Cobalt (Co)			<0.10		mg/kg		0.1	07-DEC-17
Copper (Cu)			<0.50		mg/kg		0.5	07-DEC-17
Lead (Pb)			<0.50		mg/kg		0.5	07-DEC-17



Environmental

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Client: CHUNG AND VANDER DOELEN
311 VICTORIA ST. N.
KITCHENER ON N2H 5E1

Contact: JOE VANDERZALM

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-WT	Soil							
Batch R3907089								
WG2679203-1 MB								
Molybdenum (Mo)			<0.10		mg/kg		0.1	07-DEC-17
Nickel (Ni)			<0.50		mg/kg		0.5	07-DEC-17
Selenium (Se)			<0.20		mg/kg		0.2	07-DEC-17
Silver (Ag)			<0.10		mg/kg		0.1	07-DEC-17
Thallium (Tl)			<0.050		mg/kg		0.05	07-DEC-17
Uranium (U)			<0.050		mg/kg		0.05	07-DEC-17
Vanadium (V)			<0.20		mg/kg		0.2	07-DEC-17
Zinc (Zn)			<2.0		mg/kg		2	07-DEC-17
MOISTURE-WT	Soil							
Batch R3903852								
WG2677077-3 DUP		L2029712-1						
% Moisture		9.98	9.79		%	1.9	20	04-DEC-17
WG2677077-2 LCS								
% Moisture			98.6		%		90-110	04-DEC-17
WG2677077-1 MB								
% Moisture			<0.10		%		0.1	04-DEC-17
Batch R3903853								
WG2677376-3 DUP		L2029551-1						
% Moisture		10.7	11.2		%	4.9	20	04-DEC-17
WG2677376-2 LCS								
% Moisture			100.0		%		90-110	04-DEC-17
WG2677376-1 MB								
% Moisture			<0.10		%		0.1	04-DEC-17
Batch R3903856								
WG2677306-3 DUP		L2028950-3						
% Moisture		8.55	8.41		%	1.7	20	04-DEC-17
WG2677306-2 LCS								
% Moisture			100.2		%		90-110	04-DEC-17
WG2677306-1 MB								
% Moisture			<0.10		%		0.1	04-DEC-17
Batch R3905456								
WG2677828-3 DUP		L2030089-5						
% Moisture		5.00	4.99		%	0.2	20	05-DEC-17
WG2677828-2 LCS								
% Moisture			99.7		%		90-110	05-DEC-17
WG2677828-1 MB								



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Client: CHUNG AND VANDER DOELEN
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Contact: JOE VANDERZALM

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MOISTURE-WT								
Soil								
Batch	R3905456							
WG2677828-1 MB								
% Moisture			<0.10		%		0.1	05-DEC-17
Batch	R3905464							
WG2677928-3 DUP		L2030089-7						
% Moisture		3.96	4.03		%	1.7	20	05-DEC-17
WG2677928-2 LCS								
% Moisture			99.6		%		90-110	05-DEC-17
WG2677928-1 MB								
% Moisture			<0.10		%		0.1	05-DEC-17
PH-WT								
Soil								
Batch	R3905378							
WG2677412-1 DUP		L2030089-1						
pH		7.63	7.60	J	pH units	0.03	0.3	05-DEC-17
WG2677776-1 LCS								
pH			6.98		pH units		6.9-7.1	05-DEC-17
SAR-R511-WT								
Soil								
Batch	R3907103							
WG2678814-14 DUP		L2029656-1						
Calcium (Ca)		11.0	10.8		mg/L	1.8	30	07-DEC-17
Sodium (Na)		7.8	7.6		mg/L	2.8	30	07-DEC-17
Magnesium (Mg)		2.7	2.6		mg/L	1.6	30	07-DEC-17
WG2678814-15 IRM		WT SAR1						
Calcium (Ca)			98.8		%		70-130	07-DEC-17
Sodium (Na)			113.4		%		70-130	07-DEC-17
Magnesium (Mg)			101.8		%		70-130	07-DEC-17
WG2678814-13 MB								
Calcium (Ca)			<1.0		mg/L		1	07-DEC-17
Sodium (Na)			<1.0		mg/L		1	07-DEC-17
Magnesium (Mg)			<1.0		mg/L		1	07-DEC-17
VOC-511-HS-WT								
Soil								
Batch	R3905063							
WG2676849-4 DUP		WG2676849-3						
1,1,1,2-Tetrachloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	06-DEC-17
1,1,2,2-Tetrachloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	06-DEC-17
1,1,1-Trichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	06-DEC-17

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Client: CHUNG AND VANDER DOELEN
311 VICTORIA ST. N.
KITCHENER ON N2H 5E1

Contact: JOE VANDERZALM

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Soil						
Batch	R3905063							
WG2676849-4 DUP		WG2676849-3						
1,1,2-Trichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	06-DEC-17
1,1-Dichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	06-DEC-17
1,1-Dichloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	06-DEC-17
1,2-Dibromoethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	06-DEC-17
1,2-Dichlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	06-DEC-17
1,2-Dichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	06-DEC-17
1,2-Dichloropropane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	06-DEC-17
1,3-Dichlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	06-DEC-17
1,4-Dichlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	06-DEC-17
Acetone		<0.50	<0.50	RPD-NA	ug/g	N/A	40	06-DEC-17
Benzene		<0.0068	<0.0068	RPD-NA	ug/g	N/A	40	06-DEC-17
Bromodichloromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	06-DEC-17
Bromoform		<0.050	<0.050	RPD-NA	ug/g	N/A	40	06-DEC-17
Bromomethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	06-DEC-17
Carbon tetrachloride		<0.050	<0.050	RPD-NA	ug/g	N/A	40	06-DEC-17
Chlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	06-DEC-17
Chloroform		<0.050	<0.050	RPD-NA	ug/g	N/A	40	06-DEC-17
cis-1,2-Dichloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	06-DEC-17
cis-1,3-Dichloropropene		<0.030	<0.030	RPD-NA	ug/g	N/A	40	06-DEC-17
Dibromochloromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	06-DEC-17
Dichlorodifluoromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	06-DEC-17
Ethylbenzene		<0.018	<0.018	RPD-NA	ug/g	N/A	40	06-DEC-17
n-Hexane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	06-DEC-17
Methylene Chloride		<0.050	<0.050	RPD-NA	ug/g	N/A	40	06-DEC-17
MTBE		<0.050	<0.050	RPD-NA	ug/g	N/A	40	06-DEC-17
m+p-Xylenes		<0.030	<0.030	RPD-NA	ug/g	N/A	40	06-DEC-17
Methyl Ethyl Ketone		<0.50	<0.50	RPD-NA	ug/g	N/A	40	06-DEC-17
Methyl Isobutyl Ketone		<0.50	<0.50	RPD-NA	ug/g	N/A	40	06-DEC-17
o-Xylene		<0.020	<0.020	RPD-NA	ug/g	N/A	40	06-DEC-17
Styrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	06-DEC-17
Tetrachloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	06-DEC-17
Toluene		<0.080	<0.080	RPD-NA	ug/g	N/A	40	06-DEC-17
trans-1,2-Dichloroethylene		<0.050	<0.050		ug/g			06-DEC-17

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KITCHENER ON N2H 5E1

Contact: JOE VANDERZALM

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Soil						
Batch	R3905063							
WG2676849-4 DUP		WG2676849-3						
trans-1,2-Dichloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	06-DEC-17
trans-1,3-Dichloropropene		<0.030	<0.030	RPD-NA	ug/g	N/A	40	06-DEC-17
Trichloroethylene		<0.010	<0.010	RPD-NA	ug/g	N/A	40	06-DEC-17
Trichlorofluoromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	06-DEC-17
Vinyl chloride		<0.020	<0.020	RPD-NA	ug/g	N/A	40	06-DEC-17
WG2676849-2 LCS								
1,1,1,2-Tetrachloroethane			101.0		%		60-130	05-DEC-17
1,1,2,2-Tetrachloroethane			98.9		%		60-130	05-DEC-17
1,1,1-Trichloroethane			102.2		%		60-130	05-DEC-17
1,1,2-Trichloroethane			102.1		%		60-130	05-DEC-17
1,1-Dichloroethane			109.7		%		60-130	05-DEC-17
1,1-Dichloroethylene			89.0		%		60-130	05-DEC-17
1,2-Dibromoethane			101.6		%		70-130	05-DEC-17
1,2-Dichlorobenzene			104.2		%		70-130	05-DEC-17
1,2-Dichloroethane			101.0		%		60-130	05-DEC-17
1,2-Dichloropropane			101.9		%		70-130	05-DEC-17
1,3-Dichlorobenzene			103.4		%		70-130	05-DEC-17
1,4-Dichlorobenzene			105.4		%		70-130	05-DEC-17
Acetone			108.5		%		60-140	05-DEC-17
Benzene			103.6		%		70-130	05-DEC-17
Bromodichloromethane			99.96		%		50-140	05-DEC-17
Bromoform			93.8		%		70-130	05-DEC-17
Bromomethane			93.7		%		50-140	05-DEC-17
Carbon tetrachloride			101.5		%		70-130	05-DEC-17
Chlorobenzene			104.1		%		70-130	05-DEC-17
Chloroform			104.7		%		70-130	05-DEC-17
cis-1,2-Dichloroethylene			107.0		%		70-130	05-DEC-17
cis-1,3-Dichloropropene			101.4		%		70-130	05-DEC-17
Dibromochloromethane			101.6		%		60-130	05-DEC-17
Dichlorodifluoromethane			49.8	MES	%		50-140	05-DEC-17
Ethylbenzene			98.3		%		70-130	05-DEC-17
n-Hexane			76.2		%		70-130	05-DEC-17
Methylene Chloride			110.3		%		70-130	05-DEC-17

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Client: CHUNG AND VANDER DOELEN
311 VICTORIA ST. N.
KITCHENER ON N2H 5E1

Contact: JOE VANDERZALM

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Soil						
Batch	R3905063							
WG2676849-2	LCS							
MTBE			104.7		%		70-130	05-DEC-17
m+p-Xylenes			98.1		%		70-130	05-DEC-17
Methyl Ethyl Ketone			104.3		%		60-140	05-DEC-17
Methyl Isobutyl Ketone			94.8		%		60-140	05-DEC-17
o-Xylene			97.5		%		70-130	05-DEC-17
Styrene			97.5		%		70-130	05-DEC-17
Tetrachloroethylene			103.9		%		60-130	05-DEC-17
Toluene			100.7		%		70-130	05-DEC-17
trans-1,2-Dichloroethylene			101.9		%		60-130	05-DEC-17
trans-1,3-Dichloropropene			94.9		%		70-130	05-DEC-17
Trichloroethylene			109.7		%		60-130	05-DEC-17
Trichlorofluoromethane			95.1		%		50-140	05-DEC-17
Vinyl chloride			81.6		%		60-140	05-DEC-17
WG2676849-1	MB							
1,1,1,2-Tetrachloroethane			<0.050		ug/g		0.05	05-DEC-17
1,1,2,2-Tetrachloroethane			<0.050		ug/g		0.05	05-DEC-17
1,1,1-Trichloroethane			<0.050		ug/g		0.05	05-DEC-17
1,1,2-Trichloroethane			<0.050		ug/g		0.05	05-DEC-17
1,1-Dichloroethane			<0.050		ug/g		0.05	05-DEC-17
1,1-Dichloroethylene			<0.050		ug/g		0.05	05-DEC-17
1,2-Dibromoethane			<0.050		ug/g		0.05	05-DEC-17
1,2-Dichlorobenzene			<0.050		ug/g		0.05	05-DEC-17
1,2-Dichloroethane			<0.050		ug/g		0.05	05-DEC-17
1,2-Dichloropropane			<0.050		ug/g		0.05	05-DEC-17
1,3-Dichlorobenzene			<0.050		ug/g		0.05	05-DEC-17
1,4-Dichlorobenzene			<0.050		ug/g		0.05	05-DEC-17
Acetone			<0.50		ug/g		0.5	05-DEC-17
Benzene			<0.0068		ug/g		0.0068	05-DEC-17
Bromodichloromethane			<0.050		ug/g		0.05	05-DEC-17
Bromoform			<0.050		ug/g		0.05	05-DEC-17
Bromomethane			<0.050		ug/g		0.05	05-DEC-17
Carbon tetrachloride			<0.050		ug/g		0.05	05-DEC-17
Chlorobenzene			<0.050		ug/g		0.05	05-DEC-17
Chloroform			<0.050		ug/g		0.05	05-DEC-17

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Client: CHUNG AND VANDER DOELEN
311 VICTORIA ST. N.
KITCHENER ON N2H 5E1

Contact: JOE VANDERZALM

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Soil						
Batch	R3905063							
WG2676849-1	MB							
cis-1,2-Dichloroethylene			<0.050		ug/g		0.05	05-DEC-17
cis-1,3-Dichloropropene			<0.030		ug/g		0.03	05-DEC-17
Dibromochloromethane			<0.050		ug/g		0.05	05-DEC-17
Dichlorodifluoromethane			<0.050		ug/g		0.05	05-DEC-17
Ethylbenzene			<0.018		ug/g		0.018	05-DEC-17
n-Hexane			<0.050		ug/g		0.05	05-DEC-17
Methylene Chloride			<0.050		ug/g		0.05	05-DEC-17
MTBE			<0.050		ug/g		0.05	05-DEC-17
m+p-Xylenes			<0.030		ug/g		0.03	05-DEC-17
Methyl Ethyl Ketone			<0.50		ug/g		0.5	05-DEC-17
Methyl Isobutyl Ketone			<0.50		ug/g		0.5	05-DEC-17
o-Xylene			<0.020		ug/g		0.02	05-DEC-17
Styrene			<0.050		ug/g		0.05	05-DEC-17
Tetrachloroethylene			<0.050		ug/g		0.05	05-DEC-17
Toluene			<0.080		ug/g		0.08	05-DEC-17
trans-1,2-Dichloroethylene			<0.050		ug/g		0.05	05-DEC-17
trans-1,3-Dichloropropene			<0.030		ug/g		0.03	05-DEC-17
Trichloroethylene			<0.010		ug/g		0.01	05-DEC-17
Trichlorofluoromethane			<0.050		ug/g		0.05	05-DEC-17
Vinyl chloride			<0.020		ug/g		0.02	05-DEC-17
Surrogate: 1,4-Difluorobenzene			107.4		%		50-140	05-DEC-17
Surrogate: 4-Bromofluorobenzene			106.3		%		50-140	05-DEC-17
WG2676849-5	MS	WG2676849-3						
1,1,1,2-Tetrachloroethane			103.1		%		50-140	06-DEC-17
1,1,2,2-Tetrachloroethane			99.97		%		50-140	06-DEC-17
1,1,1-Trichloroethane			103.7		%		50-140	06-DEC-17
1,1,2-Trichloroethane			106.3		%		50-140	06-DEC-17
1,1-Dichloroethane			113.7		%		50-140	06-DEC-17
1,1-Dichloroethylene			91.0		%		50-140	06-DEC-17
1,2-Dibromoethane			106.2		%		50-140	06-DEC-17
1,2-Dichlorobenzene			107.0		%		50-140	06-DEC-17
1,2-Dichloroethane			105.3		%		50-140	06-DEC-17
1,2-Dichloropropane			104.7		%		50-140	06-DEC-17
1,3-Dichlorobenzene			104.8		%		50-140	06-DEC-17

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KITCHENER ON N2H 5E1

Contact: JOE VANDERZALM

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Soil						
Batch	R3905063							
WG2676849-5 MS		WG2676849-3						
1,4-Dichlorobenzene			106.8		%		50-140	06-DEC-17
Acetone			111.5		%		50-140	06-DEC-17
Benzene			105.5		%		50-140	06-DEC-17
Bromodichloromethane			102.1		%		50-140	06-DEC-17
Bromoform			95.8		%		50-140	06-DEC-17
Bromomethane			96.8		%		50-140	06-DEC-17
Carbon tetrachloride			103.1		%		50-140	06-DEC-17
Chlorobenzene			105.7		%		50-140	06-DEC-17
Chloroform			107.7		%		50-140	06-DEC-17
cis-1,2-Dichloroethylene			110.0		%		50-140	06-DEC-17
cis-1,3-Dichloropropene			99.7		%		50-140	06-DEC-17
Dibromochloromethane			104.4		%		50-140	06-DEC-17
Dichlorodifluoromethane			54.0		%		50-140	06-DEC-17
Ethylbenzene			99.2		%		50-140	06-DEC-17
n-Hexane			78.5		%		50-140	06-DEC-17
Methylene Chloride			114.3		%		50-140	06-DEC-17
MTBE			106.1		%		50-140	06-DEC-17
m+p-Xylenes			98.6		%		50-140	06-DEC-17
Methyl Ethyl Ketone			109.1		%		50-140	06-DEC-17
Methyl Isobutyl Ketone			93.6		%		50-140	06-DEC-17
o-Xylene			98.7		%		50-140	06-DEC-17
Styrene			98.0		%		50-140	06-DEC-17
Tetrachloroethylene			105.5		%		50-140	06-DEC-17
Toluene			102.7		%		50-140	06-DEC-17
trans-1,2-Dichloroethylene			102.2		%		50-140	06-DEC-17
trans-1,3-Dichloropropene			94.2		%		50-140	06-DEC-17
Trichloroethylene			110.7		%		50-140	06-DEC-17
Trichlorofluoromethane			98.3		%		50-140	06-DEC-17
Vinyl chloride			83.3		%		50-140	06-DEC-17

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
J	Duplicate results and limits are expressed in terms of absolute difference.
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MBS	Surrogate recovery in Method Blank was outside ALS DQO. Moderately low-biased results in the MB do not significantly affect its purpose.
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

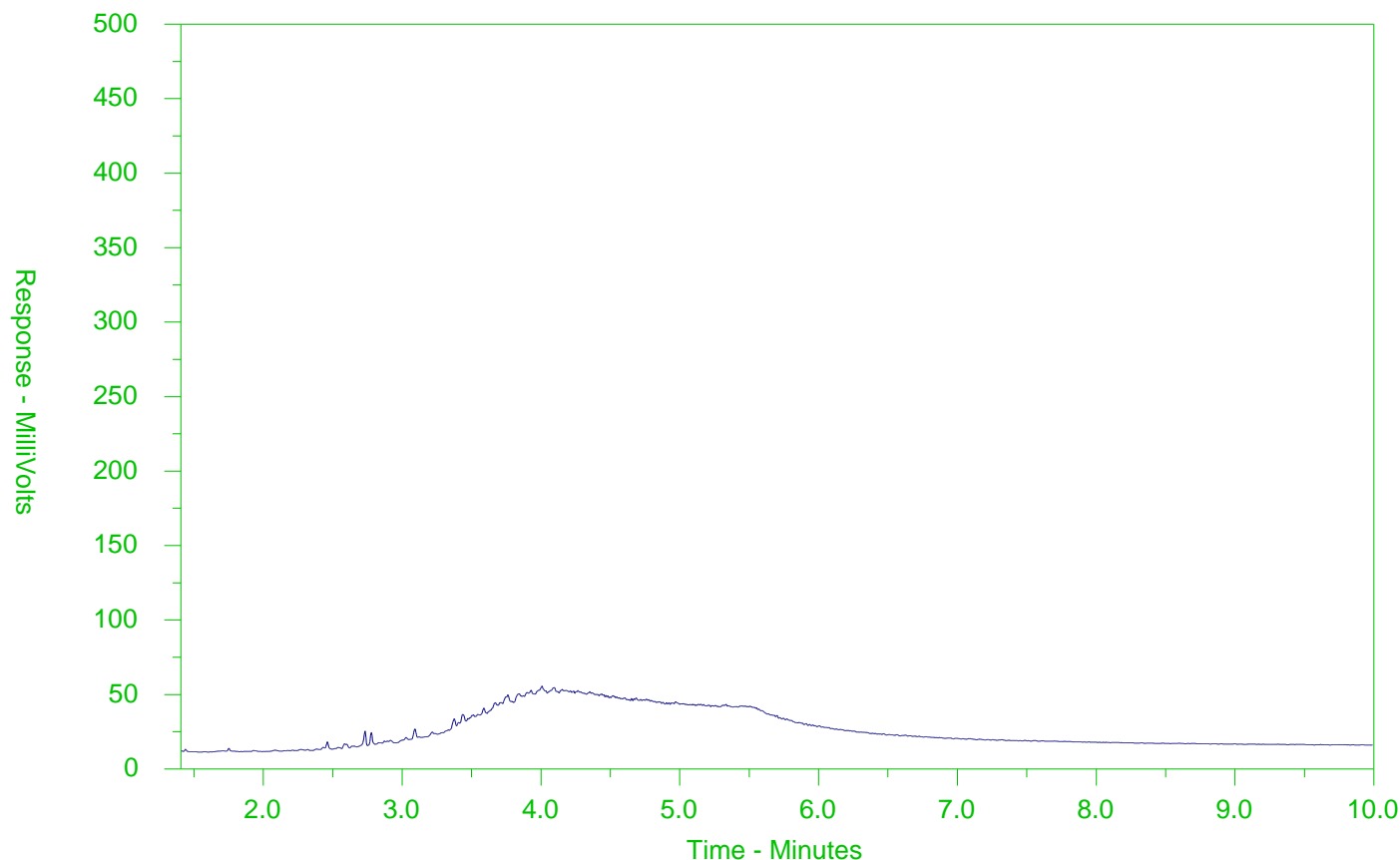
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2030089-1
Client Sample ID: BH1-SA2



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

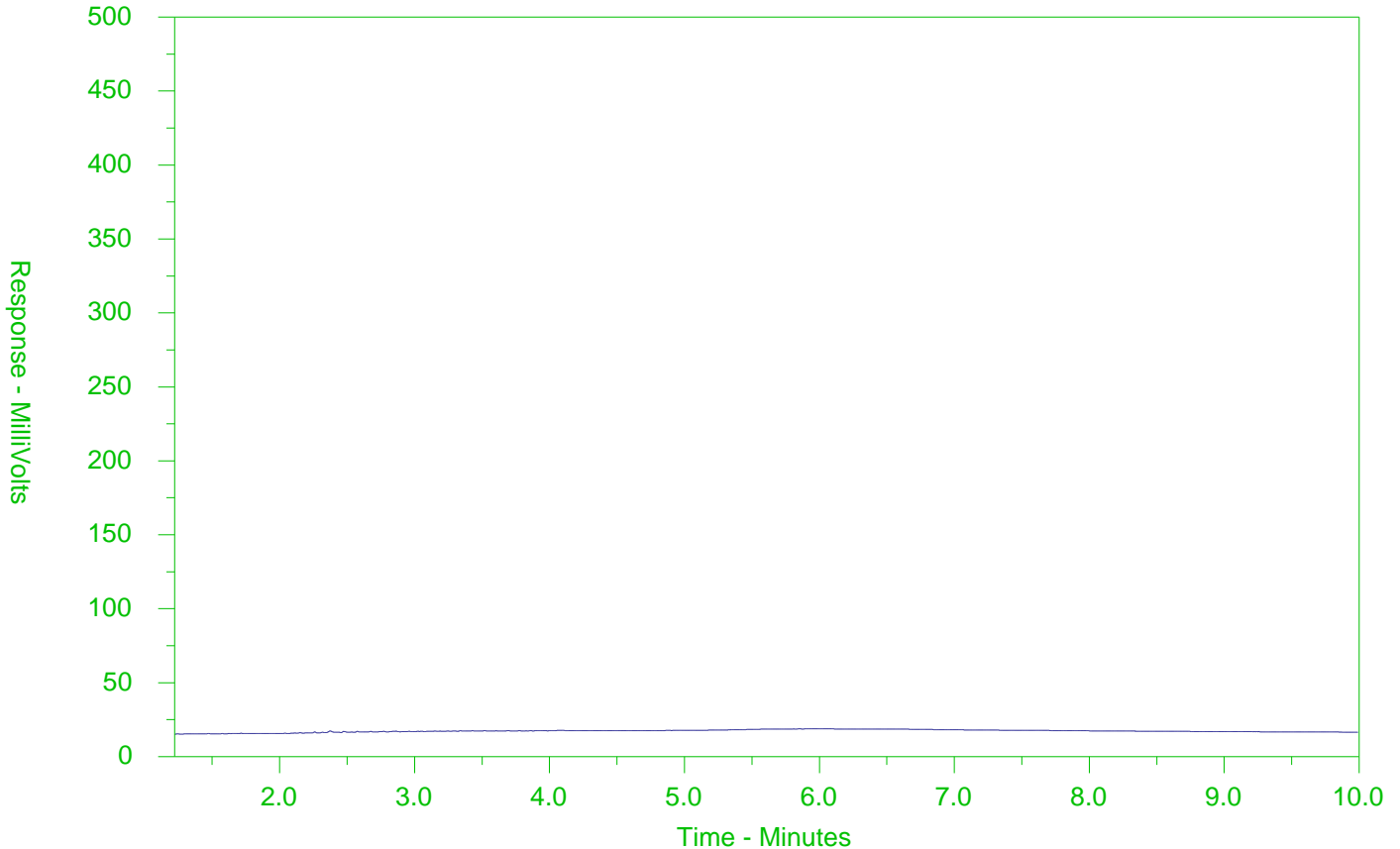
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2030089-2
Client Sample ID: BH2-SA5



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

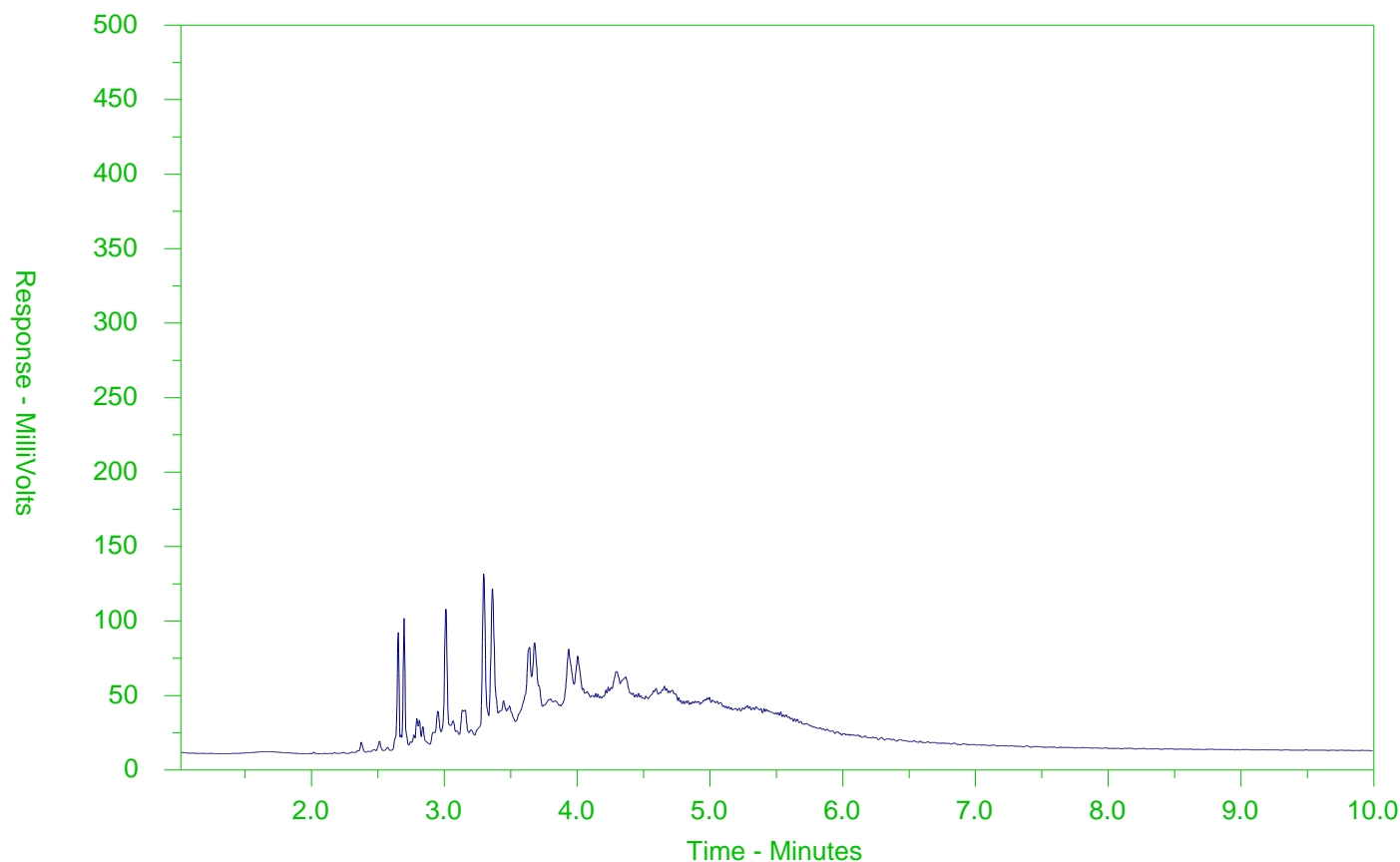
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2030089-3
Client Sample ID: BH5-SA1



F2		F3		F4	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

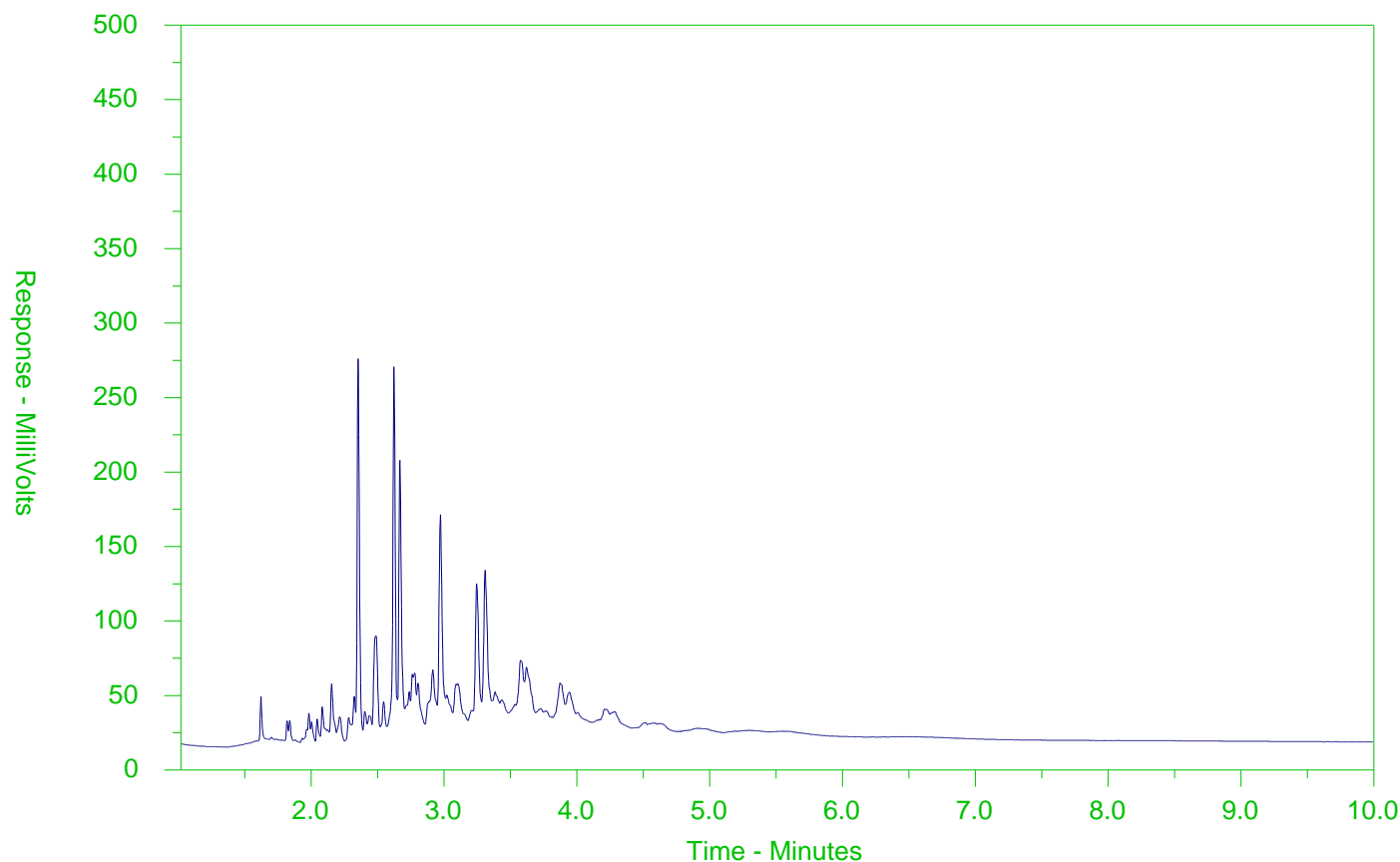
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2030089-4
Client Sample ID: BH9-SA2



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

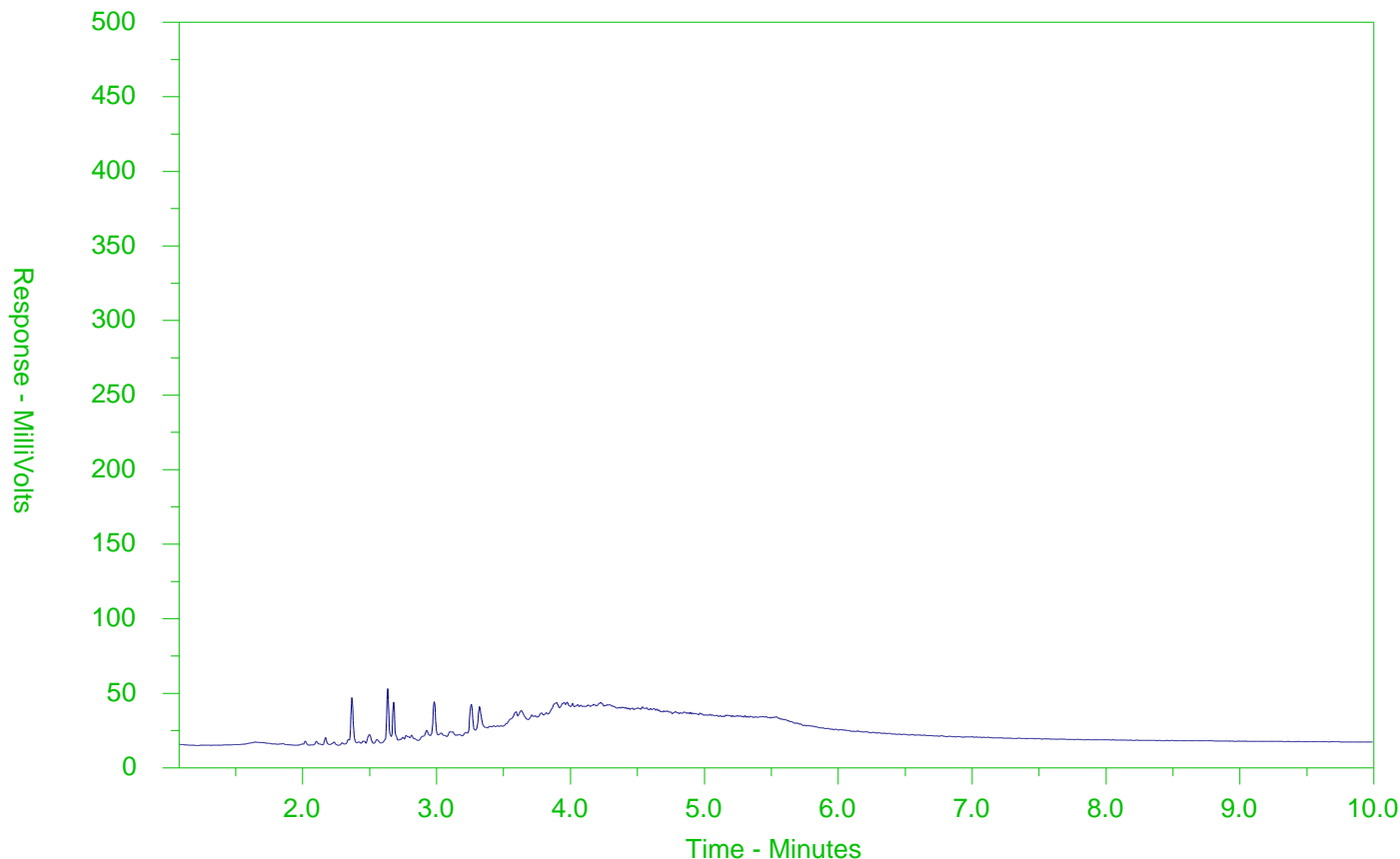
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2030089-5
Client Sample ID: BH13-SA1



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

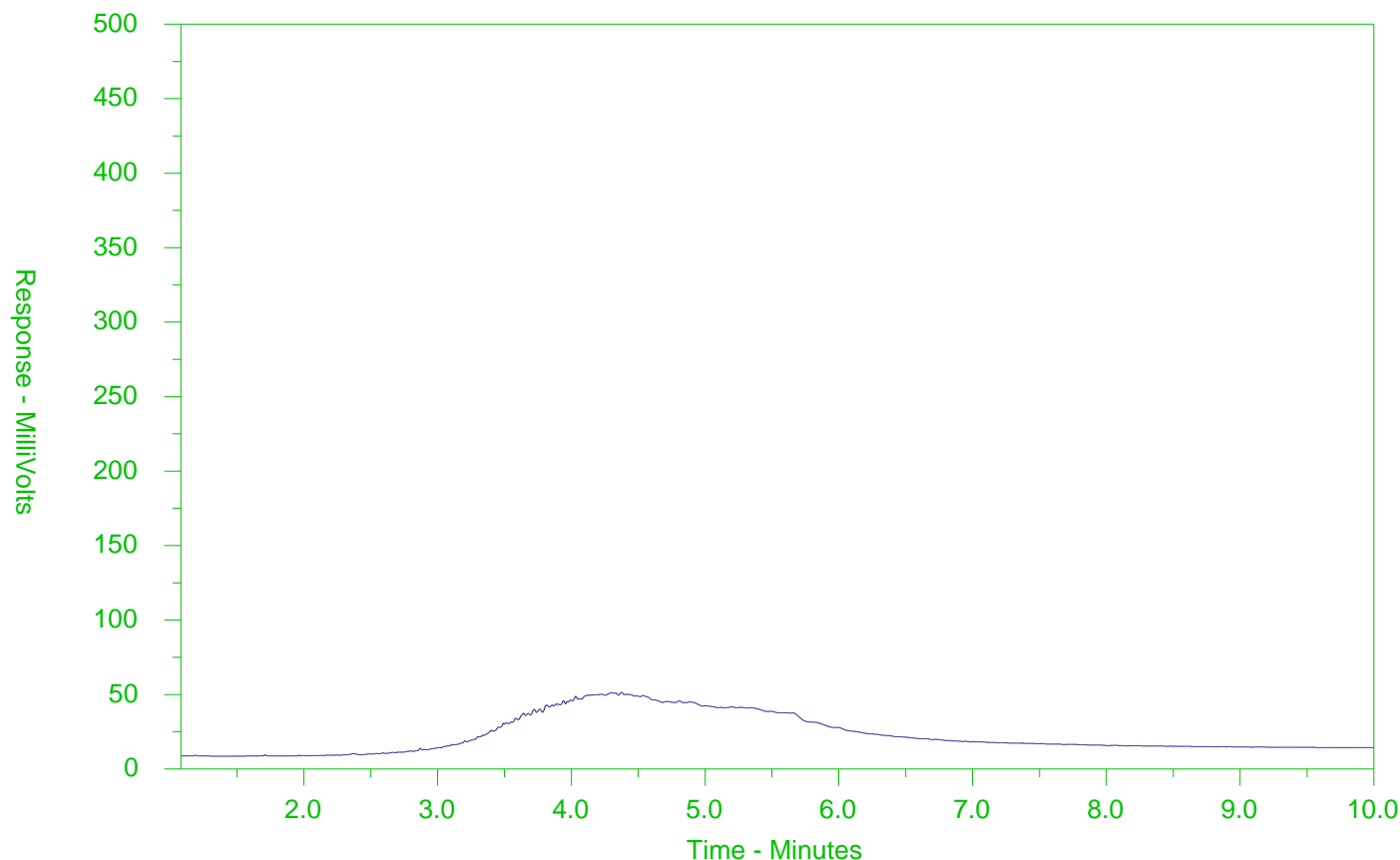
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2030089-7
Client Sample ID: BH16-SA2



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

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L2030089-COFC

COC Number: 14 - 460142

Page 1 of 1

Report To Company: <u>CVD ENGINEERING</u> Contact: <u>SOE VANDERZAL</u> Address: <u>311 VICTORIA ST. W. KITCHENER</u> Phone: _____		Report Format / Distribution Select Report Format: <input checked="" type="checkbox"/> PDF <input type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL) Quality Control (QC) Report with Report <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> Criteria on Report - provide details below if box checked Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: <u>soe.vanderzalm@cudengineering.ca</u> Email 2: _____		Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests) R <input type="checkbox"/> Regular (Standard TAT if received by 3pm) P <input type="checkbox"/> Priority (2-4 business days if received by 3pm) E <input type="checkbox"/> Emergency (1-2 business days if received by 3pm) E2 <input type="checkbox"/> Same day or weekend emergency if received by 10am - contact ALS for surcharge. Specify Date Required for E2, E or P: _____																																																																														
Invoice To Same as Report To <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Copy of Invoice with Report <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Company: _____ Contact: _____		Invoice Distribution Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: _____ Email 2: _____		Analysis Request Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below																																																																														
Project Information ALS Quote #: _____ Job #: <u>617496</u> PO / AFE: _____ LSD: _____		Oil and Gas Required Fields (client use) Approver ID: _____ Cost Center: _____ GL Account: _____ Routing Code: _____ Activity Code: _____ Location: _____		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>Sample Type</th> <th>Filtered (F)</th> <th>Preserved (P)</th> <th>Filtered and Preserved (F/P)</th> </tr> <tr> <td>METALS</td> <td></td> <td></td> <td></td> </tr> <tr> <td>INORGANICS</td> <td></td> <td></td> <td></td> </tr> <tr> <td>ELECTRICAL CONDUCTIVITY</td> <td></td> <td></td> <td></td> </tr> <tr> <td>SAR</td> <td></td> <td></td> <td></td> </tr> <tr> <td>PHC (F1 - F4)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>VOLATILE ORGANIC COMPOUNDS</td> <td></td> <td></td> <td></td> </tr> </table>		Sample Type	Filtered (F)	Preserved (P)	Filtered and Preserved (F/P)	METALS				INORGANICS				ELECTRICAL CONDUCTIVITY				SAR				PHC (F1 - F4)				VOLATILE ORGANIC COMPOUNDS																																																				
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4	BH9 - SA2	21-NOV-17		SOZC	✓	✓	✓	✓	✓	✓																																																																								
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Drinking Water (DW) Samples (client use) Are samples taken from a Regulated DW System? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Are samples for human drinking water use? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Special Instructions / Specify Criteria to add on report (client use) <u>0-REG 153-04 -> BOTH TABLE 2</u> <u>BOTH TABLE 2 (COARSE)</u>		SAMPLE CONDITION AS RECEIVED (lab use only) Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/> Ice packs Yes <input type="checkbox"/> No <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/> Cooling Initiated <input type="checkbox"/> INITIAL COOLER TEMPERATURES °C _____ FINAL COOLER TEMPERATURES °C <u>2.3</u>																																																																														
SHIPMENT RELEASE (client use) Released by: <u>[Signature]</u> Date: <u>Dec 1 / 17</u> Time: <u>12:30</u>		INITIAL SHIPMENT RECEPTION (lab use only) Received by: _____ Date: _____ Time: _____		FINAL SHIPMENT RECEPTION (lab use only) Received by: <u>491</u> Date: <u>1-DEC-17</u> Time: <u>12:30</u>																																																																														

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

ALS-POL-0024-01 Rev 03 October 2015

SIF

APPENDIX “C”

Comparison of the Soil Chemistry Results to the Applicable Regulatory Criteria



ANALYTICAL RESULTS FOR SOIL
MOE Soil, Ground Water and Sediment Standards for Use Under Part XV.1
of the Environmental Protection Act, April 15, 2011

		<i>Table 1 Agricultural or Other Property Use Standard</i>	<i>Table 1 Residential/ Parkland/ Institutional/ Industrial/ Comercial/ Community Property Use Standard</i>	<i>Table 2 Residential/ Parkland/ Institutional Property Use Standard (Coarse)</i>	<i>Table 2 Industrial/ Commercial/ Community Property Use Standard (Coarse)</i>	BH 1 - SA 2	BH 2 - SA 5	BH 5 - SA 1	BH 9 - SA 2	BH 13 - SA 1	BH 16 - SA 2
<i>Metals & Inorganics</i>	Conductivity	0.47	0.57	0.7	1.4	0.266	0.843	0.361	0.337	0.34	0.588
	% Moisture	-	-	-	-	16.1	16.9	6.52	6.43	5	3.96
	pH	-	-	-	-	7.63	7.78	8.16	7.66	8.13	8.27
	SAR	1	2.4	5	12	1.78	17.6	7.49	8.19	5.48	13.7
	Calcium (Ca)	-	-	-	-	9	5.4	2.2	3.5	3.4	2.6
	Magnesium (Mg)	-	-	-	-	1.5	<1.0	1.5	<1.0	2.8	1
	Sodium (Na)	-	-	-	-	21.9	148	59.2	55.3	56.4	103
	Antimony (Sb)	1	1.3	7.5	40	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Arsenic (As)	11	18	18	18	3.1	1.9	1.9	2.1	1.8	1.1
	Barium (Ba)	210	220	390	670	16.8	15.6	8	14	7.8	4.2
	Beryllium (Be)	2.5	2.5	4	8	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	Boron (B)	36	36	120	120	5.3	8.6	6.9	<5.0	5.2	<5.0
	Boron (B), Hot Water Ext. Available	36	36	1.5	2	0.25	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)	1	1.2	1.2	1.9	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	Chromium (Cr)	67	70	160	160	16	8.5	6.2	12.2	5.8	5.1
	Cobalt (Co)	19	21	22	80	3.3	3	2	2.9	1.8	1.2
	Copper (Cu)	62	92	140	230	6.9	7.7	6.3	5.4	5.8	1.1
	Lead (Pb)	45	120	120	120	13.6	2.5	2.2	2.5	2	<1.0
	Mercury (Hg)	0.16	0.27	0.27	3.9	0.0371	<0.0050	0.0056	0.0277	0.0056	<0.0050
	Molybdenum (Mo)	2	2	6.9	40	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Nickel (Ni)	37	82	100	270	6.7	6.2	4.1	5.6	3.8	2.5
	Selenium (Se)	1.2	1.5	2.4	5.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Silver (Ag)	0.5	0.5	20	40	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Thallium (Tl)	1	1	1	3.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	Uranium (U)	1.9	2.5	23	33	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Vanadium (V)	86	86	86	86	27.9	12.5	11.1	21	9.8	7.2
	Zinc (Zn)	290	290	340	340	29.2	13.3	11.7	12.3	9.8	5.3
	Chromium, Hexavalent	0.66	0.66	8	8	0.21	<0.20	<0.20	0.48	<0.20	<0.20
<i>Petroleum Hydrocarbons F2-F4</i>	F1 (C6-C10)	17	25	55	55	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	F1-BTEX	17	25	55	55	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	F2 (C10-C16)	10	10	98	230	<10	<10	<20	15	<10	<10
	F3 (C16-C34)	240	240	300	1700	71	<50	300	194	55	56
	F4 (C34-C50)	120	120	2800	3300	121	<50	340	53	82	129
	F4G-SG (GHH-Silica)	120	120	2800	3300	-	-	1420	270	-	510
<i>Volatile Organic Compounds (VOC's)</i>	Acetone	0.5	0.5	16	16	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	Benzene	0.02	0.02	0.21	0.32	<0.0068	<0.0068	<0.0068	<0.0068	<0.0068	<0.0068
	Bromodichloromethane	0.05	0.05	1.5	1.5	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Bromoform	0.05	0.05	0.27	0.61	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Bromomethane	0.05	0.05	0.05	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Carbon tetrachloride	0.05	0.05	0.05	0.21	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Chlorobenzene	0.05	0.05	2.4	2.4	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Dibromochloromethane	0.05	0.05	2.3	2.3	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloroform	0.05	0.05	0.05	0.47	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	1,2-Dibromoethane	0.05	0.05	0.05	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	1,2-Dichlorobenzene	0.05	0.05	1.2	1.2	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	1,3-Dichlorobenzene	0.05	0.05	4.8	9.6	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	1,4-Dichlorobenzene	0.05	0.05	0.083	0.2	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Dichlorodifluoromethane	0.05	0.05	16	16	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	1,1-Dichloroethane	0.05	0.05	0.47	0.47	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	1,2-Dichloroethane	0.05	0.05	0.05	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	1,1-Dichloroethylene	0.05	0.05	0.05	0.064	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	cis-1,2-Dichloroethylene	0.05	0.05	1.9	1.9	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	trans-1,2-Dichloroethylene	0.05	0.05	0.084	1.3	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Methylene Chloride	0.05	0.05	0.1	1.6	<1.0	<2.0	<0.50	<0.050	<0.50	<0.15
	1,2-Dichloropropane	0.05	0.05	0.05	0.16	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	1,3-Dichloropropene (cis & trans)	0.05	0.05	0.05	0.059	<0.042	<0.042	<0.042	<0.042	<0.042	<0.042
	Ethylbenzene	0.05	0.05	1.1	1.1	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018
	n-Hexane	0.05	0.05	2.8	46	<0.10	<0.050	<0.050	<0.050	<0.050	<0.050
	Methyl Ethyl Ketone	0.5	0.5	16	70	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	Methyl Isobutyl Ketone	0.5	0.5	1.7	31	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	MTBE	0.05	0.05	0.75	1.6	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Styrene	0.05	0.05	0.7	34	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	1,1,1,2-Tetrachloroethane	0.05	0.05	0.058	0.087	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	1,1,2,2-Tetrachloroethane	0.05	0.05	0.05	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Tetrachloroethylene	0.05	0.05	0.28	1.9	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Toluene	0.2	0.2	2.3	6.4	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
	1,1,1-Trichloroethane	0.05	0.05	0.38	6.1	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	1,1,2-Trichloroethane	0.05	0.05	0.05	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Trichloroethylene	0.05	0.05	0.061	0.55	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Trichlorofluoromethane	0.05	0.25	4	4	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Vinyl chloride	0.02	0.02	0.02	0.032	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
	Xylenes (Total)	0.05	0.05	3.1	26	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050

NOTES:

1. Units = ug/g
2. "-" - Paramater not included in chemical analysis
3. "nv" - no value

4. Test results shown in **bold and highlighted text** exceed the Table 1 Standard for Agricultural Other Property Use
5. Test results shown in **bold and highlighted text** exceed the Table 1 Standard for Residential/Parkland/Institutional/Industrial/Comercial/Community Property Use
6. Test results shown in **bold and highlighted text** exceed the Table 2 Standard for Residential/Parkland/Institutional Property Use (Coarse)
7. Test results shown in **bold and highlighted text** exceed the Table 2 Standard for Industrial/Commercial/Community Property Use (Coarse)

ENCLOSURES



FILE No: G17496

BOREHOLE No. 1



Client: **GM BluePlan Engineering Limited**

Project: **Road Reconstruction / Realignment Projects**

Location: **Bruce County Roads 25 and 33, Saugeen Shores, Ontario**

EQUIPMENT DATA

Machine: **D50T**
Method: **Hollow Stem Auger**
Size: **107 mm I.D.**
Date: **Nov 20 / 17 TO Nov 20 / 17**

SOIL LITHOLOGY				SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. × LAB TEST: Unc. ■ P.P. □ 50 100 150 200				W _p W W _L					
							PENETRATION RESISTANCE STANDARD ● DYN. CONE ○ 20 40 60 80				10 20 30					
Ground Elevation: 202.91 m																
202.80 0.11	110 mm ASPHALT															
	Granular Base some silt	0.5		1	AS											
202.21 0.70	loose to compact brown	1.0		2	SS	8										
	SAND some silt trace gravel	1.5														
	occ. to frequent silt and clayey silt lenses/seams	2.0		3	SS	26										
	moist to saturated	2.5		4	SS	12										
		3.0														
		3.5		5	SS	25										
		4.0														
		4.5														
198.03 4.88	compact, grey SILT	5.0		6	SS	16										
	some sand trace clay occ. sand seams	5.5														
	saturated	6.0														
196.36 6.55	End of Borehole	6.5		7	SS	21										

water level at a depth of 1.83 m bgs upon completion of drilling
cave-in to a depth of 1.98 m bgs upon completion of drilling

PROJECT MANAGER: **RVD**

**CHUNG & VANDER DOELEN
ENGINEERING LTD.**

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FILE No: G17496**BOREHOLE No. 2**Client: **GM BluePlan Engineering Limited**Project: **Road Reconstruction / Realignment Projects**Location: **Bruce County Roads 25 and 33, Saugeen Shores, Ontario****EQUIPMENT DATA**Machine: **D50T**Method: **Hollow Stem Auger**Size: **107 mm I.D.**Date: **Nov 20 / 17 TO Nov 20 / 17**

SOIL LITHOLOGY				SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. × LAB TEST: Unc. ■ P.P. □				W _p W W _L					
							PENETRATION RESISTANCE STANDARD ● DYN. CONE ○				↗ ○ ↖					
							20	40	60	80	10	20	30			
201.69 0.11	110 mm ASPHALT															
	brown silty sand FILL trace to some gravel moist	0.5		1	AS											cemented flushmount protective cover at grade
200.90 0.90	TOPSOIL	1.0		2	SS	25										
200.60 1.20	dense, brown SAND some silt damp	1.5		3	SS	32										bentonite seal
199.70 2.10	compact, brown SILT some sand and clay moist to saturated	2.0		4	SS	10										
		2.5														
		3.0		5	SS	15										
		3.5														
	occ. clayey silt and sand lenses/seams	4.0														
		4.5		6	SS	16										3.05 m long, 50 mm I.D. PVC screen with sandpack
196.90 4.90	compact, brown SAND trace silt occ. clayey silt seams saturated	5.0														
		5.5														
		6.0														water level measured at 4.02 m depth on November 23, 2017
195.25 6.55	End of Borehole	6.5		7	SS	23										water level measured at 4.34 m depth on December 5, 2017

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FILE No: G17496**BOREHOLE No. 3**Client: **GM BluePlan Engineering Limited**Project: **Road Reconstruction / Realignment Projects**Location: **Bruce County Roads 25 and 33, Saugeen Shores, Ontario****EQUIPMENT DATA**Machine: **D50T**Method: **Hollow Stem Auger**Size: **107 mm I.D.**Date: **Nov 20 / 17 TO Nov 20 / 17**

SOIL LITHOLOGY				SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. × LAB TEST: Unc. ■ P.P. □ 50 100 150 200				WATER CONTENT (%) W _p W W _L					
							PENETRATION RESISTANCE STANDARD ● DYN. CONE ○				↔ — ○ — ↔					
							20 40 60 80				10 20 30					
Ground Elevation: 200.89 m																
200.79 0.10	100 mm ASPHALT		■													
	brown		▨	1	AS											
	silty sand FILL trace gravel and clay	0.5	▨												0.5	
	moist		▨													
200.05 0.84																
199.82 1.07	TOPSOIL	1.0	▨	2	SS	19	●					○			1.0	
	compact orangy brown to brown		▨													
	SAND AND SILT trace clay and organics	1.5	▨				●					○			1.5	
	moist to wet		▨	3	SS	15										
		2.0	▨												2.0	
198.79 2.10	compact, brown SAND some silt	2.5	▨	4	SS	16	●					○		▽	2.5	water level at a depth of 2.44 m bgs upon completion of drilling
	wet to saturated		▨													
197.99 2.90	loose brown	3.0	▨												3.0	cave-in to a depth of 2.90 m bgs upon completion of drilling
	SILT some sand occ. clayey seams	3.5	▨	5	SS	6	●					○			3.5	
	saturated		▨													
196.89 4.00	compact to dense brown	4.0	▨	6	SS	19	●					○			4.0	
	SAND some silt	4.5	▨												4.5	
	occ. to frequent silt and clayey silt lenses/seams	5.0	▨	7	SS	21	●					○			5.0	
	saturated	5.5	▨												5.5	
		6.0	▨												6.0	
			▨	8	SS	32	●					○			6.5	
194.34 6.55	End of Borehole	6.5														



water level at a depth of 2.44 m bgs upon completion of drilling

cave-in to a depth of 2.90 m bgs upon completion of drilling

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FILE No: G17496**BOREHOLE No. 4**Client: **GM BluePlan Engineering Limited**Project: **Road Reconstruction / Realignment Projects**Location: **Bruce County Roads 25 and 33, Saugeen Shores, Ontario****EQUIPMENT DATA**Machine: **D50T**Method: **Hollow Stem Auger**Size: **107 mm I.D.**Date: **Nov 20 / 17 TO Nov 20 / 17**

SOIL LITHOLOGY				SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. ×				WATER CONTENT (%)					
							LAB TEST: Unc. ■ P.P. □				W _p W W _L					
							PENETRATION RESISTANCE				↗ ○ ↖					
	Ground Elevation: 200.05 m						20	40	60	80	10	20	30			
200.09	50 mm ASPHALT															
	brown sand FILL trace to some silt and gravel moist	0.5		1	AS											
199.21 0.84 198.98 1.07	TOPSOIL	1.0		2	SS	28										
	compact, brown SAND some silt occ. clayey silt/silt seams moist to wet	1.5		3	SS	13										
197.95 2.10	compact, brown SAND AND SILT trace clay moist to saturated	2.5		4	SS	15										
		3.0		5	SS	16										
196.05 4.00	compact, brown SAND trace silt occ. silt seams saturated	4.5		6	SS	22										
		5.0														
		5.5														
		6.0														
193.50 6.55	End of Borehole	6.5		7	SS	22										

water level and cave-in to a depth of 2.74 m bgs upon completion of drilling

PROJECT MANAGER: **RVD**
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FILE No: G17496**BOREHOLE No. 5**Client: **GM BluePlan Engineering Limited**Project: **Road Reconstruction / Realignment Projects**Location: **Bruce County Roads 25 and 33, Saugeen Shores, Ontario****EQUIPMENT DATA**Machine: **D50T**Method: **Hollow Stem Auger**Size: **107 mm I.D.**Date: **Nov 21 / 17 TO Nov 21 / 17**

SOIL LITHOLOGY				SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. × LAB TEST: Unc. ■ P.P. □ 50 100 150 200				W _p W W _L					
							PENETRATION RESISTANCE STANDARD ● DYN. CONE ○ 20 40 60 80				↗ — ○ — ↖ 10 20 30					
Ground Elevation: 199.49 m																
199.44	50 mm ASPHALT															
198.65 0.84	brown sand FILL trace to some silt and gravel moist	0.5		1	AS											
198.35 1.14	TOPSOIL	1.0		2	SS	20										
197.79 1.70	loose, orangy brown SAND AND SILT	1.5														
	moist															
	firm, brown CLAYEY SILT	2.0		3	SS	6										
	moist															bulk sample taken
196.99 2.50		2.5		4	SS	4										
	loose to compact brown SAND	3.0														
	trace to some silt															
	occ. clayey silt seams	3.5		5	SS	7										
	moist to saturated															
		4.0		6	SS	17										
		4.5														
		5.0		7	SS	17										
		5.5														
		6.0														
		6.5		8	SS	15										
192.94 6.55	End of Borehole															

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FILE No: G17496**BOREHOLE No. 6**Client: **GM BluePlan Engineering Limited**Project: **Road Reconstruction / Realignment Projects**Location: **Bruce County Roads 25 and 33, Saugeen Shores, Ontario****EQUIPMENT DATA**Machine: **D50T**Method: **Hollow Stem Auger**Size: **107 mm I.D.**Date: **Nov 21 / 17 TO Nov 21 / 17**

SOIL LITHOLOGY			SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS	
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. × LAB TEST: Unc. ■ P.P. □ 50 100 150 200				W _p W W _L ↗ ○ ↖					
Ground Elevation: 199.16 m							PENETRATION RESISTANCE STANDARD ● DYN. CONE ○ 20 40 60 80				10 20 30					
199.05	50 mm ASPHALT															
	brown sand FILL some silt and gravel moist	0.5		1	AS											
198.26 0.90	TOPSOIL	1.0		2	SS	18										
		1.5														
197.36 1.80	loose, orangy brown SAND AND SILT trace clay moist	2.0		3	SS	8										
		2.5		4	SS	4										
196.26 2.90	compact, brown SAND trace to some silt occ. to frequent silt and clayey silt lenses/seams moist to saturated	3.0		5	SS	19										
		3.5														
		4.0														
		4.5														
		5.0		6	SS	15										
		5.5														
		6.0														
192.61 6.55	End of Borehole	6.5		7	SS	20										

▽

water level and cave-in to a depth of 3.66 m bgs upon completion of drilling

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FILE No: G17496**BOREHOLE No. 7**Client: **GM BluePlan Engineering Limited**Project: **Road Reconstruction / Realignment Projects**Location: **Bruce County Roads 25 and 33, Saugeen Shores, Ontario****EQUIPMENT DATA**Machine: **D50T**Method: **Hollow Stem Auger**Size: **107 mm I.D.**Date: **Nov 21 / 17 TO Nov 21 / 17**

SOIL LITHOLOGY			SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS	
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. × LAB TEST: Unc. ■ P.P. □ 50 100 150 200				PENETRATION RESISTANCE STANDARD ● DYN. CONE ○ 20 40 60 80					W _p W W _L
Ground Elevation: 198.75 m																
198.04	40 mm ASPHALT															
	brown sand FILL some silt, trace gravel moist	0.5		1	AS											cemented flushmount protective cover at grade
197.99 0.76	TOPSOIL	1.0		2	SS	16										
197.37 1.38	compact, brown SAND AND SILT trace clay moist	1.5		3	SS	21										bentonite seal
196.25 2.50	compact, brown SAND trace to some silt occ. silt seams moist to saturated	2.5		4	SS	13										
		3.0		5	SS	23										
		3.5														
		4.0														
		4.5		6	SS	19										3.05 m long, 50 mm I.D. PVC screen with sandpack
		5.0														
		5.5														
		6.0														water level measured at 3.91 m depth on November 23, 2017
192.20 6.55	End of Borehole	6.5		7	SS	16										water level measured at 3.93 m depth on December 5, 2017

PROJECT MANAGER: **RVD****CHUNG & VANDER DOELEN
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FILE No: G17496**BOREHOLE No. 8**Client: **GM BluePlan Engineering Limited**Project: **Road Reconstruction / Realignment Projects**Location: **Bruce County Roads 25 and 33, Saugeen Shores, Ontario****EQUIPMENT DATA**Machine: **D50T**Method: **Hollow Stem Auger**Size: **107 mm I.D.**Date: **Nov 21 / 17 TO Nov 21 / 17**

SOIL LITHOLOGY			SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS	
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. × LAB TEST: Unc. ■ P.P. □ 50 100 150 200				WATER CONTENT (%) W _p — W — W _L					
							PENETRATION RESISTANCE STANDARD ● DYN. CONE ○ 20 40 60 80									
Ground Elevation: 198.00 m																
197.85	50 mm ASPHALT															
197.50	brown sand FILL some gravel, some silt moist	0.5		1	AS											
196.93	TOPSOIL	1.0		2	SS	8										
195.90	loose, orangy brown SILTY SAND damp	1.5		3	SS	9										
2.10		2.0														
	loose to compact brown SAND some silt to silty trace gravel occ. silt seams moist to saturated	2.5		4	SS	16										
		3.0														
		3.5		5	SS	17										
		4.0														
		4.5														
		5.0		6	SS	15										
		5.5														
	trace to some gravel	6.0														
		6.5		7	SS	20										
191.45	End of Borehole	6.5														

water level at a depth of 2.44 m bgs upon completion of drilling
cave-in to a depth of 2.74 m bgs upon completion of drilling



water level at a depth of 2.44 m bgs upon completion of drilling
cave-in to a depth of 2.74 m bgs upon completion of drilling

PROJECT MANAGER: **RVD**
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FILE No: G17496**BOREHOLE No. 9**Client: **GM BluePlan Engineering Limited**Project: **Road Reconstruction / Realignment Projects**Location: **Bruce County Roads 25 and 33, Saugeen Shores, Ontario****EQUIPMENT DATA**Machine: **D50T**Method: **Hollow Stem Auger**Size: **107 mm I.D.**Date: **Nov 21 / 17 TO Nov 21 / 17**

SOIL LITHOLOGY			SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. × LAB TEST: Unc. ■ P.P. □ 50 100 150 200				W _p W W _L ↗ — ○ ↖				
Ground Elevation: 197.42 m						PENETRATION RESISTANCE STANDARD ● DYN. CONE ○ 20 40 60 80				10 20 30					
197.83 0.03	50 mm ASPHALT														
	brown sand FILL			1	AS										
196.96 0.46	some silt and gravel	0.5												0.5	
196.68 0.74	TOPSOIL														
	compact, brown SAND	1.0		2	SS	13								1.0	
	trace to some silt														
	trace gravel	1.5												1.5	
	occ. to frequent silt and clayey silt lenses/seams	2.0		3	SS	18								2.0	
	damp to saturated	2.5													
		3.0												3.0	
		3.5		5	SS	22								3.5	
		4.0												4.0	
		4.5												4.5	
		5.0		6	SS	15								5.0	
		5.5												5.5	
		6.0												6.0	
		6.5		7	SS	22								6.5	
190.87 6.55	End of Borehole														
cave-in and dry to a depth of 4.27 m bgs upon completion of drilling															

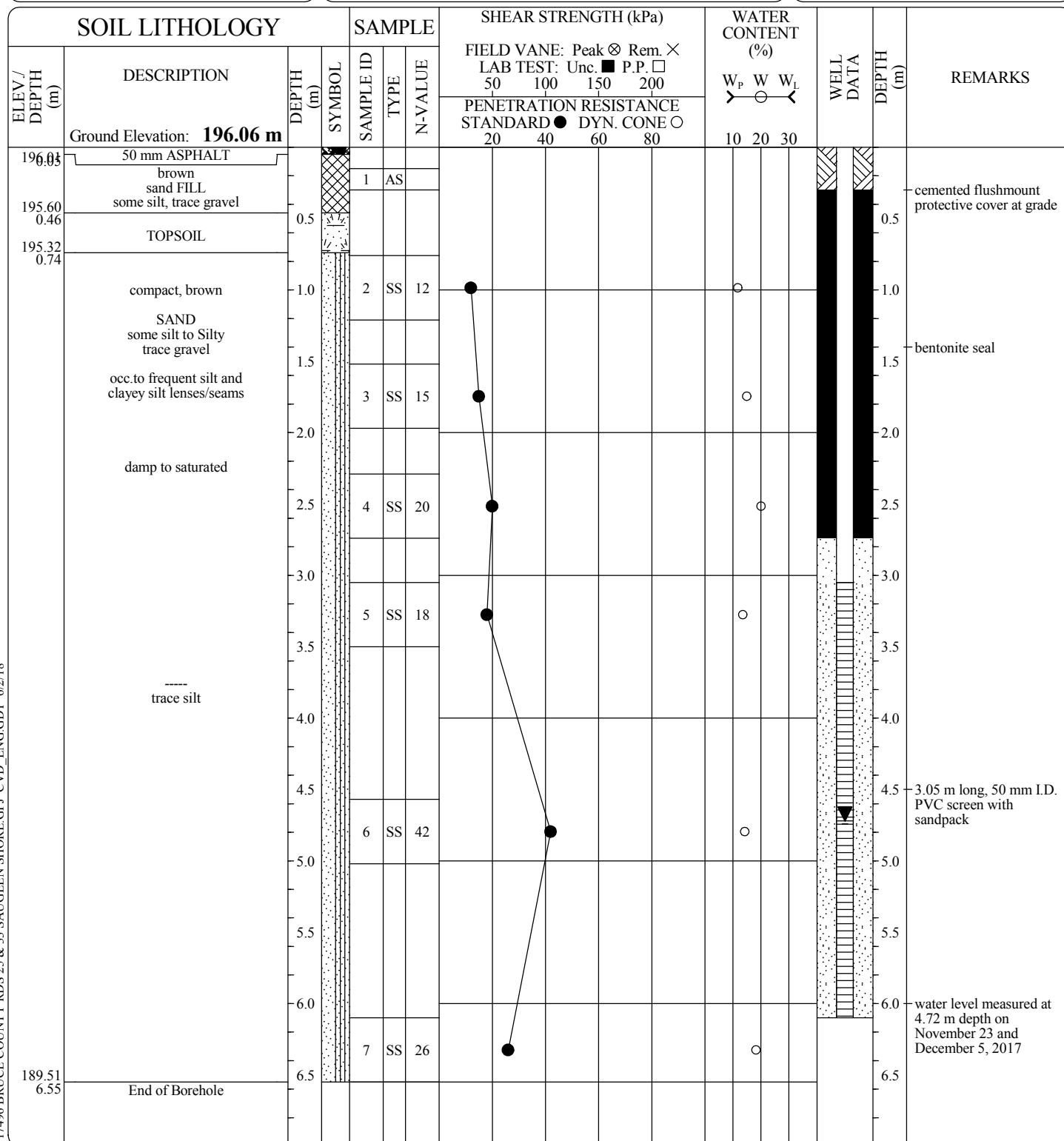
cave-in and dry to a depth of 4.27 m bgs upon completion of drilling

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FILE No: G17496**BOREHOLE No. 10**Client: **GM BluePlan Engineering Limited**Project: **Road Reconstruction / Realignment Projects**Location: **Bruce County Roads 25 and 33, Saugeen Shores, Ontario****EQUIPMENT DATA**Machine: **D50T**Method: **Hollow Stem Auger**Size: **107 mm I.D.**Date: **Nov 21 / 17 TO Nov 21 / 17**

SOIL LITHOLOGY				SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. × LAB TEST: Unc. ■ P.P. □ 50 100 150 200				PENETRATION RESISTANCE STANDARD ● DYN. CONE ○ 20 40 60 80					
Ground Elevation: 196.72 m																
196.68	40 mm ASPHALT		⊠													
	brown sand FILL		⊠	1	AS											
196.26 0.46	some silt, trace gravel	0.5	⊠												0.5	
195.98 0.74	TOPSOIL		⊠													
	compact to very dense brown	1.0	⊠	2	SS	13									1.0	
	SAND		⊠													
	trace to some silt	1.5	⊠												1.5	
	trace gravel		⊠													
	occ. silt seams	2.0	⊠	3	SS	26									2.0	bulk sample taken
	moist to saturated	2.5	⊠													
		3.0	⊠	4	SS	20									2.5	
			⊠												3.0	
	-sand and gravel layer	3.5	⊠	5	SS	55									3.5	
		4.0	⊠												4.0	
		4.5	⊠												4.5	cave-in and dry to a depth of 4.27 m bgs upon completion of drilling
		5.0	⊠	6	SS	20									5.0	
		5.5	⊠												5.5	
		6.0	⊠												6.0	
			⊠													
		6.5	⊠	7	SS	19									6.5	
190.17 6.55	End of Borehole															

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FILE No: G17496**BOREHOLE No. 11**Client: **GM BluePlan Engineering Limited**Project: **Road Reconstruction / Realignment Projects**Location: **Bruce County Roads 25 and 33, Saugeen Shores, Ontario****EQUIPMENT DATA**Machine: **D50T**Method: **Hollow Stem Auger**Size: **107 mm I.D.**Date: **Nov 22 / 17 TO Nov 22 / 17**PROJECT MANAGER: **RVD****CHUNG & VANDER DOELEN
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FILE No: G17496**BOREHOLE No. 12**Client: **GM BluePlan Engineering Limited**Project: **Road Reconstruction / Realignment Projects**Location: **Bruce County Roads 25 and 33, Saugeen Shores, Ontario****EQUIPMENT DATA**Machine: **D50T**Method: **Hollow Stem Auger**Size: **107 mm I.D.**Date: **Nov 22 / 17 TO Nov 22 / 17**

SOIL LITHOLOGY			SAMPLE		SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. × LAB TEST: Unc. ■ P.P. □ 50 100 150 200	PENETRATION RESISTANCE STANDARD ● DYN. CONE ○ 20 40 60 80	W _p W W _L	10 20 30				
194.74 0.08	Ground Elevation: 194.82 m 75 mm ASPHALT													
	brown sand FILL some silt and gravel moist	0.5		1	AS									
193.92 0.90	stiff, brown CLAYEY SILT occ. sand lenses/seams moist	1.0		2	SS	10								
		1.5												
		2.0		3	SS	13								
192.72 2.10	compact to dense brown SAND some silt trace gravel damp to saturated	2.5		4	SS	32								
		3.0												
		3.5		5	SS	32								
		4.0												
		4.5												
		5.0		6	SS	18								
		5.5												
		6.0												
188.27 6.55	End of Borehole	6.5		7	SS	25								

▽

water level and cave-in to a depth of 4.57 m bgs upon completion of drilling

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FILE No: G17496**BOREHOLE No. 13**Client: **GM BluePlan Engineering Limited**Project: **Road Reconstruction / Realignment Projects**Location: **Bruce County Roads 25 and 33, Saugeen Shores, Ontario****EQUIPMENT DATA**Machine: **D50T**Method: **Hollow Stem Auger**Size: **107 mm I.D.**Date: **Nov 22 / 17 TO Nov 22 / 17**

SOIL LITHOLOGY			SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS	
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. × LAB TEST: Unc. ■ P.P. □ 50 100 150 200				WATER CONTENT (%) W _p W W _L					
							PENETRATION RESISTANCE STANDARD ● DYN. CONE ○ 20 40 60 80				10 20 30					
188.69	Ground Elevation: 188.69 m															
	50 mm ASPHALT															
	compact to dense brown	0.5		1	AS											
	sand FILL some silt trace to some gravel	1.0		2	SS	47										
	damp to moist	1.5														
		2.0		3	SS	26										
186.59 2.10	loose TOPSOIL (possible Fill)	2.5		4	SS	6										
		3.0														
		3.5		5	SS	6										
184.84 3.85	loose, orangy brown SILTY SAND	4.0		6	SS	5										
184.19 4.50	moist	4.5														
	compact, brown SAND trace to some silt	5.0		7	SS	12										
	saturated	5.5														
		6.0														
		6.5		8	SS	29										
182.14 6.55	End of Borehole															

cave-in and wet to a depth of 2.44 m bgs upon completion of drilling

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FILE No: G17496**BOREHOLE No. 14**Client: **GM BluePlan Engineering Limited**Project: **Road Reconstruction / Realignment Projects**Location: **Bruce County Roads 25 and 33, Saugeen Shores, Ontario****EQUIPMENT DATA**Machine: **D50T**Method: **Hollow Stem Auger**Size: **107 mm I.D.**Date: **Nov 22 / 17 TO Nov 22 / 17**

SOIL LITHOLOGY				SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. × LAB TEST: Unc. ■ P.P. □ 50 100 150 200				W _P W W _L ↗ ○ ↖					
							PENETRATION RESISTANCE STANDARD ● DYN. CONE ○ 20 40 60 80									
											10 20 30					
184.78 0.04	40 mm ASPHALT															
184.32 0.46	brown sand FILL some silt, trace gravel	0.5		1	AS											
184.02 0.76	TOPSOIL															
	compact, brown SAND trace silt	1.0		2	SS	26										
	damp to saturated	1.5														
		2.0		3	SS	16										
		2.5		4	SS	14										
		3.0														
		3.5		5	SS	21										
		4.0														
180.48 4.30	very dense, brown SAND and GRAVEL saturated	4.5		6	SS	50/100 mm										
179.96 4.82	Auger Refusal on suspect boulder	5.0														
		5.5														
		6.0														
		6.5														

water level and cave-in to a depth of 2.13 m bgs upon completion of drilling

PROJECT MANAGER: **RVD**
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FILE No: G17496**BOREHOLE No. 15**Client: **GM BluePlan Engineering Limited**Project: **Road Reconstruction / Realignment Projects**Location: **Bruce County Roads 25 and 33, Saugeen Shores, Ontario****EQUIPMENT DATA**Machine: **D50T**Method: **Hollow Stem Auger**Size: **107 mm I.D.**Date: **Nov 22 / 17 TO Nov 22 / 17**

SOIL LITHOLOGY				SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. × LAB TEST: Unc. ■ P.P. □ 50 100 150 200				W _p W W _L ↗ ○ ↖					
							PENETRATION RESISTANCE STANDARD ● DYN. CONE ○ 20 40 60 80				10 20 30					
Ground Elevation: 182.20 m																
182.10 0.10	100 mm ASPHALT		■													
	loose brown to dark brown sand FILL some silt and gravel	0.5	⊗	1	AS											cemented flushmount protective cover at grade
	moist to wet	1.0		2	SS	6	●					○				bentonite seal
180.83 1.37	TOPSOIL	1.5	⊗													
180.40 1.80			⊗	3	SS	13	●					○				
	loose to dense brown SAND trace silt	2.0	⊗													
		2.5		4	SS	17	●					○				
	saturated	3.0														
		3.5		5	SS	8	●					○				
		4.0		6	SS	18	●					○				
		4.5														
		5.0		7	SS	42	●					○				
177.17 5.03	End of Borehole	5.0														water level measured at 1.47 m depth on November 23, 2017
		5.5														water level measured at 1.46 m depth on December 5, 2017
		6.0														
		6.5														

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FILE No: G17496**BOREHOLE No. 16**Client: **GM BluePlan Engineering Limited**Project: **Road Reconstruction / Realignment Projects**Location: **Bruce County Roads 25 and 33, Saugeen Shores, Ontario****EQUIPMENT DATA**Machine: **D50T**Method: **Hollow Stem Auger**Size: **107 mm I.D.**Date: **Nov 22 / 17 TO Nov 22 / 17**





SOIL LITHOLOGY			SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS	
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. × LAB TEST: Unc. ■ P.P. □ 50 100 150 200				W _p W W _L ↗—○—↖					
							PENETRATION RESISTANCE STANDARD ● DYN. CONE ○ 20 40 60 80				10 20 30					
Ground Elevation: 181.78 m																
181.72 0.06	60 mm ASPHALT		■													
181.39 0.39	Granular Base some silt		▨	1	AS											
	compact to dense brown	0.5														
	SAND trace silt	1.0		2	SS	15	●					○				
	damp to saturated	1.5														
		2.0														
		2.5		4	SS	14	●						○			
		3.0														
		3.5		5	SS	30	●						○			
		4.0														
		4.5														
		5.0		6	SS	44	●						○			
		5.5														
		6.0														
		6.5		7	SS	45	●						○			
175.23 6.55	End of Borehole															

water level and cave-in to a depth of 2.13 m bgs upon completion of drilling

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FILE No: G17496**BOREHOLE No. 17**Client: **GM BluePlan Engineering Limited**Project: **Road Reconstruction / Realignment Projects**Location: **Bruce County Roads 25 and 33, Saugeen Shores, Ontario****EQUIPMENT DATA**Machine: **D50T**Method: **Solid Stem Auger**Size: **150 mm O.D.**Date: **Nov 23 / 17 TO Nov 23 / 17**

SOIL LITHOLOGY			SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS	
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. × LAB TEST: Unc. ■ P.P. □ 50 100 150 200				W _p W W _L ↗ ○ ↖					
Ground Elevation: 197.71 m							PENETRATION RESISTANCE STANDARD ● DYN. CONE ○ 20 40 60 80				10 20 30					
197.38 0.33	330 mm TOPSOIL			1	SS	5	●						○			water level and cave-in to a depth of 3.20 m bgs upon completion of drilling
	loose, brown SAND AND SILT trace clay moist to wet	0.5														
1.0		2		SS	8	●						○				
1.5																
195.61 2.10	compact, brown SAND trace to some silt occ. to frequent silt and clayey silt lenses/seams moist to saturated	2.0		3	SS	5	●						○			
		2.5														
		3.0														
194.20 3.51	End of Borehole	3.5		5	SS	18	●						○			
		4.0														
		4.5														
		5.0														
		5.5														
		6.0														
		6.5														



water level and cave-in to
a depth of 3.20 m bgs
upon completion of
drilling

PROJECT MANAGER: **RVD**
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FILE No: G17496**BOREHOLE No. 18**Client: **GM BluePlan Engineering Limited**Project: **Road Reconstruction / Realignment Projects**Location: **Bruce County Roads 25 and 33, Saugeen Shores, Ontario****EQUIPMENT DATA**Machine: **D50T**Method: **Solid Stem Auger**Size: **150 mm O.D.**Date: **Nov 23 / 17 TO Nov 23 / 17**

SOIL LITHOLOGY			SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS		
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. × LAB TEST: Unc. ■ P.P. □ 50 100 150 200				W _P W W _L ↗ ○ ↖						
							PENETRATION RESISTANCE STANDARD ● DYN. CONE ○ 20 40 60 80				10 20 30						
Ground Elevation: 197.30 m																	
197.12 0.18	180 mm TOPSOIL																
	compact orangy brown to brown SAND some silt to Silty occ. to frequent silt and clayey silt lenses/seams moist to saturated	0.5		1	SS	4	●						○				
		1.0		2	SS	12	●							○			
		1.5															
		2.0		3	SS	16	●							○			
		2.5		4	SS	18	●							○			
		3.0															
3.51	End of Borehole																
193.79 3.51		4.0															
		4.5															
		5.0															
		5.5															
		6.0															
		6.5															

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water level and cave-in to
a depth of 2.90 m bgs
upon completion of
drillingPROJECT MANAGER: **RVD****CHUNG & VANDER DOELEN
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FILE No: G17496**BOREHOLE No. 19**Client: **GM BluePlan Engineering Limited**Project: **Road Reconstruction / Realignment Projects**Location: **Bruce County Roads 25 and 33, Saugeen Shores, Ontario****EQUIPMENT DATA**Machine: **D50T**Method: **Solid Stem Auger**Size: **150 mm O.D.**Date: **Nov 23 / 17 TO Nov 23 / 17**

SOIL LITHOLOGY			SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS	
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. × LAB TEST: Unc. ■ P.P. □ 50 100 150 200				W _p W W _L ↔ — ○ — ↔					
							PENETRATION RESISTANCE STANDARD ● DYN. CONE ○ 20 40 60 80				10 20 30					
196.76 0.15	150 mm TOPSOIL															
	loose to compact brown SAND some silt to Silty occ. to frequent silt and clayey silt lenses/seams moist to saturated	0.5		1	SS	5	●						○		0.5	
		1.0		2	SS	7	●						○		1.0	
		1.5													1.5	
		2.0		3	SS	8	●						○		2.0	
		2.5		4	SS	14	●						○		2.5	
		3.0													3.0	
		3.5		5	SS	18	●					○		3.5		
193.40 3.51	End of Borehole															
		4.0													4.0	water level at a depth of 2.74 m bgs upon completion of drilling cave-in to a depth of 3.05 m bgs upon completion of drilling
		4.5												4.5		
		5.0												5.0		
		5.5												5.5		
		6.0												6.0		
		6.5												6.5		

water level at a depth of 2.74 m bgs upon completion of drilling
cave-in to a depth of 3.05 m bgs upon completion of drilling

PROJECT MANAGER: **RVD**
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FILE No: G17496**BOREHOLE No. 20**Client: **GM BluePlan Engineering Limited**Project: **Road Reconstruction / Realignment Projects**Location: **Bruce County Roads 25 and 33, Saugeen Shores, Ontario****EQUIPMENT DATA**Machine: **D50T**Method: **Solid Stem Auger**Size: **150 mm O.D.**Date: **Nov 23 / 17 TO Nov 23 / 17**

SOIL LITHOLOGY				SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS	
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. × LAB TEST: Unc. ■ P.P. □ 50 100 150 200				WATER CONTENT (%) W _p W W _L						
							PENETRATION RESISTANCE STANDARD ● DYN. CONE ○ 20 40 60 80										
Ground Elevation: 196.53 m																	
200 mm TOPSOIL																	
196.33 0.20	loose to compact brown SAND some silt to Silty occ. to frequent silt and clayey silt lenses/seams moist to saturated	0.2		1	SS	7	●							○			
		0.5															
		1.0		2	SS	16	●								○		
		1.5															
		2.0		3	SS	20	●								○		
		2.5		4	SS	14	●								○		
193.02 3.51	End of Borehole	3.0															
		3.5		5	SS	17	●								○		
		4.0															
		4.5															
		5.0															
		5.5															
		6.0															
		6.5															









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water level at a depth of 2.90 m bgs upon completion of drilling

open to a depth of 3.51 m bgs upon completion of drilling

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FILE No: G17496**BOREHOLE No. 21**Client: **GM BluePlan Engineering Limited**Project: **Road Reconstruction / Realignment Projects**Location: **Bruce County Roads 25 and 33, Saugeen Shores, Ontario****EQUIPMENT DATA**Machine: **D50T**Method: **Solid Stem Auger**Size: **150 mm O.D.**Date: **Nov 23 / 17 TO Nov 23 / 17**

SOIL LITHOLOGY			SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS		
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. × LAB TEST: Unc. ■ P.P. □ 50 100 150 200				W _p W W _L ↔ — ○ — ↔						
Ground Elevation: 196.40 m							PENETRATION RESISTANCE STANDARD ● DYN. CONE ○ 20 40 60 80				10 20 30						
196.20 0.20	200 mm TOPSOIL																
	loose to compact brown SAND some silt to Silty occ. to frequent silt and clayey silt lenses/seams moist to saturated	0.5		1	SS	4	●							○			
		1.0		2	SS	7	●							○			
		1.5															
		2.0		3	SS	10	●							○			
		2.5		4	SS	14	●							○			
		3.0															
		3.5		5	SS	15	●							○			
192.89 3.51	End of Borehole														open and dry to a depth of 3.51 m bgs upon completion of drilling		

bulk sample taken

open and dry to a depth of 3.51 m bgs upon completion of drilling

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FILE No: G17496**BOREHOLE No. 22**Client: **GM BluePlan Engineering Limited**Project: **Road Reconstruction / Realignment Projects**Location: **Bruce County Roads 25 and 33, Saugeen Shores, Ontario****EQUIPMENT DATA**Machine: **D50T**Method: **Solid Stem Auger**Size: **150 mm O.D.**Date: **Nov 23 / 17 TO Nov 23 / 17**

SOIL LITHOLOGY			SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS		
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. × LAB TEST: Unc. ■ P.P. □ 50 100 150 200				W _P W W _L ↔ — ○ —↔						
Ground Elevation: 196.08 m							PENETRATION RESISTANCE STANDARD ● DYN. CONE ○ 20 40 60 80				10 20 30						
195.83 0.25	250 mm TOPSOIL																
	loose to dense brown SILT some sand to Sandy occ. clayey silt and sand lenses/seams moist			1	SS	7	●						○				
				2	SS	35				●				○			
				3	SS	15				●				○			
				4	SS	13				●				○			
				5	SS	18				●				○			
193.18 2.90	End of Borehole																
															open and dry to a depth of 3.51 m bgs upon completion of drilling		

open and dry to a depth of 3.51 m bgs upon completion of drilling

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FILE No: G17496**BOREHOLE No. 23**Client: **GM BluePlan Engineering Limited**Project: **Road Reconstruction / Realignment Projects**Location: **Bruce County Roads 25 and 33, Saugeen Shores, Ontario****EQUIPMENT DATA**Machine: **D50T**Method: **Solid Stem Auger**Size: **150 mm O.D.**Date: **Nov 23 / 17 TO Nov 23 / 17**

SOIL LITHOLOGY			SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS		
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. × LAB TEST: Unc. ■ P.P. □ 50 100 150 200				W _P W W _L ↔ ○ ↔						
							PENETRATION RESISTANCE STANDARD ● DYN. CONE ○ 20 40 60 80										
Ground Elevation: 195.52 m											10 20 30						
195.06 0.46	460 mm TOPSOIL			1	SS	4	●										
	loose to compact brown	0.5															
	SAND AND SILT some silt to silty	1.0		2	SS	8	●						○				
	occ. silt and clayey silt seams	1.5															
	moist to wet	2.0		3	SS	6	●							○			
192.62 2.90	----- sand and silt	2.5		4	SS	28								○			
	compact, brown SILT some sand, trace clay moist to wet	3.0															
192.01 3.51	End of Borehole	3.5		5	SS	21	●							○			
		4.0															borehole open and dry to a depth of 3.51 m bgs upon completion of drilling
		4.5															
		5.0															
		5.5															
		6.0															
		6.5															

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FILE No: G17496**BOREHOLE No. 24**Client: **GM BluePlan Engineering Limited**Project: **Road Reconstruction / Realignment Projects**Location: **Bruce County Roads 25 and 33, Saugeen Shores, Ontario****EQUIPMENT DATA**Machine: **D50T**Method: **Solid Stem Auger**Size: **150 mm O.D.**Date: **Nov 23 / 17 TO Nov 23 / 17**




SOIL LITHOLOGY			SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS		
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. × LAB TEST: Unc. ■ P.P. □ 50 100 150 200				W _p W W _L ↔ — ○ —↔						
Ground Elevation: 195.02 m							PENETRATION RESISTANCE STANDARD ● DYN. CONE ○ 20 40 60 80				10 20 30						
194.69 0.33	330 mm TOPSOIL			1	SS	4	●							○			
	loose to compact brown SAND AND SILT occ. clayey silt seams moist to wet	0.5					●							○		0.5	
		1.0		2	SS	7	●							○		1.0	
		1.5														1.5	
		2.0		3	SS	8	●								○		2.0
		2.5			4	SS	18	●							○		2.5
192.12 2.90	compact, brown SAND trace silt moist	3.0														3.0	
191.51 3.51	End of Borehole	3.5		5	SS	25	●							○		3.5	
		4.0														4.0	
		4.5														4.5	
		5.0														5.0	
		5.5														5.5	
		6.0														6.0	
		6.5														6.5	

open and dry to a depth of 3.51 m bgs upon completion of drilling

PROJECT MANAGER: **RVD**
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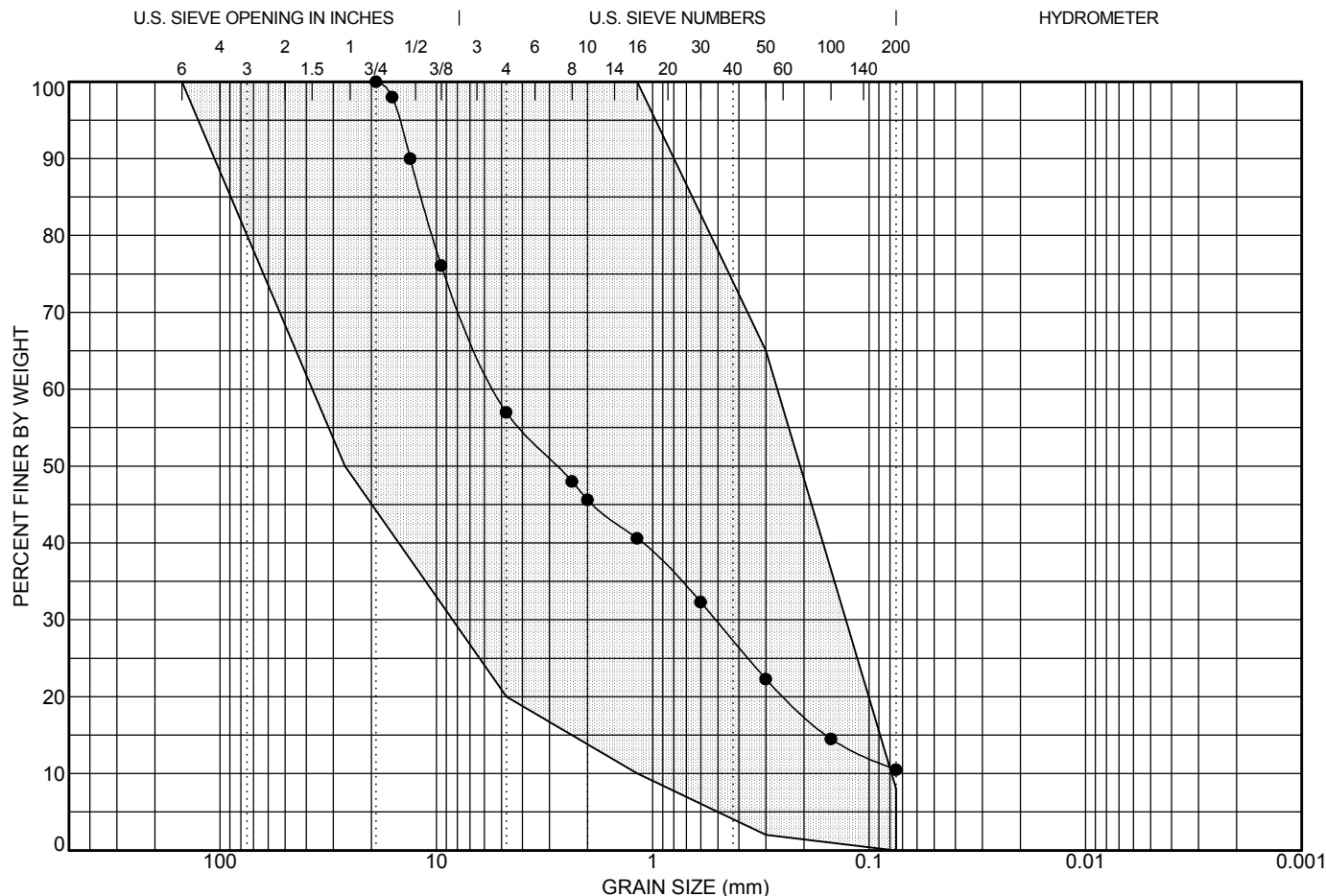
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FILE No: G17496**BOREHOLE No. 25**Client: **GM BluePlan Engineering Limited**Project: **Road Reconstruction / Realignment Projects**Location: **Bruce County Roads 25 and 33, Saugeen Shores, Ontario****EQUIPMENT DATA**Machine: **D50T**Method: **Solid Stem Auger**Size: **150 mm O.D.**Date: **Nov 23 / 17 TO Nov 23 / 17**

SOIL LITHOLOGY			SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS	
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. × LAB TEST: Unc. ■ P.P. □ 50 100 150 200				W _p W W _L ↔ — ○ —↔					
Ground Elevation: 194.46 m							PENETRATION RESISTANCE STANDARD ● DYN. CONE ○ 20 40 60 80				10 20 30					
194.16 0.30	300 mm TOPSOIL			1	SS	7	●								○	
	loose to compact brown SILT trace to some sand occ. clayey silt seams moist	0.5														
1.0				2	SS	6	●								○	
1.5																
		2.0		3	SS	12	●								○	
192.36 2.10	dense, brown SAND trace silt damp	2.5		4	SS	33										
		3.0														
3.5				5	SS	34	●							○		
190.95 3.51	End of Borehole															
		4.0														
		4.5														
		5.0														
		5.5														
		6.0														
		6.5														

borehole open and dry to a depth of 3.51 m bgs upon completion of drilling

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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
			0.72	77.01	19	5.296	0.512		43.0	46.5	10.5	

Date: Dec. 21 / 2017
Client: GM BluePlan Engineering Limited
Contractor:
Source:
Sampled From: BH 16, 0.15 to 0.30 m depth
Sample No.: 16-1
Date Sampled: Nov. 22 / 2017
Sampled By: JV
Lab No.: 2562
Date Tested: Dec. 04 / 2017
Type of Material: Granular Base, some silt

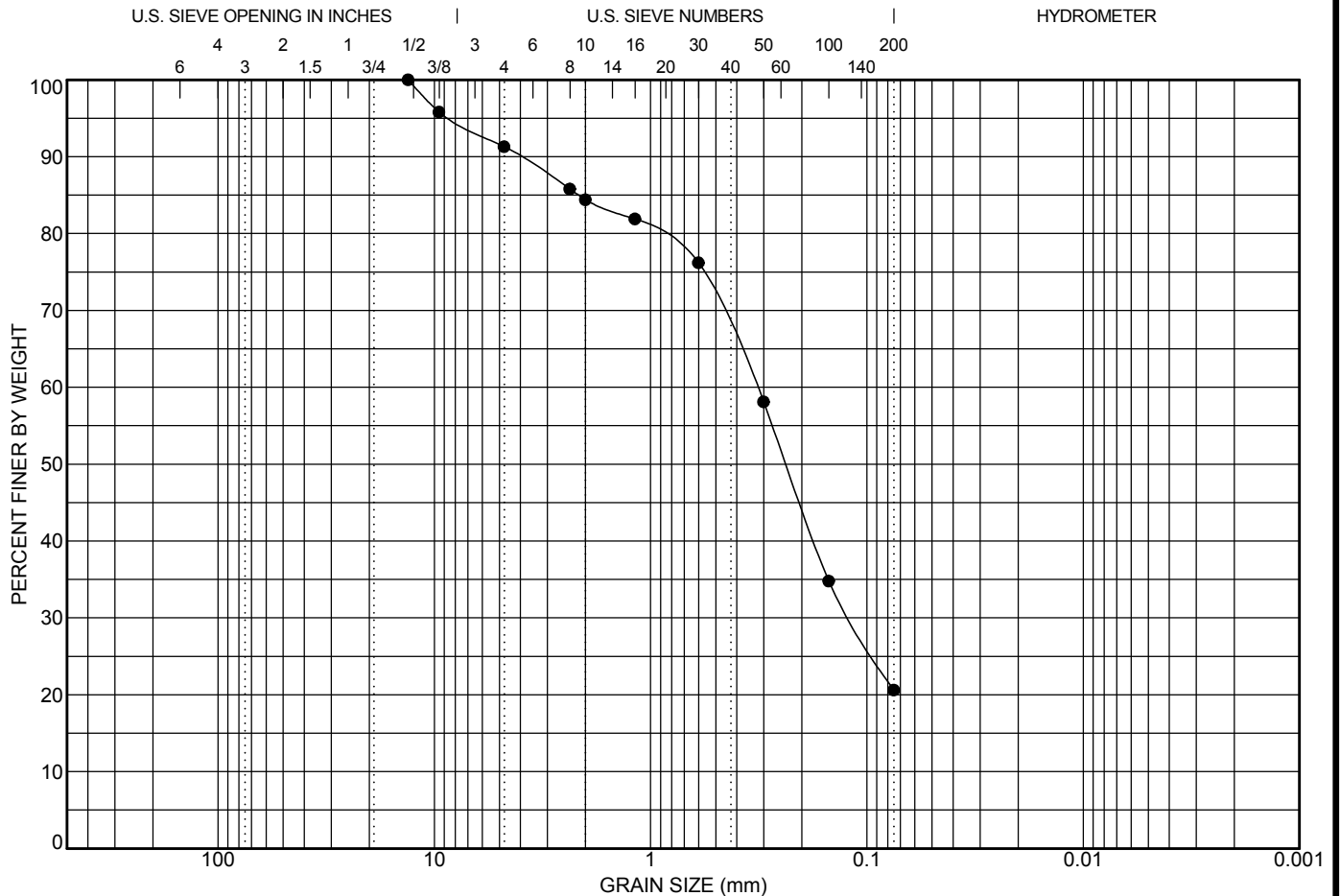
Sieve Size (mm)	Percent Passing	OPSS 1010 Granular 'B' Type I
150		100
26.5		50 - 100
4.75	57.0	20 - 100
1.18	40.6	10 - 100
0.300	22.3	2 - 65
0.075	10.5	0 - 8



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GRAIN SIZE DISTRIBUTION

Project: Road Reconstruction / Realignment Projects
Location: Bruce County Roads 25 and 33, Saugeen Shores, Ontario
File No.: G17496
Enclosure No.: 26



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
					13.2	0.323	0.119		8.7	70.7	20.6	

Date: Dec. 21 / 2017
Client: GM BluePlan Engineering Limited
Contractor:
Source:
Sampled From: BH 3, 0.15 to 0.30 m depth
Sample No.: 3-1
Date Sampled: Nov. 20 / 2017
Sampled By: JV
Lab No.: 255
Date Tested: Dec. 04 / 2017
Type of Material: Silty Sand Fill, trace gravel

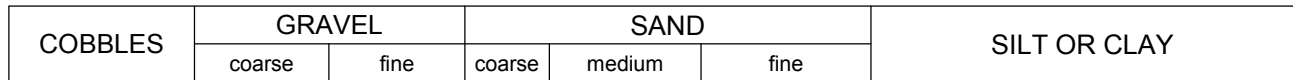
Sieve Size (mm)	Percent Passing	No Specifications



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GRAIN SIZE DISTRIBUTION

Project: Road Reconstruction / Realignment Projects
Location: Bruce County Roads 25 and 33, Saugeen Shores, Ontario
File No.: G17496
Enclosure No.: 27



Date:	Dec. 21 / 2017	Sieve Size (mm)	Percent Passing	No Specifications
Client:	GM BluePlan Engineering Limited			
Contractor:				
Source:				
Sampled From:	BH 6, 0.15 to 0.30 m depth			
Sample No.:	6-1			
Date Sampled:	Nov. 21 / 2017			
Sampled By:	JV			
Lab No.:	2556			
Date Tested:	Dec. 04 / 2017			
Type of Material:	Sand Fill, some silt and gravel			



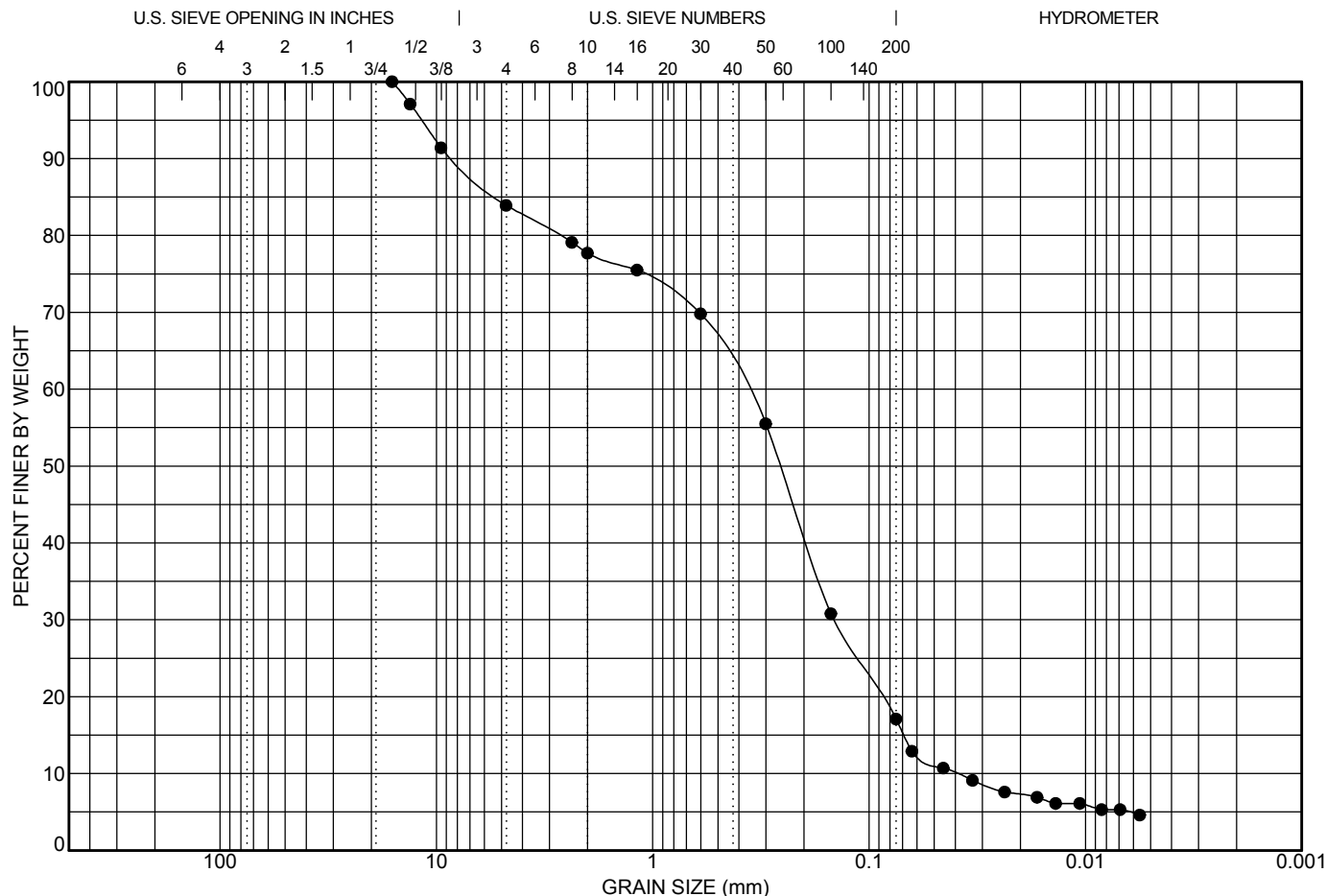
GRAIN SIZE DISTRIBUTION

Project: Road Reconstruction / Realignment Projects

Location: Bruce County Roads 25 and 33, Saugeen Shores,
Ontario

File No.: G17496

Enclosure No.: 28



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
			1.41	9.44	16	0.373	0.144	0.04	16.1	66.8	17.1	

Date: Dec. 21 / 2017
Client: GM BluePlan Engineering Limited
Contractor:
Source:
Sampled From: BH 9, 0.15 to 0.30 m depth
Sample No.: 9-1
Date Sampled: Nov. 21 / 2017
Sampled By: JV
Lab No.: 2558
Date Tested: Dec. 04 / 2017
Type of Material: Sand Fill, some silt and gravel

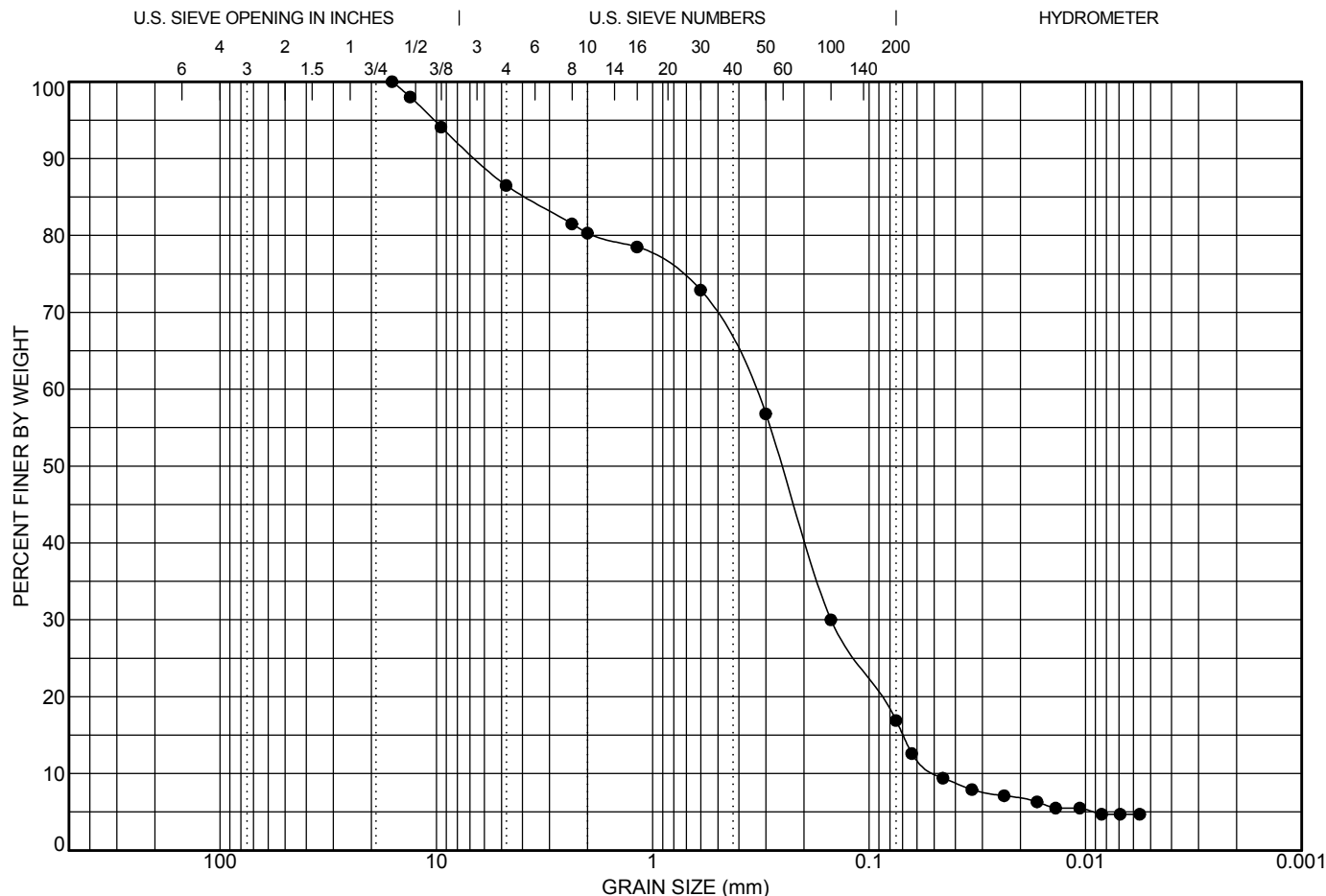
Sieve Size (mm)	Percent Passing	No Specifications

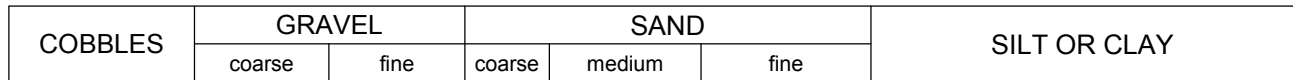


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GRAIN SIZE DISTRIBUTION

Project: Road Reconstruction / Realignment Projects
Location: Bruce County Roads 25 and 33, Saugeen Shores, Ontario
File No.: G17496
Enclosure No.: 29





Date:	Dec. 21 / 2017	Sieve Size (mm)	Percent Passing	No Specifications
Client:	GM BluePlan Engineering Limited			
Contractor:				
Source:				
Sampled From:	BH 1, 1.52 to 1.98 m depth			
Sample No.:	1-3			
Date Sampled:	Nov. 20 / 2017			
Sampled By:	JV			
Lab No.:	2553			
Date Tested:	Dec. 04 / 2017			
Type of Material:	Sand, some silt, trace gravel			



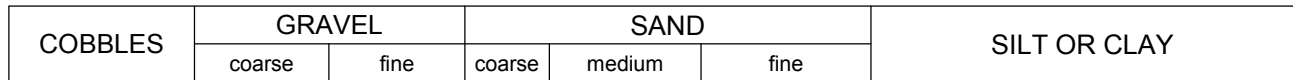
GRAIN SIZE DISTRIBUTION

Project: Road Reconstruction / Realignment Projects

Location: Bruce County Roads 25 and 33, Saugeen Shores,
Ontario

File No.: G17496

Enclosure No.: 31



Date:	Dec. 21 / 2017	Sieve Size (mm)	Percent Passing	No Specifications
Client:	GM BluePlan Engineering Limited			
Contractor:				
Source:				
Sampled From:	BH 8, 1.52 to 1.98 m depth			
Sample No.:	8-3			
Date Sampled:	Nov. 21 / 2017			
Sampled By:	JV			
Lab No.:	2557			
Date Tested:	Dec. 04 / 2017			
Type of Material:	Sand, some silt to silty			



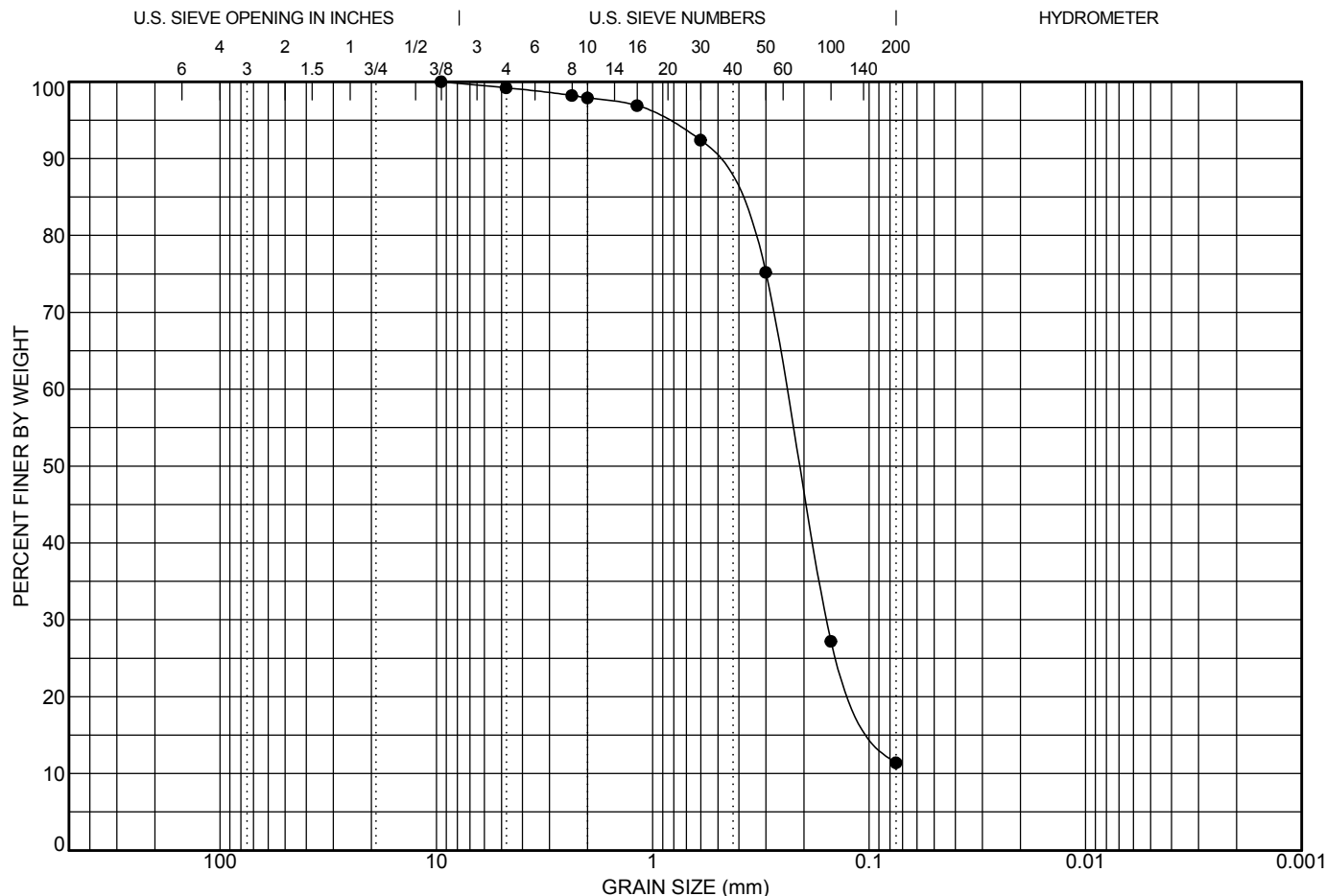
GRAIN SIZE DISTRIBUTION

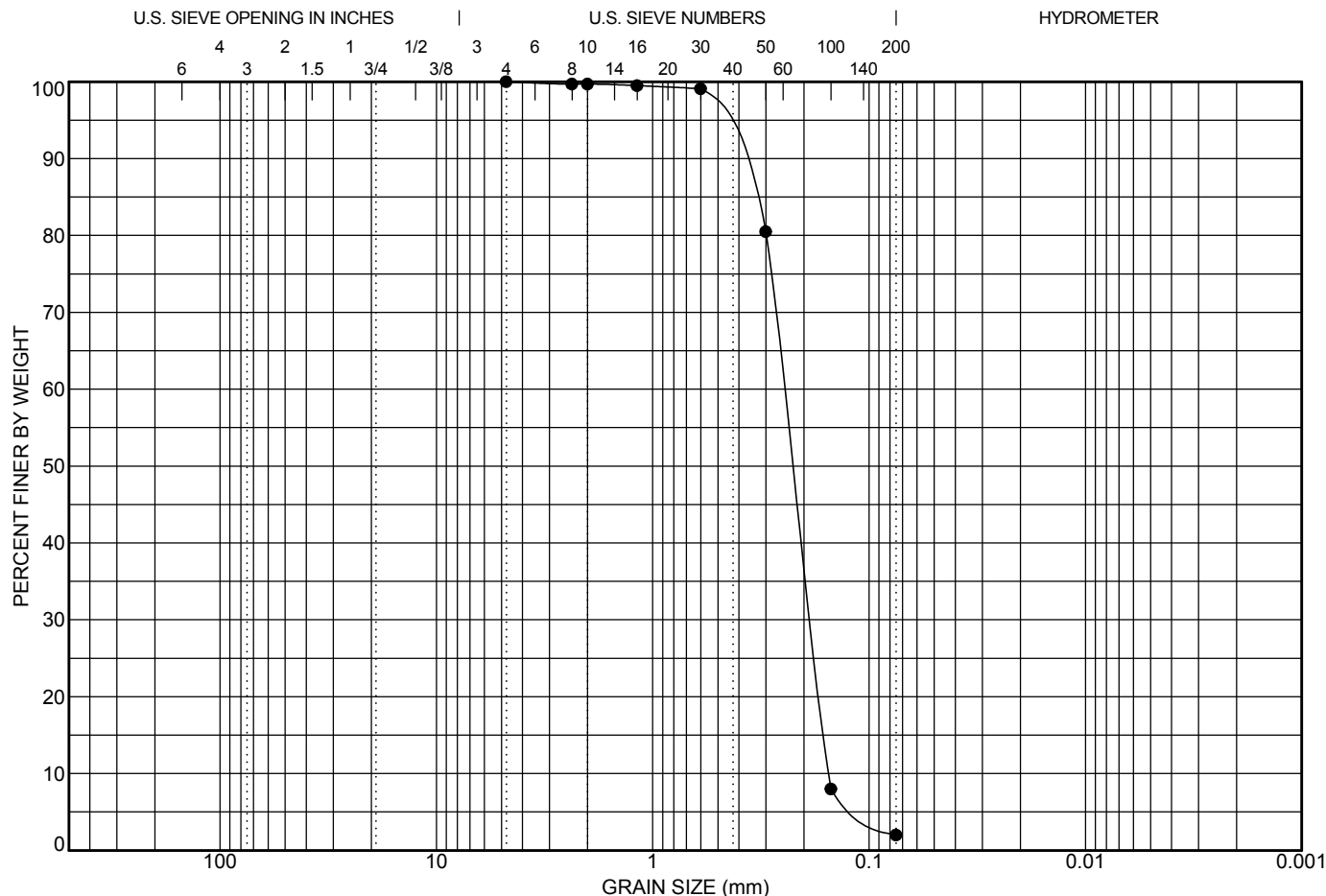
Project: Road Reconstruction / Realignment Projects

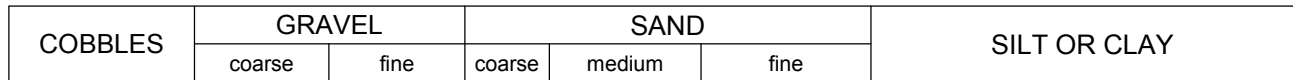
Location: Bruce County Roads 25 and 33, Saugeen Shores,
Ontario

File No.: G17496

Enclosure No.: 32







Date:	Dec. 21 / 2017	Sieve Size (mm)	Percent Passing	No Specifications
Client:	GM BluePlan Engineering Limited			
Contractor:				
Source:				
Sampled From:	BH 18, 2.29 to 2.74 m depth			
Sample No.:	18-4			
Date Sampled:	Dec. 23 / 2017			
Sampled By:	JV			
Lab No.:	2563			
Date Tested:	Dec. 04 / 2017			
Type of Material:	Silty Sand, trace clay			



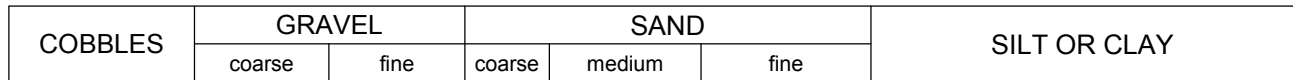
GRAIN SIZE DISTRIBUTION

Project: Road Reconstruction / Realignment Projects

Location: Bruce County Roads 25 and 33, Saugeen Shores,
Ontario

File No.: G17496

Enclosure No.: 35



Date:	Dec. 21 / 2017	Sieve Size (mm)	Percent Passing	No Specifications
Client:	GM BluePlan Engineering Limited			
Contractor:				
Source:				
Sampled From:	BH 23, 2.29 to 2.74 m depth			
Sample No.:	23-4			
Date Sampled:	Nov. 23 / 2017			
Sampled By:	JV			
Lab No.:	2564			
Date Tested:	Dec. 05 / 2017			
Type of Material:	Sand and Silt			



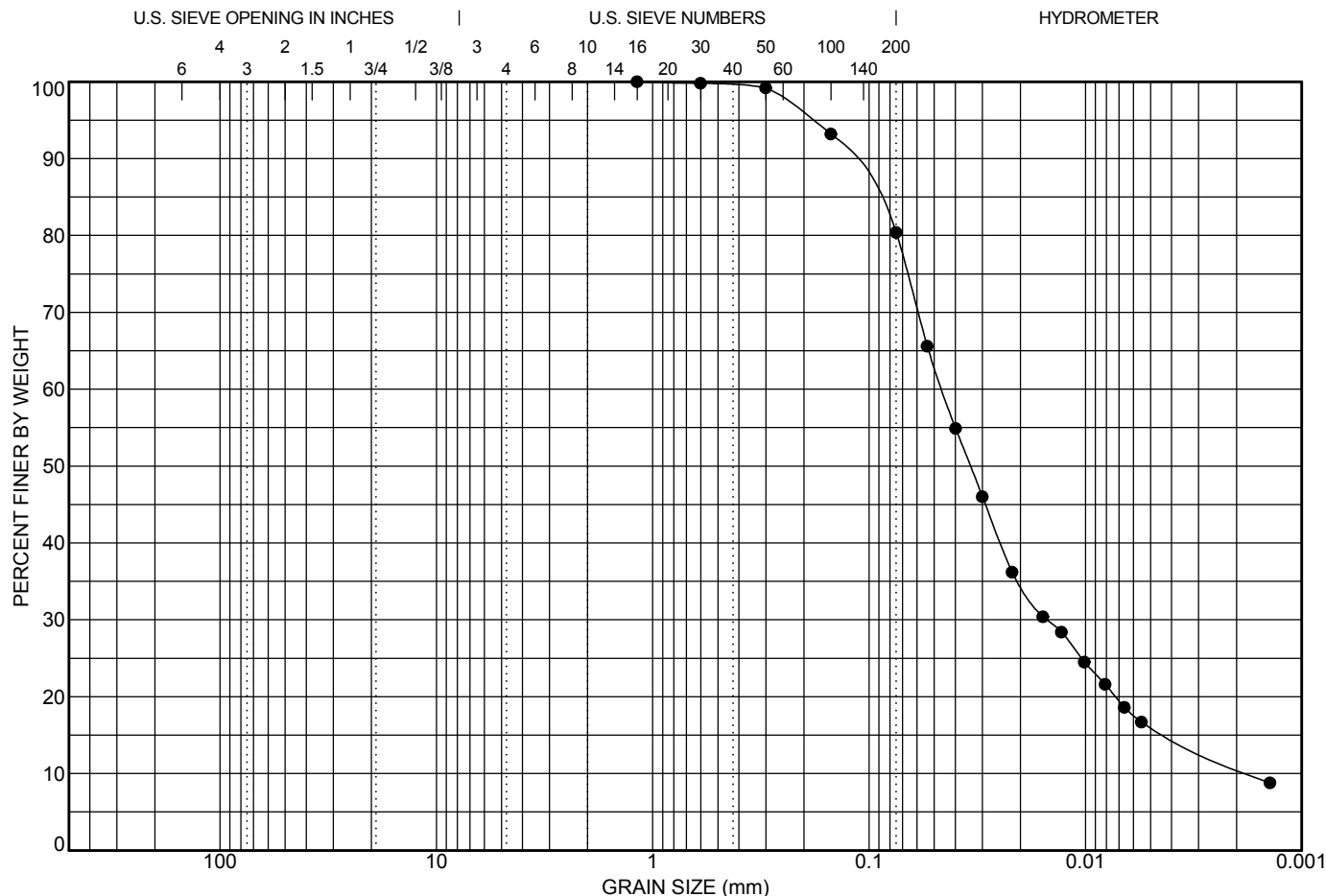
GRAIN SIZE DISTRIBUTION

Project: Road Reconstruction / Realignment Projects

Location: Bruce County Roads 25 and 33, Saugeen Shores,
Ontario

File No.: G17496

Enclosure No.: 36



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
			2.88	26.66	1.18	0.046	0.015	0.002	0.0	19.6	80.4	

Date: Dec. 21 / 2017
Client: GM BluePlan Engineering Limited
Contractor:
Source:
Sampled From: BH 2, 2.29 to 2.74 m depth
Sample No.: 2-4
Date Sampled: Nov. 20 / 2017
Sampled By: JV
Lab No.: 2554
Date Tested: Dec. 04 / 2017
Type of Material: Silt, some sand and clay

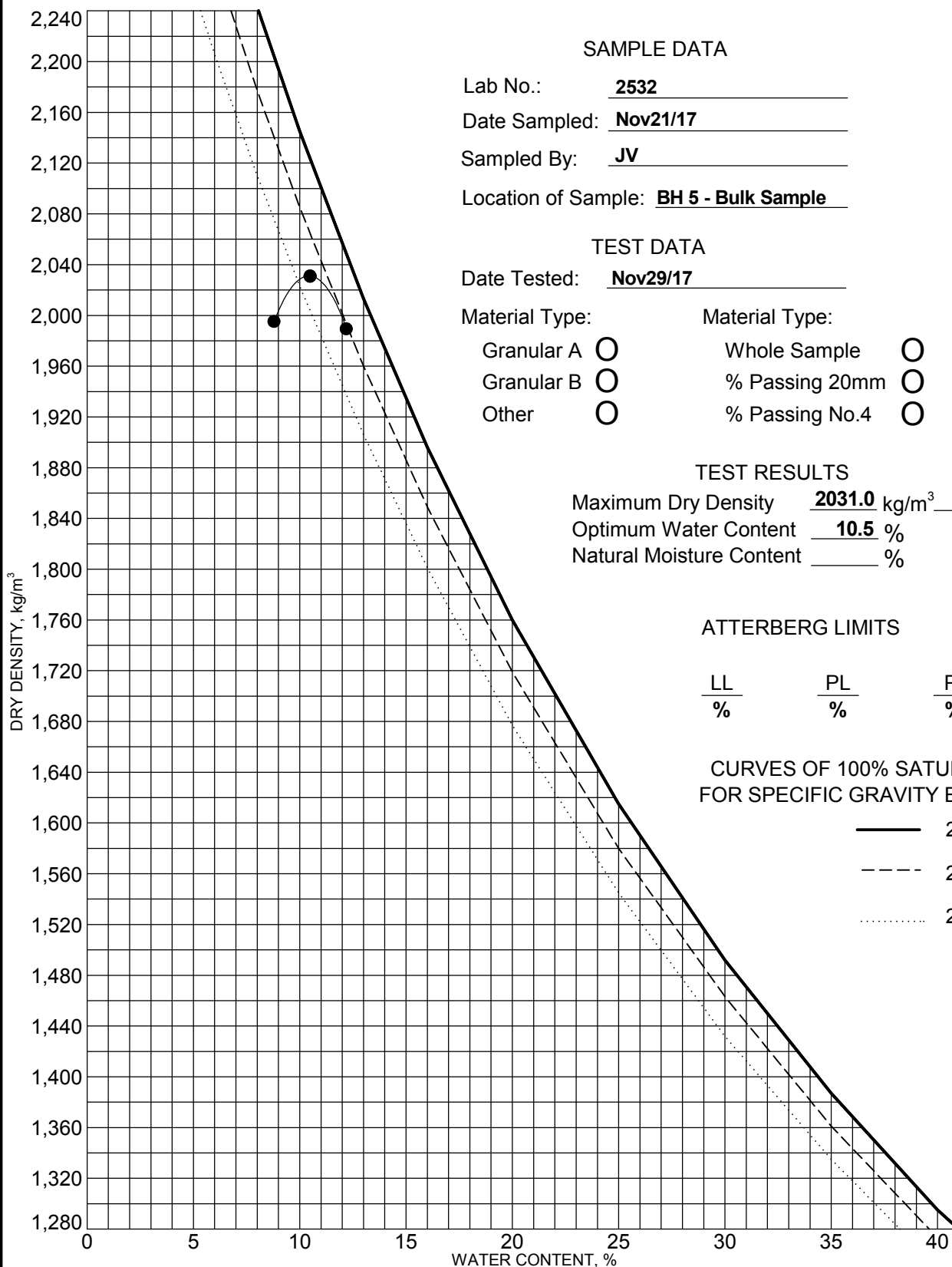
Sieve Size (mm)	Percent Passing	No Specifications



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GRAIN SIZE DISTRIBUTION

Project: Road Reconstruction / Realignment Projects
Location: Bruce County Roads 25 and 33, Saugeen Shores, Ontario
File No.: G17496
Enclosure No.: 37



SAMPLE DATA

Lab No.: 2532

Date Sampled: Nov21/17

Sampled By: JV

Location of Sample: BH 5 - Bulk Sample

TEST DATA

Date Tested: Nov29/17

Material Type:

Granular A ☐

Granular B ☐

Other ☐

Material Type:

Whole Sample ☐

% Passing 20mm ☐

% Passing No.4 ☐

TEST RESULTS

Maximum Dry Density 2031.0 kg/m³ 126.8 PCF

Optimum Water Content 10.5 %

Natural Moisture Content _____ %

ATTERBERG LIMITS

$\frac{LL}{\%}$ $\frac{PL}{\%}$ $\frac{PI}{\%}$

CURVES OF 100% SATURATION
FOR SPECIFIC GRAVITY EQUAL TO:

— 2.80

- - - 2.70

..... 2.60



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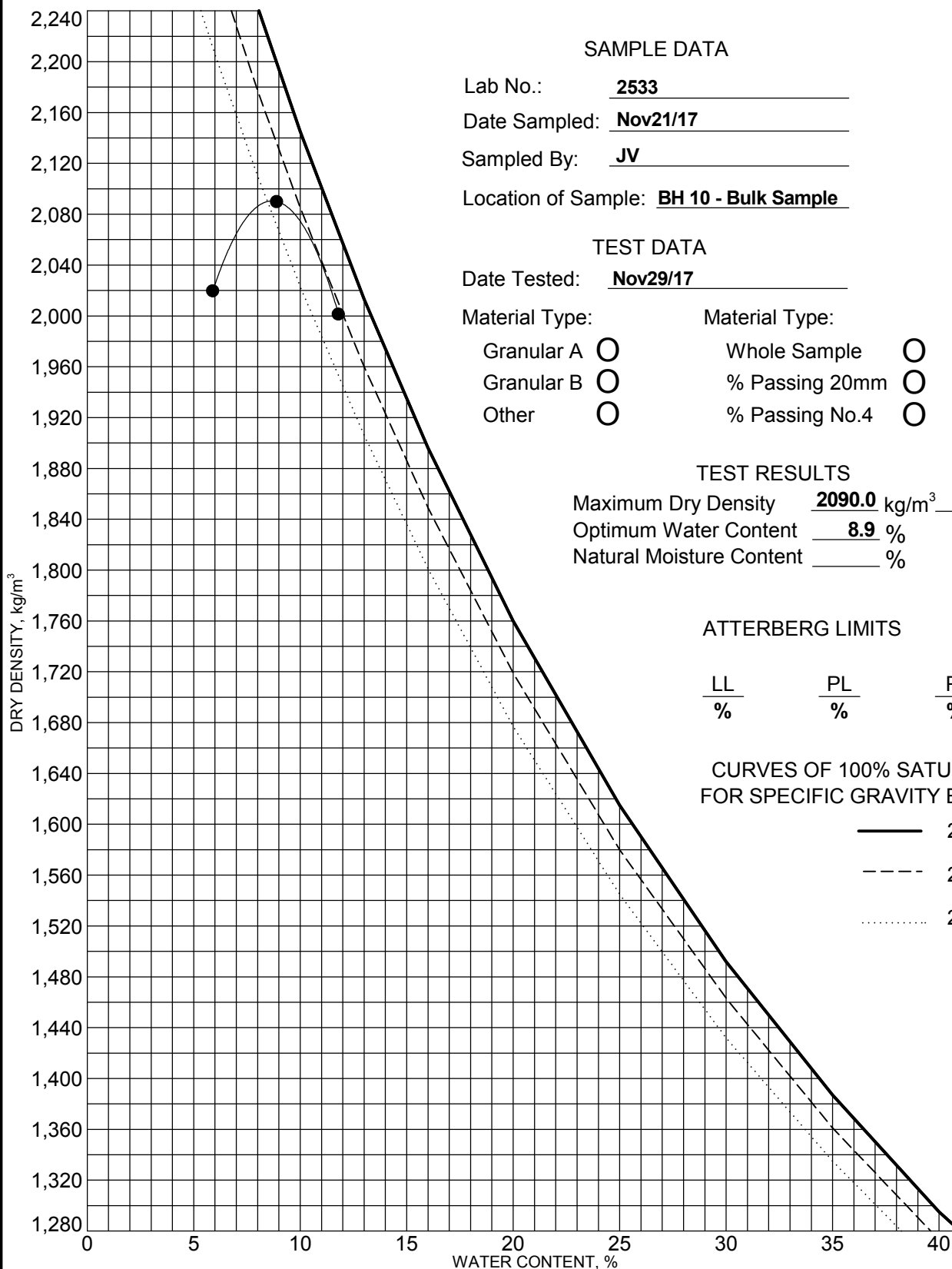
STANDARD PROCTOR TEST RESULTS

Project: **Road Reconstruction / Realignment Projects**

Location: **Bruce County Roads 25 and 33, Saugeen Shores, Ontario**

File No.: **G17496**

Enclosure No.: 38



SAMPLE DATA

Lab No.: 2533

Date Sampled: Nov21/17

Sampled By: JV

Location of Sample: BH 10 - Bulk Sample

TEST DATA

Date Tested: Nov29/17

Material Type:

Granular A ☐

Granular B ☐

Other ☐

Material Type:

Whole Sample ☐

% Passing 20mm ☐

% Passing No.4 ☐

TEST RESULTS

Maximum Dry Density 2090.0 kg/m³ 130.5 PCF

Optimum Water Content 8.9 %

Natural Moisture Content _____ %

ATTERBERG LIMITS

LL	PL	PI
%	%	%

CURVES OF 100% SATURATION
FOR SPECIFIC GRAVITY EQUAL TO:

— 2.80

- - - 2.70

..... 2.60



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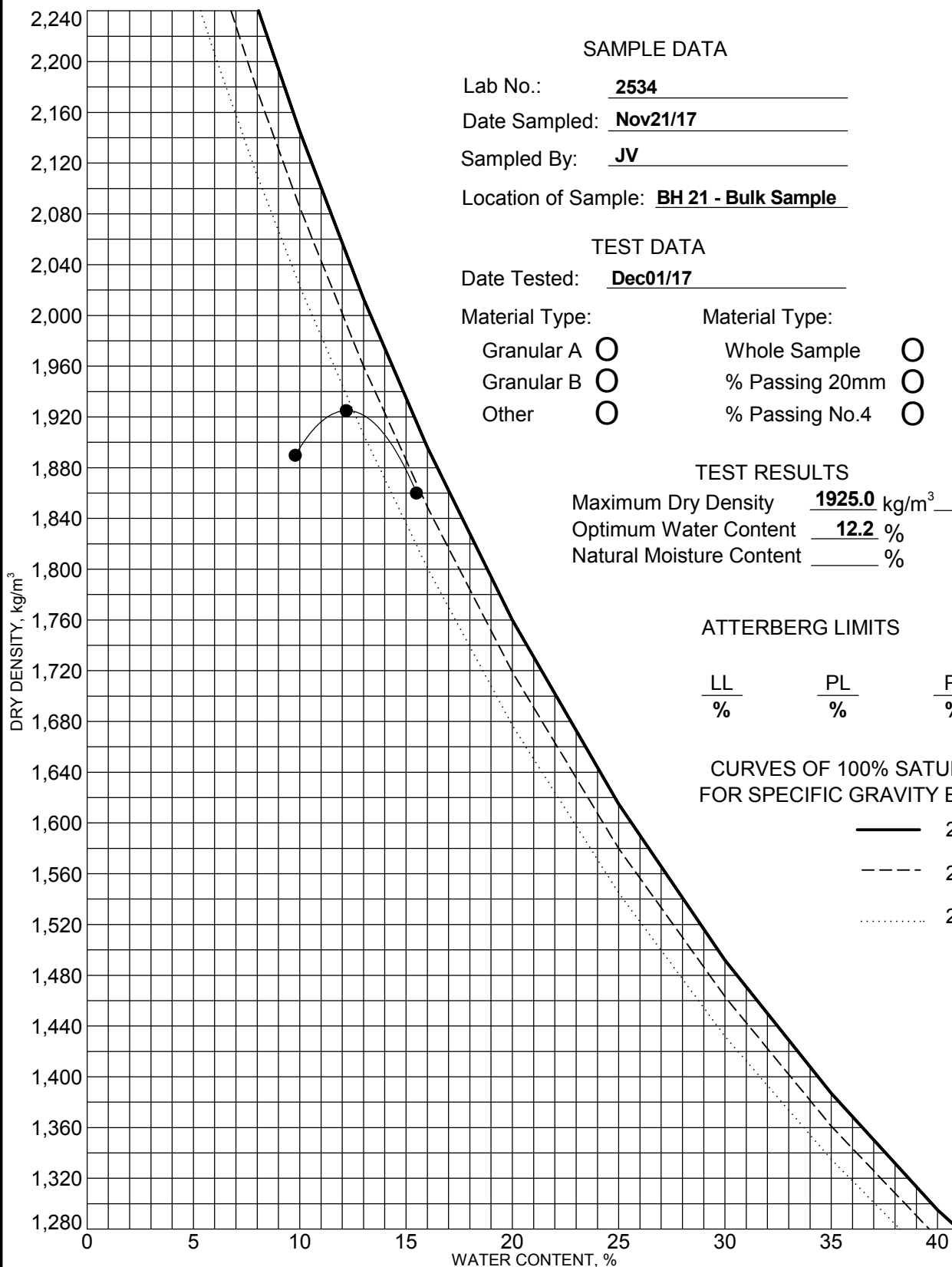
STANDARD PROCTOR TEST RESULTS

Project: **Road Reconstruction / Realignment Projects**

Location: **Bruce County Roads 25 and 33, Saugeen Shores, Ontario**

File No.: **G17496**

Enclosure No.: 39



SAMPLE DATA

Lab No.: 2534

Date Sampled: Nov21/17

Sampled By: JV

Location of Sample: BH 21 - Bulk Sample

TEST DATA

Date Tested: Dec01/17

Material Type:

Granular A ☐

Granular B ☐

Other ☐

Material Type:

Whole Sample ☐

% Passing 20mm ☐

% Passing No.4 ☐

TEST RESULTS

Maximum Dry Density 1925.0 kg/m³ 120.2 PCF

Optimum Water Content 12.2 %

Natural Moisture Content _____ %

ATTERBERG LIMITS

LL	PL	PI
%	%	%

CURVES OF 100% SATURATION
FOR SPECIFIC GRAVITY EQUAL TO:

— 2.80

- - - 2.70

..... 2.60



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STANDARD PROCTOR TEST RESULTS

Project: **Road Reconstruction / Realignment Projects**

Location: **Bruce County Roads 25 and 33, Saugeen Shores, Ontario**

File No.: **G17496**

Enclosure No.: 40

Prepared By:



Bruce County Road 33 Re-Alignment

Conceptual Stormwater Management Design Brief Saugeen Shores, ON

GMBP File: 217127

April, 2018



Be an explorer.



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LIST OF FIGURES

FIGURE 1: SITE LOCATION MAP

FIGURE 2: PRE-DEVELOPMENT CATCHMENT AREAS

FIGURE 3: POST-DEVELOPMENT CATCHMENT AREAS

APPENDICES

APPENDIX A: MIDUSS MODELLING – PRE-DEVELOPMENT CONDITIONS

APPENDIX B: MIDUSS MODELLING – POST-DEVELOPMENT CONDITIONS

APPENDIX C: ENHANCED GRASS SWALES – MIDUSS MODELLING

CONCEPTUAL STORMWATER MANAGEMENT DESIGN BRIEF

BRUCE COUNTY ROAD 33 RE-ALIGNMENT

APRIL, 2018

GMBP FILE: 217127

1. INTRODUCTION AND BACKGROUND

The County of Bruce (County), as the operating authority for Bruce Road 25 and Bruce Road 33 (BR25 & BR33), proposes to reconstruct the existing BR25 roadway between Saugeen Beach Road and Goderich Street (Provincial Highway 21), as well as to construct a new roadway to re-align BR33 to intersect BR25 at a location approximately 535m to the east of its current intersection with BR25 as shown on Figure 1. The Town of Saugeen Shores (Town) has identified future development in the area which would extend Bruce Street southerly, to intersect with BR25 at the location of the proposed BR25/BR33 intersection.

The proposed reconstruction of BR25 and re-alignment of BR33 are supported by the recommendations of the recently completed Master Plan for Roads and Drainage (Master Plan) study completed about May, 2017 that addressed Phases 1 and 2 of the Municipal Class Environmental Assessment (EA) process.

Subsequent to the Notice of Completion for the Master Plan, the County and Town prepared the following implementation plan:

Phase 1 – Trunk Storm Sewer on BR25 from Lake Ridge Estates to Lake Huron, including full urbanized road section from Shipley Avenue to Saugeen Beach Road. (Schedule A+ Activity)

Phase 2 – 2-Lane urbanized road section from Shipley Avenue to Bruce Street, including local storm sewer down the bluff. (Schedule A+ Activity)

Phase 3 – 4-Lane urbanized road section from Bruce Street to Goderich Street, including municipal services (subject to a future Schedule B EA process)

Phase 4 – New Construction of BR 33 (Subject to current EA process)

GM BluePlan Engineering Limited (GMBP) was retained to prepare a Stormwater Management (SWM) Design Brief to address the drainage interests of the Town and County in relation to the proposed development of BR33, as Phase 4 of the implementation plan.

Based on the recommendations of the Master Plan, the reconstruction of BR25 will include the design and installation of a trunk storm sewer to drain runoff from the roadway and upstream lands, to an outlet at Lake Huron, as Phase 1 of the implementation plan. The design of the proposed BR25 storm sewer will be addressed in a separate design brief, although capacity would be provided within that storm sewer to accommodate quantity and quality related issues for runoff from the north end of the re-aligned BR33, under Phase 4 of the implementation plan.

Therefore, the SWM requirements of the BR25 reconstruction are outside the scope of this Preliminary SWM Design Brief for BR33.

The Master Plan identifies that the residential lands in the Baker Road area to the west of the existing BR33, occasionally suffer from seasonal flooding issues, and currently lack a storm sewer system. As a result, drainage conditions within the Baker Subdivision should not be worsened by runoff associated with development within upstream lands, and be improved if possible.

This Preliminary SWM Design Brief addresses, in general terms, the drainage interests associated with the portions of the proposed BR33 construction, which would drain to Baker Road. Additional details would be prepared, as necessary, during the project design phase.

2. EXISTING CONDITIONS AND DRAINAGE

In general, lands to the south of BR25, west of the Gore Drain Trail and east of the Baker Road Subdivision area, drain downward from east to west. Lands associated with the BR33 re-alignment and draining to the Baker Subdivision are zoned as Planned Development. Current land use is for agricultural purposes.

Runoff from lands east of the Baker Subdivision currently drain across the existing BR33 (Lake Range Road) at two locations; a 750mm Ø culvert approximately 155m to the south of BR25, or a 750mm Ø approximately 50m to the south of Baker Road.

Runoff draining to the northerly culvert is conveyed through the area to the north of the Baker Street Subdivision towards BR25, and is not considered to contribute to the identified drainage issues within the Baker Subdivision.

Runoff draining to the southerly culvert drains in an open watercourse across private properties to a system of roadside ditches within the Baker Subdivision, and ultimately is conveyed to Lake Huron.

2.1 Stormwater Management Design Criteria

Based on pre-development drainage conditions, and correspondence with the Town and County, the SWM criteria used to develop the appropriate SWM approach for the proposed development is as follows:

1. Post-development peak flow rates discharging from the proposed BR33 development and upstream lands to the Baker Subdivision are to be attenuated to less than, or equal to, pre-development conditions.
2. Future development within the lands zoned as Planned Development will be responsible to manage its own stormwater, beyond the existing condition.
3. Enhanced water quality treatment (80% TSS Removal) is to be provided for runoff draining from the proposed development and its upstream lands prior to draining to the Baker Subdivision.

3. POST-DEVELOPMENT CONDITIONS AND DRAINAGE

The re-aligned BR33 section is proposed to be constructed from the existing BR33 at a location approximately 190m to the south of the existing intersection with Baker Road, to BR25 at a location approximately 535m to the east of its existing intersection with BR25. The new, proposed BR25/BR33 intersection is in line with a planned extension of Bruce Street, as illustrated on Figure 1.

The approximately 990m re-aligned BR33 section is generally proposed to be constructed with a two-lane rural cross-section, transitioning to a two-lane plus a left-turn lane urban cross-section at the intersection of BR25. The northerly 200m of the BR33 re-alignment will drain northerly to the planned BR25 trunk storm sewer, intended to be constructed as Phase 1 of the implementation plan.

The section of the existing BR33 immediately to the south of Baker Road is proposed to be reconstructed as a cul-de-sac to maintain access to the private properties, although the design phase may alter the final configuration.

An approximately 90m long road with a two-lane rural cross-section is proposed to be constructed between the existing BR33 / Baker Road intersection and the proposed re-aligned BR33 to maintain access. All proposed roadworks include the construction of roadside ditches to convey the runoff from the roadways and their upstream lands.

At this time, no reconstruction is proposed for Baker Road west of its intersection with the existing BR33. The existing BR33, north of its intersection with Baker Road, is planned to be re-surfaced only.

The proposed re-aligned BR33 will intercept runoff from a portion of the lands upstream. The proposed grading of the roadway and roadside ditches generally will maintain the pre-development drainage tributary areas to each of the existing culverts on Lake Range Road (existing BR33).

The outlet provided by the existing BR33 culvert to the south of Baker Road is proposed to be replaced, ultimately by a planned storm sewer system through the Baker Subdivision that drains to Lake Huron. The planned storm sewer system, as a recommendation of the Master Plan, will be designed to convey the 5 year design flows associated with the Baker Subdivision area and its upstream lands. The currently proposed project includes the installation of the inlet section of the planned storm sewer. Therefore, the runoff draining to the inlet section of the storm sewer system is to be controlled to consider seasonal flooding issues within the Baker Subdivision.

Under proposed conditions, runoff from the proposed BR33 roadworks will drain to a proposed SWM facility.

The SWM facility is designed as a dry pond to provide temporary runoff storage to attenuate peak runoff rates. The outlet to the SWM facility constitutes the inlet section of the planned Baker Subdivision storm sewer system. Ultimately, attenuated outflows from the proposed SWM facility will drain via the planned storm sewer system to Lake Huron. In the interim, attenuated outflows will be conveyed by the existing ditch systems within the Baker Subdivision to Lake Huron.

4. QUANTITY CONTROL CRITERIA, PARAMETERS AND MODELLING

4.1 Design Rainfall Events

Rainfall data collected by Environment Canada for the Goderich area over the years from 1970 to 1980, and 1997 to 2007 were used to prepare IDF statistical rainfall data. The data was entered in the MIDUSS computer modeling software to generate coefficients for the Chicago type rainfall distribution patterns. The Chicago storm input parameters used to model the various design rainfall events for the subject property are summarized in the following Table 1.

Table 1 – Design Rainfall Events (Generated from Environment Canada IDF Data for Goderich)

COEFFICIENT	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
A	1264.60	2258.60	3043.26	4026.22	4882.60	5607.28
B	10.288	14.090	16.180	17.817	19.202	19.798
C	0.8891	0.9265	0.9456	0.9604	0.9719	0.9772
R	0.375	0.375	0.375	0.375	0.375	0.375
Duration (min)	360	360	360	360	360	360
Depth (mm)	39.5	56.0	67.0	80.9	91.3	200.5
Intensity (mm/hr)	85.7	116.7	136.8	162.7	181.2	101.4

4.2 Site Soil Conditions

The soil type within the site is generally characterized as Berrien sandy loam, as per the Bruce County Soils Map (Ontario Soil Survey Report No. 16) published by the Department of Agriculture. Berrien sandy loam is known to be of the Hydrological Soil Group AB.

With consideration of the pre-development and post-development pervious ground cover of the roadway and its upstream lands, which could be defined as “crop and other improved land”, a Group AB soil is represented with an SCS Curve Number of 70 as per the MTO Drainage Manual’s Design Chart 1.09.

The impervious areas within all catchments are associated with an SCS Curve Number of 98.

4.3 Pre-Development Catchment Areas

For pre-development conditions analysis purposes, the approximately 48.45 ha area associated with the proposed roadworks and their upstream lands that drain to the Baker Subdivision are modelled as one (1) drainage catchment, described in Table 2 below, and as shown on Figure 2. The pre-development conditions MIDUSS computer modelling is attached in Appendix ‘A’.

Table 2 – Pre-Development Conditions Catchment

Catchment	Description	Area (ha)	Impervious Level (%)
10	Lands Draining to the Baker Subdivision	48.45	0

The results of the existing conditions routing analysis are summarized in Section 4.5.

4.4 Post-Development Catchment Areas

For post-development conditions analysis purposes, the approximately 48.45 ha area associated with the proposed roadworks and their upstream lands that drain to the Baker Subdivision are modelled as two (2) drainage catchments, described in Table 3 below, and as shown on Figure 3. The post-development conditions MIDUSS computer modelling is attached in Appendix 'B'.

Table 3 – Post-Development Conditions Catchments

Catchment	Description	Area (ha)	Impervious Level (%)
100	Lands to the east of the re-aligned BR33 draining to the Baker Subdivision	42.65	2
200	Lands to the west of the re-aligned BR33 draining to the Baker Subdivision	5.80	10

The results of the post-development conditions routing analysis are summarized in Section 4.5.

4.5 MIDUSS Quantity Control Modelling Results

MIDUSS modelling software was used to model the expected pre-development conditions and post-development conditions stormwater runoff draining to the Baker Subdivision under the various design storms. Results from the models are summarized in the following Tables 4 and 5, and the modelling is provided for reference in Appendix 'A' and 'B'.

Table 4 below provides the total peak flow rates discharging from the modelled catchments to the Baker Subdivision under pre-development conditions and the total post-development peak flow rates discharging to SWM facility prior discharging to the Baker Subdivision.

Table 4 – Summary of Peak Runoff Flow Results

Catchments	Return Storm Frequency (yr)					
	2	5	10	25	50	100
Pre-Development Conditions						
Lands draining to the Baker Subdivision – Catch.10 (m ³ /s)	0.096	0.318	0.543	0.909	1.243	1.604
Post-Development Conditions						
Lands to the east of the re-aligned BR33, draining to the Baker Subdivision – Catch. 100 (m ³ /s)	0.095	0.305	0.518	0.864	1.183	1.516
Lands to the west of the re-aligned BR33, draining to the Baker Subdivision – Catch. 200 (m ³ /s)	0.091	0.144	0.184	0.242	0.309	0.398
Total Uncontrolled Runoff Draining to SWM Facility (m³/s)	0.172	0.349	0.591	0.984	1.325	1.729

From the total post-development peak flow rates draining to the SWM facility shown in Table 4, a conceptual SWM facility was designed within the MIDUSS modelling to estimate the active storage volume required to provide the required attenuation of peak flow rates discharging to the Baker Subdivision.

From the results of the modelling, an active storage volume of approximately 2500m³ is required to be provided within the SWM facility to achieve adequate attenuation of post-development peak flow rates to less than, or equal to, pre-development peak flow rates for all design storm events up to, and including, the 100 year return period.

With the assumption that the mean depth of the active storage volume is 1.25m, the footprint area of the SWM facility is expected to be approximately 2000m². Based on preliminary designs, it is believed that about 2400m² of area is available for the construction of the SWM facility.

5. STORMWATER QUALITY TREATMENT

Stormwater quality treatment for runoff draining to the Baker Subdivision is addressed via a treatment train approach. Runoff is conveyed and treated by Enhanced Grass Swales and further polished by the SWM facility which has been designed as a "dry pond".

The roadside ditches along the proposed roadworks have been generally designed to meet the criteria of an Enhanced Grass Swale as per the Low Impact Development Stormwater Management Planning and Design Guide¹ (LIDSWMP Design Guide) published by the Credit Valley Conservation Authority (CVCA) and the Toronto and Regional Conservation Authority (TRCA).

In general, the roadside ditches are designed with the maximum side slopes of 3:1 (H:V), a minimum of 0.85m wide bottom, and a longitudinal slope of about 0.5%. Table 6 below compares the characteristics of the maximum peak flow rate expected to be conveyed by the Enhanced Grass Swales (the peak flow rates from Catchment 100) during a 4 hour, 25mm Chicago storm even in comparison with the requirements set by the LIDSWMP Design Guide; MIDUSS modelling for the results are attached as Appendix 'C'.

Table 6 – Enhanced Grass Swale Design in Comparison to Requirements

Characteristics	During 4 hour, 25mm Chicago Storm Event	
	As Designed*	As Required
Maximum depth of flow through Enhanced Grass Swale	0.098 m	0.100 m
Maximum flow velocity through Enhanced Grass Swale	0.36 m/s	0.50 m/s

**Conservatively considers the flow through Catchment 100; the relatively lesser flows through Catchment 200 are expected to yield a more desirable treatment performance.*

¹ Publicly available online at: <http://www.creditvalleyca.ca/low-impact-development/low-impact-development-support/stormwater-management-lid-guidance-documents/low-impact-development-stormwater-management-planning-and-design-guide/>

As shown in Table 6, the design depth and velocity of flow through the Enhanced Grass Swale during a 4 hour, 25mm Chicago storm event meets the requirements of the LIDSWMP Design Guide. According to the CVCA and TRCA's LIDSWMP Design Guide, an Enhanced Grass Swale provides a median TSS removal rate of 76%.

The Enhanced Grass Swales convey runoff to the SWM facility where it is further polished. The SWM facility provides volume temporarily to store runoff. The attenuation provided by the outlet of the SWM facility reduces the velocity of flows through the SWM facility and encourages further settling out of suspended solids.

Overall, given the initial stormwater quality treatment provided by conveying runoff along the roadside ditches designed as Enhanced Grass Swales, and the further polishing provided by the SWM facility's temporary storage volume, it is expected that the runoff from the proposed roadworks will receive an enhanced water quality treatment level (80% TSS removal) prior to discharging to the Baker Subdivision.

6. SUMMARY

The County of Bruce proposes to reconstruct the existing BR25 roadway between Saugeen Beach Road and Goderich Street, as well as to construct a new roadway to re-align BR33 to intersect BR25 at a location approximately 535m to the east of its current intersection with BR25.

Seasonal flooding issues have been identified previously within the Baker Subdivision area. The drainage conditions of lands upstream of the Baker Subdivision, and consequently the Baker Subdivision, are expected to be maintained or improved by the construction of a proposed SWM facility as conceptualized within this SWM Design Brief.

Upon completion of the proposed development;

1. The construction of a SWM facility that provides a minimum active storage volume of 2000m³, and is generally designed as a dry pond, is expected to attenuate post-development peak flow rates discharging from the proposed BR33 re-alignment and upstream lands to less than, or equal to, pre-development conditions.
2. It is expected that sufficient area within the proposed development lands exists to construct the SWM facility.
3. Enhanced water quality treatment (80% TSS removal) is expected to be provided for runoff draining from the proposed development and its upstream lands prior to draining to the Baker Subdivision.

All of which is respectfully submitted,

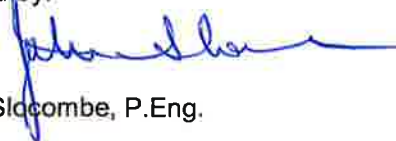
GM BLUEPLAN ENGINEERING LIMITED

Per:



Alexander C. Wilkinson, E.I.T.

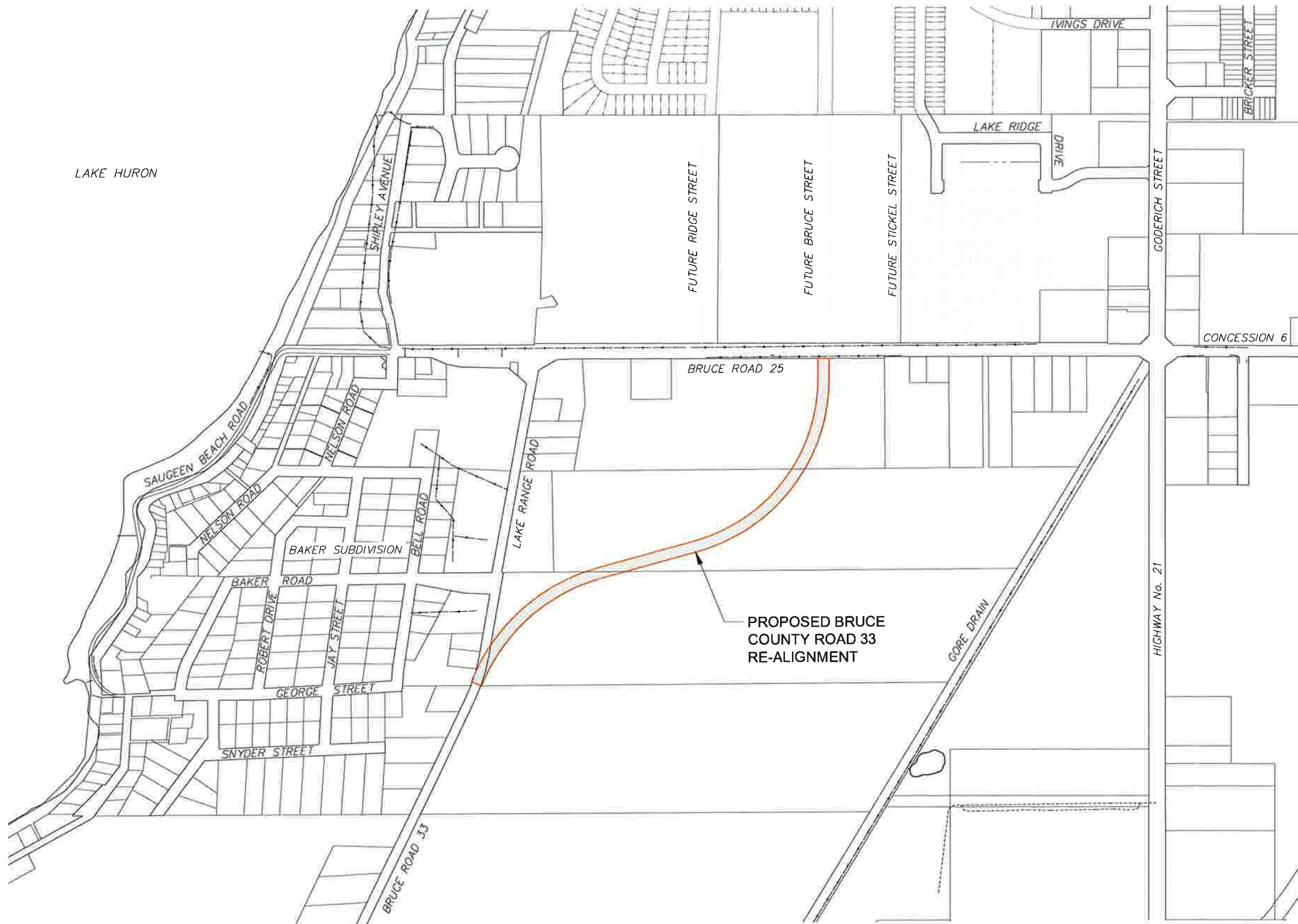
Reviewed by:



John B. Slodcombe, P.Eng.

FIGURES:

217127
Bruce County Road 33
Town of Saugeen Shores

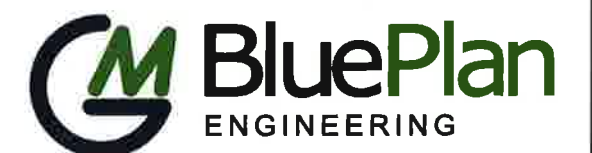


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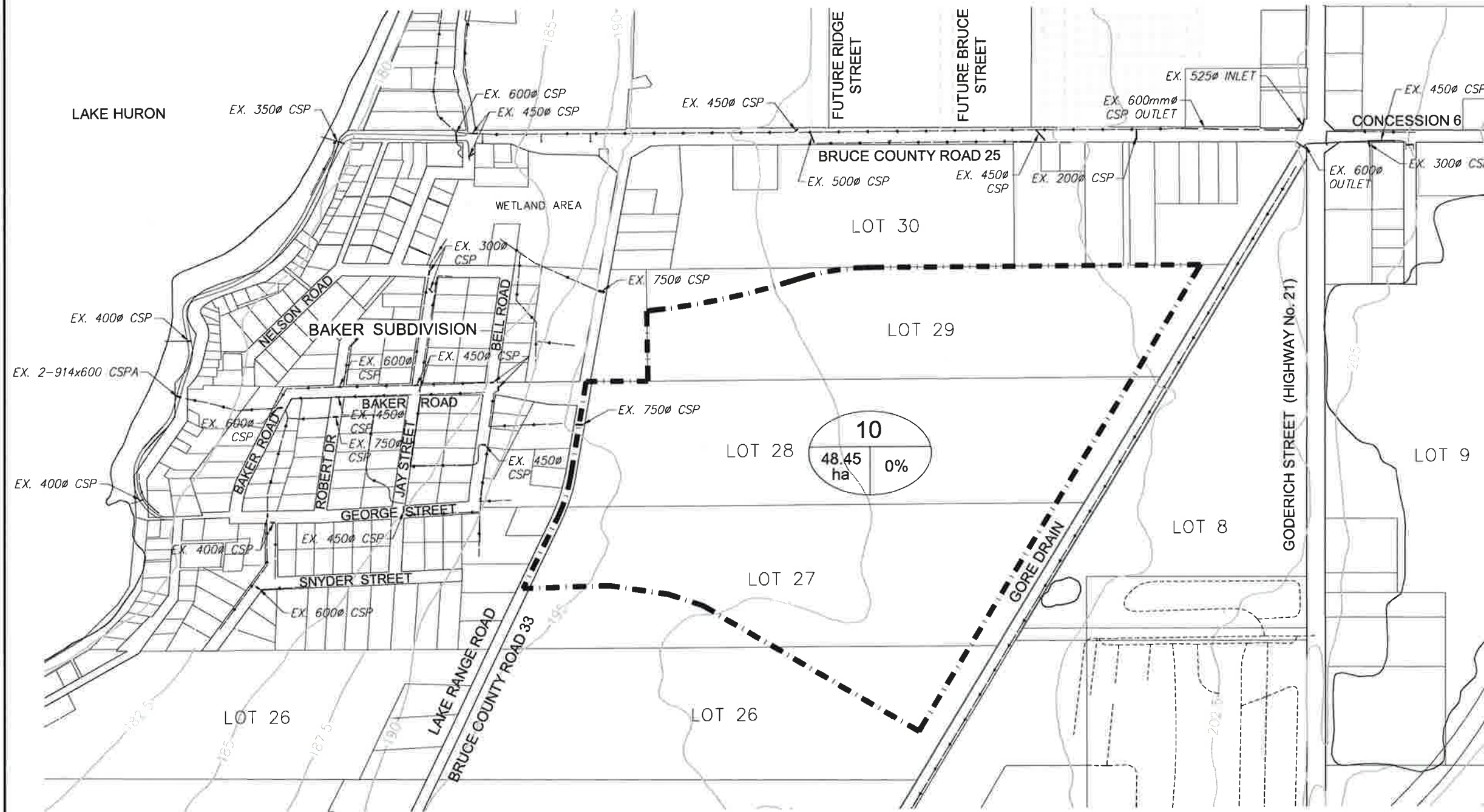
SITE LOCATION PLAN

BRUCE COUNTY
ROAD 33 RE-ALIGNMENT

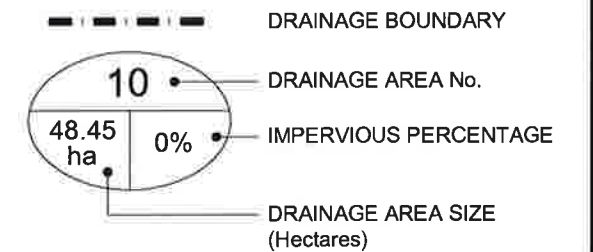
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217127
Bruce County Road 33
Town of Saugeen Shores



LEGEND



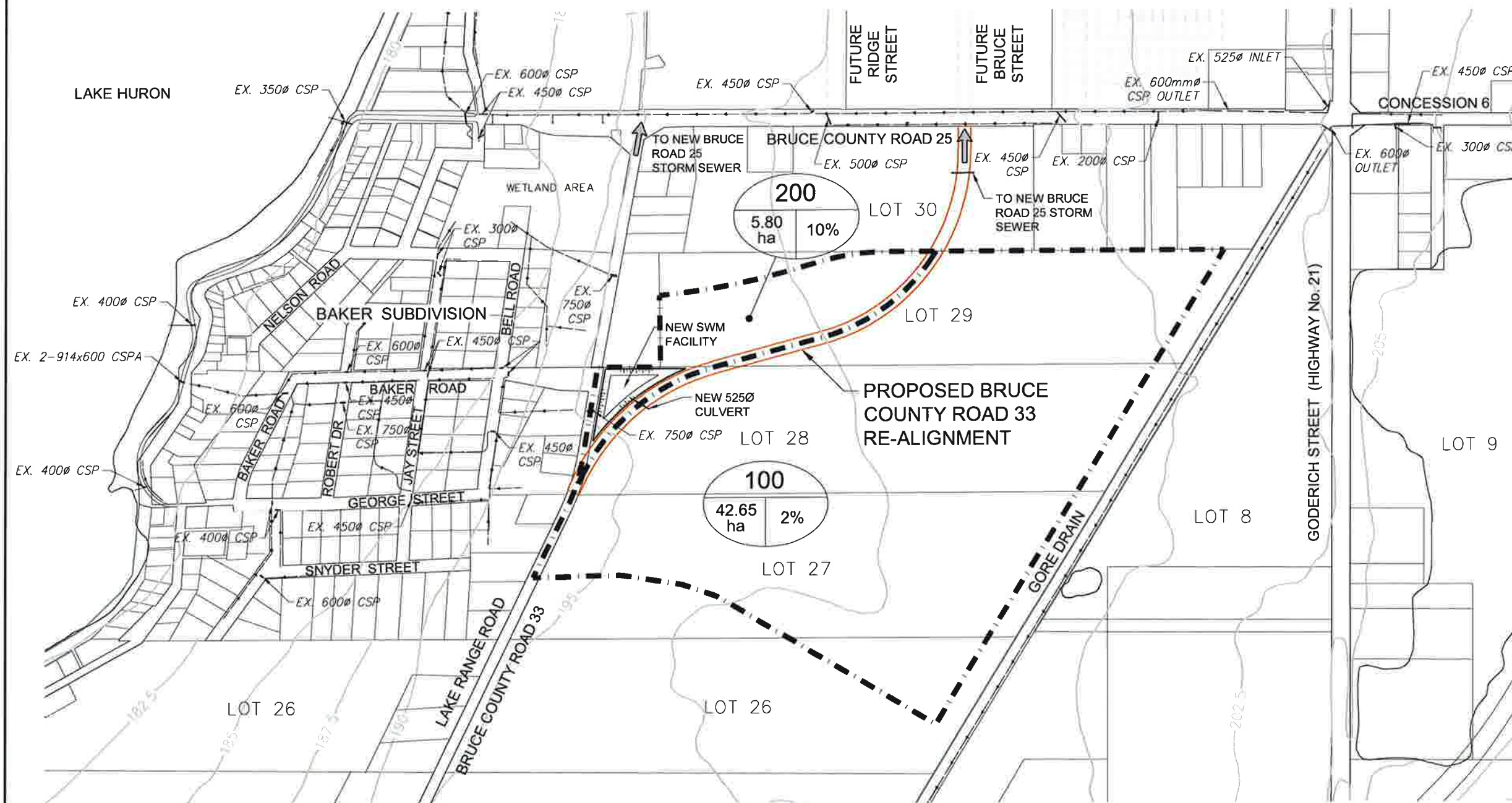
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APRIL 2018

**PRE-DEVELOPMENT
DRAINAGE AREAS**

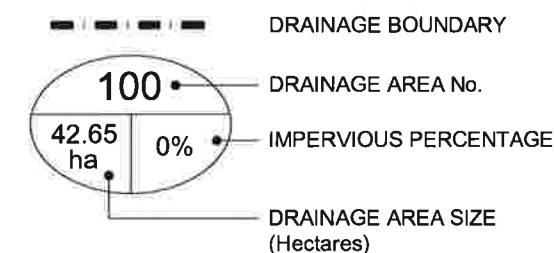
**BRUCE COUNTY
ROAD 33 RE-ALIGNMENT**

Figure No. 2

217127
Bruce County Road 33
Town of Saugeen Shores



LEGEND



SCALE 1:7,500
APRIL 2018

**POST-DEVELOPMENT
DRAINAGE AREAS**

**BRUCE COUNTY
ROAD 33 RE-ALIGNMENT**

Figure No. 3

APPENDIX A:
MIDUSS MODELLING – PRE-DEVELOPMENT CONDITIONS


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2400,000 Max. Hydrograph"
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1264,600 Coefficient A"
10,288 Constant B"
0,889 Exponent C"
0,375 Fraction R"
360,000 Duration"
1,000 Time step multiplier"
Maximum intensity 85.761 mm/hr"
Total depth 39.507 mm"
6 CATCHMENT 10" Hydrograph extension used in this file"
1 Triangular SCS"
1 Equal length"
1 SCS method"
Lands Draining to the Baker Subdivision"
10
0,000 % Impervious"
48,450 Total Area"
700,000 Flow length"
0,500 Overland Slope"
48,450 Pervious Area"
700,000 Pervious length"
0,500 Pervious slope"
0,000 Impervious Area"
700,000 Impervious length"
0,500 Impervious slope"
0,250 Pervious Manning "n"
70,000 Pervious SCS Curve No.
0,151 Pervious Runoff coefficient"
0,100 Pervious Ia/s coefficient"
10,886 Pervious initial abstraction"
0,015 Impervious Manning "n"
98,000 Impervious SCS Curve No.
0,000 Impervious Runoff coefficient"
0,100 Impervious Ia/s coefficient"
0,518 Impervious initial abstraction"
0,096 0,000 0,000
Catchment 10 Pervious 0,000 c.m/sec"
Surface Area 48,450 Total Area "
Time of concentration 336,643 24,410 336,641 hectare"
Rainfall depth 595,796 199,271 595,794 minutes"
Rainfall volume 39,507 39,507 39,507 mm"
Rainfall losses 1,9141 0,0000 1,9141 ha-m"
Runoff depth 33,548 5,152 33,548 mm"
Runoff volume 2886,88 34,355 2886,89 c.m"
Runoff coefficient 0,151 0,000 0,151 c.m/sec"
Maximum flow 0,096 0,000 0,096
4 HYDROGRAPH Add Runoff "
HYDROGRAPH Add Runoff " 0,096 0,000 0,000"
HYDROGRAPH Copy to outflow"
8 Copy to outflow" 0,096 0,000 0,000"
HYDROGRAPH Combine 1"
6 Combine "
1 Node #
Total Runoff Draining to Baker Subdivision"
Maximum flow 0,096 c.m/sec"

```

```

217127 - Pre 2 year - AW - Nov17
-----
Hydrograph volume 0.096 0.096 0.096"
START/RE-START TOTALS 10"
Runoff totals on EXIT"
Total Catchment area 48,450 hectare"
Total Impervious area 0,000 hectare"
Total % Impervious 0,000"
EXIT"

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44 2400.000 Max. Hydrograph"
45
46 32 STORM Chicago storm"
47 1 Chicago storm"
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49 14.090 Constant B"
50 0.927 Exponent C"
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63
64 0.000 % Impervious"
65 48.450 Total Area"
66 700.000 Flow length"
67 0.500 Overland Slope"
68 48.450 Pervious Area"
69 700.000 Pervious length"
70 0.500 Pervious slope"
71 0.000 Impervious Area"
72 700.000 Impervious length"
73 0.500 Impervious slope"
74 0.250 Pervious Manning "n""
75 70.000 Pervious SCS Curve No."
76 0.236 Pervious Runoff coefficient"
77 0.100 Pervious Ia/S coefficient"
78 10.886 Pervious Initial abstraction"
79 0.015 Impervious Manning "n""
80 98.000 Impervious SCS Curve No."
81 0.000 Impervious Runoff coefficient"
82 0.100 Impervious Ia/S coefficient"
83 0.518 Impervious Initial abstraction"
84
85 Catchment pervious 0.000 c.m/sec"
86 Surface Area 48.450 Total Area
87 Time of concentration 229.455 48.450 hectare"
88 Time to centroid 463.816 229.454 minutes"
89 Rainfall depth 55.992 463.815 mm"
90 Rainfall volume 2.7128 55.992 mm"
91 Rainfall losses 42.779 2.7128 ha-m"
92 Runoff depth 13.213 42.779 mm"
93 Runoff volume 6401.59 13.213 mm"
94 Runoff coefficient 0.236 6401.62 c.m"
95 Maximum flow 0.318 0.236 c.m/sec"
96
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98 4 Add Runoff " 0.318 0.000 0.318
99
100 40 HYDROGRAPH Copy to Outflow"
101 8 Copy to Outflow" 0.318 0.000 0.000
102
103 40 HYDROGRAPH combine 1"
104 6 Combine "
105 1 Node #
106 Total Runoff Draining to Baker Subdivision"
107 Maximum flow 0.318 c.m/sec"

```

```

38 Hydrograph volume 0.318
39 START/RE-START TOTALS 10"
40 3 Runoff Totals on EXIT"
41 Total Catchment area 48.450 hectare"
42 Total Impervious area 0.000 hectare"
43 Total % impervious 0.000"
44 EXIT"

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8 16,180 Constant C
9 0.946 Exponent C
10 0.375 Fraction R
11 360,000 Duration
12 1,000 Time step multiplier

Maximum intensity 136.818 mm/hr
Total depth 67.019 mm
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9 1 Equal length"
10 1 SCS method
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14 48,450 Flow Length"
15 700,000 Overland Slope"
16 0,500 pervious Area"
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23 0,250 pervious SCS Curve No. "
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26 0,100 pervious Initial abstraction"
27 10,886 Impervious Manning "n"
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29 98,000 Impervious runoff coefficient"
30 0,000 Impervious Ia/S coefficient"
31 0,100 Impervious Initial abstraction"
32 0,518 Impervious Initial abstraction"
33 0,543 0,000 0,000 0,000 c.m/sec"
34 Catchment 10 pervious Total Area "
35 Surface Area 48,450 0,000 hectare"
36 Time of concentration 132,863 19,895 192,862 minutes"
37 Time to centroid 418,731 187,429 418,730 minutes"
38 Rainfall depth 6,019 67,019 mm"
39 Rainfall volume 3,2471 0,0000 ha-m"
40 Rainfall losses 47,923 5,861 47,923 mm"
41 Runoff depth 19,096 61,158 19,096 mm"
42 Runoff volume 9,251,87 0,03 9251,90 c.m"
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44 Maximum flow 0,543 0,000 0,543 c.m/sec"
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48 HYDROGRAPH Copy to Outflow"
49 8 Copy to outflow"
50 0,543 0,543 0,000 0,000"
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52 6 Combine "
53 1 Node #
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55 Maximum flow 0,543 c.m/sec"

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	C.m"
	0.543
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Runoff Totals on EXIT"	0.543
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Total Impervious area	0.000
Total % Impervious	0.000"
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	hectare"


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360.000 Max. Storm length
2400.000 Max. Hydrograph
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1 Chicago storm
Coefficient A
Constant B
Exponent C
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Fraction R
0.375
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1.000 Time step multiplier
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1 Equal length
1 SCS method
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700.000 Flow length
0.500 Overland Slope
48.450 Pervious Area
700.000 Pervious length
0.500 Pervious slope
0.000 Impervious Area
700.000 Impervious length
0.500 Impervious slope
0.250 Pervious Manning "n"
70.000 Pervious SCS Curve No.
0.339 Pervious Runoff coefficient
0.100 Pervious Ia/S coefficient
10.886 Pervious Initial abstraction"
0.015 Impervious Manning "n"
98.000 Impervious SCS Curve No.
0.000 Impervious Runoff coefficient
0.100 Impervious Ia/S coefficient
0.518 Impervious Initial abstraction"
0.909 0.000 0.000 c.m/sec
Catchment 10 Pervious Impervious Total Area
Surface Area 48.450 0.000 48.450 hectare
Time of concentration 163.504 18.494 163.503 minutes
Time to centroid 380.942 184.158 380.942 minutes
Rainfall depth 80.877 80.877 80.877 mm
Rainfall volume 3.9185 0.0000 3.9185 ha-m
Rainfall losses 53.491 5.695 53.491 mm
Runoff depth 27.387 75.182 27.387 mm
Runoff volume 1.3269 0.0000 1.3269 ha-m
Runoff coefficient 0.339 0.000 0.339 c.m/sec
Maximum flow 0.909 0.000 0.909
4 HYDROGRAPH Add Runoff "
4 Add Runoff " 0.909 0.000 0.000
HYDROGRAPH Copy to Outflow"
8 Copy to Outflow" 0.909 0.909 0.000
HYDROGRAPH Combine 1"
6 Combine "
1 Node #
Total Runoff Draining to Baker Subdivision"
Maximum flow 0.909 c.m/sec

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217127 - Pre 25 year - AW - Nov17
Hydrograph volume 0.909 0.909 0.909 c.m
START/RE-START TOTALS 10"
3 Runoff Totals on EXIT"
Total Catchment area 48.450 hectare
Total Impervious area 0.000 hectare
Total % impervious 0.000
EXIT"

```


217127 - Pre 50 year - AW - Nov17
Hydrograph volume 1.243 16546.217 c.m.
START/RE-START TOTALS 10" 1.243
3 Runoff Totals on EXIT" 48,450
Total Catchment area 0.000
Total Impervious area 0.000
Total % impervious
EXIT"

217127 - Pre 50 year - AW - Nov17
MIDUSS Output Version 2.25 rev. 473
MIDUSS version Sunday, February 07, 2010
Units created 1e METRIC
Job folder: \\os-2k8\users_private\awilkinson\Documents\217127\MIDUSS\217127
Output filename: 217127 - Pre 50 year - AW - Nov17.out
Licensee name: Hewlett-Packard Company
Date & Time last used: 11/24/2017 at 5:52:36 PM
TIME PARAMETERS
Time Step 10.000
Max. Storm length 360.000
Max. Hydrograph 2400.000
1 STORM Chicago storm
4882.600
Coefficient A 19.202
Constant B 0.973
Exponent C 0.373
Fraction R 360.000
Duration 1.000
Time step multiplier 181.226 mm/hr
Maximum intensity 91.285
Total depth
6 050hyd Hydrograph extension used in this file"

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217127 - Pre 100 year - AW - Nov17
Hydrograph Volume 1.604 19916.957 c.m
START/RE-START TOTALS 10"
3 Runoff Totals on EXIT" 1.604
Total Catchment area 48,450 hectare"
Total Impervious area 0.000 hectare"
Total % impervious 0.000"
EXIT"

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217127 - Pre 100 year - AW - Nov17
MIDUSS version 2.25 rev. 473
MIDUSS created Sunday, February 07, 2010
Units used: \\os-2k8\users_private\awilkinson\Documents\le METRIC
Job folder: MIDUSS\217127
Output filename: 217127 - Pre 100 year - AW - Nov17.out
Licensee name: gmbp
Company: Hewlett-Packard Company
Date & Time last used: 11/24/2017 at 5:53:43 PM
TIME PARAMETERS
10.000 Time Step
360.000 Max. Storm length
2400.000 Max. Hydrograph
1 STORM Chicago storm
1 Chicago storm
5607.280 Coefficient "A"
19.798 Constant "B"
0.977 Exponent "C"
0.375 Fraction "R"
360.000 Duration
1.000 Time step multiplier
Maximum intensity 200.453 mm/hr
Total depth 101.430 mm
6 100hyd Hydrograph extension used in this file"
CATCHMENT 10
1 Triangular SCS
1 Equal length
1 SCS method
10 Lands Draining to the Baker subdivision
0.000 % Impervious
48.450 Total Area
700.000 Flow length
0.500 Overland Slope
48.450 Pervious Area
700.000 Pervious length
0.500 Pervious slope
0.000 Impervious Area
700.000 Impervious length
0.500 Impervious slope
0.250 Pervious Manning "n"
70.000 Pervious SCS Curve No.
0.405 Pervious Runoff coefficient
0.100 Pervious Ia/S coefficient
10.886 Pervious Initial abstraction
0.015 Impervious Manning "n"
98.000 Impervious SCS Curve No.
0.000 Impervious Runoff coefficient
0.100 Impervious Ia/S coefficient
0.518 Impervious Initial abstraction
Catchment 10 Pervious 0.000 0.000 c.m/sec
Surface Area 48.450 0.000 Total Area
Time of concentration 136.666 16.961 136.666 hectare"
Time to centroid 345.057 345.057 minutes"
Rainfall depth 101.430 101.430 mm"
Rainfall volume 4.9143 4.9143 ha-m"
Rainfall losses 60.321 5.532 mm"
Runoff depth 41.108 95.897 mm"
Runoff volume 1.9917 1.9917 ha-m"
Runoff coefficient 0.405 0.000 c.m/sec
Maximum flow 1.604 0.000 1.604
4 Add Runoff "1.604 1.604 0.000"
HYDROGRAPH Copy to Outflow"
8 Copy to Outflow" 1.604 1.604 0.000"
HYDROGRAPH Combine 1"
6 Combine "1.604 1.604 0.000"
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1 Total Runoff Draining to Baker subdivision" 1.604 c.m/sec
Maximum flow

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APPENDIX B:
MIDUSS MODELLING – POST-DEVELOPMENT CONDITIONS


```

217127 - Post 2 year - AW - Nov17
-----
MIDUSS output
MIDUSS version      Version 2.25 rev. 473
MIDUSS created      Sunday, February 07, 2010
Job folder:         \\os-2k8\users_private\awilkinson\Documents\
                    MIDUSS\217127
Output filename:     217127 - Post 2 year - AW - Nov17.out
Licensee name:       Hewlett-Packard Company
Date & Time last used: 11/24/2017 at 6:30:28 PM
TIME PARAMETERS
Time Step           10.000
Max. Storm length   360.000
Max. Hydrograph     2400.000
STORM Chicago storm
Coefficient A        1264.600
Coefficient B        10.288
Exponent C          0.889
Fraction R          0.375
Duration            360.000
Time step multiplier 1.000
Maximum intensity   85.735 mm/hr
Total depth         39.484 mm
6 002Hyd Hydrograph extension used in this file"
33 1 Triangular SCS
    1 Equal length"
    1 SCS method"
    1 Lands to the East of the Re-Aligned BR33 Draining to the Baker
Subdivision"
    100 % Impervious"
    2.000 Total Area"
    42.650 Flow length"
    600.000 Overland Slope"
    0.500 Pervious Area"
    41.797 Pervious length"
    600.000 Pervious slope"
    0.500 Pervious Area"
    0.853 Impervious length"
    600.000 Impervious slope"
    0.500 Pervious Manning "n"
    0.250 Pervious SCS Curve No.
    0.151 Pervious Runoff coefficient"
    0.100 Pervious Ia/S coefficient"
    10.886 Pervious Initial abstraction"
    0.015 Pervious Manning "n"
    98.000 Impervious SCS Curve No.
    0.870 Impervious Runoff coefficient"
    0.100 Impervious Ia/S coefficient"
    0.518 Impervious Initial abstraction"
    0.095 Catchment 100
    0.000 Pervious
    0.853 Surface Area
    41.797 Time of concentration
    307.043 Time to Centroid
    559.964 Rainfall depth
    39.484 Rainfall volume
    1.6303 Rainfall losses
    33.534 Runoff depth
    2486.75 Runoff volume
    292.90 Runoff coefficient
    0.151 Maximum flow
    0.090 HYDROGRAPH Add Runoff "
    0.095 Add Runoff "
    0.095 Catchment 200"
    1 Triangular SCS"
    1 Equal length"
    1 SCS method"
    200 Lands to the west of the Re-Aligned BR33 Draining to the Baker
Subdivision"
    10.000 % Impervious"

```

```

217127 - Post 2 year - AW - Nov17
-----
Total Area
Flow length"
Overland Slope"
Pervious Area"
Pervious length"
Pervious slope"
Impervious Area"
Impervious length"
Impervious slope"
Pervious Manning "n"
Pervious SCS Curve No.
Pervious Runoff coefficient"
Pervious Ia/S coefficient"
Pervious Initial abstraction"
Impervious Manning "n"
Impervious SCS Curve No.
Impervious Runoff coefficient"
Impervious Ia/S coefficient"
Impervious Initial abstraction"
Catchment 200
Surface Area
Time of concentration
Time to Centroid
Rainfall depth
Rainfall volume
Rainfall losses
Runoff depth
Runoff volume
Runoff coefficient
Runoff coefficient
Maximum flow
HYDROGRAPH Add Runoff "
4 Add Runoff "
0.091
0.172
0.000
0.000"
POND DESIGN"
0.172 Current peak flow c.m/sec"
1.604 Target outflow c.m/sec"
3288.1 Hydrograph volume c.m"
3 Number of stages"
0.000 Minimum water level metre"
1.000 Maximum water level metre"
0.000 Starting water level metre"
Keep design data: 1 = True; 0 = False"
Level Discharge Volume"
0.000 0.000 0.000"
1.250 0.09600 470.000"
0.6250 1.604 2500.000"
Peak outflow 0.096 c.m/sec"
Maximum level 0.624 metre"
Maximum storage 469.025 c.m"
Centroidal lag 9.437 hours"
0.091 0.172 0.096 0.000 c.m/sec"
HYDROGRAPH 1"
6 Combine "
1 Node #"
Total Runoff Draining to Baker Subdivision"
Maximum flow 0.096 c.m/sec"
Hydrograph volume 3288.095 c.m"
START/RE-START TOTALS 200"
3 Runoff Totals on EXIT"
Total Catchment area 48.450 hectare"
Total Impervious area 1.433 hectare"
Total % Impervious 2.958"
EXIT"

```



```

217127 - Post 5 year - AW - Nov17
-----
MIDUSS Output
MIDUSS Version Version 2.25 rev. 473
MIDUSS created Sunday, February 07, 2010
Units used: \\os-2k8\users\private\awilkinson\Documents\ie METRIC
Job Folder: MIDUSS\217127
Output filename: 217127 - Post 5 year - AW - Nov17.out
Licensee name: Hewlett-Packard Company
Date & Time last used: 11/24/2017 at 6:32:45 PM

TIME PARAMETERS
Time step 10.000
Max. storm length 360.000
Max. Hydrograph 2400.000
STORM Chicago storm
Coefficient A 1
Constant B 2258.600
Exponent C 14.090
Fraction R 0.927
Duration 360.000
Time step multiplier 1.000
Total intensity 116.710 mm/hr
Total depth 55.992 mm
6.00SHyd Hydrograph extension used in this file"
CATCHMENT 100
1 Triangular SCS
1 Equal length"
1 SCS method"
100 Lands to the East of the Re-Aligned BR33 Draining to the Baker
Subdivision"
2.000 % Impervious"
42.650 Total Area"
600.000 Flow length"
0.500 Overland Slope"
41.797 Pervious Area"
600.000 Pervious length"
0.500 Pervious slope"
0.853 Impervious Area"
0.500 Impervious length"
0.250 Pervious Manning "n"
0.236 Pervious SCS Curve No.
0.100 Pervious Runoff coefficient"
0.100 Pervious Ia/S coefficient"
10.886 Pervious Initial abstraction"
0.015 Pervious Manning "n"
98.000 Impervious SCS Curve No.
0.899 Impervious Runoff coefficient"
0.100 Impervious Ia/S coefficient"
0.518 Impervious Initial abstraction"
0.305 Pervious
0.000 Impervious
Catchment 100 Pervious
Surface Area 41.797
Time of concentration 209.184
Time to Centroid 438.814
Rainfall depth 55.992
Rainfall volume 2.3403
Rainfall losses 2.3403
Runoff depth 15.213
Runoff volume 532.44
Runoff coefficient 0.236
Maximum flow 0.299
HYDROGRAPH Add_Runoff " 0.299
4 Add Runoff " 0.305 0.000 0.000"
CATCHMENT 200
1 Triangular SCS"
1 Equal length"
1 SCS method"
200 Lands to the west of the Re-Aligned BR33 Draining to the Baker
Subdivision"
10.000 % Impervious"

```

```

217127 - Post 5 year - AW - Nov17
-----
Total Area" 5.800
Flow length" 150.000
Overland Slope" 0.500
Pervious Area" 150.000
Pervious length" 0.500
Pervious slope" 0.580
Impervious Area" 150.000
Impervious length" 0.500
Pervious Manning "n" 0.250
Pervious SCS Curve No. 70.000
Pervious Runoff coefficient" 0.236
Pervious Ia/S coefficient" 0.100
Pervious Initial abstraction" 10.886
Impervious Manning "n" 0.015
Impervious SCS Curve No. 98.000
Impervious Runoff coefficient" 0.896
Impervious Ia/S coefficient" 0.100
Impervious Initial abstraction" 0.518
Catchment 200 Pervious 0.144 0.305 0.000
Surface Area 5220
Time of concentration 91.033
Time to Centroid 282.453
Rainfall depth 55.992
Rainfall volume 2922.80
Rainfall losses 42.781
Runoff depth 13.212
Runoff volume 689.64
Runoff coefficient 0.236
Maximum flow 0.896
HYDROGRAPH Add_Runoff " 0.076 0.132 0.144
4 Add Runoff " 0.144 0.349 0.000 0.000"
POND DESIGN"
0.349 Current peak flow c.m/sec"
1.604 Target outflow c.m/sec"
6932.3 Hydrograph volume c.m"
0.000 Number of stages"
1.000 Minimum water level metre"
0.000 Maximum water level metre"
0.000 Starting water level metre"
Keep Design Data: 1 = True; 0 = False"
Level Discharge Volume"
0.6250 0.09600 470.000"
1.250 1.604 2500.000"
Peak outflow 0.334 c.m/sec"
Maximum level 0.724 metre"
Maximum storage 790.348 c.m"
Centroidal lag 7.566 hours"
0.144 0.349 0.334 0.000 c.m/sec"
6 HYDROGRAPH Combine 1"
1 Node #"
Total Runoff Draining to Baker Subdivision"
Maximum flow 0.334 c.m/sec"
Hydrograph volume 6933.469 c.m"
0.144 0.334 0.334"
3 START/RE-START TOTALS 200"
Runoff Totals on EXIT"
Total Catchment area 48.450 hectare"
Total Impervious area 1.433 hectare"
Total % Impervious 2.958"
EXIT"

```



```

217127 - Post 10 year - AW - Nov17
-----
MIDUSS Output:
MIDUSS version: Version 2.25 rev. 473
MIDUSS created: Sunday, February 07, 2010
Units used: \\os-2k8\users_private\awilkinson\Documents\
MIDUSS\217127
Job folder:
Output filename: 217127 - Post 10 year - AW - Nov17.out
Licensee name: Hewlett-Packard Company
Company: gmbp
Date & Time last used: 11/24/2017 at 6:34:46 PM
TIME PARAMETERS:
31 10.000 Time Step
360.000 Max. Storm Length
2400.000 Max. Hydrograph
32 STORM Chicago storm
3043.260 Coefficient A
16.180 Constant B
0.946 Exponent C
0.375 Fraction R
360.000 Duration
1.000 Time step multiplier
Maximum intensity 136.818 mm/hr
Total depth 67.019 mm
6 CATCHMENT 100
1 Triangular SCS
1 Equal length
1 SCS method
1 Lands to the East of the Re-Aligned BR33 Draining to the Baker
Subdivision 100
% Impervious
2.000 Total Area
42.650 Flow length
600.000 Overland Slope
0.500 Pervious Area
41.797 Pervious length
600.000 Pervious slope
0.500 Impervious Area
0.853 Impervious length
600.000 Impervious Manning "n"
0.500 Pervious Manning "n"
0.230 Pervious SCS Curve No.
0.285 Pervious Runoff coefficient
0.100 Pervious Ia/S coefficient
10.886 Pervious Initial abstraction
0.015 Impervious Manning "n"
98.000 Impervious SCS Curve No.
0.918 Impervious Runoff coefficient
0.100 Impervious Ia/S coefficient
0.518 Impervious Initial abstraction
0.518 Catchment 100
Surface Area 41.797 Pervious
Time of concentration 175.825
Rainfall depth 397.300
Rainfall volume 67.019
Rainfall losses 2.8012
Runoff depth 19.094
Runoff volume 7980.69
Runoff coefficient 0.285
Maximum flow 524.58
HYDROGRAPH Add Runoff " 0.518 0.000 0.000 0.000"
4 Add Runoff " 0.518 0.518 0.000 0.000"
CATCHMENT 200
1 Triangular SCS
1 Equal length
1 SCS method
200 Lands to the west of the Re-Aligned BR33 Draining to the Baker
Subdivision 10.000 % Impervious

```

```

217127 - Post 10 year - AW - Nov17
-----
Total Area 5.800
Flow length 150.000
Overland Slope 0.500
Pervious Area 5.220
Pervious length 150.000
Pervious slope 0.500
Impervious Area 0.580
Impervious length 150.000
Impervious Manning "n" 0.500
Pervious SCS Curve No. 0.230
Pervious Runoff coefficient 0.285
Pervious Ia/S coefficient 0.100
Pervious Initial abstraction 10.886
Impervious Manning "n" 0.015
Impervious SCS Curve No. 98.000
Impervious Runoff coefficient 0.903
Impervious Ia/S coefficient 0.100
Impervious Initial abstraction 0.518
Catchment 200
Surface Area 5.220
Time of concentration 76.532
Rainfall depth 272.413
Rainfall volume 3498.38
Rainfall losses 47.938
Runoff depth 19.080
Runoff volume 996.00
Runoff coefficient 0.285
Maximum flow 0.128
HYDROGRAPH Add Runoff " 0.184 0.518 0.000 0.000"
4 Add Runoff " 0.184 0.591 0.000 0.000"
POND DESIGN
0.591 Current peak flow c.m/sec
1.604 Target outflow c.m/sec
9852.1 Hydrograph volume c.m
3 Number of stages metre
0.000 Minimum water level metre
1.000 Maximum water level metre
0.000 Starting water level metre
Keep Design Data: I = True; O = False
Level discharge volume 0.000
0.6250 0.09600 470.000
1.250 1.604 2500.000
Peak outflow 0.560 c.m/sec
Maximum level 0.818 metre
Maximum storage 1095.426 c.m
Centroidal lag 6.881 hours
0.184 0.591 0.560 0.000 c.m/sec
HYDROGRAPH Combine 1
6 Combine " Node #
Total Runoff Draining to Baker Subdivision
Maximum flow 0.560 c.m/sec
Hydrograph volume 9850.785 c.m
0.184 0.591 0.560 0.560"
3 START/RE-START TOTALS 200
Runoff totals on EXIT
Total Catchment area 48.450 hectare
Total Impervious area 1.433 hectare
Total % impervious 2.958
EXIT

```


217127 - Post 25 year - AW - Nov17

MIDUSS Output
MIDUSS version 2.25 rev. 473
MIDUSS created Sunday, February 07, 2010
Units used: 1e METRIC
Job folder: \\os-2k8\users_private\awilkinson\Documents\217127\MIDUSS\217127
Output filename: 217127 - Post 25 year - AW - Nov17.out
Licensee name: Hewlett-Packard Company
Company: gmbp
Date & Time last used: 11/24/2017 at 6:36:32 PM

TIME PARAMETERS

Max. Storm length

Max. Hydrograph

STORM Chicago storm

Chicago storm

Coefficient A

Constant B

Exponent C

Fraction R

Duration

Time step multiplier

Maximum intensity

Total depth

0.25hyd Hydrograph extension used in this file

CATCHMENT 100

Triangular SCS

Equal length

SCS method

Lands to the East of the Re-Aligned BR33 Draining to the Baker

Subdivision

% Impervious

Total Area

Flow length

Overland Slope

Pervious Area

Pervious length

Impervious Slope

Impervious Manning

Pervious SCS Curve No.

Pervious Runoff coefficient

Pervious Ia/S coefficient

Pervious Initial abstraction

Impervious Manning

Impervious SCS Curve No.

Impervious Runoff coefficient

Impervious Ia/S coefficient

Impervious Initial abstraction

Catchment 100

Surface Area

Time of concentration

Time to Centroid

Rainfall depth

Rainfall volume

Rainfall losses

Runoff depth

Runoff volume

Runoff coefficient

Maximum flow

HYDROGRAPH Add Runoff

Add Runoff

CATCHMENT 200

Triangular SCS

Equal length

SCS method

Lands to the West of the Re-Aligned BR33 Draining to the Baker

Subdivision

% Impervious

10.000

217127 - Post 25 year - AW - Nov17

Total Area
Flow length
Overland Slope
Pervious Area
Pervious length
Pervious slope
Impervious Area
Impervious length
Impervious Manning
Pervious SCS Curve No.
Pervious Runoff coefficient
Pervious Ia/S coefficient
Pervious Initial abstraction
Impervious Manning
Impervious SCS Curve No.
Impervious Runoff coefficient
Impervious Ia/S coefficient
Impervious Initial abstraction
Catchment 200
Surface Area
Time of concentration
Time to Centroid
Rainfall depth
Rainfall volume
Rainfall losses
Runoff depth
Runoff volume
Runoff coefficient
Maximum flow
HYDROGRAPH Add Runoff
Add Runoff
POND DESIGN
Current peak flow
Target outflow
Hydrograph volume
Number of stages
Minimum water level
Maximum water level
Starting water level
Keep Design Data: 1 = True; 0 = False
Level Discharge
Volume
Peak outflow
Maximum level
Maximum storage
Centroidal lag
HYDROGRAPH Combine
Node #
Total Runoff Draining to Baker Subdivision
Maximum flow
Hydrograph volume
START/RE-START TOTALS
Runoff totals on EXIT
Total Catchment area
Total Impervious area
Total % Impervious
EXIT

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Subdivision

% Impervious

Total Area

Flow length

Overland Slope

Pervious Area

Pervious length

Impervious Slope

Impervious Area

Impervious length

Impervious Manning

Pervious SCS Curve No.

Pervious Runoff coefficient

Pervious Ia/S coefficient

Pervious Initial abstraction

Impervious Manning

Impervious SCS Curve No.

Impervious Runoff coefficient

Impervious Ia/S coefficient

Impervious Initial abstraction

Catchment 100

Surface Area

Time of concentration

Time to Centroid

Rainfall depth

Rainfall volume

Rainfall losses

Runoff depth

Runoff volume

Runoff coefficient

Maximum flow

HYDROGRAPH Add Runoff

Add Runoff

CATCHMENT 200

Triangular SCS

Equal length

SCS method

Lands to the West of the Re-Aligned BR33 Draining to the Baker

Subdivision

% Impervious

10.000


```

31 MIDUSS Output ----->
MIDUSS version Version 2.25 rev. 473
MIDUSS created Sunday, February 07, 2010
Units used: ie METRIC
Job folder: \\os-2k8\users_private\awilkinson\Documents\
MIDUSS\217127
Output filename: 217127 - Post 50 year - AW - Nov17.out
Licensee name: Hewlett-Packard Company
Company gmop
Date & Time last used: 11/24/2017 at 6:37:59 PM
TIME PARAMETERS
31 10.000 Time Step
360.000 Max. Storm length"
2400.000 Max. Hydrograph"
32 STORM Chicago storm"
1 Chicago storm"
Coefficient A"
19.202 Constant B"
0.972 Exponent C"
0.375 Fraction R"
360.000 Duration"
1.000 Time step multiplier"
Maximum intensity 181.226 mm/hr"
Total depth 91.285 mm"
6 CATCHMENT 100"
1 Triangular SCS"
1 Equal length"
1 SCS method"
33 Lands to the East of the Re-Aligned BR33 Draining to the Baker
100 % Impervious"
2.000 Total Area"
42.650 Flow length"
600.000 Overland Slope"
0.500 Pervious Area"
41.797 Pervious length"
600.000 Pervious slope"
0.500 Impervious Area"
0.853 Impervious length"
600.000 Impervious slope"
0.500 Pervious Manning "n"
0.250 Pervious SCS Curve No.
0.374 Pervious Runoff coefficient"
0.100 Pervious Ia/S coefficient"
10.886 Pervious Initial abstraction"
0.015 Impervious Manning "n"
98.000 Impervious SCS Curve No.
0.938 Impervious Runoff coefficient"
0.100 Impervious Ia/S coefficient"
0.518 Impervious Initial abstraction"
0.000 c.m./sec"
Catchment 100 Pervious Total Area "
Surface Area 41.797 Impervious Total Area "
Time of concentration 135.353 129.549 hectare"
Rainfall depth 343.590 335.632 minutes"
Rainfall volume 91.285 91.285 mm"
Rainfall losses 3.8154 3.8933 ha-m"
Runoff depth 34.135 35.649 mm"
Runoff volume 34.135 35.649 ha-m"
Runoff coefficient 1.4275 1.5005
Maximum flow 0.374 0.938 c.m./sec"
HYDROGRAPH Add Runoff " 1.167 0.295
4 Add Runoff " 1.183 0.000 0.000"
33 CATCHMENT 200"
1 Triangular SCS"
1 Equal length"
1 SCS method"
200 Lands to the west of the Re-Aligned BR33 Draining to the Baker
10.000 % Impervious"

```

```

5.800 Total Area"
150.000 Flow length"
0.500 Overland Slope"
5.220 Pervious Area"
150.000 Pervious length"
0.500 Pervious slope"
0.580 Impervious Area"
150.000 Impervious length"
0.500 Impervious slope"
0.500 Pervious Manning "n"
0.250 Pervious SCS Curve No.
0.374 Pervious Runoff coefficient"
0.100 Pervious Ia/S coefficient"
10.886 Pervious Initial abstraction"
0.015 Impervious Manning "n"
98.000 Impervious SCS Curve No.
0.938 Impervious Runoff coefficient"
0.100 Impervious Ia/S coefficient"
0.518 Impervious Initial abstraction"
0.000 c.m./sec"
Catchment 200 Pervious Total Area "
Surface Area 5.220 Impervious Total Area "
Time of concentration 58.916 7.017 hectare"
Rainfall depth 246.510 166.943 minutes"
Rainfall volume 91.285 91.285 mm"
Rainfall losses 57.151 7.392 c.m"
Runoff depth 34.134 83.892 mm"
Runoff volume 1781.79 486.58 c.m"
Runoff coefficient 0.374 0.919 c.m./sec"
Maximum flow 0.284 0.216 c.m./sec"
4 Add Runoff " 1.325 0.000 0.000"
POND DESIGN"
1.325 Current peak flow c.m./sec"
1.604 Target outflow c.m./sec"
172733 Hydrograph volume c.m"
3. Number of stages" metre"
0.000 Minimum water level metre"
1.000 Maximum water level metre"
0.000 Starting water level metre"
0 Keep Design Data: 1 = True; 0 = False"
Level Discharge Volume"
0.6250 0.09600 470.000"
1.250 1.604 2500.000"
Peak outflow 1.247 c.m./sec"
Maximum level 1.102 metre"
Maximum storage 2019.060 c.m"
Centroidal lag 5.985 hours"
0.309 1.325 1.247 0.000 c.m./sec"
HYDROGRAPH Combine 1"
6 Combine " Node #
1 Total Runoff Draining to Baker Subdivision"
Maximum flow 1.247 c.m./sec"
Hydrograph volume 17268.881 1.247"
START/RE-START TOTALS 200"
3 Runoff Totals on EXIT"
Total Catchment area 48.450 hectare"
Total Impervious area 1.433 hectare"
Total % Impervious 2.958"
EXIT"

```


MIDUSS Output
 MIDUSS version Version 2.25 rev. 473
 MIDUSS created Sunday, February 07, 2010
 Units used: \\os-2k8\users_private\aw\lkinson\Documents\ MIDUSS\217127.out
 Job folder:
 Output filename: 217127 - Post 100 year - AW - NOV17.out
 Licensee name: Hewlett-Packard Company
 Date & Time last used: 11/24/2017 at 6:16:16 PM

10

TIME PARAMETERS

31 10,000 Time step
 360,000 Max. Storm length
 2400,000 Max. Hydrograph
 1 STORM Chicago storm
 5607,280 Coefficient A
 19,798 Constant B
 0.977 Exponent C
 0.375 Fraction R
 360,000 Duration
 1,000 Time step multiplier

32 600,000 Maximum intensity 200.453 mm/hr
 101.430 mm
 6 100hyd Hydrograph extension used in this file
 33 CATCHMENT 100
 1 Triangular SCS
 1 Equal length
 1 SCS method
 1 Lands to the East of the Re-Aligned BR33 Draining to the Baker

Subdivision
 2,000 % Impervious
 42,650 Total Area
 600,000 Flow length
 0,500 Overland Slope
 41,797 Pervious Area
 600,000 Pervious length
 0,500 Pervious slope
 0,853 Impervious Area
 600,000 Impervious length
 0,500 Impervious slope
 0,250 Pervious Manning 'n'
 70,000 Pervious SCS Curve No.
 0.405 Pervious Runoff coefficient
 0.100 Pervious Ia/S coefficient
 10,886 Pervious Initial abstraction
 0.015 Impervious Manning 'n'
 98,000 Impervious SCS Curve No.
 0.941 Impervious Runoff coefficient
 0.100 Impervious Ia/S coefficient
 0.518 Impervious Initial abstraction

Catchment 100 Pervious 0.000 c.m/sec
 Surface Area 41,797 Impervious 42,650
 Time of concentration 124,593 15,463
 Rainfall depth 329,625 322,841
 Rainfall volume 4,239 4,320
 Rainfall losses 60,324 59,239
 Runoff depth 41,105 59,239
 Runoff volume 1,7181 59,239
 Runoff coefficient 0.405 0.416
 Maximum flow 1,495 0.334
 HYDROGRAPH Add Runoff " 1.516 1.516
 4 Add Runoff " 1.516 1.516 0.000 0.000"

33 CATCHMENT 200

1 Triangular SCS
 1 Equal length
 1 SCS method
 200 Lands to the West of the Re-Aligned BR33 Draining to the Baker
 Subdivision
 10,000 % Impervious

5,800 Total Area
 150,000 Flow length
 0,500 Overland Slope
 5,220 Pervious Area
 150,000 Pervious length
 0,500 Pervious slope
 0,580 Impervious Area
 150,000 Impervious length
 0,500 Impervious slope
 0,250 Pervious Manning 'n'
 70,000 Pervious SCS Curve No.
 0.405 Pervious Runoff coefficient
 10,886 Pervious Ia/S coefficient
 0.015 Impervious Manning 'n'
 98,000 Impervious SCS Curve No.
 0.927 Impervious Runoff coefficient
 0.100 Impervious Ia/S coefficient
 0.518 Impervious Initial abstraction
 0.398 1.516
 Catchment 200 Pervious 0.000 c.m/sec
 Surface Area 5,220 Impervious 42,650
 Time of concentration 239,795 166,061
 Rainfall depth 101,430 101,430
 Rainfall volume 5294,63 588,29
 Rainfall losses 60,323 7,437
 Runoff depth 41,107 93,993
 Runoff volume 2145,76 545,16
 Runoff coefficient 0.405 0.927
 Maximum flow 0.356 0.239
 HYDROGRAPH Add Runoff " 0.398 1.729 0.000 0.000"

40

4 Add Runoff " 0.398 1.729 0.000 0.000"

54

POND DESIGN

1,729 Current peak flow c.m/sec
 1,604 Target outflow c.m/sec
 20686.0 Hydrograph volume c.m
 0,000 Number of stages
 0,000 Minimum water level metre
 1,000 Starting water level metre
 0,000 Keep Design Data: 1 = True; 0 = False

Level Discharge Volume
 0.6250 0.09600 470,000
 1,250 1,604 2500,000

Peak outflow 1,595 c.m/sec
 Maximum level 1,248 metre
 Maximum storage 2494,451 c.m
 Centroidal lag 5,752 hours
 0.398 1.729 1.595 0.000 c.m/sec

6 HYDROGRAPH Combine 1"

1 Node #
 Total Runoff Draining to Baker Subdivision
 Maximum flow 1,595 c.m/sec
 Hydrograph volume 20681,271 c.m
 1,395 1,395

START/RE-START TOTALS

200
 3 Runoff Totals on EXIT
 Total Catchment area
 Total Impervious area
 Total % Impervious

48,450 hectare
 1,433 hectare
 2.958

APPENDIX C:
ENHANCED GRASS SWALES – MIDUSS MODELLING


```

217127 - Post 4 hr 25 mm - AW - NOV17
-----
MIDUSS Output ----->
MIDUSS version Version 2.25 rev. 473
MIDUSS created Sunday, February 07, 2010
Units used: \\os-2k8\users_private\awilkinson\documents\1e METRIC
Job folder: MIDUSS\217127
Output filename: 217127 - Post 4 hr 25 mm - AW - NOV17.out
Licensee name: Hewlett-Packard Company
Company: gmrb
Date & Time last used: 11/24/2017 at 5:55:23 PM

TIME PARAMETERS
10.000 Time step
240.000 Max. storm length"
2400.000 Max. Hydrograph"
2400.000 Max. Canada AES"
32 4 Canada AES"
25.000 Rainfall depth"
240.000 Duration" depth"
84.000 Time to peak"
7.000 Decay factor"
Maximum intensity 21.392 mm/hr"
Total depth 25.000 mm"
6 001hyd Hydrograph extension used in this file"
33 CATCHMENT 100"
1 Triangular SCS"
1 Equal length"
1 SCS method"
100 Lands to the East of the Re-Aligned BR33 Draining to the Baker
Subdivision"
2.000 % Impervious"
42.650 Total Area"
600.000 Flow length"
0.500 Overland Slope"
41.797 Pervious Area"
600.000 Pervious length"
0.500 Pervious slope"
0.853 Impervious Area"
600.000 Impervious length"
0.500 Impervious slope"
0.250 Pervious Manning "n"
70.000 Pervious SCS Curve No.
0.064 Pervious Runoff coefficient"
0.100 Pervious Ia/S coefficient"
10.886 Pervious Initial abstraction"
0.015 Impervious Manning "n"
98.000 Impervious SCS Curve No.
0.806 Impervious Runoff coefficient"
0.100 Impervious Ia/S coefficient"
0.518 Impervious Initial abstraction"
0.041 0.000 0.000 0.000 c.m/sec"
Catchment 100 Pervious Impervious Total Area "
Surface Area 41.797 42.650 hecta-e"
Time of concentration 516.931 38.538 419.462 minutes"
Rainfall depth 606.885 125.117 508.728 mm"
Rainfall volume 25.000 25.000 25.000 ha-m"
Rainfall losses 23.393 4.849 23.022 mm"
Runoff depth 1.607 20.151 1.978 mm"
Runoff volume 671.77 171.89 843.67 c.m"
Runoff coefficient 0.064 0.806 0.079 c.m/sec"
Maximum Flow 0.019 0.040 0.041
4 Add Runoff" 0.041 0.000 0.000"
CHANNEL DESIGN"
0.041 Current peak flow c.m/sec"
0.035 Manning "n"
0. Cross-section type: 0=trapezoidal; 1=general"
0.850 Basewidth metre"
3.000 Left bank slope"
3.000 Right bank slope"
0.100 Channel depth metre"
0.500 Gradient %"

```

```

217127 - Post 4 hr 25 mm - AW - NOV17
-----
Depth of flow 0.098 metre"
Velocity 0.364 m/sec"
Channel capacity 0.042 c.m/sec"
Critical depth 0.058 metre"
ROUTE Zero Route"
0.00 Zero Route Reach length (metre)" 0.000 c.m/sec"
1" 0.041 1"
6 HYDROGRAPH " Combine
1 Node #
Maximum Flow through EGS" 0.041 c.m/sec"
Hydrograph volume 843.665 c.m"
0.041 0.041 0.041"
3 START/RE-START TOTALS 100"
Runoff Totals on EXIT"
Total Catchment area
Total Impervious area
Total % Impervious
EXIT"
42.650 hectare"
0.853 hectare"
2.000*

```


APPENDIX C: CONSULTATION

**SCHEDULE "B" MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT
BRUCE ROAD 33 RE-ALIGNMENT
TOWN OF SAUGEEN SHORES
PUBLIC AGENCY CIRCULATION LIST
FILE NO. 217127
APRIL 2018**

AGENCIES	CONTACT
UTILITIES	
Eastlink 77 Main Street Lions Head, ON N0H 1W0	Dan Oswald Tel: (519) 793-3111 Email: dan.oswald@corp.eastlink.ca
MUNICIPAL AGENCIES	
County of Bruce Planning and Development 1243 MacKenzie Road Port Elgin, ON N0H2C6	Tessa Fortier Tel: 226-909-1601 ext.2 Email: TFortier@brucecounty.on.ca
County of Bruce Highways Department 30 Park Street, PO Box 848 Walkerton, ON N0G 2V0	Brian Knox Tel: (519) 881-1782 ext. 263 Fax: (519) 507-3030 Email: bknox@brucecounty.on.ca
Grey Bruce Health Unit 101-17 th Street East Owen Sound, ON N4K 0A5	Bev Middleton Tel: (519) 376-9420 Fax: (519) 376-5043 Email: publichealth@publichealthgreybruce.on.ca
Saugeen Valley Conservation Authority 1078 Bruce Road 12, Box 150 Formosa, ON N0G 1W0	Erik Downing Tel: (519) 367-3040 Fax: (519) 367-3041 Email: e.downing@svca.on.ca
Town of Saugeen Shores PO Box 820 600 Tomlinson Drive Port Elgin, ON N0H 2C0	Amanda Froese Tel: (519) 832-2008 Fax: (519) 832-2140 Email: amanda.froese@saugeenshores.ca
Ministry of the Environment Owen Sound Area Office 101-17 th Street East, 3 rd Floor Owen Sound, ON N4K 0A5	Ian Mitchell Tel: (519) 371-2901 Fax: (519) 371-2905 Email: ian.mitchell@ontario.ca
Ministry of the Environment Southwestern Region London Regional Office 733 Exeter Road, 2 nd Floor London, ON N6E 1L3	Tammie Ryall Tel: (519) 873-5014 Fax: (519) 873-5020 Email: tammy.ryall@ontario.ca
Ministry of the Environment Environmental Assessment & Approvals Branch 135 St. Clair Avenue West, 1 st Floor Toronto, ON M4V 1P5 • Notices of Completion Only	Email: mea.notices.eaab@ontario.ca

**SCHEDULE "B" MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT
BRUCE ROAD 33 RE-ALIGNMENT
TOWN OF SAUGEEN SHORES
PUBLIC AGENCY CIRCULATION LIST
FILE NO. 217127
APRIL 2018**

CIRCULATED BY COUNTY

AGENCIES	CONTACT
FIRST NATION / MÉTIS	
Saugeen Ojibway Nation SON Environmental Office 25 Maadookii Subdivision R.R. #5 Wiarton, ON N0H 2T0	Doran Ritchie Tel: (519) 534-5507 ext. 226 Fax: (519) 534-5525 Email: d.ritchie@saugeenojibwaynation.ca
Saugeen First Nation Chippewas of Saugeen First Nation No. 29 6493 Highway 21, RR#1 Southampton, ON N0H 2L0	Cheree Urscheler Tel: (519) 797-2781 Fax: (519) 797-2978 Email: sfn@saugeenfirstnation.ca
Historic Saugeen Metis 204 High Street, Box 1492 Southampton, ON N0H 2L0	George Govier Tel: (519) 483-4000 Fax: (519) 783-4002 Email: saugeenmetisadmin@bmts.com
Chippewas of Nawash Unceded Nation 135 Lakeshore Boulevard Neyaashinigmiing, ON N0H 2T0	Rose Lameman Tel: (519) 534-1689 Fax: (519) 534-2130 Email: cnadministrator@nawash.ca
MNO Great Lakes Metis Council 380-9 th Street East Owen Sound, ON N4K 1P1	Pete Couture Tel: (519) 370-0435 Fax: (519) 370-0436 Email: consultations@metisnation.org
PRIVATE GROUPS	
Lake Ridge Estates P.O. Box 614, R.R. #3 Port Elgin, ON N0H 2C0	Andy Kuperus Tel: (519) 832-2058 Fax: (519) 389-4547 Email: l.kuperus@bmts.com
Port Elgin & Saugeen Township Beacher's Organization Box 377 Port Elgin, ON N0H 2C0	David Shemilt Tel: (519) 386-0934 Email: manager@beachers.org
CAW Family Education Centre R.R. #1, Bruce County Road 25 115 Shipley Avenue Port Elgin, ON N0H 2C5	Tel: (519) 389-3200 Email: confcentre@unifor.org
Canadian Tire Real Estate	Victor Simone Email: victor.simone@cantire.com
Unifor (CAW) 205 Placer Court North York, ON M2H 3H9	Graeme Brown Tel: (416) 495-3799 Fax: (416) 495-6559 Email: Graeme.Brown@unifor.org
Unifor (CAW) 10 Collard Way PO Box 1725 Port Elgin, ON N0H 2C0	Brad R. Pryde, P.Eng. Tel: (519) 832-5950 Email: bpryde@bmts.com
Cuesta Planning Consultants 978 First Avenue West Owen Sound ON N4K 4K5	David Ellingwood Tel 519-372-9790 Email: cuesta@cuestaplanning.com



BRUCE ROAD 25 AND BRUCE ROAD 33 REALIGNMENT
Town of Saugeen Shores - Port Elgin
August 11, 2017 -10am



MEETING MINUTES

Attendees: Amanda Froese, Town of Saugeen Shores
Adam Stanley, Town of Saugeen Shores
Len Perdue, Town of Saugeen Shores
John Slocombe, GM BluePlan
Brian Knox, Bruce County Highways
Kerri Meier, Bruce County Highways

Master Plan - Bruce Road 25 & Bruce Road 33 Realignment

Background on the outcome of the Master Plan for Roads and Drainage was provided:

Drainage:

- Construct a new 1:100 year capacity storm sewer on Bruce Road 25 from Goderich St. to Lake Range Road
- Construct a new 1:5 year capacity storm sewer on Bruce Road 25 from Lake Range Road to Lake Huron
- Provide a 1:100 year overland flow route within an urban road cross section on Bruce Road 25 from Lake Range Road westerly to spill to the watercourse west of Shipley Ave
- Provide a secondary local storm sewer system on Bruce Road 25 west of Lake Range Road to collect and treat road runoff prior to discharging to the watercourse outlet west of Shipley Ave
- Construct a local area storm sewer system within Baker Subdivision at the time of the sanitary sewer installation

Road:

- Re-align Bruce Road 33 to intersect Bruce Road 25 at the planned Bruce Street Location
- A 4-lane urban cross section on Bruce Road 25 from Goderich Street (Highway 21) to the planned Bruce Street intersection
- A dedicated left turn lane on eastbound Bruce Road 25 at Goderich Street
- A stop-controlled "Tee" intersection on the planned Stickel Street at Bruce Road 25
- Traffic signals at the planned Bruce Street/Bruce Road 25 intersection
- A 2-lane urban cross section on Bruce Road 25 from the planned Bruce Street intersection to Saugeen Beach Road
- A stop-controlled "Tee" intersection on the planned Ridge Street at Bruce Road 25
- A Multi-Use Trail from Goderich Street to Saugeen Beach Road on the north side of Bruce Road 25
- Transfer of Bruce Road 33 from Bruce Road 25 southerly to about Baker Road from the County to the Town
- Transfer of Bruce Road 25 from the planned Bruce Street intersection westerly to Saugeen Beach Road from the County to the Town

Development charges

- Town inquired into whether the County has considered incorporating development charges
- Brian noted that this has not been a past practice of the County.

Land Purchases

- The County has been in discussion with Tom Fenton and Peter Ens about land purchases. Both landowners are interested in moving forward and have questions regarding severances and servicing of properties.
- Brian asked John to prepare a plan of the County Road 33 realignment and include the remaining parcels of land owned by Tom Fenton and Peter Ens.
- Amanda suggested that the Town and County planners set up a meeting with the two landowners to review the project and implications on their properties.
- There are four properties at the intersection of Bruce Road 25 and Goderich St that require land purchases to accommodate the five lanes. Two properties are within County jurisdiction and two are within the Towns.

Proposed 2017 Work

- Geotechnical work for the entire project will be facilitated by GMBLuePlan
- GMBLuePlan to undertake engineering for the project and specifically 2018 work including a rough estimate of the work scheduled for each year.
- GMBLuePlan to investigate whether undertaking the installing the 2018 storm sewer would be best coordinated with the required road work between Saugeen Beach Road and the planned Bruce Street
- County and Saugeen Shores to develop cost-sharing agreement.
- GMBLuePlan to prepare a plan identifying tree removal to accommodate the project in order that adjacent landowners can be approached.
- It was agreed that the Master Plan facilitates the land purchase for the CR 33 realignment. The County would pursue the re-alignment land purchases.
- The County will complete the Schedule B project and provide notice to landowners (via mail out) and public (via newspaper).
- Town to review the Master Servicing Study to confirm requirements for services along the new Bruce Road 33.

Proposed 2018 Work

- Schedule A+
- Construct a new 1:100 year capacity storm sewer on Bruce Road 25 from the Kaparus SWM pond to Lake Range Road
- Construct a new 1:5 year capacity storm sewer on Bruce Road 25 from Lake Range Road to Lake Huron
- Provide a 1:100 year overland flow route within an urban road cross section on Bruce Road 25 from Lake Range Road westerly to spill to the watercourse west of Shipley Ave, it was thought that storm work would be shared on a 50-50 basis between County and Town. Town and County to review timing and costs.
- Provide a secondary local storm sewer system on Bruce Road 25 west of Lake Range Road to collect and treat road runoff prior to discharging to the watercourse outlet west of Shipley Ave. Town to review timing and costs.
- Implement the findings of the GMBLuePlan investigation of storm sewer and potentially construct the 2-lane urban cross section work between Saugeen Beach Road and the planned Bruce Street, including a 3 meter wide multiuse trail in the north boulevard

and water and sanitary services where required. There were ongoing discussions on the cost-sharing of this work.

- Consider whether the project or the developer would construct the apron for a stop-controlled "Tee" intersection on the planned Ridge Street at Bruce Road 25.
- Road work will be contracted out by the County
- Bruce Road 25 from planned Bruce Street to the Saugeen Beach Road will be transfer to Saugeen Shores once Bruce Road 33 realignment is completed.

Proposed 2019 Work

- Schedule B - Notice in papers and mail outs to direct landowners (County)
- Construct a 4-lane urban cross section on Bruce Road 25 from Goderich Street (Highway 21) to the planned Bruce Street intersection with a dedicated left turn lane on eastbound Bruce Road 25 intersection and including a stop-controlled "Tee" intersection on the planned Stickel Street at Bruce Road 25. Include a 3 m wide multi-use trail on north boulevard and including water and sanitary services where required.
- GMBLuePlan to provide the Town with CAD files to prepare PHM125 drawings for the traffic signals at the Goderich St. intersection. These signals will be the responsibility of the Town of Saugeen Shores
- GMBLuePlan to provide the County with CAD files to prepare the PHM125 drawings for the traffic signals at the Bruce Road 25 and Bruce Road 33 alignment (Bruce Street). These signals will be the responsibility of the County.
- Road work will be contracted out by the County
- Potential to start Storm water management pond at the Bruce Road 33 realignment

Proposed 2020 Work

- Schedule B - Notice in papers and mail outs to direct landowners (County)
- Construct the realignment of Bruce Road 33 to intersect Bruce Road 25 at the planned Bruce Street Location
- County is of the opinion that BR 33 would be constructed as a rural road
- Discussions regarding the urban planning limit as well as potential for sideroad locations were held, these details will be further reviewed with planning departments and current landowners.
- It was noted that the road will require an elevated road platform for storm drainage purposes.
- The potential to provide servicing of BR 33 to the urban planning limit is being considered.
- There was discussion on the rehabilitation of the section of Lake Range Road, currently Bruce Road 33, from Bruce Road 25 to the beginning of the realignment. It appeared clear that the County would be involved in the apron from the realigned Bruce Road 33 onto Lake Range Road.
- Traffic signals at the Bruce Road 25 and Bruce Road 33 alignment (Bruce Street) will be the responsibility of the County.
- Transfer of Bruce Road 33 from Bruce Road 25 southerly to about Baker Road from the County to the Town.
- Transfer of Bruce Road 25 from the planned Bruce Street intersection westerly to Saugeen Beach Road from the County to the Town.

Preliminary Cost Sharing

2017

- Engineering - County

2018

- Geotechnical Investigation - County
- Land purchases/Legal - County and Saugeen Shores based on property
- Storm Sewer Servicing - 50/50 County/Town
- Potential roadwork from planned Bruce Street to Saugeen Beach Road to be further discussed.

2019

- Traffic Lanes - County
- Curb and Gutter - County
- Storm Service - 50/50 split
- Servicing - Saugeen Shores
- Multi-Use Trail - Saugeen Shores
- Traffic Signals - County (Bruce St.), Saugeen Shores (Goderich St)

2020

- Traffic Lanes - County
- Servicing - Saugeen Shores

Proposed Tender dates for Annual Projects

- February / March tender
- April / May construction

Action Items

County

- Initiate meeting with Town, County Planning, Fenton and Ens
- Land purchases

GMBLuePlan

- Undertake engineering for the project and specifically 2018 work including a rough estimate of the work scheduled for each year.
- Prepare a plan identifying tree removal to accommodate the project in order that adjacent landowners can be approached.
- Geotechnical Investigation

Saugeen Shores

- Land purchases
- Extent of servicing on BR 25 and BR 33 realignment



Committee Report

To: Warden Paul Eagleson
Members of the Transportation and Environmental Services
Committee

From: Brian Knox
Engineer

Date: February 15, 2018

Re: Bruce Road 33 Environmental Assessment

Recommendation:

The report Bruce Road 33 Environmental Assessment is for information.

Background:

In January the Department submitted an information report to support the 'Notice of Project Initiation' for the potential realignment of Bruce Road 33. The notice was published in the Shoreline Beacon, posted on the County and Town website and circulated to landowners, agencies and Indigenous communities on January 9, 2018. The Department has received comments, with a large number referring to components of the Master Plan that are outside of the Bruce Road 33 EA Schedule B project. At this time, the Engineer believes it to be beneficial to review the process of the Master Plan for Bruce Road 25 and Bruce Road 33 for Roads and Drainage that was initiated in September 2015, the various projects derived from the Master Plan and the specific Bruce Road 33 Schedule B project.

Bruce Road 25 & 33 - Master Plan

At the April 20, 2017 meeting, Committee approved the preferred solution for the Bruce County Road 25 and 33 Municipal Class Environmental Assessment Master Plan for roads and drainage. The Department and Town of Saugeen Shores completed the Master Plan by issuing the Notice of Completion on May 9, 2017. The outcome of the Master Plan included a number of projects as follows:

Schedule A Projects - Drainage

- Construct new storm sewer along Bruce Road 25 including outfall to Lake Huron.
- Construct local storm sewer system within Baker subdivision to coincide with sanitary sewer installation.



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Schedule B Projects - Roads

- Re-align Bruce Road 33 to intersect Bruce Road 25 at future Bruce Street alignment.
- Provide additional lanes on Bruce Road 25 between future Bruce Street intersection and Goderich Street (4-lane urban cross-section)

The Master Plan addressed Phase 1 and 2 of the Municipal Class EA process that supports the Schedule A projects while the Schedule B projects require additional technical studies, documentation and review period. The following is an overview of the proposed work over a four-year period (2018-2021). A drawing identifying the work is attached.

Phase 1 - Schedule A (2018): Bruce Road 25 - trunk storm sewer from Lake Ridge Estates to Lake Huron, including a full urbanized road section from Shipley Avenue to Saugeen Beach Road.

Phase 2 - Schedule A (2019): Two lane urbanized road section from Shipley Avenue to Bruce Street, including the local storm sewer.

Phase 3 - Schedule B (2020): Four lane urbanized cross section from Bruce Street to Goderich Street, including municipal services.

Phase 4 - Schedule B (2021): Construction of the new Bruce Road 33 realignment and rehabilitation of current Bruce Road 33 (new Lake Range Road).

Bruce Road 33 Realignment - Schedule B - Environmental Assessment

The County of Bruce, Town of Saugeen Shores and GM BluePlan initiated the Bruce Road 33 Realignment Environmental Assessment as an outcome of the Master Plan for Roads and Drainage for Bruce Road 25 and Bruce Road 33.

Bruce Road 33 Realignment is being undertaken in accordance with the Municipal Class Environmental Assessment (EA) Planning Process as a Schedule B Project. The Notice of Project initiation was issued on January 9, 2018 outlining three alternative solutions:

- i) Do nothing but resurfacing,
- ii) Intersection and capacity improvements on BR 25, and
- iii) Re-align the BR33 intersection with the future Bruce Street intersection.

The Master Plan and Schedule B EA project file relating to the Bruce Road 33 Realignment was available for viewing by agencies, public, landowners and Indigenous Communities with comments due on February 6, 2018.



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The Department and Town of Saugeen Shores received a number of comments regarding the Bruce Road 33 Realignment as well as questions regarding the future work on Bruce Road 25, which was reviewed under the Master Plan process. A summary of the comments regarding Bruce Road 33 Realignment are as follows:

- General acceptance of the realignment of Bruce Road 33 with the future Bruce Street which would assist in traffic flow and safety concerns.
- Tree planting on the new realignment which would be beneficial during winter.
- Review of placing a roundabout at the intersection of future Bruce Street and future Bruce Road 33; a signalized intersection was considered as the preferred solution for pedestrian safety reasons and the planned Active Transportation Route.
- Drainage was considered under the Master Plan process and will be further advanced as the Bruce Road 25 design is developed.
- There was interest in the alignment of Baker Street and the location of the connection to the proposed Bruce Road 33 new alignment.

The Schedule B project will be reviewed further taking into consideration the comments received during the comment period. A preferred solution for the Bruce Road 33 Schedule B EA will be recommended at the March Committee for approval, prior to the Notice of Completion being issued.

Bruce Road 25 - Drainage

The Department, Town and GM BluePlan are reviewing the feedback pertaining to the Bruce Road 25 Schedule "A" projects, specifically the drainage outlet and will be providing further information to agencies, public, landowners and Indigenous Communities.

Response to Comments

In order to manage the comments and to move forward on this undertaking Saugeen Shores and the Department have agreed that the project team composed of the Town Saugeen Shores, consultant GM Blue Plan and the Department will continue to work together on discussing the comments received, however the Town of Saugeen Shores will respond to comments on the Schedule A projects as outlined in Phases 1 and 2 above and the Department will respond to Schedule B projects as outlined in Phases 3 and 4 above.

Financial/Staffing/Legal/IT Considerations:

There are no financial, staffing, legal or IT considerations associated with this report.



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Interdepartmental Consultation:

Not applicable.

Link to Strategic Goals and Elements:

Goal #6 - Explore alternative options to improve efficiency, service

Element #D - Coordinate working with other agencies

Approved by:

Kelley Coulter
Chief Administrative Officer

Schedule B - Environmental Assessment - Bruce Road 33 Realignment Project Schedule

Date	Activity	Responsibility
November 2017	Geotechnical Investigation (includes BR25)	County / GMBLuePlan
December 1 2017	Landowner information package circulated	County
Ongoing 2017-2018	Land purchases/OLS survey	County
December 18 2018	Correspondence to First Nation/Metis	County
January 9 2018	Schedule B EA - Notice of Project Initiation <ul style="list-style-type: none"> Shoreline Beacon - County Landowner Mail-out - County Agency Contact - GMBLuePlan 	County / GMBLuePlan
February 6 2018	Response deadline	GMBLuePlan
February 15 2018	Report to Highways Committee with information report/comments received	County
March 22, 2018	Report to Highways Committee with recommended preferred solution	County
March 30 2018	Schedule B EA - Notice of Completion <ul style="list-style-type: none"> Shoreline Beacon - County Landowner Mail-out - County Agency Contact - GMBLuePlan First Nation/Metis - County 	County / GMBLuePlan
April 30 2018	Schedule B EA - 30 day review period ends	GMBLuePlan
May 7 2018	Reports due to Highways Committee	County
May 17 2018	Highways Committee	County



Committee Report

To: Warden Paul Eagleson
Members of the Transportation and Environmental Services Committee

From: Kerri Meier
Environmental Coordinator

Date: April 19, 2018

Re: Bruce Road 33 Environmental Assessment

Recommendation:

That the preferred solution for the Bruce Road 33 Schedule B Environmental Assessment be option iii) re-align the Bruce Road 33 intersection with the future Bruce Street Intersection be approved.

Background:

At the February Committee, the Department submitted an information report to provide a status update on the Bruce Road 33 Schedule B Environmental Assessment.

The Bruce Road 33 Realignment is being undertaken in accordance with the Municipal Class Environmental Assessment (EA) Planning Process as a Schedule B Project. The Notice of Project initiation was issued on January 9, 2018 outlining three alternative solutions:

- i) Do nothing but resurfacing,
- ii) Intersection and capacity improvements on Bruce Road 25, and
- iii) Re-align the Bruce Road 33 intersection with the future Bruce Street Intersection.

The Master Plan and Schedule B EA project file relating to the Bruce Road 33 Realignment was available for viewing by agencies, public and landowners and Indigenous Communities with comments due on February 6, 2018.

A summary of the comments regarding Bruce Road 33 realignment are as follows:

- General acceptance of the realignment of Bruce Road 33 with the future Bruce Street which would assist in traffic flow and safety concerns.
- Tree planting on the new realignment would be beneficial during winter.
- Review option of a roundabout at the intersection of future Bruce Street and future Bruce Road 33, a signalized intersection was considered as the preferred solution for pedestrian safety and the planned Active Transportation Route. A north-bound stop control on the proposed re-aligned Bruce Road 33 would be the interim solution until the extension of Bruce Street southerly to Bruce Road 25 occurs.



- Interest in the alignment of Baker Street and the location of the connection to the proposed Bruce Road 33 new alignment.
- The storm water management along future Bruce Road 33 will be incorporated into the design and approvals phase.
- Drainage comments are being considered as the Bruce Road 25 design is developed.

The County, Town and Consultant reviewed all comments received regarding the Schedule B project and acknowledge the preferred solution of the realignment of the Bruce Road 33 intersection with the future Bruce Street Intersection.

A Notice of Completion, including the updated project file will be issued in the near future. The Department will provide a status report on the project after the 30-day review period is complete.

Financial/Staffing/Legal/IT Considerations:

There are no financial, staffing, legal or IT considerations associated with this report.

Interdepartmental Consultation:

Not Applicable.

Link to Strategic Goals and Elements:

Goal #6 - Explore alternative options to improve efficiency, service
Element #D - Coordinate working with other agencies

Approved by:

Kelley Coulter
Chief Administrative Officer

Moved by Councillor Mitch Twolan
Seconded by Councillor Milt McIver

That the preferred solution for the Bruce Road 33 Schedule B Environmental Assessment be option iii) re-align the Bruce Road 33 intersection with the future Bruce Street Intersection be approved.

Carried



1078 Bruce Road 12, P.O. Box 150, Formosa ON Canada N0G 1W0
Tel 519-367-3040, Fax 519-367-3041, publicinfo@svca.on.ca, www.svca.on.ca

February 8, 2018

The County of Bruce
Brian Know, P.Eng.
30 Park St., Box 398
Walkerton, ON
N0G 2V0

Town of Saugeen Shores
Amanda Froese, P.Eng.
600 Tomlinson Drive
P.O. Box 820
Port Elgin, ON
N0H 2C0

GM BluePlan Engineering Limited
Consulting Professional Engineers
John Slocombe, P.Eng.
1260-2nd Ave. East, Unit 1
Owen Sound, ON
N4K 2J3

Dear Mr. Knox, Ms. Froese, and Mr. Slocombe:

RE: Notice of Project Initiation – Schedule B Municipal Class Environmental Assessment Bruce Rd. 33 Re-Alignment
Detailed Design, Bruce Rd. 25 Drainage Works, November 2017
Part Lot 27-30, Lake Range
Geographic Township of Saugeen
Town of Saugeen Shores

The Saugeen Valley Conservation Authority (SVCA) has reviewed this proposal in accordance with the SVCA's mandate and the Environmental Planning and Regulations Policies Manual, approved May 16, 2017. The proposed Bruce Rd. 33 Re-Alignment, and Bruce Road 25 Project would facilitate a new roadway pattern, drainage route, and potential outlet modification and drainage route of stormwater to the Lake Huron Shoreline in an area of drainage problems.

Details to the proposed have been provided to the SVCA January 16, 2018 and November 20, 2017. The SVCA has reviewed the Preliminary Stormwater Management Design Brief – Saugeen Shores, ON and Bruce Road 33 Re-Alignment and Schedule B Class Environmental Assessment – Brief. The SVCA has also reviewed some related plans associated with Bruce Rd. 25 proposed works and the related drainage proposal. The SVCA offers the following comments.



Watershed Member Municipalities

Municipality of Arran-Elderslie, Municipality of Brockton, Township of Chatsworth, Municipality of Grey Highlands,
Town of Hanover, Township of Howick, Municipality of Morris-Turnberry, Municipality of South Bruce,
Township of Huron-Kinloss, Municipality of Kincardine, Town of Minto, Township of Wellington North,
Town of Saugeen Shores, Township of Southgate, Municipality of West Grey

General Comment

Please clarify the phasing of the proposed Bruce Rd. 25/33 works. The SVCA has some concerns around 'proposed conditions', modelling and forecasting as currently both plans are fluid, and requiring integration and reliance on the other being completed initially. Perhaps there is a need to combine these two, linked proposals, as one project for design and review purposes with phasing plans. Detailed design is underway for Bruce Road 25 while 33 is undergoing EA still. Master plan process has reviewed multiple options for the area, but perhaps a larger scale plan should proceed given the interdependence.

Bruce Road 25 Works:

Bruce Road 25 on the Glacial Lake Bluff, over the watercourse north and west of Shipley Ave. and within its floodplain, where the roadway intersects the shoreline of Lake Huron and within an offset of these features is located within the SVCA's Regulated Area. This proposal will require permission from the SVCA in the form of an SVCA permit to Alter a Regulated Area and likely and Alteration to a Watercourse permit.

- 1) Alterations to the slope will require SVCA approval in the form of a permit. SVCA staff request additional details as to grading on and around the proposed roadway ensuring the stability of the slope is maintained on and surrounding the project area. A Geotechnical slope stability analysis may be necessary given proposed grading and additional material placement. Groundwater conditions management would need to be addressed in this report.
- 2) Alterations to the watercourse and/or floodplain of a watercourse will require SVCA permission in the form of a permit. A cut/fill analysis, floodplain report, and an indication of flow maintenance of the watercourse are required by SVCA staff in order to insure no negative impacts on the watercourse or the control of flooding. Please refer to previous comments regarding DFO involvement associated with fisheries.
- 3) Alterations within a Dynamic Beach area for the proposed outlet will require SVCA permission in the form of a permit. A coastal report appears to be prudent as increased flows, to an enlarged outlet, could negatively impact erosion and dynamic beaches in the area. Water quality impacts should be investigated at this outlet as well.

Bruce Rd. 33 Environmental Assessment

- 1) The SVCA would recommend larger runoff events be considered then 100 yr. event given sensitive receptors in area, the intent of this work to resolve drainage issues, and given climate change considerations as indicated to be an intent of EA process. Ultimately the intend of this proposal is not to maintain current problems, but it is to resolve problems SVCA staff understand.
- 2) BR 25 is not factored into this proposal, with limited/no opportunities for stormwater management in that project. Potentially this project could 'over manage' drainage to make up for lost perviousness associated with BR25.
- 3) Water quality improvements are sought associated with the Lake Huron Shoreline. While 'Enhanced' water quality treatment is proposed associated with the Bruce Rd. 33 component of this project, what about BR25 and can increased water quality be achieved to represent a net gain at shoreline?
- 4) The SVCA's Regulation may be applicable to the proposed Bruce Road 33 western/southern realignment. Road widening or works at the top of the slope, or within 15 metres of the slope and related 'rills' would require SVCA permission. Design details are not yet known at this location for SVCA review.

Notice of Project Initiation – Schedule B Municipal Class Environmental Assessment
Bruce Rd. 33 Re-Alignment, Bruce Rd. 25 Drainage Works
February 8, 2018
Page 3 of 3

The SVCA will continue our review upon clarifications and/or revisions being provided to the SVCA.

If you have any questions on the above, please do not hesitate to contact this office.

Yours Sincerely,

A handwritten signature in black ink, appearing to read 'Erik Downing', with a stylized flourish at the end.

Erik Downing
Manager, Environmental Planning & Regulations
Saugeen Conservation

ED/

cc: Luke Charbonneau, Authority Member, SVCA, via email
Mike Smith, Authority Member, SVCA, via email.

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

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

February 9, 2018

The County of Bruce
Brian Knox
30 Park Street
Box 398
Walkerton ON
N0G 2V0

Attention: Brian Knox

Re: Class EA for the Realignment of Bruce Road 33

Dear Brian Knox:

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

It is this ministry's understanding that the County of Bruce is initiating a Class EA process to re-align Bruce Road 33 as identified in the Town of Saugeen Shores' Master Plan for Roads and Drainage.

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

Aboriginal Consultation

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

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

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

Nation	Contact Information	
Saugeen First Nation	<p>Saugeen Ojibway Nation Environment Office 25 Maadookii Road Neyaashiinigmiing, ON N0H 2T0 519-534-5507 Doran Ritchie Land Use Planning Coordinator d.ritchie@saugeenojibwaynation.ca (Please send hard copy to Doran Ritchie)</p>	<p>Saugeen First Nation 6493 Highway 21 R.R.#1 Southampton, ON N0H 2L0 519-797-2781 Chief Lester Anoquot lanoquot@saugeenfirstnation.ca (Email copy to Chief Anoquot)</p>
Chippewas of Nawash Unceded First Nation		<p>Chippewas of Nawash Unceded First Nation R.R.#5 Wiarton, ON N0H 2T0 519-534-1689 Chief Gregory Nadjiwon chiefsdesk@nawash.ca (Email copy to Chief Nadjiwon)</p>
Historic Saugeen Metis	<p>Historic Saugeen Metis 204 High Street, Box 1492 Southampton, ON N0H 2L0 President, Archie Indoe <u>Other Contact:</u> George Govier Consultation Coordinator 519-483-4000 saugeenmetisadmin@bmts.com</p>	
Great Lakes Metis Council	<p>Great Lakes Metis Council 380 9th Street East Owen Sound, ON N4K 1P1 519-370-0435 Other Contact: James Wagar, Consultation Assessment Coordinator jamesw@metisnation.org and consultations@metisnation.org (Please send email copies to email addresses listed above)</p>	

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

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

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

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

- aboriginal or treaty rights impacts are identified to you by the communities;
- you have reason to believe that your proposed project may adversely affect an aboriginal or treaty right;
- consultation has reached an impasse;

- a Part II Order request or elevation request is expected.

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

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

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

Source Water Protection

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

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

Climate Change

The Municipality is strongly encouraged to include climate change in this EA. Climate change should be considered in the context of mitigation and the context of adaptation. The Ministry has recently released a guidance document to support proponents in including climate change in environmental assessments. The guide can be found online: <https://www.ontario.ca/page/considering-climate-change-environmental-assessment-process> . It should be noted that Climatic Features is identified in Appendix 2 of the Municipal Class EA page 2-7 (2015).

Information on Notice of Commencement and Timing

The noticed received by the Ministry of Environment and Climate Change did not include a map showing the project area. Appendix 6 of the Municipal Class EA identifies the information that must be part of a notice, including a map of the study area or location (where applicable). Given that this project is for the realignment of a specific section of existing transportation infrastructure, it would seem that providing mapping of the area would be fitting. MOECC encourages the County to consider including mapping in future notices, as appropriate, and to review the requirements of notices prior to issuance to ensure all items are met, as applicable.

Also identified in Appendix 6 (page 6-2) is a circulation to ministry list that includes sending all notices to the applicable MOECC Regional Offices. The regional office address can be found in the header. Alternatively, electronic submissions may be made directly the Environmental Assessment Coordinator. Please ensure all notices are sent to the appropriate offices. This expedites ministry response when necessary.

Conclusion

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

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

Yours truly,



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

Copy:

Amanda Froese, Town of Saugeen Shores
John Slocombe, GM BluePlan Engineering
Ian Mitchell, MOECC
John Ritchie, MOECC
Scott Abernethy, MOECC

Ministry of the Environment
and Climate Change

Environmental Assessment and
Permissions Branch
135 St. Clair Avenue West
1st Floor
Toronto ON M4V 1P5
Tel.: 416 314-8001
Fax: 416 314-8452

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

Direction des évaluations et des
permissions environnementales
135, avenue St. Clair Ouest
Rez-de-chaussée
Toronto ON M4V 1P5
Tél : 416 314-8001
Télec. : 416 314-8452



ENV1283MC-2018-266

March 13, 2018

Brian Knox and Kerri Meier
The County of Bruce
Box 70, 30 Park St.
Walkerton ON N0G 2V0

Dear Mr. Brian Knox and Ms. Kerri Meier:


On February 5, 2018, the Ministry of the Environment and Climate Change (ministry) received one Part II Order request asking that the County of Bruce (County) be required to prepare an individual environmental assessment for Bruce County Roads 25 and 33 Master Plan for Roads and Drainage (Project). The Project was planned under the Master Plan procedures of the Municipal Engineers Association's Municipal Class Environmental Assessment (Class EA).

On March 9, 2018, the ministry received correspondence from the requester indicating that the requester wished to withdraw the Part II Order request. I understand that this withdrawal was a result of negotiating a mutual agreement, and I appreciate the County's efforts to reach a successful resolution of the requester's concerns. With no outstanding Part II Order requests before the ministry, the County can continue planning the Project.

I would like to ensure that the County understands that failure to comply with the *Environmental Assessment Act*, the provisions of the Class EA, and failure to implement the Project in the manner described in the planning documents, are contraventions of the act and may result in prosecution under section 38 of the act.

I am confident that the County recognizes the importance and value of the act and will ensure that its requirements and those of the Class EA are satisfied.

Yours sincerely,

 Annamaria Cross
Manager, Environmental Assessment Services Section
Environmental Assessment and Permissions Branch

April 5, 2018

Via E-Mail

Good Morning Kim, John and Kerri:

Please be advised that staff of the Ministry of Environment and Climate Change Southwestern Region (MOECC SWR) don't have any surface water concerns about the conceptual design of the storm water outlet structure at the beach – a headwall/plunge pool feature. The outlet structure is discussed in the preliminary storm sewer design brief (page 13 of 14). Consideration was given to minor and major storm events, water infiltration, storage and flow velocity reduction (erosion control). Water quality control is provided in upstream drainage areas. Alternate designs for the outlet were considered and rejected for acceptable reasons. The design brief says that a landscaping plan may be included with the detailed design for the headwall/plunge pool structure to beautify it. MOECC SWR would suggest that a landscaping plan is a good idea in this case.

Thank you for providing this ministry's Southwestern Region this pre-submission review opportunity. Please feel free to submit a formal application for an Environmental Compliance Approval to staff of this ministry's Approvals Branch in Toronto.

Yours truly,

Craig Newton
Regional Environmental Planner / Regional EA Coordinator
Ministry of the Environment and Climate Change
Southwestern Region
(519) 873-5014



COUNTY OF BRUCE

HIGHWAYS DEPARTMENT

Box 398, 30 Park Street, Walkerton, Ontario N0G 2V0
(519) 881-2400 1-877-681-1291 Ext 4 Fax: (519) 507-3030
Brian R. Knox, County Engineer

September 9, 2015

Our File: M-1552

Saugeen Ojibway Nation
SON Environmental Office
25 Maadookii Subdivision
R.R. #5, Wiarton, ON N0H 2T0

Attention: Mr. Doran Ritchie
Landuse Planning Coordinator

Re: Master Plan for Roads and Drainage
Bruce County Roads 25 and 33
Saugeen Shores
Preliminary Information

Dear Mr. Ritchie,

The County of Bruce is embarking on a Master Plan process to address issues with roads and drainage in the southerly area of the Former Town of Port Elgin (Saugeen Shores), about the intersection of Bruce Roads 25 and 33.

The process will follow the outline of a Municipal Class Environmental Assessment. We are providing Saugeen Ojibway Nation (SON) with this preliminary information package identifying the issues currently under consideration and the plan to host a "Discretionary" Public Information Centre (PIC) under the process as outlined in the enclosed information. We would welcome the opportunity of meeting with you prior to the PIC and look forward to working with you on this initiative.

We will provide you with updates as this initiative progresses, but please contact me or our consultant John Slocombe, P.Eng of GM BluePlan Engineering Limited if you have any questions, comments or require additional information.

Yours truly,

Brian Knox, P.Eng
County Engineer

Encls.

cc: Dave Burnside – Saugeen Shores: burnsided@saugeenshores.ca
Stuart Doyle – Saugeen Shores: doyles@saugeenshores.ca
John Slocombe – GM BluePlan: john.slocombe@gmblueplan.ca



**MASTER PLAN FOR ROADS AND DRAINAGE
BRUCE COUNTY ROADS 25 AND 33
NOTICE OF PROJECT INITIATION
DISCRETIONARY PUBLIC INFORMATION CENTRE**

The County of Bruce as Proponent, with the Town of Saugeen Shores, is studying road and drainage alternatives in the area of Bruce County Roads 25 and 33 (BR25 & BR33), located centrally in Saugeen Shores, and is inviting interested members of the public to attend an Information Centre.

The County has identified various deficiencies with its road and drainage infrastructure within the Study Area. Through initial discussions with the Town, other related issues having a broader scope have emerged which the County wishes to consider at a Master Planning level to ensure individual projects are completed in context with an appropriate overall plan. The purpose of the Discretionary Public Information Centre is to describe the identified issues within the Study Area and to receive input from the public on the issues as well as potential alternative solutions.

Issues related to roads include deteriorated travelled surfaces, poor sight lines at the intersection of BR25 and BR33, and planned future intersections at Stickel, Bruce and Ridge Streets. Preliminary Alternatives for Road Works include; Do Nothing but resurfacing, Re-align the BR33 intersection with the future Ridge Street intersection, or Re-align the BR33 intersection the with the future Bruce Street intersection.

Issues related to drainage include limited capacity along BR25, poor drainage through the Baker Subdivision, and inadequate drainage outlets within the Study Area. Preliminary Alternatives for Drainage works include; Do Nothing, Improve an outlet westerly on BR25 to Lake Huron, Divert flows from BR25 southerly along BR33 to a new constructed outlet westerly across Lot 26 to the existing Gore Drain outlet below Saugeen Beach Road, or Divert flows southerly along BR33 to the existing Gore Drain outlet below Lake Range Road (BR33)..

The Master Plan is being conducted under the **Municipal Class Environmental Assessment (EA)** project planning process and is intended to follow, as a minimum, Phases 1 and 2 of the EA Process, in support of Schedule B and/or Schedule C projects, which may be identified for implementation through the process.

As part of this process a Phase I – Discretionary **Public Information Centre** is planned at the Town of **Saugeen Shores Rotary Hall on October 7th, 2015 at 7:00 p.m. – 9:00 p.m.**, at which time project information will be displayed and the Project Team will be available for discussions.

The public is invited to provide written comments for incorporation into the planning considerations for this project. A future Public Information Centre, planned as part of the process, will be scheduled at a future date at which time a Problem / Opportunity Statement and Alternative Solutions will be more fully developed. Additional information is provided on the municipal web sites.

This Notice issued September 22nd, 2015.

The County of Bruce
Mr. Brian Knox, P.Eng.
Box 398, 30 Park St.
Walkerton, ON N0G 2V0
Tel: (519) 881-2400
www.brucecounty.on.ca

The Town of Saugeen Shores
Mr. Dave Burnside
600 Tomlinson Drive
P.O. Box 820
Port Elgin, ON N0H 2C0
Tel: (519) 832-2008
www.saugeenshores.ca

GM BluePlan Engineering Limited
Consulting Professional Engineers
Mr. John Slocombe, P.Eng.
1260 2nd Avenue East, Unit 1
Owen Sound, ON N4K 2J3
Tel: (519) 376-1805
www.gmbblueplan.ca



Master Plan - Roads and Drainage

Bruce County Roads 25 & 33

County of Bruce

Town of Saugeen Shores





Welcome

Public Information Centre

Bruce County Roads 25 & 33

Master Plan – Roads and Drainage

County of Bruce
Town of Saugeen Shores

October 7th, 2015
7:00 pm to 9:00 pm

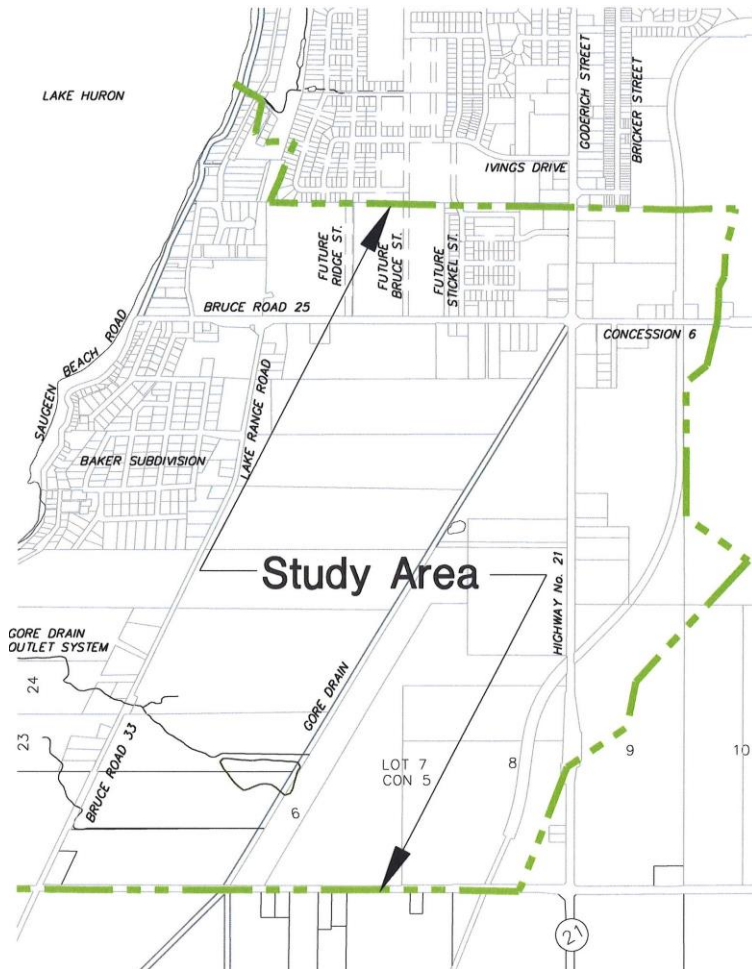
Please sign in so that we can keep you updated on the study.



Intentions of the “Discretionary” Public Information Centre

- Identify the Study Area;
- Identify the Problems/Opportunities within the Study Area;
- Present the Process Framework (Municipal Class Environmental Assessment – Master Plan Process);
- Consider Preliminary Alternatives for Roads;
- Consider Preliminary Alternatives for Drainage;
- Public Involvement in the Process; and
- Identify the Next Steps.

Study Area Location Map



Basic Issues

Roads:

The Proponent is considering to:

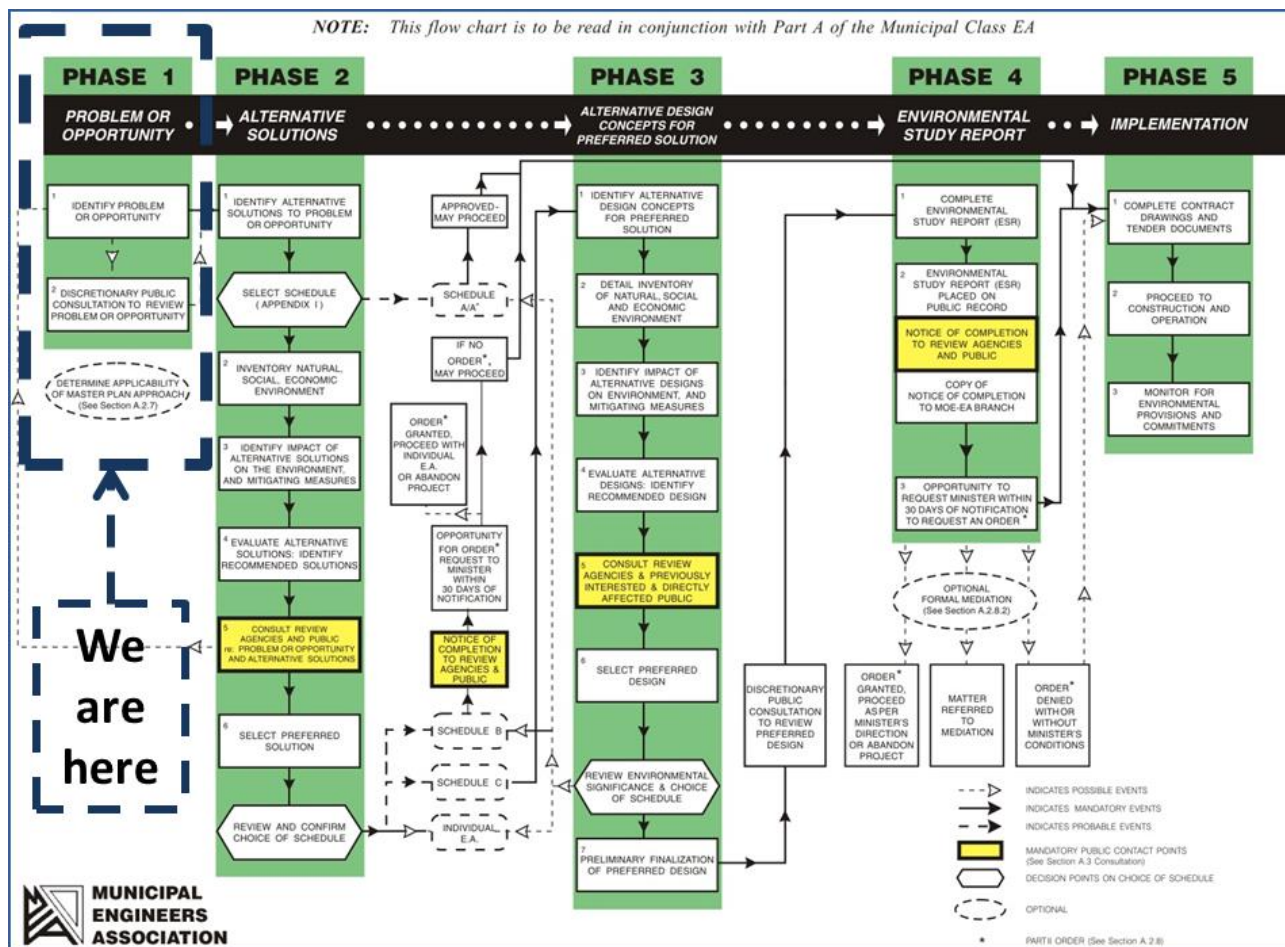
- Improve road surfaces on Bruce Road 25 (BR25) and Bruce Road 33 (BR33)
- Optimize the traffic flow patterns, and
- Address future requirements for number of lanes and traffic control at planned intersections along BR25.

Drainage:

The Proponent is considering to:

- Address drainage deficiencies along BR25
- Address flooding issues within the Baker Subdivision west of BR33, and
- Consider an appropriate outlet (s) supportive of area interests.

Municipal Class EA Process



Planning and implementation of municipal infrastructure projects are undertaken in accordance with an approved procedure, giving due regard to the need to protect the environment and minimize negative effects.

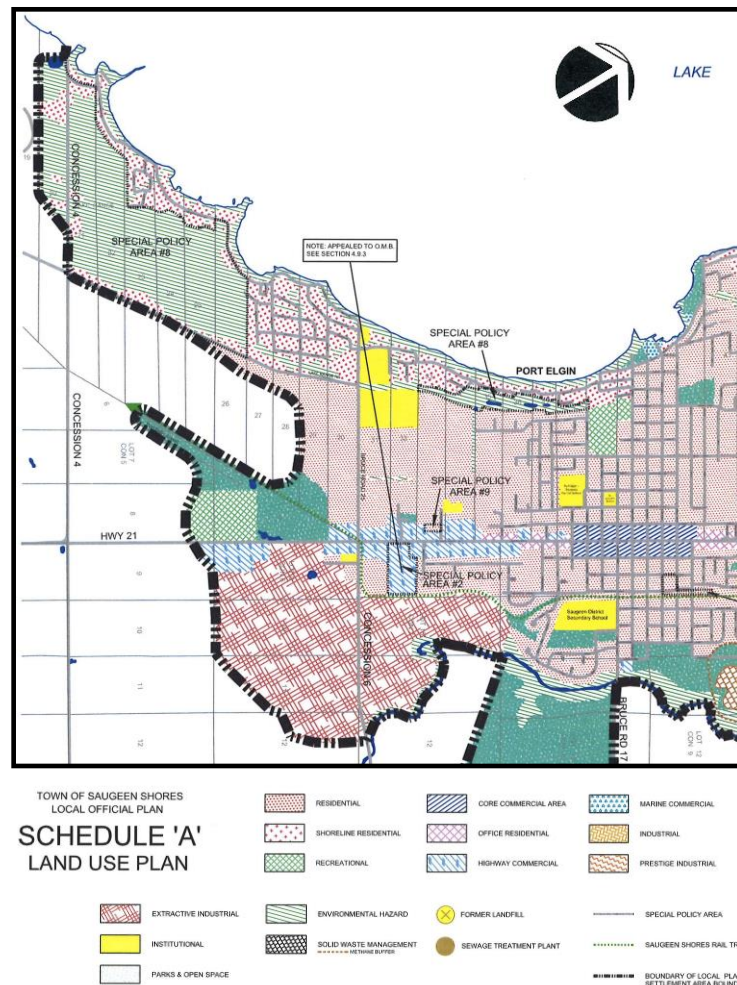
Key message: we are in the very early stages of a 'multi-phased' study



Phase 1

Local Official Plan: Schedule 'A'

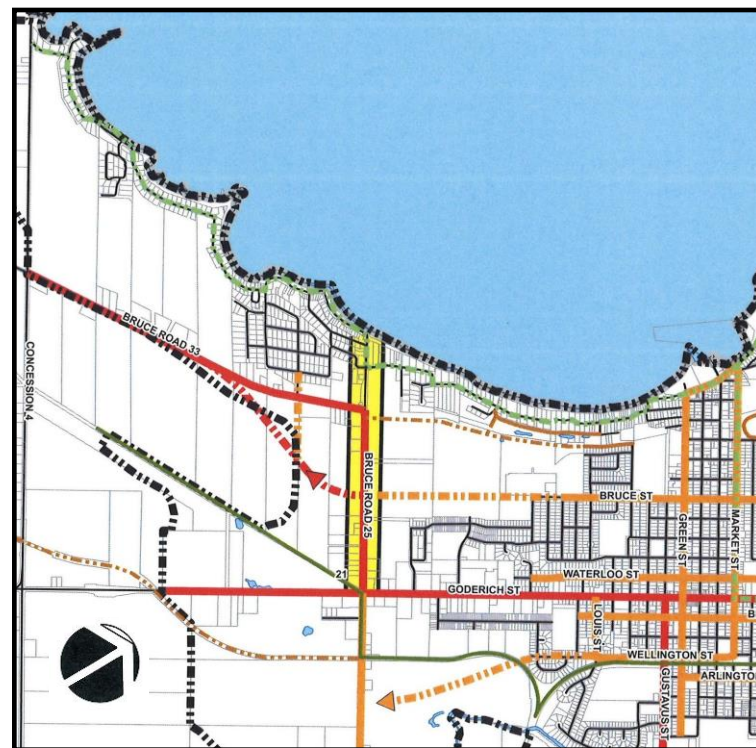
- Solutions for Roads and Drainage should consider planned future land uses;
- Future land uses adjacent to BR25 (north and south) and BR33 (east) are planned residential;
- Draft Plans of Subdivision are in place north of BR25;
- No current Secondary Plan or Draft Plan of Subdivision South of BR25.



Phase 1

Problems & Opportunities - Roads

- BR25 is currently a 2-lane rural cross-section with a tee intersection at BR33;
- Existing asphalt surfaces are in need of repair or replacement; and
- Intersection of BR25 and BR33 has poor sight lines that do not meet current design criteria.
- Previous plans have identified requirements for water and sewer services, additional lanes, an urban cross-section, active transportation and improved intersection control along BR25 from the Bruce Street alignment to Goderich Street.
- Planned extensions of Stickel Street, Bruce Street and Ridge Street to BR25 from the north, along with the existing BR33 intersection would create four off-set intersections (2 major) within a short length along BR25.



Town of Saugeen Shores
Local Official Plan
Schedule 'B'
Transportation Plan with Trails

- | | | |
|---------------------|---|--|
| — Arterial Road | — Proposed Collector | — Existing Trail |
| — Collector Road | — Local Road | — Proposed Trail |
| — Proposed Arterial | — Boundary of Local Plan/Settlement Area Boundary | — Saugeen Shores Rail Trail |
| | | — Proposed Active Transportation Route |
| | | — Active Transportation Route |



Phase 2 – Step 1

Alternative Solutions - Roads

At this early stage, the project team has identified 3 alternatives, representing a range of possible approaches/solutions.

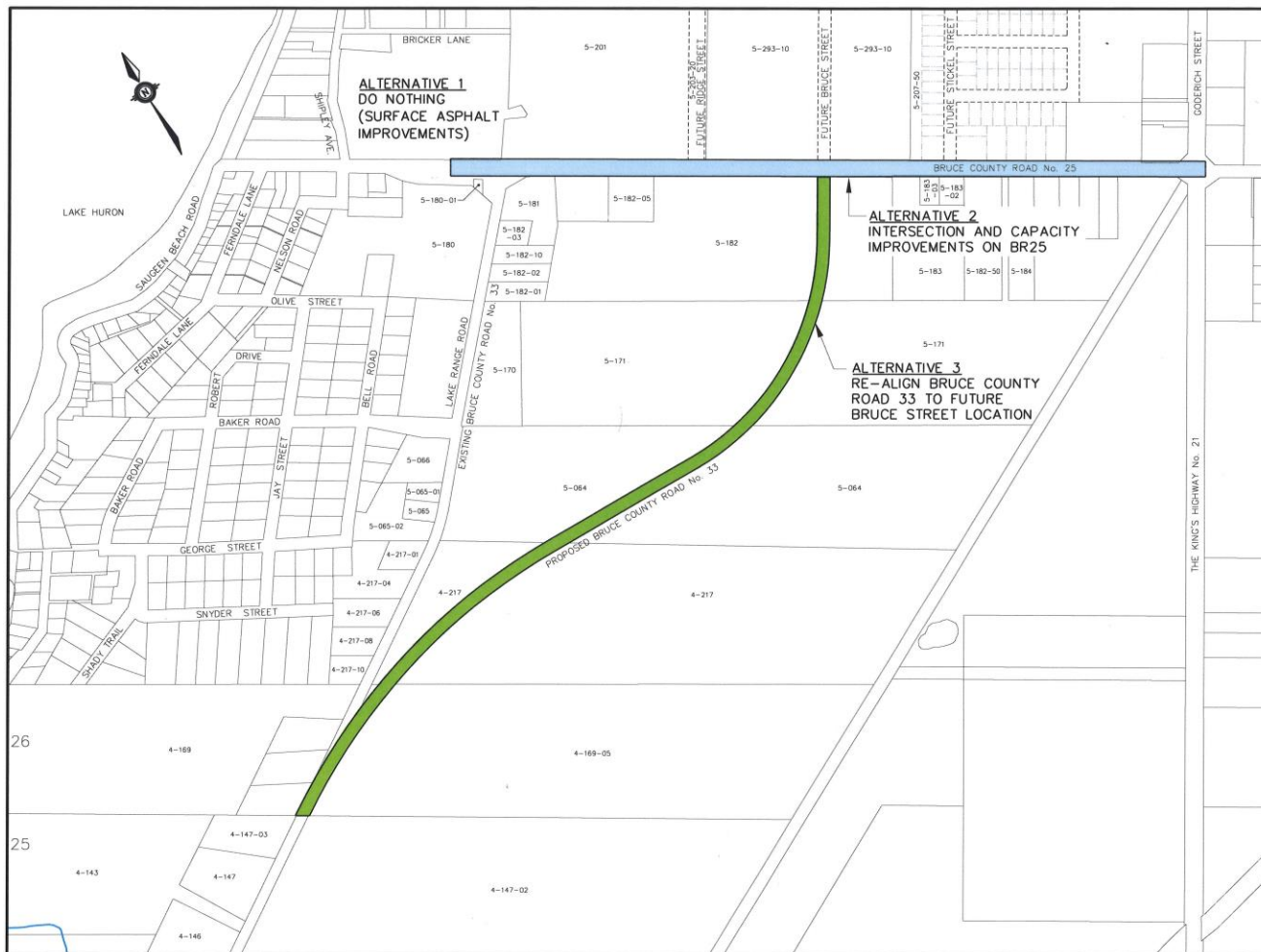
Variations of these may be developed as the study progresses.

- Alternative 1 – Do Nothing (Surface Asphalt Improvements Only)
- Alternative 2 – Intersection and Capacity Improvements on BR25
- Alternative 3 – Re-align BR33 to intersect BR25 future Bruce Street location.



Phase 2 – Step 1

Alternative Solutions - Roads





Phase 2 – Step 2

Inventory Natural, Social and Economic “Environments”- Roads

Natural

- Water Courses / Drainage Routes
- Bluff Feature
- Habitats (Flora and Fauna)

Social

- Land Requirements
- Archaeological Resources / Cultural Heritage
- Future Development / Community Needs
- Public Safety / Liability

Economic

- Capital and Maintenance Costs
- Life Cycle Costs (Asset Management)
- Potential Funding Partners



Phase 2 – Step 3

Screening and Mitigating Measures - Roads

- Identify issues and/or constraints with respect to each alternative and each “environment”;
- Consider the relative magnitude of each net positive and net negative effect;
- Explore mitigating measures and relative impacts.



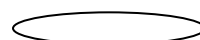
Phase 2 – Step 4

Sample Evaluation of Alternatives - Roads

Category	Assessment Factor	Alt 1 Do Nothing	Alt 2 Intersection & Capacity Improvements BR25	Alt 3 Realignment of BR33 to Bruce Street
Natural Environment	Water Courses / Drainage Routes			
	Bluff Feature			
	Habitats (Flora and Fauna)			
Social Environment	Land Requirements			
	Archaeological Resources / Cultural Heritage			
	Future Development / Community Needs			
	Public Safety / Liability			
Economic	Capital and Maintenance Costs			
	Life Cycle Costs (Asset Management)			
	Potential Funding Partners			
Regulatory	Permits/Approvals			



Negative



Neutral

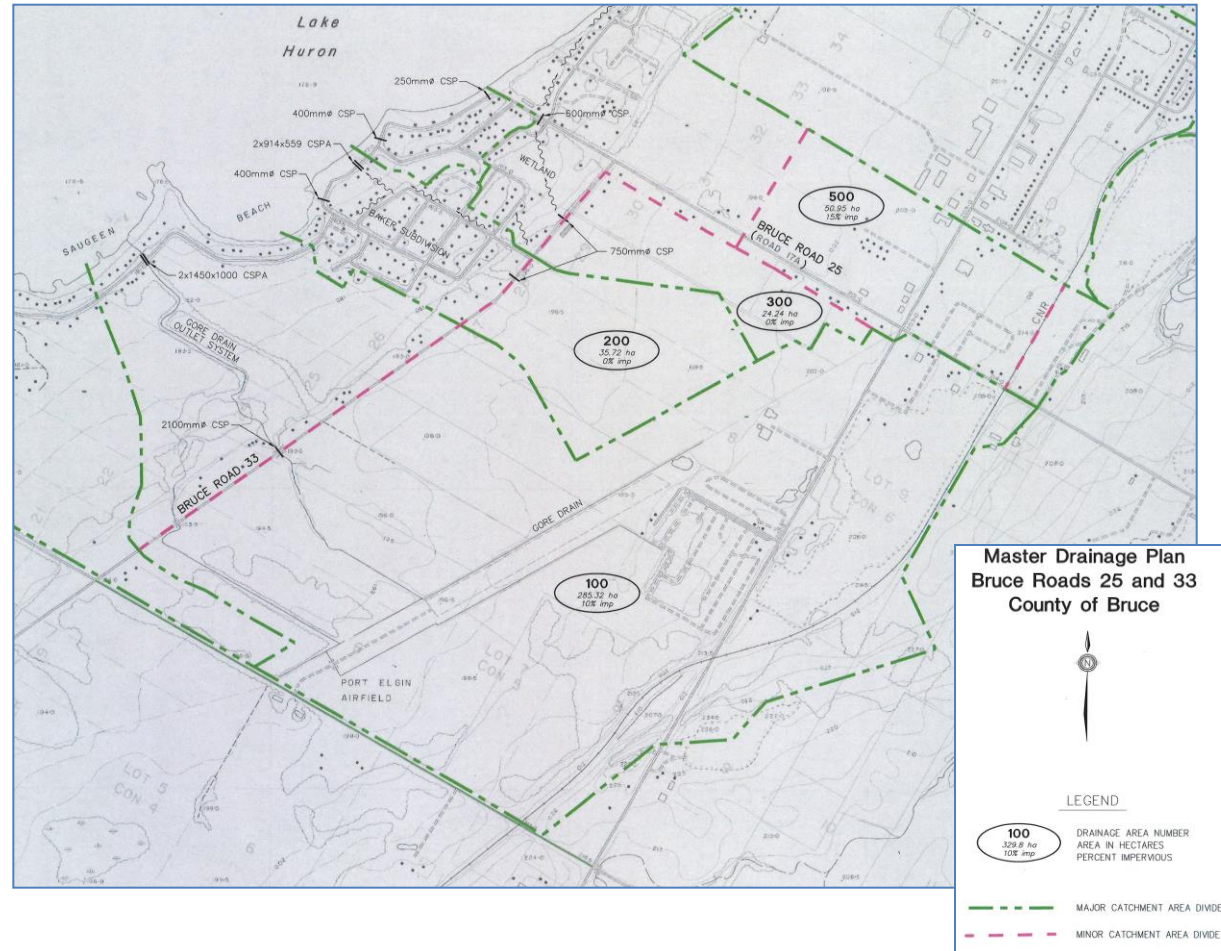


Positive

Phase 1

Problems & Opportunities - Drainage

- Existing outlet on BR25 is at capacity and crosses private properties.
- The drainage system on BR25 is inadequate to support existing conditions.
- Baker Subdivision experiences seasonal flooding.
- Planned development is on hold pending resolution to drainage issues.
- Existing outlet across public beach at the end of BR25 is relatively minor and there is a preference for not enlarging.





Phase 2 – Step 1

Alternative Solutions - Drainage

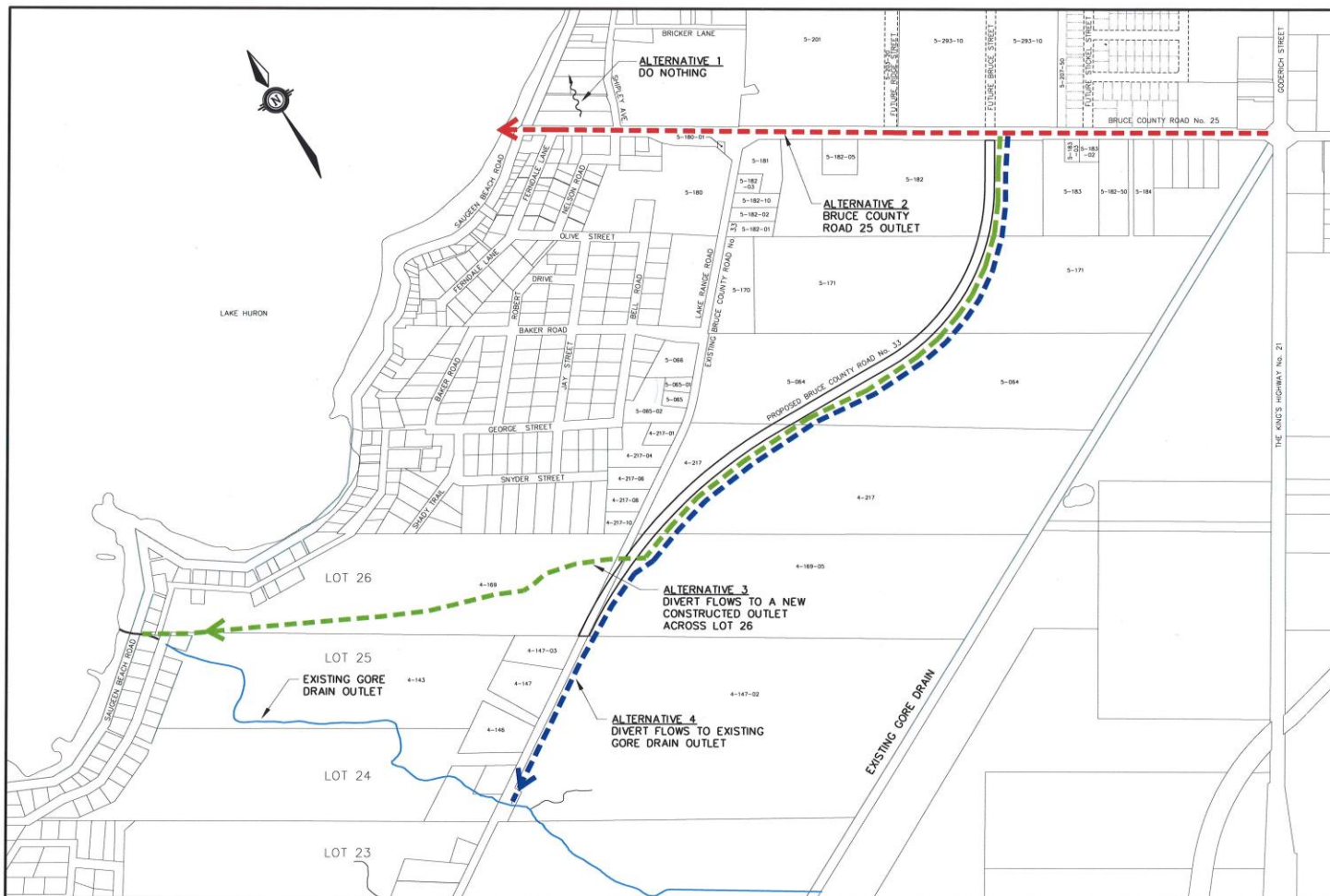
At this early stage, the project team has identified 4 alternatives, representing a range of possible approaches/solutions.

Variations of these may be developed as the study progresses.

- Alternative 1 – Do Nothing
- Alternative 2 – Improve BR25 Outlet to Lake Huron
- Alternative 3 – Divert flows from BR25 to a new constructed outlet across Lot 26 to existing Gore Drain Outlet west of Saugeen Beach Road
- Alternative 4 – Divert flows from BR25 to existing Gore Drain Outlet west of BR33.



Phase 2 – Step 1 Alternative Solutions - Drainage





Phase 2 – Step 2

Inventory Natural, Social and Economic “Environments”- Drainage

Natural

- Water courses / Drainage Routes (Quantity and Quality)
- Bluff Feature
- Wetlands
- Shoreline / Beaches
- Habitats (Flora and Fauna / Terrestrial and Aquatic)

Social

- Land Requirements
- Flooding Issues
- Archaeological Resources / Cultural Heritage
- Future Development / Community Needs
- Shoreline, Beaches, Recreational Opportunities
- Public Safety / Liability

Economic

- Capital and Maintenance Costs
- Life Cycle Costs (Asset Management)
- Potential Funding Partners



Phase 2 – Step 3

Screening and Mitigating Measures - Drainage

- Identify issues and constraints with respect to each alternative and each “environment”;
- Consider the relative magnitude of each net positive and net negative effect;
- Explore mitigating measures.



Phase 2 – Step 4: Sample Evaluation of Alternatives - Drainage

Category	Assessment Factor	Alt 1 Do Nothing	Alt 2 BR25 Outlet	Alt 3 Lot 26 Outlet	Alt 4 Gore Drain Outlet
Natural Environment	Water Courses / Drainage Routes (Quantity and Quality)				
	Bluff Feature				
	Wetlands				
	Shoreline / Beaches				
	Habitats (Flora and Fauna / Terrestrial and Aquatic)				
Social Environment	Land Requirements				
	Flooding Issues				
	Archaeological Resources / Cultural Heritage				
	Future Development / Community Needs				
	Shoreline, Beaches, Recreational Opportunities				
	Public Safety / Liability				
Economic	Capital and Maintenance Costs				
	Life Cycle Costs (Asset Management)				
	Potential Funding Partners				
Regulatory	Permits/Approvals				



Negative



Neutral



Positive



Phase 2 – Step 5

Agency and Public Involvement

Agency Involvement

Agencies include: Federal Departments, Provincial Ministries, Local Governments, First Nation Groups, Conservation Authorities, Utility Companies, etc. The Project Team will engage relevant agencies throughout the process.

Public Involvement

Public input is an essential part of the planning and decision-making process.

Opportunities to provide your input are not limited to formal consultation events.

Our Public Consultation program includes inviting feedback from:

- Directly affected private landowners;
- Other interested stakeholders;
- General Public.

* The Phase 2 – Step 5 Public Information Centre will be scheduled at a later date. A recommended solution may be provided at that time.

* Phase 2 – Step 6 confirms the preferred solution(s).



Next Steps

The next steps in this project planning are expected as follows:

- ❖ Receive initial feedback from the public (Discretionary PIC),
- ❖ Update Project File (Alternatives/Inventories/Screening/Evaluation),
- ❖ Receive Agency Comments,
- ❖ Update Project File based on comments received,
- ❖ Hold Mandatory Public Information Centre #1 and receive public comments,
- ❖ Update Project File and recommend a Preferred (set of) Alternative(s),
- ❖ Review choice of project schedule (as appropriate),
- ❖ Issue "Notice of Completion".



Please Provide Your Feedback

Thank you for attending this Phase 1 Public Information Centre

Would you like to be included on the study mailing list?

Do you have any questions or comments about the study?

Please let us know your thoughts by completing a Comment Sheet.

Completed sheets can either be deposited in the envelope on the way out or submitted by **October 21st, 2015.**

Opportunities to provide input are not limited to formal meetings or events. You can provide input to the study team at any point through the study.

*Information collected will be used in accordance with the
Freedom of Information and Protection of Privacy Act.*

With the exception of personal information, all comments will become part of the public record.



COUNTY OF BRUCE

HIGHWAYS DEPARTMENT

Box 398, 30 Park Street, Walkerton, Ontario N0G 2V0
(519) 881-2400 1-877-681-1291 Fax: (519) 507-3030
Brian R. Knox, County Engineer

April 22, 2016
Our File: M-1552

Great Lakes Métis
380 – 9th Street East
Owen Sound, ON N4K 1P1

Attention: Mr. Peter Couture
President

Re: Master Plan for Roads and Drainage
Bruce County Roads 25 and 33
Saugeen Shores
Phase 2 Public Information Centre

Dear Mr. Peter Couture,

The County of Bruce and Town of Saugeen Shores are undertaking a Master Plan process, as outlined in Approach 1 of the Municipal Class Environmental Assessment Planning Manual, to address issues with roads and drainage in the southerly area of the Former Town of Port Elgin (Saugeen Shores), about the intersection of Bruce Roads 25 and 33.

A Discretionary Public Information Centre was held on October 7, 2015 and since this time this initiative has progressed into Phase 2 of the Municipal Class Environmental Assessment Planning and Design Process. Assessment and evaluation tables have been prepared for three road systems and seven drainage system alternatives and will be available for viewing on the County's website on May 2, 2016.

We are providing Great Lakes Métis with this information package identifying the issues currently under consideration and the plan to host a Public Information Centre (PIC) on May 18, 2016. We would welcome the opportunity of meeting with you prior to the PIC and look forward to working with you on this initiative.

We will provide you with updates as this initiative progresses, please contact me or our consultant John Slocombe, P.Eng of GM BluePlan Engineering Limited if you have any questions, comments or require additional information.

Yours truly,

Brian Knox, P.Eng
County Engineer

Encl.

c: Len Perdue – Saugeen Shores: perduel@saugeenshores.ca
John Slocombe – GM BluePlan: john.slocombe@gmblueplan.ca



**MASTER PLAN FOR ROADS AND DRAINAGE
BRUCE COUNTY ROADS 25 AND 33
NOTICE OF PHASE 2
PUBLIC INFORMATION CENTRE**

The County of Bruce as Proponent, with the Town of Saugeen Shores, is studying road and drainage alternatives in the area of Bruce County Roads 25 and 33 (BR25 & BR33), located centrally in Saugeen Shores, and is inviting interested members of the public to attend an Information Centre.

The County has identified various deficiencies with its road and drainage infrastructure within the Study Area. Through initial discussions with the Town, other related issues having a broader scope have emerged which the County wishes to consider at a Master Planning level to ensure individual projects are completed in context with an appropriate overall plan. The purpose of the Phase 2 Public Information Centre is to describe the identified issues within the Study Area and to receive input from the public on the evaluation of alternative solutions to the identified problems.

Issues related to roads include deteriorated travelled surfaces, poor sight lines at the intersection of BR25 and BR33, and planned future intersections at Stickel, Bruce and Ridge Streets. Alternatives for Road Systems include; Do Nothing but resurfacing, Re-align the BR33 intersection with the future Ridge Street intersection, or Re-align the BR33 intersection the with the future Bruce Street intersection.

Issues related to drainage include limited capacity along BR25, poor drainage through the Baker Subdivision, and inadequate drainage outlets within the Study Area. Alternatives for Drainage systems include; Do Nothing, Improve Existing Conditions, Construct a new outlet westerly on BR25 to Lake Huron, Divert flows northerly to the existing South End Drain Outlet, Divert flows from BR25 southerly along BR33 to a new constructed outlet westerly through the Baker Subdivision, Divert flows from BR25 southerly along BR33 to a new constructed outlet across Lot 26 to the existing Gore Drain outlet below Saugeen Beach Road, or Divert flows southerly along BR33 to the existing Gore Drain outlet below Lake Range Road (BR33).

The Master Plan is being conducted under the **Municipal Class Environmental Assessment (EA)** project planning process and is intended to follow, as a minimum, Phases 1 and 2 of the EA Process, in support of Schedule B and/or Schedule C projects, which may be identified for further study and implementation through the process.

As part of this process a Phase 2 **Public Information Centre** is planned at the Town of **Saugeen Shores Rotary Hall on Wednesday, May 18th, 2016 at 7:00 p.m. – 9:00 p.m.**, at which time project information will be displayed and a recommended solution presented. The Project Team will be available for discussions.

The public is invited to provide written comments for incorporation into the planning considerations for this project. Upon receipt of comments from the public, a Project File will consolidate the Master Planning process and a Preferred Solution will be recommended for acceptance by County and Town Councils. Additional information is provided on the municipal web sites.

This Notice issued May 2nd, 2016.

The County of Bruce
Mr. Brian Knox, P.Eng.
Box 398, 30 Park St.
Walkerton, ON N0G 2V0
Tel: (519) 881-2400
www.brucecounty.on.ca

The Town of Saugeen Shores
Mr. Len Perdue
600 Tomlinson Drive
P.O. Box 820
Port Elgin, ON N0H 2C0
Tel: (519) 832-2008
www.saugeenshores.ca

GM BluePlan Engineering Limited
Consulting Professional Engineers
Mr. John Slocombe, P.Eng.
1260 2nd Avenue East, Unit 1
Owen Sound, ON N4K 2J3
Tel: (519) 376-1805
www.gmbblueplan.ca



COUNTY OF BRUCE

HIGHWAYS DEPARTMENT

Box 398, 30 Park Street, Walkerton, Ontario N0G 2V0
(519) 881-2400 1-877-681-1291 Fax: (519) 507-3030
Brian R. Knox, County Engineer

April 22, 2016

Our File: M-1552

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

Attention: Mr. George Govier
Lands and Resources Coordinator

Re: Master Plan for Roads and Drainage
Bruce County Roads 25 and 33
Saugeen Shores
Phase 2 Public Information Centre

Dear Mr. Govier,

The County of Bruce and Town of Saugeen Shores are undertaking a Master Plan process, as outlined in Approach 1 of the Municipal Class Environmental Assessment Planning Manual, to address issues with roads and drainage in the southerly area of the Former Town of Port Elgin (Saugeen Shores), about the intersection of Bruce Roads 25 and 33.

A Discretionary Public Information Centre was held on October 7, 2015 and since this time this initiative has progressed into Phase 2 of the Municipal Class Environmental Assessment Planning and Design Process. Assessment and evaluation tables have been prepared for three road systems and seven drainage system alternatives and will be available for viewing on the County's website on May 2, 2016.

We are providing Historic Saugeen Métis (HSM) with this information package identifying the issues currently under consideration and the plan to host a Public Information Centre (PIC) on May 18, 2016. We would welcome the opportunity of meeting with you prior to the PIC and look forward to working with you on this initiative.

We will provide you with updates as this initiative progresses, please contact me or our consultant John Slocombe, P.Eng of GM BluePlan Engineering Limited if you have any questions, comments or require additional information.

Yours truly,

Brian Knox, P.Eng
County Engineer

Encl.

c: Len Perdue – Saugeen Shores: perduel@saugeenshores.ca
John Slocombe – GM BluePlan: john.slocombe@gmblueplan.ca



**MASTER PLAN FOR ROADS AND DRAINAGE
BRUCE COUNTY ROADS 25 AND 33
NOTICE OF PHASE 2
PUBLIC INFORMATION CENTRE**

The County of Bruce as Proponent, with the Town of Saugeen Shores, is studying road and drainage alternatives in the area of Bruce County Roads 25 and 33 (BR25 & BR33), located centrally in Saugeen Shores, and is inviting interested members of the public to attend an Information Centre.

The County has identified various deficiencies with its road and drainage infrastructure within the Study Area. Through initial discussions with the Town, other related issues having a broader scope have emerged which the County wishes to consider at a Master Planning level to ensure individual projects are completed in context with an appropriate overall plan. The purpose of the Phase 2 Public Information Centre is to describe the identified issues within the Study Area and to receive input from the public on the evaluation of alternative solutions to the identified problems.

Issues related to roads include deteriorated travelled surfaces, poor sight lines at the intersection of BR25 and BR33, and planned future intersections at Stickel, Bruce and Ridge Streets. Alternatives for Road Systems include; Do Nothing but resurfacing, Re-align the BR33 intersection with the future Ridge Street intersection, or Re-align the BR33 intersection the with the future Bruce Street intersection.

Issues related to drainage include limited capacity along BR25, poor drainage through the Baker Subdivision, and inadequate drainage outlets within the Study Area. Alternatives for Drainage systems include; Do Nothing, Improve Existing Conditions, Construct a new outlet westerly on BR25 to Lake Huron, Divert flows northerly to the existing South End Drain Outlet, Divert flows from BR25 southerly along BR33 to a new constructed outlet westerly through the Baker Subdivision, Divert flows from BR25 southerly along BR33 to a new constructed outlet across Lot 26 to the existing Gore Drain outlet below Saugeen Beach Road, or Divert flows southerly along BR33 to the existing Gore Drain outlet below Lake Range Road (BR33).

The Master Plan is being conducted under the **Municipal Class Environmental Assessment (EA)** project planning process and is intended to follow, as a minimum, Phases 1 and 2 of the EA Process, in support of Schedule B and/or Schedule C projects, which may be identified for further study and implementation through the process.

As part of this process a Phase 2 **Public Information Centre** is planned at the Town of **Saugeen Shores Rotary Hall on Wednesday, May 18th, 2016 at 7:00 p.m. – 9:00 p.m.**, at which time project information will be displayed and a recommended solution presented. The Project Team will be available for discussions.

The public is invited to provide written comments for incorporation into the planning considerations for this project. Upon receipt of comments from the public, a Project File will consolidate the Master Planning process and a Preferred Solution will be recommended for acceptance by County and Town Councils. Additional information is provided on the municipal web sites.

This Notice issued May 2nd, 2016.

The County of Bruce
Mr. Brian Knox, P.Eng.
Box 398, 30 Park St.
Walkerton, ON N0G 2V0
Tel: (519) 881-2400
www.brucecounty.on.ca

The Town of Saugeen Shores
Mr. Len Perdue
600 Tomlinson Drive
P.O. Box 820
Port Elgin, ON N0H 2C0
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COUNTY OF BRUCE

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Brian R. Knox, County Engineer

April 22, 2016
Our File: M-1552

Saugeen Ojibway Nation
SON Environmental Office
25 Maadookii Subdivision
R.R. #5, Wiarton, ON N0H 2T0

Attention: Mr. Doran Ritchie
Landuse Planning Coordinator

Re: Master Plan for Roads and Drainage
Bruce County Roads 25 and 33
Saugeen Shores
Phase 2 Public Information Centre

Dear Mr. Ritchie,

The County of Bruce and Town of Saugeen Shores are undertaking a Master Plan process, as outlined in Approach 1 of the Municipal Class Environmental Assessment Planning Manual, to address issues with roads and drainage in the southerly area of the Former Town of Port Elgin (Saugeen Shores), about the intersection of Bruce Roads 25 and 33.

A Discretionary Public Information Centre was held on October 7, 2015 and since this time this initiative has progressed into Phase 2 of the Municipal Class Environmental Assessment Planning and Design Process. Assessment and evaluation tables have been prepared for three road systems and seven drainage system alternatives and will be available for viewing on the County's website on May 2, 2016.

We are providing Saugeen Ojibway Nation (SON) with this information package identifying the issues currently under consideration and the plan to host a Public Information Centre (PIC) on May 18, 2016. We would welcome the opportunity of meeting with you prior to the PIC and look forward to working with you on this initiative.

We will provide you with updates as this initiative progresses, please contact me or our consultant John Slocombe, P.Eng of GM BluePlan Engineering Limited if you have any questions, comments or require additional information.

Yours truly,

Brian Knox, P.Eng
County Engineer

Encl.

c: Len Perdue – Saugeen Shores: perduel@saugeenshores.ca
John Slocombe – GM BluePlan: john.slocombe@gmblueplan.ca



**MASTER PLAN FOR ROADS AND DRAINAGE
BRUCE COUNTY ROADS 25 AND 33
NOTICE OF PHASE 2
PUBLIC INFORMATION CENTRE**

The County of Bruce as Proponent, with the Town of Saugeen Shores, is studying road and drainage alternatives in the area of Bruce County Roads 25 and 33 (BR25 & BR33), located centrally in Saugeen Shores, and is inviting interested members of the public to attend an Information Centre.

The County has identified various deficiencies with its road and drainage infrastructure within the Study Area. Through initial discussions with the Town, other related issues having a broader scope have emerged which the County wishes to consider at a Master Planning level to ensure individual projects are completed in context with an appropriate overall plan. The purpose of the Phase 2 Public Information Centre is to describe the identified issues within the Study Area and to receive input from the public on the evaluation of alternative solutions to the identified problems.

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Issues related to drainage include limited capacity along BR25, poor drainage through the Baker Subdivision, and inadequate drainage outlets within the Study Area. Alternatives for Drainage systems include; Do Nothing, Improve Existing Conditions, Construct a new outlet westerly on BR25 to Lake Huron, Divert flows northerly to the existing South End Drain Outlet, Divert flows from BR25 southerly along BR33 to a new constructed outlet westerly through the Baker Subdivision, Divert flows from BR25 southerly along BR33 to a new constructed outlet across Lot 26 to the existing Gore Drain outlet below Saugeen Beach Road, or Divert flows southerly along BR33 to the existing Gore Drain outlet below Lake Range Road (BR33).

The Master Plan is being conducted under the **Municipal Class Environmental Assessment (EA)** project planning process and is intended to follow, as a minimum, Phases 1 and 2 of the EA Process, in support of Schedule B and/or Schedule C projects, which may be identified for further study and implementation through the process.

As part of this process a Phase 2 **Public Information Centre** is planned at the Town of **Saugeen Shores Rotary Hall on Wednesday, May 18th, 2016 at 7:00 p.m. – 9:00 p.m.**, at which time project information will be displayed and a recommended solution presented. The Project Team will be available for discussions.

The public is invited to provide written comments for incorporation into the planning considerations for this project. Upon receipt of comments from the public, a Project File will consolidate the Master Planning process and a Preferred Solution will be recommended for acceptance by County and Town Councils. Additional information is provided on the municipal web sites.

This Notice issued May 2nd, 2016.

The County of Bruce
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Owen Sound, ON N4K 2J3
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www.gmbblueplan.ca



December 18, 2017

Chippewas of Nawash Unceded Nation
135 Lakeshore Boulevard
Neyaashinigmiing, ON N0H 2T0

Attention: Rose Lameman

Re: Schedule B Environmental Assessment - Bruce Road 33 Re-Alignment

The County of Bruce and Town of Saugeen Shores initiated a Master Plan for Roads and Drainage for Bruce Road 25 and Bruce Road 33 in September 2015. The Notice of Study Completion for the Master Plan was issued on May 9, 2017 and identified the re-alignment of Bruce Road 33 to intersect with Bruce Road 25 at the future Bruce Street alignment as a Schedule B project.

We are providing Saugeen First Nation with the attached Notice of Project Initiation for the Schedule B Environmental Assessment (EA) for the Bruce County Road 33 Re-Alignment that will be issued on January 9, 2018. A Stage 1 and 2 Archaeological Assessment was completed for the study area in June 2017, Saugeen Ojibway Nation monitors were present during the assessment.

The Master Plan and the Schedule B EA Project File, which includes all background technical reports, will be available on the County of Bruce and Town of Saugeen Shores websites and at the County of Bruce Administration Building and Town of Saugeen Shore Municipal Office for viewing on January 9, 2018.

We will continue to provide updates as this project progresses. Please contact our office or our consultant John Slocombe, P.Eng of GMBLuePlan Engineering Limited if you have any questions, comments or require additional information.

Yours truly,

Brian Knox
County Engineer

Encl.

c: John Slocombe, GM BluePlan Engineering Ltd.
Amanda Froese, Town of Saugeen Shores

County of Bruce Highways Department
30 Park Street, P.O. Box 398, Walkerton, ON N0G 2V0
(519) 881-2400 1-877-681-1291 Fax (519)507-3030
Brian R. Knox, County Engineer

brucecounty.on.ca



December 18, 2017

MNO Great Lakes Metis Council
380-9th Street East
Owen Sound, ON N4K 1P1

Attention: Peter Couture

Re: Schedule B Environmental Assessment - Bruce Road 33 Re-Alignment

The County of Bruce and Town of Saugeen Shores initiated a Master Plan for Roads and Drainage for Bruce Road 25 and Bruce Road 33 in September 2015. The Notice of Study Completion for the Master Plan was issued on May 9, 2017 and identified the re-alignment of Bruce Road 33 to intersect with Bruce Road 25 at the future Bruce Street alignment as a Schedule B project.

We are providing Saugeen First Nation with the attached Notice of Project Initiation for the Schedule B Environmental Assessment (EA) for the Bruce County Road 33 Re-Alignment that will be issued on January 9, 2018. The Master Plan and the Schedule B EA Project File, which includes all background technical reports, will be available on the County of Bruce and Town of Saugeen Shores websites and at the County of Bruce Administration Building and Town of Saugeen Shore Municipal Office for viewing on January 9, 2018.

We will continue to provide updates as this project progresses. Please contact our office or our consultant John Slocombe, P.Eng of GMBLuePlan Engineering Limited if you have any questions, comments or require additional information.

Yours truly,

A handwritten signature in dark ink, appearing to be 'B. Knox', written over a horizontal line.

Brian Knox
County Engineer

Encl.

c: John Slocombe, GM BluePlan Engineering Ltd.
Amanda Froese, Town of Saugeen Shores



December 18, 2017

Historic Saugeen Metis
204 High Street, PO Box 1492
Southampton, ON N0H2L0

Attention: George Govier

Re: Schedule B Environmental Assessment - Bruce Road 33 Re-Alignment

The County of Bruce and Town of Saugeen Shores initiated a Master Plan for Roads and Drainage for Bruce Road 25 and Bruce Road 33 in September 2015. The Notice of Study Completion for the Master Plan was issued on May 9, 2017 and identified the re-alignment of Bruce Road 33 to intersect with Bruce Road 25 at the future Bruce Street alignment as a Schedule B project.

We are providing Saugeen First Nation with the attached Notice of Project Initiation for the Schedule B Environmental Assessment (EA) for the Bruce County Road 33 Re-Alignment that will be issued on January 9, 2018. The Master Plan and the Schedule B EA Project File, which includes all background technical reports, will be available on the County of Bruce and Town of Saugeen Shores websites and at the County of Bruce Administration Building and Town of Saugeen Shore Municipal Office for viewing on January 9, 2018.

We will continue to provide updates as this project progresses. Please contact our office or our consultant John Slocombe, P.Eng of GMBLuePlan Engineering Limited if you have any questions, comments or require additional information.

Yours truly,

Brian Knox
County Engineer

Encl.

c: John Slocombe, GM BluePlan Engineering Ltd.
Amanda Froese, Town of Saugeen Shores



December 18, 2017

Saugeen First Nation
Chippewas of Saugeen First Nation No.29
6493 Highway 21, RR#1
Southampton, ON N0H2L0

Attention: Allen Deleary

Re: Schedule B Environmental Assessment - Bruce Road 33 Re-Alignment

The County of Bruce and Town of Saugeen Shores initiated a Master Plan for Roads and Drainage for Bruce Road 25 and Bruce Road 33 in September 2015. The Notice of Study Completion for the Master Plan was issued on May 9, 2017 and identified the re-alignment of Bruce Road 33 to intersect with Bruce Road 25 at the future Bruce Street alignment as a Schedule B project.

We are providing Saugeen First Nation with the attached Notice of Project Initiation for the Schedule B Environmental Assessment (EA) for the Bruce County Road 33 Re-Alignment that will be issued on January 9, 2018. A Stage 1 and 2 Archaeological Assessment was completed for the study area in June 2017, Saugeen Ojibway Nation monitors were present during the assessment.

The Master Plan and the Schedule B EA Project File, which includes all background technical reports, will be available on the County of Bruce and Town of Saugeen Shores websites and at the County of Bruce Administration Building and Town of Saugeen Shore Municipal Office for viewing on January 9, 2018.

We will continue to provide updates as this project progresses. Please contact our office or our consultant John Slocombe, P.Eng of GMBLuePlan Engineering Limited if you have any questions, comments or require additional information.

Yours truly,

Brian Knox
County Engineer

Encl.

c: John Slocombe, GM BluePlan Engineering Ltd.
Amanda Froese, Town of Saugeen Shores



December 18, 2017

Saugeen Ojibway Nation
SON Environmental Office
25 Maadookii Subdivision
RR#5, Wiarton ON N0H 2T0

Attention: Doran Ritchie

Re: Schedule B Environmental Assessment - Bruce Road 33 Re-Alignment

The County of Bruce and Town of Saugeen Shores initiated a Master Plan for Roads and Drainage for Bruce Road 25 and Bruce Road 33 in September 2015. The Notice of Study Completion for the Master Plan was issued on May 9, 2017 and identified the re-alignment of Bruce Road 33 to intersect with Bruce Road 25 at the future Bruce Street alignment as a Schedule B project.

We are providing Saugeen Ojibway Nation (SON) with the attached Notice of Project Initiation for the Schedule B Environmental Assessment (EA) for the Bruce County Road 33 Re-Alignment that will be issued on January 9, 2018. A Stage 1 and 2 Archaeological Assessment was completed for the study area in June 2017, SON monitors were present during the assessment.

The Master Plan and the Schedule B EA Project File, which includes all background technical reports, will be available on the County of Bruce and Town of Saugeen Shores websites and at the County of Bruce Administration Building and Town of Saugeen Shore Municipal Office for viewing on January 9, 2018.

We will continue to provide updates as this project progresses. Please contact our office or our consultant John Slocombe, P.Eng of GMBLuePlan Engineering Limited if you have any questions, comments or require additional information.

Yours truly,

Brian Knox
County Engineer

Encl.

c: John Slocombe, GM BluePlan Engineering Ltd.
Amanda Froese, Town of Saugeen Shores



**SCHEDULE B MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT
BRUCE COUNTY ROAD 33 RE-ALIGNMENT
NOTICE OF PROJECT INITIATION**

The County of Bruce as Proponent, with the Town of Saugeen Shores, having recently completed a Master Plan for Roads and Drainage for the general Study Area, is advancing project specific planning for the re-alignment of Bruce Road 33 (BR33), located centrally in Saugeen Shores.

The County has identified various deficiencies with road and drainage infrastructure within the Study Area. Issues related to roads include deteriorated travelled surfaces, poor sight lines at the intersection of B25 and BR33, and planned future intersections at Sitckel, Bruce, and Ridge Streets. The Master Plan process reviewed alternative solutions for roads including;

- i) Do nothing but resurfacing,
- ii) Intersection and Capacity Improvements on BR25, and
- iii) Re-align the BR33 intersection with the future Bruce Street intersection.

Through the Master Plan process, the re-alignment of BR33 to intersect with BR25 at a future Bruce Street alignment location was identified as the preferred solution to address the issues identified.

Project specific planning for the re-alignment of BR33 is being conducted as a Schedule B activity under the **Municipal Class Environmental Assessment (EA)**. Project planning is intended to follow, as a minimum, Phases 1 and 2 of the EA Process. The Schedule B EA process is project specific to the re-alignment of Bruce Road 33 and is intended to update and verify the direction resolved through the more general Master Plan process.

Both the Master Plan Report and the Schedule B EA Project File are available on the County and Town websites at the addresses noted below.

The public is invited to review the documentation and to provide written comments for incorporation into the planning considerations for the Bruce Road 33 re-alignment project. Comments may be directed to any one of the contacts listed below, and should be received by **February 6, 2018**.

This Notice first issued on January 9, 2018.

The County of Bruce
Mr. Brian Knox, P.Eng.
30 Park Street
Box 398
Walkerton, ON N0G 2V0
bknox@brucecounty.on.ca
Tel: 519-881-2400
www.brucecounty.on.ca

The Town of Saugeen Shores
Ms. Amanda Froese, P. Eng.
600 Tomlinson Drive
P.O. Box 820
Port Elgin, ON N0H 2C0
amanda.froese@saugeenshores.ca
Tel: 519-832-2008
www.saugeenshores.ca

GM BluePlan Engineering Limited
Consulting Professional Engineers
Mr. John Slocombe, P.Eng.
1260-2nd Avenue East, Unit 1
Owen Sound, ON N4K 2J3
john.slocombe@gmblueplan.ca
Tel: 519-376-1805
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County of Bruce Transportation &
Environmental Services Department
30 Park Street, P.O. Box 398, Walkerton, ON N0G 2V0
(519) 881-2400 1-877-681-1291 Fax (519)507-3030

brucecounty.on.ca

April 25, 2018

Chippewas of Nawash Unceded Nation
135 Lakeshore Boulevard
Neyaashinigmiing, ON N0H 2T0

Attention: Rose Lameman

Re: Schedule B Environmental Assessment - Bruce Road 33 Re-Alignment

The County of Bruce and Town of Saugeen Shores initiated a Master Plan for Roads and Drainage for Bruce Road 25 and Bruce Road 33 in September 2015. The Notice of Study Completion for the Master Plan was issued on May 9, 2017 and identified the re-alignment of Bruce Road 33 to intersect with Bruce Road 25 at the future Bruce Street alignment as a Schedule B project. Correspondence was provided to Chippewas of Nawash Unceded Nation on December 18, 2017 regarding the Schedule B EA for Bruce Road 33 and the Notice of Project Initiation dated January 9, 2018.

The Department is moving forward with the Schedule B EA for Bruce Road 33 and is issuing the Notice of Study Completion on May 1, 2018. The notice identifies the preferred solution to be the re-alignment of Bruce Road 33 intersection with the future Bruce Street Intersection. A copy of the notice is enclosed for your review.

The Schedule B EA Project File will be available on the County of Bruce and Saugeen Shores websites and at the County of Bruce Administration Building and Town of Saugeen Shores Municipal Office for viewing on May 1, 2018.

We will continue to provide correspondence as the project progresses. Please contact our office or our consultant John Slocombe of GMBLuePlan Engineering Limited if you have any questions, comments or require additional information.

Yours truly,

Kerri Meier
Environmental Coordinator

Encl.

c: Kelley Coulter, CAO Bruce County
John Slocombe, GM BluePlan Engineering Ltd.
Amanda Froese, Town of Saugeen Shores



County of Bruce Transportation &
Environmental Services Department
30 Park Street, P.O. Box 398, Walkerton, ON N0G 2V0
(519) 881-2400 1-877-681-1291 Fax (519)507-3030

brucecounty.on.ca

April 25, 2018

MNO Great Lakes Metis Council
380-9th Street East
Owen Sound, ON N4K 1P1

Attention: Peter Couture

Re: Schedule B Environmental Assessment - Bruce Road 33 Re-Alignment

The County of Bruce and Town of Saugeen Shores initiated a Master Plan for Roads and Drainage for Bruce Road 25 and Bruce Road 33 in September 2015. The Notice of Study Completion for the Master Plan was issued on May 9, 2017 and identified the re-alignment of Bruce Road 33 to intersect with Bruce Road 25 at the future Bruce Street alignment as a Schedule B project. Correspondence was provided to MNO Great Lakes Metis Council on December 18, 2017 regarding the Schedule B EA for Bruce Road 33 and the Notice of Project Initiation dated January 9, 2018.

The Department is moving forward with the Schedule B EA for Bruce Road 33 and is issuing the Notice of Study Completion on May 1, 2018. The notice identifies the preferred solution to be the re-alignment of Bruce Road 33 intersection with the future Bruce Street Intersection. A copy of the notice is enclosed for your review.

The Schedule B EA Project File will be available on the County of Bruce and Saugeen Shores websites and at the County of Bruce Administration Building and Town of Saugeen Shores Municipal Office for viewing on May 1, 2018.

We will continue to provide correspondence as the project progresses. Please contact our office or our consultant John Slocombe of GMBLuePlan Engineering Limited if you have any questions, comments or require additional information.

Yours truly,

Kerri Meier
Environmental Coordinator

Encl.

c: Kelley Coulter, CAO Bruce County
John Slocombe, GM BluePlan Engineering Ltd.
Amanda Froese, Town of Saugeen Shores



County of Bruce Transportation &
Environmental Services Department
30 Park Street, P.O. Box 398, Walkerton, ON N0G 2V0
(519) 881-2400 1-877-681-1291 Fax (519)507-3030

brucecounty.on.ca

April 25, 2018

Historic Saugeen Metis
P.O. Box 1492, 204 High Street
Southampton, ON N0H 2L0

Attention: George Govier

Re: Schedule B Environmental Assessment - Bruce Road 33 Re-Alignment

The County of Bruce and Town of Saugeen Shores initiated a Master Plan for Roads and Drainage for Bruce Road 25 and Bruce Road 33 in September 2015. The Notice of Study Completion for the Master Plan was issued on May 9, 2017 and identified the re-alignment of Bruce Road 33 to intersect with Bruce Road 25 at the future Bruce Street alignment as a Schedule B project. Correspondence was provided to Historic Saugeen Metis on December 18, 2017 regarding the Schedule B EA for Bruce Road 33 and the Notice of Project Initiation dated January 9, 2018.

The Department is moving forward with the Schedule B EA for Bruce Road 33 and is issuing the Notice of Study Completion on May 1, 2018. The notice identifies the preferred solution to be the re-alignment of Bruce Road 33 intersection with the future Bruce Street Intersection. A copy of the notice is enclosed for your review.

The Schedule B EA Project File will be available on the County of Bruce and Saugeen Shores websites and at the County of Bruce Administration Building and Town of Saugeen Shores Municipal Office for viewing on May 1, 2018.

We will continue to provide correspondence as the project progresses. Please contact our office or our consultant John Slocombe of GMBLuePlan Engineering Limited if you have any questions, comments or require additional information.

Yours truly,

Kerri Meier
Environmental Coordinator

Encl.

c: Kelley Coulter, CAO Bruce County
John Slocombe, GM BluePlan Engineering Ltd.
Amanda Froese, Town of Saugeen Shores



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brucecounty.on.ca

April 25, 2018

Saugeen First Nation
Chippewas of Saugeen First Nation No.29
6493 Highway 21, RR#1
Southampton, ON N0H2L0

Attention: Cheree Urscheler

Re: Schedule B Environmental Assessment - Bruce Road 33 Re-Alignment

The County of Bruce and Town of Saugeen Shores initiated a Master Plan for Roads and Drainage for Bruce Road 25 and Bruce Road 33 in September 2015. The Notice of Study Completion for the Master Plan was issued on May 9, 2017 and identified the re-alignment of Bruce Road 33 to intersect with Bruce Road 25 at the future Bruce Street alignment as a Schedule B project. Correspondence was provided to Saugeen First Nation on December 18, 2017 regarding the Schedule B EA for Bruce Road 33 and the Notice of Project Initiation dated January 9, 2018.

The Department is moving forward with the Schedule B EA for Bruce Road 33 and is issuing the Notice of Study Completion on May 1, 2018. The notice identifies the preferred solution to be the re-alignment of Bruce Road 33 intersection with the future Bruce Street Intersection. A copy of the notice is enclosed for your review.

The Schedule B EA Project File will be available on the County of Bruce and Saugeen Shores websites and at the County of Bruce Administration Building and Town of Saugeen Shores Municipal Office for viewing on May 1, 2018.

We will continue to provide correspondence as the project progresses. Please contact our office or our consultant John Slocombe of GMBLuePlan Engineering Limited if you have any questions, comments or require additional information.

Yours truly,

Kerri Meier
Environmental Coordinator

Encl.

c: Kelley Coulter, CAO Bruce County
John Slocombe, GM BluePlan Engineering Ltd.
Amanda Froese, Town of Saugeen Shores



County of Bruce Transportation &
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brucecounty.on.ca

April 25, 2018

Saugeen Ojibway Nation
SON Environmental Office
25 Maadookii Subdivision
RR#5, Wiarton ON N0H 2T0

Attention: Doran Ritchie

Re: Schedule B Environmental Assessment - Bruce Road 33 Re-Alignment

The County of Bruce and Town of Saugeen Shores initiated a Master Plan for Roads and Drainage for Bruce Road 25 and Bruce Road 33 in September 2015. The Notice of Study Completion for the Master Plan was issued on May 9, 2017 and identified the re-alignment of Bruce Road 33 to intersect with Bruce Road 25 at the future Bruce Street alignment as a Schedule B project. Correspondence was provided to Saugeen Ojibway Nation (SON) on December 18, 2017 regarding the Schedule B EA for Bruce Road 33 and the Notice of Project Initiation dated January 9, 2018.

The Department is moving forward with the Schedule B EA for Bruce Road 33 and is issuing the Notice of Study Completion on May 1, 2018. The notice identifies the preferred solution to be the re-alignment of Bruce Road 33 intersection with the future Bruce Street Intersection. A copy of the notice is enclosed for your review.

The Schedule B EA Project File will be available on the County of Bruce and Saugeen Shores websites and at the County of Bruce Administration Building and Town of Saugeen Shores Municipal Office for viewing on May 1, 2018.

We will continue to provide correspondence as the project progresses. Please contact our office or our consultant John Slocombe of GMBLuePlan Engineering Limited if you have any questions, comments or require additional information.

Yours truly,

Kerri Meier
Environmental Coordinator

Encl.

c: Kelley Coulter, CAO Bruce County
John Slocombe, GM BluePlan Engineering Ltd.
Amanda Froese, Town of Saugeen Shores

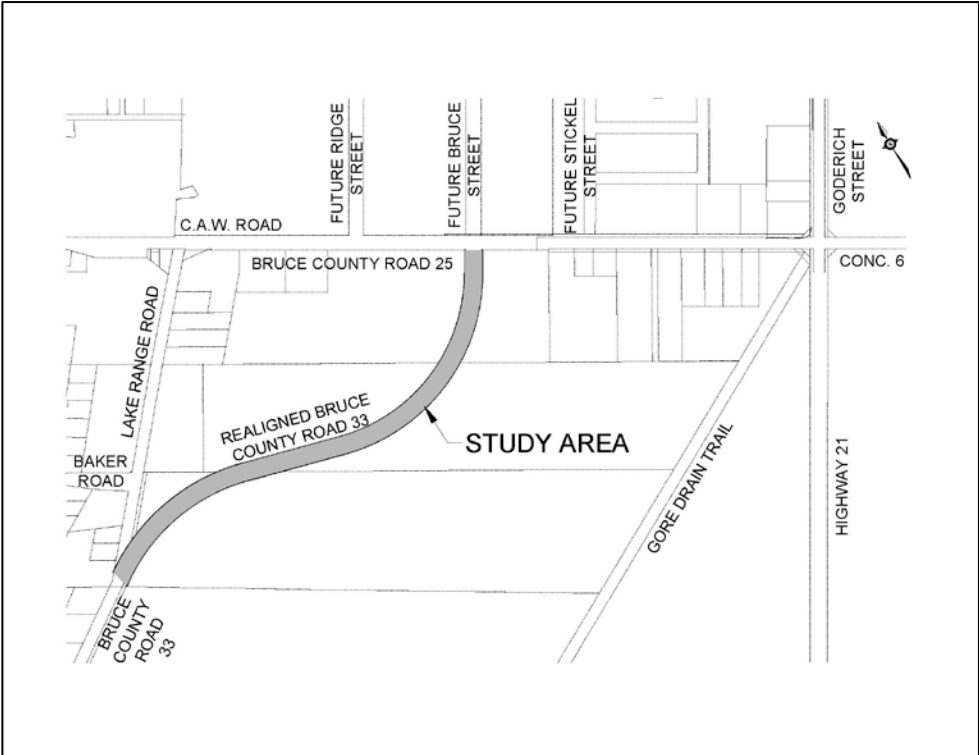
SCHEDULE B MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT
BRUCE COUNTY ROAD 33 RE-ALIGNMENT
NOTICE OF STUDY COMPLETION

The County of Bruce as Proponent, with the Town of Saugeen Shores, having recently completed a Master Plan for the general Study Area, is advancing project specific planning for the re-alignment of Bruce Road 33 (BR33), located where shown on the accompanying map. Issues related to roads include deteriorated travelled surfaces, poor sight lines and planned future intersections at Stickel, Bruce, and Ridge Streets. The Master Plan process reviewed alternative solutions for roads including;

- i) Do nothing but resurfacing,
- ii) Intersection and Capacity Improvements on BR25, and
- iii) Re-align the BR33 intersection with the future Bruce Street intersection.

Through the Master Plan process, the re-alignment of BR33 to intersect with BR25 at a future Bruce Street alignment location was identified as the preferred solution to address the issues identified.

Project specific planning for the re-alignment of BR33 is being conducted as a Schedule B activity under the **Municipal Class Environmental Assessment (EA)**. The Schedule B EA process is project specific to the re-alignment of Bruce Road 33 and is intended to update and verify the direction resolved through the more general Master Plan process. A Notice of Project Initiation was issued on **January 9, 2018**. Based on the study findings and comments, the BR33 re-alignment alternative, as described in the Master Plan, is adopted by Council as the Preferred Solution to this Schedule B EA process. Both the Master Plan Report and the Schedule B EA Project File are available on the County and Town websites at the addresses noted below.




Interested parties should provide written comments to the County of Bruce, at the address noted below, within 30 calendar days from the date of this Notice. If concerns arise regarding this project, which cannot be resolved in discussion with the County, a person or party may request the Minister of the Environment and Climate Change to order a change in the project status and require a higher level of assessment under an individual Environmental Assessment process (referred to as a Part II Order). Reasons must be provided for the request. Requests must be received by the Minister within 30 calendar days of this Notice.

Part II Order requests are to be submitted to:

Minister Ministry of the Environment and Climate Change 77 Wellesley St. W., Floor 11 Toronto, ON M7A 2T5 Fax: 416-314-8452	Director Environmental Assessment & Permissions Branch Ministry of the Environment and Climate Change 135 St. Clair Avenue W, 1 st Floor Toronto, ON M4V 1L5
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A copy of the request should also be sent to the following:

The County of Bruce Ms. Kerri Meier 30 Park Street, Box 398 Walkerton, ON N0G 2V0 kmeier@brucecounty.on.ca Tel: 519-881-2400 www.brucecounty.on.ca	The Town of Saugeen Shores Ms. Amanda Froese, P. Eng. 600 Tomlinson Drive , P.O. Box 820 Port Elgin, ON N0H 2C0 amanda.froese@saugeenshores.ca Tel: 519-832-2008 www.saugeenshores.ca	GM BluePlan Engineering Limited Consulting Professional Engineers Mr. John Slocombe, P.Eng. 1260-2 nd Avenue East, Unit 1 Owen Sound, ON N4K 2J3 john.slocombe@gmblueplan.ca Tel: 519-376-1805 www.gmblueplan.ca
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Feb.5, 2018

Minister of the Environment and Climate Change
77 Wellesley St. W, Floor 11
Toronto ON M7A 2T5

Dear Minister Chris Ballard

**Part II Order Request
Bruce County Road 33 Re-alignment**

I have reviewed the project file Bruce County Road 33 Re-alignment and feel that there has not been adequate consultation of the cottagers who are major stakeholders and therefore I am submitting this Part II Order Request. It is necessary for proper engagement that the cottagers in the area be consulted because we are major users of CR 25 and CR 33 and the surrounding area which are being affected by the project.

Both the Notice of Phase 2 and the Project Initiation Notice do not refer to the roads by their commonly known names. CR 25 has commonly been known as the CAW Road and Con. 6. CR33 is commonly known as Lake Range Road. These names are referenced in the report but not in the Notices. The notices state that the project is located centrally in Saugeen Shores when in fact it is in the south end of Saugeen Shores and there was not a map included in the notices to show the project location. When I received the notice, I did not realize that I frequently travel these roads and the stormwater outflow would potentially affect the shoreline.

The Notice of Phase 2 Public Information Centre was sent May 2 for a meeting Wednesday May 18 from 7:00 to 9:00 pm. It is difficult for most cottagers to attend a mid-week meeting on such short notice in May (prior to many cottage openings Victoria Day Weekend). A Stakeholder meeting was held Oct. 25, 2017, which again was mid week, shortly after Thanksgiving.

Having been a cottager for more than 50 years, I feel that I should have been engaged in the planning process. I feel that the recreation, safety, environment and tourism aspects of the project have not adequately been addressed in the study and I would like more information.

From a recreational point of view and safety, I feel that the proposed multi-use path proposed on the north side of CR25 must be built at the same time that the road is upgraded. Recently I have heard from the Beachers' Association that the multi-use path will not be built for at least 4 years. This would be a missed opportunity and we all know any delay means it may never happen. In the summer people walk and ride bikes along CR25 between Town and the lake and I have felt for a long time that there should be a bike path on CR 25. It is not safe to walk or ride along CR 25 because of the site lines and therefore from a safety perspective this should be built without a 4 year delay.

I would not like to see the addition of a traffic light at CR33 and CR25 and the addition of more stop signs until the traffic warrants it. I prefer the option of a round about if it can be done safely taking into account pedestrians and cyclists.

From a tourism standpoint, I believe biking should be encouraged and thus the plans must take this into account, not just motor vehicles. CR 33 should also have bike lanes because it is a well travelled bike route. Although they are discussed briefly, they are not described in detail.

Stormwater management and sewers are big issues in this area of Saugeen Shores. The sewers have never been continued south of CR 25 and many of the septic systems are extremely old. Before further development takes place in this area, the sewers must be extended. Although it is mentioned in the report, stormwater management is an issue, with increased run-off according to the plan. There are not sufficient details discussing water quality. This is significant because the outflow will be into the lake. The water quality is extremely important for tourism, for the residents/cottagers and the natural environment, therefore consideration must be given to how the water quality will be preserved.

I am not trying to stop the project, but I am submitting this Part II Order Request to ensure proper consultation with the hope that Bruce County and Saugeen Shores will notify the stakeholders properly and incorporate the feedback into the plan, which are the fundamental principles of the EA process.

Sincerely,



cc.

Kathleen O'Neill, Director EA Brand

Brian Knox, County of Bruce

From: Brian Knox

Sent: Thursday, March 1, 2018 4:14 PM

To: [REDACTED]

Cc: Kerri Meier <kmeier@brucecounty.on.ca>; Amanda Froese (amanda.froese@saugeenshores.ca) <amanda.froese@saugeenshores.ca>; John Slocombe (John.Slocombe@gmblueplan.ca) <John.Slocombe@gmblueplan.ca>

Subject: Bruce County Road 33 Re-alignment

[REDACTED]

The County received your letter dated February 5, 2018 to the Minister of Environment and Climate Change regarding the Part II Order Request - Bruce County Road 33 Re-alignment. We called earlier today and it seemed best to email and to comment on a number of items you had included in your letter.

The County of Bruce and Town of Saugeen Shores initiated a Master Plan for Roads and Drainage for Bruce Road 25 and Bruce Road 33 in September 2015. The Master Plan process included two public information sessions and comment periods. We noted that the meetings were very well attended. The Notice of Study Completion for the Master Plan was issued on May 9, 2017. We note that various projects are derived from the Master Plan and we have identified the re-alignment of Bruce Road 33 to intersect with Bruce Road 25 at the future Bruce Street alignment as a Schedule B project.

The Bruce Road 33 re-alignment will be undertaken in accordance with the Municipal Class Environmental Assessment (EA) Planning Process as a Schedule B project. The Notice of Project Initiation was issued on January 9, 2018 with comments due on February 6, 2018. The County is now considering all the comments received and will review the project and will update the project file prior to the Notice of Completion being issued and the 30 day review period commencing. We expect to take the recommendation for the preferred solution to the March 22 meeting of the Transportation and Environmental Services Committee. The Committee's decision on the recommendation would form the basis of the Notice of Completion.

An active transportation route is proposed on the north side of Bruce Road 25 and will be constructed throughout the four years that the Bruce Road 25 and Bruce Road 33 projects will be undertaken. The County is also working with the Great Lakes Waterfront Trail project which identifies a mapping route for cyclist throughout Bruce County. The proposed route encourages cyclist to travel on Bruce Road 33 to Conc 4, then along Saugeen Beach Road and consequently to Bruce Road 25 or to continue along Shipley Ave. We are of the opinion that the active transportation route on Bruce Road 25 will assist with the cyclist safety.

Concerning your comment on the Bruce Road 33 realignment, we did consider a traffic circle at the proposed Bruce Road 25/33 intersection in the Master Plan but a signalized intersection was considered as "preferred" for pedestrian safety reasons, this decision is being reviewed by the Town, County and Consultants.

The Bruce County Road 33 Re-alignment does have regard for storm water management and water quality will be considered and incorporated in the design.

Many thanks for your comments and feel free to give us a call.

Many thanks,

Brian

Brian Knox

Engineer

Transportation & Environmental Services
Corporation of the County of Bruce

519-881-2400 ext 263

www.brucecounty.on.ca

From: Kerri Meier [<mailto:kmeier@brucecounty.on.ca>]

Sent: March-06-18 4:47 PM

To: [REDACTED]

Cc: Amanda Froese (amanda.froese@saugeenshores.ca); John Slocombe (John.Slocombe@gmblueplan.ca); Brian Knox; Robinson, Callee (MOECC)

Subject: RE: Bruce County Road 33 Re-alignment

[REDACTED]

Thank you for the phone conversation this morning to review and discuss the email below.

We acknowledge your concerns regarding stakeholder engagement for projects which include seasonal residences. We noted the public consultation was undertaken during the Master Plan process and the County and Town of Saugeen Shores will continue to correspond with landowners, agencies, organizations as the various projects proceed.

We provided a general overview of the status of the Schedule A - drainage project and the Schedule B – Bruce Road 33 project.

The Schedule A – drainage project is in the design phase and an application to the MOECC and Saugeen Valley Conservation Authority will be submitted prior to construction approval. We note that the Town, Consultant and County will review further means to ensure public input is included. We did note that the Town has met with the Beacher's Association and has corresponded with the Lake Huron Coastal Centre regarding this project. It is proposed that in the near future, Town Council will be updated on the project and pre-consultation with the MOECC will take place. Following that the Town will host an Open House to share information with the Public.

The Schedule B – Bruce Road 33 road project will proceed with the EA process. It was noted that the construction of the Active Transportation Route is included under each phase of the project, having regarding for cyclist safety. It was also confirmed that the proposed Bruce Road 33 re-alignment will include water and sanitary services and a stormwater management pond.

We thank you for your comments and welcome any further questions/comments as the we move forward with the Bruce Road 25 and Bruce Road 33 projects.

Kerri

Kerri Meier
Environmental Coordinator
Transportation & Environmental Services
Corporation of the County of Bruce

519-881-2400 ext 307
www.brucecounty.on.ca



Ministry of the Environment
and Climate Change

Environmental Assessment and
Permissions Branch
135 St. Clair Avenue West
1st Floor
Toronto ON M4V 1P5
Tel.: 416 314-8001
Fax: 416 314-8452

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

Direction des évaluations et des
permissions environnementales
135, avenue St. Clair Ouest
Rez-de-chaussée
Toronto ON M4V 1P5
Tél : 416 314-8001
Télec. : 416 314-8452



ENV1283MC-2018-266

March 13, 2018

[Redacted address block]

Dear [Redacted name],


Thank you for your February 5, 2018, correspondence to the Minister of the Environment and Climate Change in regards to the Bruce County Roads 25 and 33 Master Plan for Roads and Drainage (Project) proposed by the County of Bruce (County). I am pleased to respond on behalf of the Minister.

By way of this letter, I am acknowledging that you are withdrawing your Part II Order request following discussions with the County. I understand that you and the County have been engaged in discussions regarding the Project, and have come to an agreement that resolves your concerns to your satisfaction.

As there are no outstanding Part II Order requests before the ministry, the County may continue planning the Project.

Thank you for participating in the Class EA process and for bringing your concerns to the attention of the ministry.

Yours sincerely,

 Annamaria Cross
Manager, Environmental Assessment Services Section
Environmental Assessment and Permissions Branch

c: Brian Knox
County of Bruce

EA File No. 18021
Bruce County Roads 25 and 33 Master Plan for Roads and Drainage

Comment Received	Response Provided	Additional Discussion
Resident #1		
<p>Res. #1 – Comment #1</p> <p>The intersection to Baker Road should be removed. Preferably, all legs of an intersection should be on a tangent section. Where a minor road intersects a major road on a horizontal curve, the geometric design of the intersection becomes significantly more complicated, particularly for sight distance, turning movements, channelization, and superelevation. This will a short cut for the NW properties. Based in the intermittent and traffic flow patterns a traffic circle would be a better design option for Rte 33/Rte 25 intersection. Tree planting should start immediately for the portion of Rte 33 in the open field. That portion will be a safety issue especially during winter condition and when HWY21 is closed.</p>	<p>Thank you for your comments in response to the notice of project initiation.</p> <p>You provided three comments to which we wish to respond as follows:</p> <ol style="list-style-type: none"> 1. The Baker subdivision residents noted the connection to the realigned road and were in favor. The horizontal alignment of the proposed realigned Bruce road 33 is a radius of 335m which reflects a design speed of 90 kph and subsequently a posted speed of 80kph. is very close to a 90kph. The proposed Bruce Road 33 is an elevated rural platform and easier to manage than a curbed urban cross-section. We acknowledge your comment on the potential of Lake Range Road being a short cut and shall be aware of this potential when we prepare the signage plan, ie stop signs at the Baker Road/ Lake Range Road intersection. 2. A traffic circle at the proposed Bruce Road 25/33 intersection was considered in the Master Plan but a signalized intersection was considered as “preferred” for pedestrian safety reasons. Please note the planned “Active Transportation Route” (path) along the north side of Bruce Road 25. 3. Timing will need to be sorted out with landowners, but the importance of starting early is understood. We wish to note that in our discussions with the landowners on the potential CR 33 realignment we had mentioned a thought that if the County acquired the road allowance we may wish the landowner to continue to crop through the road allowance until we undertake the CR 33 construction. <p>We will continue our review of comments received. This review will culminate in a preferred solution that we anticipate presenting to the Highways Committee in March.</p>	<p>The connection of Baker Road to BR33 is planned in the Town's Local Official Plan.</p> <p>Since the construction of Bruce Street north from BR25 is not expected in the foreseeable future, a stop-controlled tee intersection may be appropriate in the interim. A full intersection design may be revisited when Bruce Street is constructed.</p>

Comment Received		Response Provided	Additional Discussion
Resident #2			
Res. #2 – Comment #1	<p>The overall plan is excellent and it will be nice to have a second access into the South edge of the Port Elgin built up area via future Bruce Street from both a convenience and emergency perspective. Re-aligning the roadway will also improve traffic flow and safety in the area.</p> <p>Was the installation of a round-about considered at the Intersection of re-aligned Road 33 and Road 25? A round-about would provide the required traffic control without the expense of signalization and extensive use of dedicated turning lanes.</p> <p>It is noted that the abandoned portion of Road 33 will be transferred to Saugeen Shores after the re-alignment. Will Road 25 West of the new Road 33 Intersection be transferred as well? The need for this remnant portion of road to be a County responsibility seems minimal.</p> <p>The proposed SWM facility in the severed triangle between Road 33 and Baker Road makes perfect sense from a design perspective. I do note though that there seems to be a conflict on the presented drawings as to whether this triangular piece of land will be used for a detention facility or for Baker Road extension.</p> <ul style="list-style-type: none"> • The preferred would obviously be to provide both in this area if space allows. • If not, the proposed cul-de-sac at the South end of the old Road 33 could be replaced with a short radius connection to new Road 33. • Without the proposed direct link to new Road 33, Baker Road traffic would continue to use the abandoned portion of Road 33. I can see this not being desirable but the traffic volume at the present Road 25 intersection would be significantly reduced with only Baker Road contributing. <p>It is noted that SWM considerations on Road 25 are beyond the scope of this review. I suggest a preliminary review of the opportunities and constraints be investigated now to ensure we are not pushing a problem into the future that will be difficult and possibly even impossible to solve. This leads to Item 6.</p> <p>In addition to post-development areas 100 and 200, the report should investigate routing runoff from Road 25 ditches East of the proposed Road 25/33 intersection and surface discharge from Lot 30 East of the proposed alignment onto Road 33 for routing to the Baker Road Detention Facility. This would appear to offer the following benefits to Road 25 West of the proposed Road 33 Intersection:</p>	<ol style="list-style-type: none"> 1. Thank you 2. A round-about at the proposed Bruce Road 25/33 intersection was considered in the Master Plan but a signalized intersection was considered as “preferred” for pedestrian safety reasons. Please note the planned “Active Transportation Route” (path) along the north side of Bruce Road 25. 3. Yes, Saugeen Shores and the County are working together and we expect the section of Bruce Road 25 west of the proposed Bruce Street intersection to be transferred to Saugeen Shores. 4. We shall consider your thoughts as move toward final design. 5. We have asked Project Consultant John to have specific regard to your comments 5 through 7. <p>The Concept drawings provided indicate both a SWM pond and a road connection from Baker Road. In consideration of comments received through the process, the concept will be refined to provide direction to the design process.</p> <p>The Master Plan for Roads and Drainage reviewed drainage alternatives for BR25, at a systems-wide planning level.</p> <p>Flow diversion southerly, from BR25 at the planned BR25/BR33 intersection, was reviewed as Alternatives 5, 6, and 7 in the Master Plan for Roads and Drainage.</p> <p>Comments received from Baker Subdivision residents during the Master Plan process did not support diversion of flow through the Baker Subdivision (Alternative 5)</p> <p>We will continue our review of comments received. This review will culminate in a preferred solution that we anticipate presenting to the Highways Committee in March.</p>	<p>Since the construction of Bruce Street north from BR25 is not expected in the foreseeable future, a stop-controlled tee intersection may be appropriate in the interim. A full intersection design may be revisited when Bruce Street is constructed.</p> <p>The details of the BR33/Baker Road intersection and SWM Pond will be resolved during the design phase.</p> <p>Alternatives 5, 6 and 7 considered in the Master Plan had even greater challenges and were screened out earlier in the process.</p> <p>An expansion of the currently proposed SWM Pond could be considered with future adjacent land development. No proposal currently is being considered.</p>

Comment Received	Response Provided	Additional Discussion
<ul style="list-style-type: none"> • The contributing drainage area would be significantly reduced. • SWM facilities may not be required on Road 25 as a result thereby solving the need for a detention facility where little opportunity exists. • Upgrading of this portion of Road 25 would be limited to resurfacing and minor ditch cleaning. • The existing storm sewer system would remain largely as-is. • The present discharge to the cold water stream at Nelson Road, although not entirely desirable, would be maintained. However, with a smaller contributing area the present impact would be reduced. • The need for a storm outfall across the beach would be eliminated. • Ownership of this portion of the roadway could be transferred from the County to Saugeen Shores. <p>With revised contributing areas, it is acknowledged that the SWM facility adjacent to Baker Road would require additional storage volume to maintain the predevelopment discharge levels into the Baker subdivision, however:</p> <ul style="list-style-type: none"> • A single SWM facility would simplify long term maintenance obligations. • Increased area requirements could be provided through minor proposed road re-alignment and an increased roadway curve radius in this area. • An enlarged facility would provide the opportunity for a permanent pool with a wetland fringe. • This would improve the aesthetics of the facility; provide both dilution and biological filtering of runoff for improved discharge quality; and provide wildlife habitat. <p>(SWM facilities don't have to be holes in the ground, they can be landscape features. With shallow side slopes and appropriate vegetation, they do not need to be fenced exclusion compounds.)</p> <ul style="list-style-type: none"> • The impact of modelling future development lands as uncontrolled discharge could be determined and used to assess whether future on-site controls are desirable. A communal system would ensure the long term SWM functionality of these contributing areas with the benefit of not having to deal with individual land owners. • Additional costs for an enlarged facility could be offset by savings realized from: the previously mentioned reconstruction cost savings on Road 25; the removal of signalization and turning lanes at the Road 25/33 intersection, and; possible Lot Levies on adjacent future development lands imposed as a SWM contribution. 		

Comment Received		Response Provided	Additional Discussion
Resident #3			
Res. #3 – Comment #1	Does Baker Road need to be extended to the new Rd 33, can it just terminate at the old Rd 33?	In consideration of comments received through the process, the concept will be refined to provide direction to the design process.	The connection of Baker Road to BR33 is planned in the Town's Local Official Plan.
Res. #3 – Comment #2	Can the design incorporate a round about at 25/33 instead of lights? When the highway is closed, and the Bruce Power trucks come through there is little to no chance of others getting into the flow of traffic. A round about go alleviate this by allowing all to flow easier.	A traffic circle at the proposed BR25 / BR33 intersection was considered in the Master Plan but a signalized intersection was considered as “preferred” for pedestrian safety reasons; associated with the planned “Active Transportation Route” (path) along the north side of BR25.	Since the construction of Bruce Street north from BR25 is not expected in the foreseeable future, a stop-controlled tee intersection may be appropriate in the interim. A full intersection design may be revisited when Bruce Street is constructed.
		<p>Good afternoon,</p> <p>Thank you for your comments in response to the notice of project initiation.</p> <p>I understand that Amanda has responded to you concerning your comments on Bruce Road 33. I believe there were two comments:</p> <ol style="list-style-type: none"> 1. It was our opinion that the proposed intersection of Baker Street at the realigned Bruce Road 33 offered Baker Street residents the option of travelling south as they do today. The design team will review the specific details of this intersection. 2. Concerning your comment on a round about, we did consider one at the proposed Bruce Road 25/33 intersection in the Master Plan but a signalized intersection was considered as “preferred” for pedestrian safety reasons. Please note the planned “Active Transportation Route” (path) along the north side of Bruce Road 25. <p>We will continue our review of comments received. This review will culminate in a preferred solution that we anticipate presenting to the Highways Committee in March.</p>	

Comment Received		Response Provided	Additional Discussion
Res. #3 – Comment #3	<p>Brian, Thanks for your response to my comments.</p> <p>We do have a difference of opinions regarding the signaled intersection and a roundabout at Bruce Rd 33 and Bruce Rd 25. Let me first say that I am neither an engineer or planner designing roads, My comments are only the opinion of this layman.</p> <p>Before moving to Saugeen Shores, we lived in Kitchener within the Region of Waterloo.</p> <p>Like them or hate them, there are approximately 32 roundabouts within the City of Kitchener with 9 under the City jurisdiction. Since 2004, roundabouts have been an important part of the roadway landscape in the Region of Waterloo. The roundabouts are deemed to improve road safety, manage increased traffic demand and help improve air quality by eliminating stops and idling.</p> <p>Roundabouts have helped to promote traffic safety, reducing the frequency and severity of vehicle crashes. To your point, they have been less successful at safeguarding people on foot. More on that later in more detail..</p> <p>So let us look at Pros and Cons from recent readings, not my words:</p> <p>Benefits:</p> <p>Are effective traffic calmers.</p> <p>Are far safer than conventional, signal-controlled intersections. Crashes are far less likely at roundabouts, but when they do happen, they occur at lower speeds and at slighter angles. This greatly reduces the resulting property damage, injury and loss of life from wrecks.</p> <p>Roundabouts reduce delays and congestion, since vehicles do not have to come to a full stop before proceeding (except in cases where they must yield).</p> <p>Traffic flows more naturally at roundabouts than at signal-controlled intersections. Drivers are not controlled by an artificial traffic signal.</p> <p>Issues with Pedestrian Use of Roundabouts:</p> <p>One of the key limitations of roundabouts is that they have had insufficient safeguards and/or pedestrian crossing signs to protect local foot traffic. This is due to the vehicle-centric approach that spurred their intervention. This issue can be dealt with by routing foot and bicycle traffic away from the roundabout with crosswalks (Crossovers) marked by traffic safety systems, such as signage and caution lights. These measures prevent foot traffic from crossing at unauthorized locations, while also making drivers more alert to the presence of walkers or cyclists.</p>		<p>Since the construction of Bruce Street north from BR25 is not expected in the foreseeable future, a stop-controlled tee intersection may be appropriate in the interim. A full intersection design may be revisited when Bruce Street is constructed.</p> <p>The connection of Baker Road to BR33 is planned in the Town's Local Official Plan.</p>

Comment Received	Response Provided	Additional Discussion
<p>Installing marked crosswalks at roundabouts is imperative to the safety of drivers, bicyclists and pedestrians. With due caution and planning, all local citizens.and vacationers can use that route safely.</p> <p>To that, I would like to refer you to the Ministry of Transport, Ontario regulation (402/15) under the Highway Traffic Act which establishes a new traffic control device – Level 2 Pedestrian Crossover. This is contained in a City of Kitchener staff report dated November 3, 2016. as attached.</p> <p>I would also like you to refer to one of the most horrendous and ill conceived and planned roundabout intersections within the City of Kitchener at Homer Watson Blvd and Blockline Rd, which was close to where I lived. Homer Watson Blvd had 38080 vehicles in the 2015 average annual daily traffic and Blockline and Kingswood (block away) had 15053 average daily vehicle traffic.Three corners of that intersection are residential subdivisions.The fourth corner had a Tim Hortons, a gas bar and two additional eating establishments. A block away on Blockline Rd is St Mary's High Scholl with an enrollment of 2100 students, one of the largest schools in Ontario.</p> <p>So why do I even bring that up? This roundabout was not well planned with the amount of vehicular traffic combined with the amount of pedestrian traffic to the shops and high school.The speed limit on Homer Watson was 70 km with a four lane divided roadway with up to 3 lanes entering the roundabout.There were many accidents within this roundabout both pedestrians and vehicles.So eventually with a redesign and reconstruction, lower speed limit and Pedestrian Crossover this safety issue has been significantly reduced.</p> <p>See Goggle maps link for reference to Crossovers: https://www.google.ca/maps/place/Tim+Hortons/@43.4189262,-80.4726327,552m/data=!3m2!1e3!4b1!4m5!3m4!1s0x882bf53c22feb11:0xdaba14275eb66ae9!8m2!3d43.4189223!4d-80.470444</p> <p>So in reference to the planned "Active Transportation Route" (path) along the north side of Bruce Rd 25, in my view the safety concerns with a roundabout can be significantly reduced or eliminated, through proper planning design and construction of the roundabout and Crossovers. Having lived in the Baker subdivision the last number of years I have observed issues which give me doubts of the safe use of a signalized intersection at Bruce Rd 33 and 25.One only has to observe the vehicle traffic on the present Bruce 33 while highway 21 is closed due to weather conditions. With the amount of traffic from the power plant, one can not turn left onto 33 from Baker Rd (Drivers will not let you in).You are forced to take Saugeen Beach Road to .Bruce Rd 25 to go up town. Drivers do not stop at the stop sign at on Bruce Rd 33 and Bruce Rd 25,it become a race</p>		

Comment Received		Response Provided	Additional Discussion
	<p>coming up 25. So my point is, what makes us believe drivers will stop for a red light while turning right at the new signalized intersection? Will drivers use the signalized intersection like a roundabout, does this make it safer? That goes back to the point of roundabouts being safer, properly planned, designed and constructed.</p> <p>For the same reasons expressed above is why I question Baker Rd extended to the new 33. In times of highway 21 closures and high traffic volumes on 33, local traffic will have to use the old 33 (Lake Range) to Bruce 25. The only benefit will be those turning right on Bruce Rd 33 to go south.</p> <p>Thanks for giving me the opportunity to input my views.</p>		
Resident #4			
Res. #4 – Comment #1	<p>I am concerned about the recommendation for a signalized intersection at BR33 and BR25. I think that, in the interest of promoting optimum traffic flow in this area, the County and Town should consider a traffic circle at this intersection instead of signals. The future will likely see larger amounts of traffic coming up BR25 from the East (especially if and when sewers are installed below the ridge allowing for more intensive development). This traffic will need to mix with very heavy north/south traffic on BR33. To avoid congestion both north/south and east/west in the future we should install a traffic circle at this stage, while it is still possible to do so. I understand that the plan to have 4 lanes of traffic between the new BR33 and Goderich St complicates this but I remain confident that a safe and functional traffic circle could be engineered for this location.</p>	<p>A traffic circle at the proposed BR25 / BR33 intersection was considered in the Master Plan but a signalized intersection was considered as “preferred” for pedestrian safety reasons; associated with the planned “Active Transportation Route” (path) along the north side of BR25.</p> <p>Thank you for your comments in response to the notice of project initiation.</p> <p>I understand that Amanda has responded to you concerning your comments on Bruce Road 25.</p> <p>Concerning your comment on the Bruce Road 33 realignment, we did consider a traffic circle at the proposed Bruce Road 25/33 intersection in the Master Plan but a signalized intersection was considered as “preferred” for pedestrian safety reasons. Please note the planned “Active Transportation Route” (path) along the north side of Bruce Road 25.</p> <p>We will continue our review of comments received with Amanda. This review will culminate in a preferred solution that we anticipate presenting to the Highways Committee in March. We are hopeful that Saugeen Shores will also have an opportunity to share the preferred solution at the same time.</p> <p>Many thanks, Brian</p>	<p>Since the construction of Bruce Street north from BR25 is not expected in the foreseeable future, a stop-controlled tee intersection may be appropriate in the interim. A full intersection design may be revisited when Bruce Street is constructed.</p>

Comment Received		Response Provided	Additional Discussion
Resident #5			
Res. #5 – Comment #1	Living on Bruce road for 33years I have seen many changes in traffic patterns. I believe the only logical direction is to change the point of connection with Bruce rd 25 and realine Bruce rd 33 . The present connection on a hill has been a bottle neck for years and a dangerous point on slippery roads in the winter .	Thank you for your comments in response to the notice of project initiation.	
Res. #5 – Comment #2	The area from Baker road to the 25 narrowing and a deep culvert with no guard rail must be addressed.	We shall include the width and need for guardrail issues in our design of the section of the future Lake Range Road from the proposed realignment to Bruce Road 25. We will continue our review of comments received. This review will culminate in a preferred solution that we anticipate presenting to the Highways Committee in March.	This project is currently considered for Phase 4 of the implementation plan.
Resident #6			
Res #6 – Comment #1	The drawing from GMBP in the CR33 Schedule B Project File shows that the section of CR25 from Bruce St to HWY 21 will be done under a Schedule B EA. Are you saying that this section will be done under a different Schedule B EA?	The Master Plan for Roads and Drainage identified a section of BR25 between the future Bruce Street / BR33 intersection and Goderich Street as being planned for four traffic lanes. That specific project has a separate “trigger” for a Schedule B EA process related to the planned increase in road capacity.	
Res #6 – Comment #2	Also, the report shows that the most northern part of CR33 would drain to Shipley Watercourse under present conditions. As for my the current Schedule B EA for CR33. I am not satisfied with your response to my concern regarding the boundary of the CR33 study area. The CR33 drainage drawing in the CR33 Project File shows that some of the stormwater will travel north along CR33 to the “new CR25 storm sewer”. This means that the CR33 EA is relying on a successful EA for the CR25 drainage project. Since the CR25 drainage is still in the design phase, it’s not possible to assess the impact from the CR33 stormwater. Also, what happens if the CR25 drainage sewer isn’t installed for another 5 years? Then the runoff and contaminates from the north section of CR33 will get directed to the Shipley watercourse. It’s my opinion that the Study Area for the CR33 EA needs to include where the stormwater from CR33 will be diverted to.	The Master Plan for Roads and Drainage concluded with a “Preferred” set of solutions for road and drainage at a systems-wide planning level. The Current Schedule B EA planning process is “triggered” by the new road in a new location and the need to acquire land. Drainage design and implementation are considered under subsequent processes.	Interim measures can be provided to bridge between individual project implementation phases, if necessary. The BR25 trunk storm sewer is intended as Phase 1 of the implementation plan as outlined in the Bruce County Committee Report – Feb. 15, 2018.

Comment Received	Response Provided	Additional Discussion
<p>Res #6 – Comment #3</p>	<p>This appears to contradict the "Public Information Centre - May 18, 2016 - Presentation Package" page 17. The presentation acknowledges that the George Street Storm Sewer and Outlet would require a Schedule "C" EA because it is "construction of a new sewage system including outfall to a receiving water body."</p> <p>Can you explain why the proposed outlet at Gobles Grove is not considered a new outfall to a receiving water body?</p> <p>Provided below is the text from the presentation. Note that section 4 clearly states that it is Goderich to Bruce, not Goderich to Saugeen Beach Rd.</p> <p>Drainage</p> <ol style="list-style-type: none"> 1. New George Street Storm Sewer System and Outlet <ul style="list-style-type: none"> • Construction of new sewage system including outfall to receiving water body = Schedule "C" EA. • EA to be determined. 2. Baker Street storm sewer system to existing outlet <ul style="list-style-type: none"> • Establish a sewage collection system to an existing outlet; within existing road allowance = Schedule "A"+ • Town may proceed with design/approvals subject to public notification. 3. BR33 Flow Diversion from BR25 <ul style="list-style-type: none"> • Complimentary to George Street storm sewer system Schedule "C" EA. • EA to be determined. • Could proceed concurrently with Re-Align BR33 Schedule "B" EA. 4. BR25 Storm Sewer – Goderich to Bruce <ul style="list-style-type: none"> • Establish a sewage collection system to an existing sewage or natural drainage outlet, within an existing road allowance = Schedule "A"+ EA. • May proceed with design/approvals subject to public notification. • Would be coincident with Schedule "B" EA to Add Lanes to BR25, Goderich to Bruce. 	<p>The proposed outlet on Bruce Road 25 is at an existing outlet, a culvert currently exists in this location and it is within municipally owned property. Acquisition of land is not required for this solution.</p> <p>Whereas, the George Street Storm System contemplated at that time included consideration of a flow diversion from BR25 east of the Bruce Street alignment, southerly along the proposed BR33 to a new outlet at George Street.</p> <p>The Schedule C Definition is as follows:</p> <ol style="list-style-type: none"> 1. Construct new sewage system, including outfall to receiving water body and/or a constructed wetland for treatment. <p>"New Sewage or Water System" is defined in the MEA Manual as:</p> <p>"Means a new sewage or water facility, or series of facilities, having no physical connection with an existing sewage or water facility through property or process link."</p> <p>Therefore, the contemplated George Street Storm Sewer system would meet this description since there currently is no property connection along which the system necessarily would drain between BR25 and Baker Road; ultimately to the George Street outlet.</p> <p>The currently planned storm sewer on BR25 meets the description of a Schedule A+ project under Municipal Water and Wastewater Projects, as follows:</p> <ol style="list-style-type: none"> 1. Establish, extend, or enlarge a sewage collection system and all necessary works to connect the system to an existing sewage or natural drainage outlet, provided all such facilities are in either an existing road allowance or an existing utility corridor, including the use of Trenchless Technology for water crossings. <p>The reason that the descriptions are only Goderich to Bruce Street was because of the manner in which the options were compared, with appropriate planning of a storm sewer outlet westerly from Bruce Street, the balance of the system east of Bruce Street would connect to that outlet as a Schedule A+ activity. This is because of how you select the process to follow. You need to focus on the problem that you are trying to solve, and for the drainage portion there is no monetary limit in the MEA Schedules. However, the addition of lanes proposed on Bruce Road 25 from Bruce Street to Goderich Street would be triggered as a Schedule B activity. Simple addition of Bike</p>

Comment Received		Response Provided	Additional Discussion
		<p>Lanes does not have a limit for cost.</p> <p>Municipal Road Projects</p> <p>20. Reconstruction or widening where the reconstructed road or linear paved facilities (e.g. HOV lanes) will not be for the same purpose, use, capacity or at the same location" <\$2.4M</p>	
Res #6 – Comment #4	<p>I object to the proponent's strategic decision to piecemeal this project into smaller sections in order to limit the extent of the environmental assessments. There appears to be a deliberate attempt to keep costs below \$2.4 million for road work by doing it in two stages (therefore avoiding a Schedule "C" EA), and strategically classifying portions of the master plan as "separate projects" even though design and construction will be concurrent. The Municipal Class EA procedure states that projects should be assessed as a whole and not in "piecemeal"</p> <p>Here is some evidence to support that this project has been systematically piecemeal-ed to limit the extent of the environmental assessment:</p> <ol style="list-style-type: none"> 1. The intersection with CR-25 has not been included in the project boundary. Although work will be done at the intersection as part of this project, it has been excluded from the study area. This component is essential to the project, and yet the County is relying on the "separate" CR-25 project to assess the environmental impact. 2. There were no individual CR-33 Re-alignment public consultation sessions. The only sessions that occurred were part of the Master Plan development. If this is a separate project, then the proponent should have held separate public information sessions to address this project getting completed without any improvements to CR-25 or storm water management. 3. Land acquisition costs and legal fees have been excluded from the Project Costs estimate, to keep costs below the \$2.4 million threshold for roadwork. 4. Only a portion of the newly aligned CR-33 is within the drainage boundary as indicated by the CR-33 Re-alignment Project File Figure 3. The portion excluded currently drains to a natural watercourse. If this section were included it would have met the 	<p>As an Introduction to our answers the MEA Manual includes the following definition of "Master Plan" and "Cost":</p> <p>"Master Plan: Means a long range plan which integrates infrastructure requirements for existing and future land use with environmental assessment principles. At a minimum, a Master Plan addresses Phases 1 and 2 of the Municipal Class EA process."</p> <p>"Cost: Means the most up-to-date estimate prepared by the proponent of the cost of a project, and which has been accepted by the proponent as the basis on which the project is to proceed. The estimate shall not include costs for:</p> <ol style="list-style-type: none"> i) Acquisition of land. ii) Feasibility of studies and engineering design for the project. iii) Operation of the project. <p>The estimate shall include the capital costs of all components of a project required to solve the problem. If separate components of a project are independent of each other (i.e. are solving separate problems) but are being constructed together as a single project for purposes of cost effectiveness or efficiency (e.g. a defective watermain replaced while a road is being reconstructed), then the costs shall be considered to be separate."</p> <ol style="list-style-type: none"> 1. The Master Plan included review of the re-alignment for BR33; following Phases 1 and 2 of the MEA EA process. An intersection configuration was considered in the Master Plan. The Schedule B EA process for the re-alignment logically extends southerly from the existing BR25 road allowance to a re-connection point on Lake Range Road. 2. The current Schedule B EA process for the re-alignment of BR33 is on-going. We are currently in Phase 2, Part 5 of that EA process. The public communication plan does not include an "open house" event. As per the manual, a Schedule B does not require to have an open house, it requires specified points of contact, which the proponent is carrying out through the notification you are commenting on. 	

Comment Received		Response Provided	Additional Discussion
	<p>conditions for a schedule "C" EA.</p> <p>5. The northern section of CR-33, and intersection with CR-25 as indicated in the Master Plan will eventually have a new storm water discharge to Lake Huron. This project is being designed, developed and constructed concurrent to the CR-33 project by the same proponent, however strategically claimed they are separate projects so that a Schedule A+ EA could be used.</p>	<p>3. See definition of "Cost" above.</p> <p>4. See definition of Schedule A+ versus Schedule C projects provided previously. The drainage system envisioned in the Master Plan maintains flows within existing catchment areas. As such, one project can proceed independently from the other. Interim measures can be taken at the juncture of separate individual projects until the vision of the Master Plan is achieved.</p> <p>5. See definition of Schedule A+ versus Schedule C projects provided previously.</p>	
Res #6 – Comment #5	<p>One more point that I wish to clarify:</p> <p>Does your response imply that the new outlet at George St has been downgraded to a Schedule A+? If so, could you please provide the justification for this? The reason stated in the public consultation was due to the new sewage system and outfall to a receiving water body (not due to flow diversion). There is no existing outfall at this location, and it's flowing to a receiving water body.</p> <p>New George Street Storm Sewer System and Outlet</p> <ul style="list-style-type: none"> • Construction of new sewage system including outfall to receiving water body = Schedule "C" EA 	<p>I would like to reiterate that the "Preferred Master Plan for Roads and Drainage" identifies the planned drainage solution within the Baker Road area as a Schedule A+ activity as long as the system remains within an existing road allowance or utility corridor to a natural drainage outlet for George Street, if a new system is to include an outfall to accept diverted flows to an outlet along Baker Road it would be a Schedule C.</p> <p>I would like to also reiterate that at this time the Town and County are working towards a detailed design for the selected drainage solution, which is to outlet at the end of Bruce Road 25. This design will be brought forward for public information prior to construction. During the design phase, the professionals hired to complete the job are working with approval agencies and other experts to determine the best configuration. We have met with the Beachers Association for input already and will be meeting with the Waterfront Advisory Committee as well.</p>	
		<p>This link will be of interest to you, it helps explain the process and residents' responsibilities in this process. It was prepared by the Group that works with the Province on the MEA Processes.</p> <p>http://www.municipalclassea.ca/files/Companion%20Guide%20to%20MCEA%20Manual%20rev1.pdf</p> <p>It is important to for us to understand your technical concern, can you please confirm to me that your concern is that more water will be conveyed to the beach AND to the watercourse after the project is completed than in the existing condition? I do recognize that you have concerns about the process as well, and I believe the document in the link above can answer those questions, however below are our responses to your questions.</p>	

Comment Received		Response Provided	Additional Discussion
Res. #6 – Comment #6	<p>My concern is that the drainage assessment only covered a portion of the project. The boundaries for the drainage study only included approximately 2/3rds of the new road. In the section that was included, it was determined that the conversion from agricultural land to impervious asphalt would cause an increase in flow to the Baker subdivision (which was one of the defined problems in the Master Plan). To accommodate this problem, a storm water management pond was included. So my question is what impact does the new road have on the drainage of the northern 1/3rd? And is there a reason why it wasn't included in the report?</p> <p>The other technical concern that I have with the piecemeal-ed approach (identified in #2 below) is that there hasn't been consultation or assessment of only performing a portion of the Master Plan. So when the public was asked to comment, they were looking at the project as a whole. By only performing a portion of it, new problems can emerge because the supporting infrastructure hasn't been developed yet. For example, the road studies are based on present traffic levels. By completing CR33 as a stand alone project, this shortens the commute and makes this route to Bruce Power more appealing, which means more people will choose to drive this route, which causes increased traffic on in the residential section of CR25 between Goderich St and CR33. This increase in traffic on CR25 may create new safety hazards for residents in this area, however there was no place for these concerns to be identified.</p> <p>Similarly if we look at the drainage problems identified in the Master Plan, by choosing a piecemeal-ed approach of performing CR33 in isolation, you are assuming that all of the drainage projects will be successful. What happens if while performing the EA on the Baker subdivision outlets or CR25 outlet, it's discovered that the impact is too severe. An alternative strategy or option is no longer practical because the drainage project from the CR33 portion has already been completed. That's why the problems identified in the Master Plan are supposed to be looked at on a whole. By completing the CR33 project separately, you are committing to Alternative 3 for the drainage problems identified in the Master Plan without actually assessing the Environmental Impacts of Alternative 3.</p>	<p>The County and Town have established a 5 Phase implementation plan. Phase 1 is the installation of the storm sewer outlet on BR25 as a Schedule A+ activity. Phase 2 involves the continued urbanization of BR25 between Shipley and Bruce Street. Phase 3 involves urbanization of BR25 between Bruce Street and Goderich Street, subject to a future Schedule B EA process. Phase 4 would involve construction of the BR33 re-alignment, subject to the current Schedule B EA process. Phase 5 involves upgrades to Lake Range Road between BR25 and the new connection to the re-aligned BR33. Therefore, the outlet system on BR25 is intended to be constructed to service the north end of the BR33 re-alignment. Even if it is not, then temporary SWM measures could be taken to mitigate quantity and quality issues related to the north end of re-aligned BR33.</p> <p>The Master Plan approach was taken to plan road and drainage on a systems-wide level to avoid piece-mealing independent solutions. It would be impractical to construct all projects considered in the Master Plan at on time. The planned increase to road capacity on BR25 between Goderich Street and re-aligned BR33 is intended to be planned as a Schedule B process. The overall direction is established through the Master Plan with additional details to be resolved / verified through that process, once it is initiated. The results of that process will be independent of the current Schedule B EA process. As noted above, the re-alignment of BR33 is intended to be constructed after the widening to BR25 between Goderich Street and the future BR33 intersection.</p> <p>Master Plan addresses this direction, the water flows to the lake from this area and the construction of the project must be done in phases to be affordable and constructable. There are many what if scenarios that could come into play and it is not practical at any time to try to forecast that. If a development proposal came in for the Baker Subdivision, or the Town decided to urbanize these impacts would need to be addressed then. Similar to if a storm sewer outlet and piped networks were to be constructed in the Baker Subdivision, mitigation would be required regardless of the Bruce Road 25 and Bruce Road 33 projects. This design project would accommodate what was done upstream. The intent at this time is to construct a legal outlet for lands draining to Bruce Road 25 and outlet to the lake.</p>	
Res. #6 – Comment #7	<p>Regarding your comment:</p> <p>"Therefore, the outlet system on BR25 is intended to be constructed to service the north end of the BR33 re-alignment. Even if it is not, then temporary SWM measures could be taken to mitigate quantity and quality issues related to the north end of re-aligned BR33."</p>		MOECC has reviewed and accepted the preliminary design for the BR25 storm sewer.

Comment Received		Response Provided	Additional Discussion
	<p>I think the intent of the EA is to demonstrate that the impacts from the project have been considered and can be mitigated. I don't think it's enough to just say we will handle it when the time comes.</p> <p>I would request that this information be formally presented in the Environmental Assessment. ie. that the north section will have an increased flow rate and the project to install a new outlet on BR25 will accommodate it.</p>		
Resident #7			
Res. #7 – Comment #1	For the most part we view this project favourably. We consider such changes as the diversion of Bruce Road 33, the additional lanes on BR25 between Goderich intersection and the proposed Bruce Street, the proposed trail beside BR25, the enhanced quality treatment (80% TSS removal) of the drainage water and the SWM facility as examples of positive proposals in this plan.	Noted	
Resident #8			
Res. #8 – Comment #1	I would support realignment of BR33 Intersection with the future bruce street, would this be more of a by-pass so no future housing development on that road? I don't understand the need 4 lane urban crossing, wouldn't roundabout work in this case? With the addition of bike/pedestrian pathway that would connect with the Gore Drain, Rail Trail System and the Gobles Grove beaches to provide safer recreation options . I understand these "are planned future intersections" but why is there need to have 3 T-stop intersections to connect onto the CAW Rd? I understand Bruce being the prime intersection and to some degree Stickle St. due to the future housing development in that area. But sure adding a 3rd will make things move easier.	<p>As noted in the Master Plan, the lands through which BR33 re-alignment would pass considered are identified as "Planned Development" in the Town's Official Plan.</p> <p>A traffic circle at the proposed BR25 / BR33 intersection was considered in the Master Plan but a signalized intersection was considered as "preferred" for pedestrian safety reasons; associated with the planned "Active Transportation Route" (path) along the north side of BR25.</p> <p>The 3 planned intersections with BR25 from the north are considered in the Town's Official Plan.</p>	Since the construction of Bruce Street north from BR25 is not expected in the foreseeable future, a stop-controlled tee intersection may be appropriate in the interim. A full intersection design may be revisited when Bruce Street is constructed.
		<p>Good afternoon,</p> <p>Thank you for your comments in your email of February 1st to John Slocombe in response to the notice of project initiation. I understand that Amanda has responded to you concerning your comments on Bruce Road 25.</p> <p>Concerning your comment on the Bruce Road 33 realignment involving a roundabout, we did consider one at the proposed Bruce Road 25/33 intersection in the Master Plan but a signalized intersection was considered as "preferred" for</p>	

Comment Received		Response Provided	Additional Discussion
		<p>pedestrian safety reasons. Please note the planned "Active Transportation Route" (path) along the north side of Bruce Road 25. You also inquired about the three intersections onto Bruce Road 25. Stickle Street is part of a proposed plan of subdivision while the extension of Bruce Street has been an opportunity identified in a number of planning documents. I am a little uncertain on the future Ridge Street yet will inquire of my colleagues.</p> <p>We will continue our review of comments received. This review will culminate in a preferred solution on the Bruce Road 33 Re-alignment that we anticipate presenting to the Highways Committee in March.</p>	
Cuesta Planning			
	<p>Cuesta Planning Consultants wish to submit the following comments in response to the Notice of Project Initiation for the Schedule B Municipal Class Environmental Assessment for the Bruce County Road 33 Re-alignment.</p> <p>After reviewing the mapping of the road re-alignment, one primary concern that arises from a planning perspective is the future utilization of the surrounding lands. Both the lands to the north of the proposed intersection and the lots that would be crossed by the proposed Bruce Rd 33 re-alignment are zoned PD Future Development in the Saugeen Shores zoning schedules. While the exact use of this area may be undetermined at this time, it could be supposed that residential use would be a strong consideration for this section of the Town. The northern segment of the alignment through Lot 30 would partition this land parcel into approximately a 2 ha easterly block and a larger 6 ha westerly block. The parcel in Lot 29 would be divided roughly in half.</p> <p>Strong consideration needs to be given to how subdivisions could be laid out in the odd shaped parcels that would be generated by the re-alignment project.</p> <ol style="list-style-type: none"> 1. Are the resulting parcels sufficient in size to support subdivisions for example, small block on east side of alignment in Lot 30 2. Do the curves in the Bruce Rd 33 proposed alignment create unusable portions of the lots for example, long point on east side of alignment near south edge of Lot 29 	<p>Thank you for our phone conversation with Brian Knox on February 12, 2018 regarding the Bruce Road 33 Re-Alignment. We provide the following comments:</p> <p>The Town has had a long range focus that Bruce Street may be extended through the property north of Bruce Road 25 (as shown on the Town's Official Plan schedules) and would offer a 'collector' road parallel to Highway 21.</p> <p>Item 1 - there is no secondary plan for this area, landowners are aware of the lot fabric that would result following the establishment of the new road allowance. We offer that this might be developed in a variety of manners some may require planning applications to change OP designations and zoning. The land required for the road is sufficiently small enough to allow the resulting parcels to accommodate a reasonably efficient development design. Further consideration of other alternatives via the Bruce Street connection do not offer any improvement in land use without negative impacts to efficient road design and/or other good transportation planning considerations. Town Staff have reviewed how these lands could be developed as subdivisions and are satisfied that it can be done and serviced.</p> <p>Item 2 – Please note our response to Item 1, we offer that Lot 28 and 29 are owned by one landowner and there may be a future opportunity to review potential for an urban area expansion, dependent on the Official Plan.</p>	<ol style="list-style-type: none"> 1. A secondary plan has not been prepared for the PD – Planned Development lands. 2. The curves planned for BR33 meet geometric designs for roads. 3. A secondary plan has not been prepared for the PD Lands. 4. The conceptual design includes for one sideroad access to BR33 from each side. 5. The planned BR33 alignment is consistent with the Town's Local Official Plan.

Comment Received		Response Provided	Additional Discussion
	<p>3. How would neighbourhood roads be configured within these new lots for example, can roads be efficiently laid out to minimize land consumption, be serviced in a cost-effective manner, and not have odd-shaped lots that are undesirable for development</p> <p>4. Does the road geometry allow for local roads to outlet onto the new Bruce Rd 33 corridor safely for example, there may be up to five local roads outletting onto the corridor; how close can local road intersections from Lot 30 be from the new Bruce Rd 33 / Bruce Rd 25 intersection; can local road outlets from Lot 29 be positioned along the s- bend</p> <p>It is not clear from the November 2017 GM Blue Plan report whether other intersections were considered. The area to the north of Bruce Rd 25 is undeveloped at this point and it is noted that two other north-south roads are planned, namely Ridge St and Stickel St. Has any consideration been given to connecting Bruce Rd 33 to Ridge St instead? Shifting the potential re-alignment of Bruce Rd 33 one "block" west may necessitate less dramatic s-curves in the alignment and create remnant parcels that may have more desirable layouts for future developments.</p> <p>Thank you for the opportunity to provide comments on this project. By way of this submission, please add Cuesta Planning Consultants to the mailing list for future correspondence and notices regarding this project.</p>	<p>Item 3 – Please note our response to Item 1, we note that depending how the land is develop, it may require a plan of subdivision to determine the neighbourhood road configuration.</p> <p>Item 4 – The road geometry is based on a design speed of 90km/h in order to accommodate constraints, however we expect the posted speed of the new Bruce Road 33 to be 60km/h. Two accesses are currently being considered from the new Bruce Road 33, additional review is required to determine these locations.</p> <p>We note that a Ridge Street intersection was considered during the Master Plan process, however Bruce Street alignment was considered more appropriate since it is recognized in the Town's Local Official Plan. Bruce Street is a planned collector road, which would provide a continuous route parallel to Goderich Street between Bruce Road 25 and Concession 10.</p> <p>As requested we have added Cuesta to the list for future correspondence on this project. Please note Brian Knox has retired with the County of Bruce, please send any correspondence to myself and the project team as cc'd on this email.</p>	
Resident #9			
Res. #9 – Comment #1	<p>As a resident of County Road 25, I was sent a letter inviting comments to be taken into consideration for the Bruce County Road 33 Re-Alignment Project. It is my understanding that Option #3 (realign BR33 with Bruce Street) is the option that was chosen to move ahead. I would prefer that option #1 was chosen, but either way, I have reviewed the planning information, and would like these three suggestions to be considered.</p> <ol style="list-style-type: none"> 1) That a tree line or "living fence" be installed along the new section of BR 33 as the wind in this area is quite severe especially in the winter. Without it, the road may become impassable in the winter or have very poor visibility. As this will be a major alternative route to Bruce Power when hwy 21 is closed in the winter, we need to be able to keep it open. 2) The plans show several trees to be removed from BR25 during construction. There needs to be a replanting plan to replace trees that are removed during construction. 3) I did not see any immediate plans written that include sidewalks along BR25. I feel that this is an important requirement to having the road redone. There is a lot of 	<p>Thank you for comments, We have received several similar comments and I have distributed your comments to members of the design team.</p>	<ol style="list-style-type: none"> 1) A tree screen along the re-aligned BR33 will be considered in the detailed design phase. 2) A landscape plan will be considered with the detailed design of the separate BR25 project. 3) An Active Transportation Route along the north side of BR25 (3.0m wide paved path) is included in the Master Plan for Roads and Drainage.

Comment Received		Response Provided	Additional Discussion
	walking and biking traffic along this road especially in the summer. People use this as a main connection to get to the beach from town, as well as walking from cottages and Unifor into town.		
Resident #10			
Res. #10 – Comment #1	<p>Good morning Amanda, this email is in response to the notice of project initiation issued Jan 9th, 2018. My husband and I reside at [REDACTED] which appears to be the converging point of many of the possible alignment layouts for Bruce Rd 33. Naturally we are concerned about this fact. On one of the maps, our driveway is circled with a statement saying “driveway locations to be resolved. “ It seems strange to us that no one has ever approached us personally as to what sort of measures will need to be taken re our driveway.</p> <p>We have been unable to attend any of the town sessions but that should not matter.</p> <p>Also, on map M-1552 some of the layouts that converge on us are suggesting a speed limit of 80Km/h which is insane. Even with the small curve on the edge of our property and speed limit of 50 Km/h, cars are often in the ditch.</p> <p>Our choice would be to have the new road converge further down Bruce Rd 33 and not at our driveway. Thankyou,</p>	<p>Thank you for your comments regarding the Bruce Road 33 Re-Alignment Environmental Assessment. The County and Town will be considering next steps through the EA process and note the concerns you have identified in your comments. The County will be contacting you to review the layouts and the potential effect they have to your driveway as the design process evolves.</p>	

Comment Received		Response Provided	Additional Discussion
Resident #11			
Res. #11 – Comment #1	<p>I have reviewed the project file Bruce County Road 33 Re-alignment and feel that there has not been adequate consultation of the cottagers who are major stakeholders and therefore I am submitting this Part II Order Request. It is necessary for proper engagement that the cottagers in the area be consulted because we are major users of CR25 and CR33 and the surrounding area which are being affected by the project.</p> <p>Both the Notice of Phase 2 and the Project Initiation Notice do not refer to the roads by their commonly known names. CR25 has commonly been known as the CAW Road and Con. 6. CR 33 is commonly known as Lake Range Road. These names are referenced in the report but not in the Notices. The notices state that the project is located centrally in Saugeen Shores when in fact it is in the south end of Saugeen Shores and there was not a map included in the notices to show the project location. When I received the notice, I did not realize that I frequently travel these roads and the stormwater outflow would potentially affect the shoreline.</p> <p>The Notice of Phase 2 Public Information Centre was sent May 2 for a meeting Wednesday May 18 from 7:00 to 9:00 pm. It is difficult for most cottagers to attend a mid-week meeting on such short notice in May (prior to many cottage openings Victoria Day Weekend). A Stakeholder meeting was held Oc. 25, 2017, which again was mid week, shortly after Thanksgiving.</p> <p>Having been a cottager for more than 50 years, I feel that I should have been engaged in the planning process. I feel that the recreation, safety, environment and tourism aspects of the project have not adequately been addressed in the study and I would like more information.</p> <p>From a recreational point of view and safety, I feel that the proposed multi-use path proposed on the north side of CR 25 must be built at the same time that the road is upgraded. Recently I have heard from the Beachers' Association that the multi-use path will not be built for at least 4 years. This would be a missed opportunity and we all know any delay means it may never happen. In the summer people walk and ride bikes along CR 25 between Town and the lake and I have felt for a long time that there should be a bike path on CR 25. It is not safe to walk or ride along CR 25 because of the site lines and therefore from a safety perspective this should be built without a 4 year delay.</p> <p>I would not like to see the addition of a traffic light at CR 33 and</p>	<p>The County received your letter dated February 5, 2018 to the Minister of Environment and Climate Change regarding the Part II Order Request – Bruce County Road 33 Re-alignment. We called earlier today and it seemed best to email and to comment on a number of items you had included in your letter.</p> <p>The County of Bruce and Town of Saugeen Shores initiated a Master Plan for Roads and Drainage for Bruce Road 25 and Bruce Road 33 in September 2015. The Master Plan process included two public information sessions and comment periods. We noted tha the meetings were very well attended. The Notice of Study Completion for the Master Plan was issued on May 9, 2017. We note that various projects are derived from the Master Plan and we have identified the re-alignment of Bruce Road 33 to intersect with Bruce Road 25 at the future Bruce Street alignment as a Schedule B project.</p> <p>The Bruce Road 33 re-alignment will be undertaken in accordance with the Municipal Class Environmental Assessment (EA) Planning Process as a Schedule B project. The Notice of Project Initiation was issued on January 9, 2018 with comments due on February 6, 2018. The County is now considering all the comments received and will review the project and will update the project file prior to the Notice of Completion being issued and the 30 day review period commencing. We expect to take the recommendation for the preferred solution to the March 22 meeting of the Transportation and Environmental Services Committee. The Committees decision on the recommendation would form the basis of the Notice of Completion.</p> <p>An active transportation route is proposed on the north side of Bruce Road 25 and will be constructed throughout the four years that the Bruce Road 25 and Bruce Road 33 projects will be undertaken. The County is also working with the Great Lakes Waterfront Trail project which identifies a mapping route for cyclist throughout Bruce County. The proposed route encourages cyclist to travel on Bruce Road 33 to Conc 4, then along Saugeen Beach Road and consequently to Bruce Road 25 or to continue along Shipley Ave. We are of the opinion that the active transportation route on Bruce Road 25 will assist with the cyclist safety.</p> <p>Concerning your comment on the Bruce Road 33 realignment, we did consider a traffic circle at the proposed Bruce Road 25/33 intersection in the Master Plan but a signalized intersection was considered as “preferred” for pedestrian safety</p>	

Comment Received	Response Provided	Additional Discussion
<p>CR 25 and the addition of more stop signs until the traffic warrants it. I prefer the option of a round about if it can be done safely taking into account pedestrians and cyclists.</p> <p>From a tourism standpoint, I believe biking should be encouraged and thus the plans must take this into account, not just motor vehicles. CR 33 should also have bike lanes because it is a well travelled bike route. Although they are discussed briefly, they are not described in detail.</p> <p>Stormwater management and sewers are big issues in this area of Saugeen Shores. The sewers have never been continued south of CR 25 and many of the septic systems are extremely old. Before further development takes place in this area, the sewers must be extended. Although it is mentioned in the report, stormwater management is an issue, with increased run-off according to the plan. There are not sufficient details discussing water quality. This is significant because the outflow will be into the lake. The water quality is extremely important for tourism, for the residents/cottagers and the natural environment, therefore consideration must be given to how the water quality will be preserved.</p> <p>I am not trying to stop the project, but I am submitting this Part II Order Request to ensure proper consultation with the hope that Bruce County and Saugeen Shores will notify the stakeholders properly and incorporate the feedback into the plan, which are the fundamental principles of the EA process.</p>	<p>reasons, this decision is being reviewed by the Town, County and Consultants.</p> <p>The Bruce County Road 33 Re-alignment does have regard for storm water management and water quality will be considered and incorporated in the design.</p> <p>Thank you for the phone conversation this morning to review and discuss the email below.</p> <p>We acknowledge your concerns regarding stakeholder engagement for projects which include seasonal residences.</p> <p>We noted the public consultation was undertaken during the Master Plan process and the County and Town of Saugeen Shores will continue to correspond with landowners, agencies, organizations as the various projects proceed.</p> <p>We provided a general overview of the status of the Schedule A - drainage project and the Schedule B – Bruce Road 33 project.</p> <p>The Schedule A – drainage project is in the design phase and an application to the MOECC and Saugeen Valley Conservation Authority will be submitted prior to construction approval. We note that the Town, Consultant and County will review further means to ensure public input is included. We did note that the Town has met with the Beachers Association and has corresponded with the Lake Huron Coastal Centre regarding this project. It is proposed that in the near future, Town Council will be updated on the project and pre-consultation with the MOECC will take place. Following that the Town will host an Open House to share information with the Public.</p>	
	<p>The Schedule B – Bruce Road 33 road project will proceed with the EA process. It was noted that the construction of the Active Transportation Route is included under each phase of the project, having regard for cyclist safety. It was also confirmed that the proposed Bruce Road 33 re-alignment will include water and sanitary services and a stormwater management pond.</p> <p>We thank you for your comments and welcome any further questions/comments as we move forward with the Bruce Road 25 and Bruce Road 33 projects.</p>	

Comment Received		Response Provided	Additional Discussion
Res. #11 – Comment #2	<p>I would like to confirm my conversation with Kerri Meier and Brian Knox. I expressed my concern that cottage owners were not engaged although the affected people were primarily cottagers. Methods of engagement of cottagers should be considered in future projects. The description of the project and its location (including a map) would assist the audience in a better understanding of the project.</p> <p>I appreciate that Brian and Kerri will solicit community involvement for their Schedule A drainage project because it is a concern to people living/cottaging in the area, although it is not required under the Environmental Assessment Act.</p> <p>After my conversation with Brian and Kerri, I feel that they have listened to my concerns and will take them into account in future planning. Therefore I will withdraw my Part II Order request.</p> <p>Thank you for contacting me about my concerns.</p>		
Resident #12			
Res #12 – Comment #1 * Interpreted from hand written comment.	<p>In answer to your letter Bruce Street was purchased by the Saugeen Twp. to put the road in. Fenton raised (hell) about putting the road across by his house. The reeve of Saugeen Twp. thought he might lose some votes if he forced it so he decided to put the road by me. In my opinion the road should have gone through Bruce then there would not have a building there which has nothing in it. He built it to stop the road. I would say if you can put the road on Bruce Street as its needed to get the drainage right.</p>		The proposed BR33 alignment intersects BR25 at the future Bruce Street location.
Resident #13			
Res. #13 – Comment #1	<p>We do have concerns, however, on the discharge of storm sewers to Lake Huron at both the George Street and BR25 shorelines given the design of the proposed outflows are to be addressed in a separate design brief. We understand this design brief is still to be completed and presented to the public. We look forward to reading and commenting on it.</p> <p>As per our address below, we own a property on Shipley Ave and also maintain a family cottage nearby in the unserved sewer area (for full disclosure we recently engaged GM BluePlan to provide engineering work on our Shipley property). Given our knowledge of septic systems in the area, we suggest that the storm sewer issue along BR25 and George St be arranged to coincide with installation of municipal sewers in the unserved area.</p>	<p>The team had a conference call today with the intention of providing a map for the future work on Bruce Road 25. As you are aware, this project is separate from the Realignment of Bruce Road 33, and as such this email is only in response to the Bruce Road 25 works, being carried out under a Class EA Schedule A+. The County will respond separately to your comments on the realignment.</p> <p>During the Master Plan process a preferred alternative was determined through communication with agencies as well as the public. This preferred alternative is now being designed. The solution is to be vetted through the Master Plan document and is required to be in accordance to those recommendations. This means that the consultant team is reviewing the preliminary works to confirm it meets the intent, including the stormwater management plan and the environmental plan that</p>	

Comment Received		Response Provided	Additional Discussion
		<p>were prepared with the Master Plan. We have also circulated to the Conservation Authority for input into the Preliminary design. We are now going to reach out to Huron Costal Conservation to look for input on the outlet configuration and technologies that may be appropriate in this environment.</p> <p>Once the Team has the design far enough along to be able to present a configuration, the Town will prepare some form of public consultation.</p>	

NOTE: Additional comments received related to BR25 drainage are documented separately