Municipal Class Environmental Assessment – Schedule B

Project File Report

Road Network Expansion
417 Industrial Park, Township of Russell ON

Prepared for:

Township of Russell
717 Notre-Dame,
Embrun, ON K0A 1W0

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EXECUTIVE SUMMARY

The Township of Russell has initiated a Municipal Class Environmental Assessment (EA) study for the proposed expansion of the road network within the Vars Industrial Park located right next to Highway 417.

This study includes the problem/opportunity statement, evaluation of alternative solutions, and documentation of existing geotechnical, traffic, transportation, and archaeological conditions in the study area. A preferred solution is selected based on technical analysis and feedback from the public, stakeholders, Indigenous communities, and relevant agencies.
The Schedule B Class EA (Environmental Assessment) process aims to thoroughly review the expansion of the roadway infrastructure within the industrial park. The expansions would involve the construction of new road ROWs (Right of Way), and implementing associated drainage infrastructure, to expand the current road network and to assess potential connections to Burton Road and Eadie Road.

A preferred alternative solution is also identified following technical review and input received from the public, stakeholders, Indigenous communities, and agencies.
Preliminary design refinement took place to determine the preferred solution would be to extend Robot Street North to Burton Road, and extend Emard Street West, terminating prior to reaching Eadie road with a Cul-de-Sac.

This Project File Report has been prepared at the conclusion of the study and will be available for a 30-day public review period.

1 INTRODUCTION AND BACKGROUND

1.1 Introduction

The Township of Russell has initiated a Schedule B Municipal Class Environmental Assessment (Class EA) (herein referred to as the 'study') to review and study the proposed expansion of the road network within the 417 Industrial Park. The road network expansion intends to provide access to subject lands, optimize new lot configuration and improve transportation efficiency to and within the park, all while considering existing conditions and constraints.

The Municipal Class Environmental Assessment (EA) process is a provincially mandated planning framework under the Ontario Environmental Assessment Act, designed to ensure appropriate consultation, assessment and evaluation of municipal infrastructure projects takes place prior to construction. The process ensures that potential impacts related to technical, environmental, social and economic are carefully considered before the project implementation. The expansion of the roadway network follows the Schedule B EA process, which applies to projects with potential for moderate environmental impacts. Given that this project will involve an extension of the existing local roadways within the municipalities land, it is defined as a schedule B project.

This road network expansion is being undertaken in response to additional land located to the west of the current roadways requiring vehicular access, identified as trade and industry policy area in the United Counties of Prescott and Russell Official Plan (2022).

The project aligns with municipal and regional planning objectives, including the Official Plan at the counties level, and the updated draft official plan prepared by the Municipality of Russell. Through this EA process, the preferred solution will be selected based on technical, environmental, and community considerations to ensure a balanced and responsible approach to infrastructure development.

Following the prescriptive process, the following are the key objectives of this study:

- Complete all background technical studies required to implement an extension of the current roadway network to access 417 Industrial Park Vacant lands.
- Develop a range of road alignment alternatives for evaluation, with considerations to all aspects of the environment.
- Select a preferred solution through a transparent decision-making process.
- Engage stakeholders and members of the pubic throughout the process.

This study includes the problem/opportunity statement, evaluation of alternative solutions, and documentation of the background studies completed, including geotechnical, traffic, environmental, transportation, and archaeological conditions in the study area. A preferred solution is selected based on technical analysis of the parcel of land in question, combined with feedback from the public gathered throughout the process, Indigenous communities, project stakeholders and relevant agencies such as the Ministry of Culture and Multiculturalism (MCM) and South Nation Conservation Authority.

1.2 Study Location

The 417 Industrial Park is bordered to the north by Burton Road, to the west by Eadie Road, and to the south by a future road right-of way referred to as Route 100. The portion of the industrial park that is being reviewed for the roadway extension is the land located west of where Emard Road currently terminates, and north of Robot Street. The study area is captured in in ***Figure 1*** below.

Figure 1: Study Area

1.3 Class Environmental Assessment Process

This study was conducted in accordance with the requirements of the Municipal Class Environmental Assessment (MCEA) – Schedule 'B', which is an approved process under the Environmental Assessment Act. Projects undertaken through this planning process are classified as one of four "Schedule" types ranging from Schedule 'A' and 'A+' to Schedule 'B' and 'C' in accordance with their degree of anticipated environmental impact and magnitude. The focus of the framework is a comprehensive and transparent decision-making process. The Class EA consists of the following phases:

- **Phase 1** – Commence by identifying problem/ opportunity;
- **Phase 2** – Identify reasonable alternatives to the problem, Address traffic needs and impacts, evaluate, select the preferred option;
- **Phase 3** – Develop preliminary design concepts for the favored choice based on input from the public and the agency assessment;

- **Phase 4** – Complete the Project File Report (PFR), documenting the problem, alternatives considered, environmental impacts, mitigation measures, and consultation efforts and place it on the public record and review; and
- **Phase 5** – Project implementation, following the review period of the PFR, which required the detailed design to be completed, summarized in contract drawings and specifications as deemed appropriate for the project and proceed to construction and ultimate completion.

This project is classified as a Schedule 'B' Municipal Class EA (Class EA) Project and is subject to Phases 1 through 5 of Municipal Class EA process.

1.4 Policy and Planning Principles (Study Area Context)

Regional planning policies were reviewed to identify their relevance to the 417 Industrial Park Road network expansion.

1.4.1 Township of Russell Official Plan (March 2018)

The Township of Russell's Official Plan establishes the municipality's goals, priorities, and permitted land uses. It functions alongside other relevant legislation, including the Planning Act, the Provincial Policy Statement, and the United Counties of Prescott and Russell Official Plan, to guide land use planning and development.

In March 2018, the Township of Russell finalized an update to its Official Plan as part of a comprehensive review, ensuring its policies align with provincial regulations and standards, and in 2024/2025 have completed a review and issued a draft update.

The official plan provides framework to ensure industrial employment opportunities are protected and supported by expanding and servicing the employment lands in the 417 Industrial Park. Employment growth for the township identifies the 417 industrial park as a major contributor to employment growth.

The official plan Identifies Eadie Street as a Village Major Collector, while Burton Road is designated as a Village Minor Collector. Emard Street and Robot Street are categorized as local streets, primarily providing direct access to adjacent properties rather than serving as key connectors in the road network.

A draft official plan has been published for review complementing the United Counties of Prescott and Russell's official plan which identifies these lands as Trade and Industry Policy Area.

1.4.1.1 Industrial Park Design Guidelines

The Industrial Park designation permits employment-generating light and medium industrial and office uses. In the unserviced area, allowed uses include manufacturing, warehousing, transportation depots, vehicle sales and services, and compatible commercial uses. In the serviced area, additional uses such as retail, restaurants, and entertainment facilities are permitted. Open storage is allowed but must be screened from view and comply with zoning regulations. Adequate parking and loading spaces must be provided, with access points from internal roads rather than major roads. Buffers must separate incompatible uses, and developments should align with urban design policies and future water and wastewater service plans. A Well Head Protection Area east of the park may impact development, requiring adherence to County policies. The Township will monitor development pace and employment projections as urban services expand. Site plan control applies to all developments, focusing on building design, aesthetics, buffering, and transportation access.

The draft update specifically outlines the requirement for an appropriate transition to sensitive land uses to ensure land use compatibility and mitigate adverse effects. The transition might include landscaping buffers, prohibiting outdoor operations, storage, or facilities, requiring additional air filtration, noise reduction, or land uses that may require a smaller separation distance to adequately mitigate and minimize adverse effects to the sensitive land use.

1.4.1.2 Village Major Collector Policies

The Township will collaborate with the County to establish and maintain standards for Village Major Collectors. Direct access to these roads will be restricted when alternative access to local roads is available and will not be permitted if it creates traffic hazards due to limited sight lines. Any permitted severances or development proposals may require dedicating land to the County for future road expansion. To improve traffic flow, the number of local road junctions should be minimized, and in high-traffic areas, residential lots should be designed to back onto major collectors.

1.4.1.3 Village Minor Collector Policies

Direct access to Village Minor Collectors will be restricted when alternative access via local roads is feasible. Access will also not be allowed in areas where limited sightlines could create traffic hazards. All new development proposals and severances may require land dedication to the Township if needed for future road purposes. To reduce traffic conflicts, the number of junctions between local roads and minor collectors should be minimized. A minimum right-of-way width of 20 meters is required, although reduced widths may be accepted through subdivision or condominium reviews if all infrastructure needs are met, and development quality is not compromised

1.4.1.4 Village Local Street Policies

Local roads should have a minimum right-of-way width of 20 meters, though reductions may be allowed through the subdivision approval process. These roads are primarily intended for local traffic, and through traffic should be discouraged. Where existing roads do not meet the 20-metre standard, widening should be considered based on traffic flow needs, with a focus on widening intersections rather than entire roads to minimize impacts on adjacent properties.

1.4.2 Township Of Russell Transportation Master Plan (Update-March 2016)

The purpose of the 2016 Transportation Master Plan (TMP) Update was to address anticipated transportation challenges arising from population and employment growth in the Township of Russell up to 2031, with a focus on enhancing north-south connectivity to Highway 417. Key policies and plans related to the 417 Industrial Park include:

1.4.2.1 Employment Growth Priority

The 417 Industrial Park is identified as the primary driver of employment growth (72% of projected employment growth by 2031). Expansion plans include accommodating 87 hectares of new employment lands, requiring upgrades to transportation infrastructure to support industrial traffic and commuter access.

1.4.2.2 Road Network Improvements

St. Guillaume Road Widening: The preferred solution to address north-south capacity constraints involves widening St. Guillaume Road to 4 lanes from Enterprise Street to Highway 417. This corridor directly serves the 417 Industrial Park and its future development. The project requires coordination with adjacent 417 Industrial Park land development plans and stakeholders, including the United Counties of Prescott and Russell and the Ministry of Transportation.

1.4.2.3 Active Transportation Connectivity

On-road cycling routes (e.g., St. Guillaume Road, Route 300) and off-road trails (e.g., New York Central Fitness Trail) are prioritized to connect the 417 Industrial Park with surrounding villages and employment hubs. Implementation of paved shoulders along key routes is recommended to enhance safety and accessibility for cyclists.

1.5 Study Organization and Project Team

The Township Municipal Class Environmental Assessment Study was carried out by a consulting team led by LRL on behalf of the Township of Russell. The study team is outlined below:

LRL Associates Ltd.:

- Virginia Johnson, P. Eng. – Project Manager
- Kyle Herold, EIT – Civil Engineering Designer

Township of Russell:

- Francois Landry – Project Manager
- Jonathan Bourgon – Executive Director of Planning and Infrastructure Services

To support the full review, additional background studies were completed by:

- LRL Associated Ltd.- Phase 1, Environmental Site Assessment, Geotechnical Investigations
- Morrison Hershfield (Now Stantec)- 417 Industrial Park Expansion Traffic Impact Study
- Shade Group- Wood Eadie Municipal Drain Engineers Report and DFO Application
- Past Recovery Archaeological Services Inc – Stage 1 and Partial Stage 2 Archaeological Assessment
- Matrix Heritage – Stage 1 and 2 Archaeological Assessment
-

1.6 Study Schedule

The EA Study was initiated in February 2024. Key dates throughout the study are shown in ***Table 1*** below.

Table 1: Study Schedule Critical Dates

EA Stage	Date
Notice of Study Commencement	March 13, 2024
Public Information Centre No. 1	May 30, 2024
Public Information Notice- Update	November 15th, 2024
Project File Report	February 21st, 2025

1.7 Consultation Overview

As per EA requirements, notification to the public and stakeholders of study commencement is required, as well as notification of Public Information Centers. Notification of Study Commencement, Public Information Centers, and Notice of Study Completion (forthcoming) was provided through several different methods and media.

General Public:

- Project updates including study timelines, PIC dates and PIC materials were posted on the Russell Township project website. All notices were also posted on the Township's social media

Residents & businesses within the study area:

- All notices were mailed to property owners within the study area.

Technical Agencies and Indigenous Communities:

- All Notices were sent via email.

Project Mailing List (stakeholders who submitted commented during the study or indicated interest in the project):

- All Notices were sent via email.

Following the processes of a Schedule B Class EA, agencies and members of the public were contacted as per the above methods to give them the opportunity to raise any comments or concerns regarding the study, alternative solutions, and designs.

A copy of the consultation materials completed throughout the study has been included in ***Appendix A***.

2 EXISTING CONDITIONS

2.1 Geotechnical Investigation

2.1.1 Site Conditions

The geotechnical investigation for the proposed extensions of Warehouse Street (~350 m) and Emard Street (~1,100 m) in 417 Industrial Park, Russell Township, revealed that the site consists of vacant agricultural land. Warehouse Street has a flat terrain, while Emard Street exhibits rolling grade changes (~10 m). Subsurface investigations, based on 19 boreholes (1.12–2.90 m depth), identified topsoil (~0.6 m) underlain by silty clay, silt and clay, and glacial till. Groundwater was encountered between 0.87 m and 2.52 m below the surface, with perched water observed in some areas. Seasonal fluctuations in groundwater levels, particularly during spring, were noted as a potential concern. An additional investigation was completed to investigate the potential for an extension to Robot Street to ensure soil stratigraphy was known to be considered in the option analysis.

2.1.2 Drainage Conditions

The Wood-Eadie Main Drain watershed spans approximately 240 hectares, with its West Branch sub-watershed covering 119 hectares. The primary area requiring drainage is Lot 22, Concession 4, where realignment and improvements are planned to accommodate future development, while downstream work will focus on maintenance and erosion control. The existing Wood-Eadie Main Drain extends 2,550m, beginning at the northern boundary of Lot 22, Concession 4, approximately 200m south of Burton Road, and meandering southward before out-letting into the Wood-Eadie East Branch. A proposed realignment will straighten the drain through Lot 22 to facilitate development, reducing its total length to 2,476m. The Wood-Eadie West Branch, originating at the culvert under Eadie Road and flows northeast through Lot 20, Concession 4, extends 1,054m. While no construction is planned for the West Branch, future maintenance may be undertaken at the discretion of the Township's Drainage Superintendent. A plan view of watershed boundaries and drain alignments is provided in the detailed drainage report included in ***Appendix B***.

2.1.3 Sub-surface Conditions

The subsurface materials, including silty clay, silt and clay, and glacial till, are suitable for backfilling if kept free from organic or objectionable materials and if their moisture content is controlled. Temporary excavations must follow OHSA Type 3 soil guidelines, with slopes cut to 1H:1V for drained conditions. Groundwater infiltration can be managed using sump pumps, and proper drainage systems, including sub-drains and surface grading, should be implemented to prevent water accumulation. Recommended pavement structures include 840 mm of layered materials for Warehouse Street and 690 mm for Emard Street and Robot Street, using specified Granular "A" and "B" Type II materials. Subgrade preparation must include proof-rolling to identify and replace soft spots, with backfill compacted to at least 95% of its Standard Proctor Maximum Dry Density. Proper frost protection, such as extruded polystyrene insulation for culverts, should be applied where needed.
A comprehensive geotechnical investigation report is included in ***Appendix C***

2.2 Archeological Assessment

2.2.1 Site Conditions

The archaeological assessment focused on a 2.05-hectare area in the 417 Industrial Park, encompassing parts of Lots 22 and 23, Concession 4. The study area comprises agricultural fields, with a small, forested section in the eastern parcel. The soils are predominantly well-drained sandy soils, with some clay and rock inclusions. Historical records, maps, and prior assessments indicate archaeological potential due to the area's proximity to early transportation routes, historic roads, and structures noted on 19th-century maps

2.2.2 Field Investigation and Findings

The Stage 1 assessment identified the area as having potential for pre-contact Indigenous and historical Euro-Canadian archaeological remains. Field investigations for the Stage 2 assessment involved pedestrian surveys of ploughed fields and test pitting in forested areas, all conducted at 5-meter intervals. No archaeological remains, artifacts, or features with cultural heritage value or interest were encountered. The soil was predominantly clay with some rock inclusions, and no cultural stratigraphy was observed. Based on the findings, it is recommended that no further archaeological studies are required for the subject property. The area is deemed to have low to no archaeological potential. Construction and development can proceed, but compliance with the Ontario Heritage Act is advised. Any unanticipated discoveries during construction must involve a licensed archaeologist, and any human remains must be reported to the appropriate authorities as outlined by legislation. The assessment report is presented in ***Appendix D***

2.3 Built Heritage Resources and Cultural Heritage Assessment

LRL Engineering completed a screening form provided by Ministry of Culture and Multiculturalism which concluded there is low potential for built heritage or cultural heritage landscapes within the subject lands. The screening form is included in ***Appendix E***.

2.4 Traffic/Transportation Needs Assessment

In support of the Class EA, a Transportation Operations Analysis was undertaken to analyze the existing and future needs of the networks, from an operational and safety perspective. The full

Traffic Study Report is provided in ***Appendix F***. The existing conditions are summarized in 2.3.1 and the future conditions in 2.3.2.

2.4.1 Existing Traffic Conditions

According to 417 Industrial Park Expansion Traffic Impact Study, the analysis for the proposed development considered four (4) unsignalized intersections at Burton Road / Eadie Road, St. Guillaume Road / Enterprise Street, Burton Road / Corduroy Road, Burton Road / Enterprise Street, and one (1) roundabout at St. Guillaume Road / St. Pierre Road / Burton Road. Additionally, a future road extension of Robot Street to intersect with Burton Road is also considered in the background (without site trips) and future (with site trips) scenarios. Based on the capacity analysis for the existing conditions, all intersections within the study area operate well with LOS 'C', or better in the AM peak hour and with LOS 'D' or better in the PM peak hour.

2.4.2 Future Traffic Demand

According to 417 Industrial Park Expansion Traffic Impact Study, the analysis for the future scenario in 2034 with the proposed development resulted in a marginal decline in traffic operations. All the intersections continue to operate at LOS D or better during both peak hours except the eastbound movement at the St. Guillaume Road / Enterprise Street intersection in the PM peak hour, which continues to operate at LOS 'F' with a V/C ratio of 1.09. As noted previously, poor traffic operations at this movement stem from background growth and existing lane configurations, and not the proposed site itself. The queue buildup in this scenario (90.6 meters) is still accommodated by the available storage at this approach (180 meters).

For the background scenario in 2034 with no development, all intersections operate with a LOS 'D' or better in both peak hours except for the eastbound movements at the St. Guillaume Road / Enterprise Street, which operates at LOS 'F' and V/C ratio of 1.08 in the PM peak hour.

Traffic operations at the St. Guillaume /St. Pierre / Burton roundabout remain consistent across the existing, background (no-build), and future (build) scenarios, with a marginal deterioration which is expected.

2.4.3 Active Transportation

Pedestrian and cycling infrastructure are entirely absent. No sidewalks, crosswalks, or cycling lanes exist at any intersections. The transit network is also non-existent, leaving no alternatives to private vehicle use.

2.5 Phase 1 Environmental Assessment

According to Phase I Environmental site assessment, which reviewed the lands, historic uses, and records, no potential areas of environmental concern were identified. The activities on the lands within 250 m are presently agricultural, industrial, and residential. Based on review of available aerial photographs and the interview with a Site representative, the Site has been developed with agricultural fields since at least 1946 and continued to be used as agricultural fields until present day. As such, no further environmental assessment work is warranted at the Site at this time.

Further details can be reviewed in the Phase 1 Environmental Site Assessment report given in ***Appendix G***.

2.6 Natural Environment Assessment Report

A Schedule B Municipal Class Environmental Assessment Report for the potential of water and sanitary servicing of the 417 industrial park lands was historically completed in March of 2019 which included a Natural Environmental Assessment Report. The documents were reviewed to determine that the locations for the potential roadway alignments were included in the Natural Heritage Features. The potential roadway alignments were not identified to intersect with any potential ecological land classifications or natural features with the exception of the Wood Eadie Municipal Drain. The Natural Heritage Features Map is included in ***Appendix H***

The Wood Eadie Main Branch Municipal Engineers Drainage Report, and accompanying SNC permit and DFO permit to allow for a required realignment of the municipal drain is included in ***Appendix B***.

3 PROBLEM AND OPPORTUNITY STATEMENT

As per Phase 1 requirements of the Municipal Class Environmental Assessment process for a Schedule 'B' project, a "Problem and Opportunity Statement" was prepared to identify in detail the various problems and opportunities to be addressed by the study. The Problem Statement outlines the need and justification for the overall project and establishes the general parameters, or scope, of the study.

The Problem Statement for this study was developed after thoroughly reviewing and obtaining an understanding of the existing conditions, the transportation network surrounding the subject area, and the proposed development and growth anticipated for the vacant lands.

The Problem and Opportunity Statement for this study consists of the following key elements:

1. The existing road network does not provide adequate transportation connections and capacity to accommodate the planned future 417 Industrial Park development.
2. A road network expansion is necessary to connect the proposed 417 Industrial Park lands to the local roadways currently terminated to the east, and to connect to Burton Road. This will support the planned use of the surrounding area and provide the necessary capacity to accommodate future transportation and traffic volumes and access to future lots.

4 ALTERNATIVE DESIGN SOLUTIONS AND EVALUATION PROCESS

During Phase 2 of the Class EA process, various solutions to address the problem are identified and described. Each network design alternative was assessed to ensure they effectively meet the future transportation and servicing requirements while minimizing adverse impacts on the natural, cultural, social and economic environment. The evaluation results in the preferred solution, which was then presented to the public and stakeholders to solicit input.

4.1 Evaluation Criteria

The Project Team identified evaluation criteria consistent with the EA definition to evaluate the alternative solutions. **Table 2** outlines the general evaluation criteria that is used in the alternative solutions and design concept evaluation

Table 2: General Evaluation Criteria for Alternative Solution Analysis

Criteria	Description

Technical Aspects	• Roadway connectivity & impact on existing network. • Geometric design and drainage • Potential to improve active transportation • Municipal drain considerations
Socio-Economic Environment	• Impacts to archaeological, built & cultural resources • Impact to agricultural lands • Compatibility with future development opportunities • Potential effects on existing residential & commercial properties • Potential effects on air quality & noise
Environmental Concerns	• Impacts to terrestrial vegetation • Impact to wildlife/species at risk • Impact to aquatic habitat • Impact to watercourses • Climate changes
Cost and Constructability	• Utility relocation • Cost/benefit • Capital cost • Opportunity to phase construction • Maintenance cost

4.2 Evaluation Methodology

Every alternative has been reviewed according to the degree of potential impacts, risks and mitigation measures, with 1 being the least favored option and 5 the most preferred. Ratings were assigned on a scale of 1 to 5 as follows:

Table 3: Evaluation Rating Methodology

1	Potential impacts are significant, implementation of substantial mitigation measures is required. Risk cannot be eliminated.
2	Potential impacts are major, implementation of extensive mitigation measures required to reduce/eliminate risks.
3	Potential impacts are moderate, implementation of many mitigation measures required to reduce/eliminate risks.
4	Potential impacts are minor and can be easily mitigated through implementation of standard mitigation measures.
5	Potential impacts are negligible, no mitigation required.

The alternative solutions considered to address the problem identified with respect to the evaluation criteria are documented in the next section

4.3 Solution Options

4.3.1 Option 1: Emard Street to Eadie Road and Warehouse Street Extension to Burton Road

The full-length extension of Emard Street along the subject site up to Eadie Road and Warehouse with full-length extension as well to Burton Road was proposed as one of the alternatives, as indicated in ***Figure 2***

Figure 2: Option 1 - Emard Street and Warehouse Street Extension

4.3.2 Option 2: Extend Emard Street to Eadie Road and Robot Street to Burton Road

Emard Street would extend along the subject site up to Eadie Road on full length and Robot Street to Burton Road, as indicated in ***Figure 3***. Although this proposed solution received the highest points among other options (35 points), it was halted following the public information session as a non- viable option after considering additional influences such as public safety, fire protection, cost, and implications on the nearby dwelling fronting Eadie Road.

Figure 3: Option 2- Emard Street and Robot Street Extension

4.3.3 Option 3: Robot Street Extension with Cul-de-sac

Emard Street will extend towards Eadie Road, with a cul-de-sac at the end, while Robot Street will run its full length up to Burton Road, as shown in ***Figure 4***.

This plan is the approved option for the road extension, considering public feedback, safety considerations, and other factors.

Figure 4: Option 3- Robot Street Extension with Emard Cul-de-sac

4.3.4 Option 4: Robot Street Extension with Internal Circulation for Future Development

In this proposal, the extension of Robot Street would connect directly with Burton Road, while Emard Street is designed to circulate and meet Robot Street.

This layout would ensure connectivity throughout the area, however, limits the future lotting of the overall land.

Figure 5: Option 4- Robot Street Extension with Internal Circulation

4.3.5 Option 5: Extension of Robot Street and Extension of Emard Street Networking Back to Robot

In this option, Robot Street would be extended to connect directly with Burton Road, while Emard Street would be extended and turned back to intersect with Robot Street as depicted in ***Figure 6***.

Figure 6: Option 5: Extension of Robot Street and Extension of Emard Street Networking Back to Robot

4.4 Analysis of Alternatives

Table 4 on the following page compares all alternatives, with consideration given to the technical aspects, socio economic impacts, environmental aspect and the cost and constructability.

Table 4:Alternative Road Alignment Analysis

- Option 1: Emard Street and Warehouse Street Extension
- Option 2: Emard Street and Robot Street Extension
- Option 3: Robot Street Extension with Cul-de-sac
- Option 4: Robot Street Extension with Internal Circulation for Future Development
- Option 5: Extension Of Robot Street, And Extension of Emard Steet Networking Back to Robot

Criteria/Alternative	**Option 1**		**Option 2**		**Option 3**		**Option 4**		**Option 5**	
	Rationale	**Evaluation**	**Rationale**	**Evaluation**	**Rationale**	**Evaluation**	**Rationale**	**Evaluation**	**Rationale**	**Evaluation**
Technical Aspects										
Safety	Improved connectivity, traffic flow and regulation, continuous road alignment. Potential congestion on Emard St between Warehouse and Robot.	4	Improved connectivity, traffic flow and regulation, continuous road alignment. Potential congestion on Emard St between Warehouse and Robot.	5	Poor connectivity, increased traffic flow through Robot Street, no continuity through Emard Street.	2	Poor connectivity, driveway issues for lots through loop roads, frequent bends/turns.	1	Poor connectivity, frequent bends/turns.	2
Traffic Volume/Distribution	Two additional points of entry/exit promotes traffic distribution. Increase in volume of traffic within the industrial park.	4	Two additional points of entry/exit promotes traffic distribution. Increase in volume of traffic within the industrial park.	4	Single point of entry/exit limits traffic distribution, increased volume within cul-de-sac.	2	Improved flow of traffic with two lanes. Increased traffic volume along Robot Street and at Robot/Burton intersection.	3	Improved flow of traffic with two east/west roadways. Increased traffic volume along Robot Street and at Robot/Burton intersection.	3
Connectivity	Provides access to both Eadie Road and Burton Road. Warehouse-Burton connection is close in proximity to the Corduroy-Burton connection.	4	Provides access to both Eadie Road and Burton Road. Warehouse-Burton connection is close in proximity to the Corduroy-Burton connection.	5	Provides access to Burton Road. No access to Eadie Road.	3	Provides access to Burton Road. No access to Eadie Road.	3	Provides access to Burton Road. No access to Eadie Road.	3
Geometric Design & Drainage	Simple geometric design, road and ditch can easily follow existing drainage patterns.	5	Simple geometric design, road and ditch can easily follow existing drainage patterns.	5	Simple geometric road design. Additional consideration for drainage required for lots around and west of cul-de-sac.	3	Complex geometric road design. Additional consideration for drainage required for lots around loops and west-most driveway.	1	Complex geometric road design. Additional consideration for drainage required for lots around west-most driveway.	2

Socio Economic Aspects										
Impact to surrounding properties	Emard-Eadie connection will increase flow of traffic on Eadie Road, added concerns with property owners in the vicinity of Eadie Road.	1	Emard-Eadie connection will increase flow of traffic on Eadie Road, added concerns with property owners in the vicinity of Eadie Road.	1	No connection or disruption to Eadie Road.	5	No connection or disruption to Eadie Road.	5	No connection or disruption to Eadie Road.	5
Efficient Land Use	Simplistic road design leads to flexibility in overall park design and lot configuration, small lots on east of Warehouse Rd.	4	Simplistic road design leads to flexibility in overall park design and lot configuration.	4	Simplistic road design leads to flexibility in overall park design and lot configuration. Lot configuration around round-a-bout not optimal for industrial sites.	3	Reduction in potential average lot size, less opportunity for large industrial development, difficulty for large vehicle maneuverability.	1	Reduction in potential average lot size, less opportunity for large industrial development.	2
Environmental Aspects										
Archaeological Impact	No Impact	5	No Impact	5	No Impact	5	No Impact	5	No Impact	5
Natural Environment Impact	Emard Street intersects with existing Municipal Drain branch, road construction will have a moderate impact to natural environment.	2	Emard Street intersects with existing Municipal Drain branch, road construction will have a moderate impact to natural environment.	2	Emard Street intersects with existing Municipal Drain branch, road construction will have a low to moderate impact to natural environment.	3	Emard Street intersects with existing Municipal Drain branch twice, road construction will have a moderate to high impact to natural environment.	2	Emard Street intersects with existing Municipal Drain branch twice, road construction will have a moderate to high impact to natural environment.	2
Cost & Constructability										
Constructability	Simplistic geometric road layout design aids in buildability.	5	Simplistic geometric road layout design aids in buildability.	5	Simplistic geometric road layout design aids in buildability. Consideration required for drainage of site around round-a-bout.	4	Complex geometric road layout, difficulty for sewer and utility installation and drainage design.	1	Moderate geometric road layout, some challenge for sewer and utility installation and drainage design.	2
Construction Cost	Shorter road length results in less construction costs for road.	4	Shorter road length results in less construction costs for road.	4	Shorter road length results in less construction costs for road.	5	Long road length results in greater construction costs for road.	1	Moderate road length results in greater construction costs for road.	2
Total Score		**38**		**40**		**35**		**23**		**28**

4.5 Preferred Solution

Initial review and the methodology used to evaluate the options led to the extension of Emard through to Eadie road and Robot Street being preferred; however strong public feedback throughout the process concluded the preferred option to include a cul-de -sac to terminate Emard prior to reaching Eadie Road.

The preferred solution for the road network expansion includes the extension of Emard Road, which will terminate in a cul-de-sac designed to accommodate the required vehicular turning movements for emergency vehicles. This design choice minimizes impacts on existing residential parcels fronting Eadie Road, as it eliminates the possibility of direct connectivity to Eadie, preserving the character and function of the existing neighborhood.

Additionally, the northern connection will extend directly to Burton Road along the current alignment of Robot Street, ensuring a logical and efficient roadway extension. This alignment provides a dispersed entry and exit point for the Highway 417 Industrial Park, reducing traffic concentration on existing roadways to the east and enhancing overall traffic circulation within the area.

Furthermore, this configuration accommodates various internal lotting layouts for future development, allowing for flexibility in parcel configurations while maintaining efficient access and circulation. The proposed design supports local transportation needs while mitigating potential land use conflicts, ensuring compatibility with both industrial and residential areas.

5 CONSULTATION AND ENGAGEMENT

Public and stakeholder consultation is a key component of the Municipal Class Environmental Assessment (MCEA) Schedule B process. The consultation strategy for this project ensured meaningful engagement with affected parties, regulatory agencies, Indigenous communities, businesses in the 417 Industrial Park, and nearby residents to identify concerns, incorporate provided feedback, and develop an informed solution for the alignment of the road network expansion.

5.1 Stakeholder Identification

The following groups were identified as key stakeholders for this project:

1. **Government and Regulatory Agencies:**
    - United Counties of Prescott and Russell
    - Ministry of Transportation (MTO)
    - Ministry of the Environment, Conservation and Parks (MECP)
    - Ministry of Cultural and Multiculturalism (MCM)
    - South Nation Conservation Authority (SNC)
    - Local emergency services (fire and paramedics)

2. **Indigenous Communities:**
    - Consultation was initiated with Indigenous groups as per provincial requirements. Notices were sent to relevant communities identified through the Ministry of Indigenous Affairs and local knowledge sources.

3. **Public and Local Residents:**
    - Property owners fronting Eadie Road, Emard Road, and Burton Road
    - Residents and businesses within and surrounding the study area

4. **Businesses and Industry Groups:**
    - Owners and tenants within the 417 Industrial Park
    - Local business associations and commercial property owners

5.2 Public Engagement Activities

Public consultation was conducted in accordance with the Municipal Class EA Schedule B Requirements, ensuring stakeholders were informed and had an opportunity to provide input

1. **Notice of Commencement**
    - A public notice was issued at the project's initiation via local newspapers, the municipal website, e-mail and direct mail to affected property owners on March 13th, 2024.
    - The notice outlined the study purpose, scope, and consultation process.
2. **Public Information Centre (PIC)**
    - On May 30th, 2024, the Township of Russell held a Public Information Centre (PIC) at the Township of Russell Office from 6:00 to 8:00 pm. The PIC was held to provide information and overview of the study, proposed alternatives and preferred solutions.
    - Display boards were available for review, and municipal staff and the LRL engineering team were present to answer questions.
    - Feedback on the proposed road network alternatives was received. A total of 18 people attended and agreed to be added to the contact list for the study, with 8 participants providing input through comment sheets and emails.
    - Some attendees provided direct input on their preferred or least preferred options. During the public consultation, Option 1 proposing a full-length extension of Emard Street directly to Eadie Road and Burton Road was strongly opposed due to concerns about traffic, environmental impact, and residential disturbances.
    - A comprehensive summary of the comments received can be found in ***Appendix I***.
3. **Public Notice- Update**
    - A memo summarizing the status of the study, background reports, and next steps was circulated via e-mail and available on the Township's website to all stakeholders on November 15th, 2024.
    - Feedback received from this communication is included in ***Appendix I***.
4. **Summary of Indigenous Consultation**
    - In accordance with provincial guidelines, Indigenous communities with potential interest in the project were notified and invited to participate in the consultation process.
    - Formal notice of commencement and opportunities for engagement were provided to relevant Indigenous groups.

- No significant concerns were raised
- An indigenous monitor from Algonquins of Pikwakanagan First Nation took part in the Archaeological study completed by Past Recoveries during the detailed background studies that took place.

5. **Agency Consultation and Correspondence**
   - The Ministry of transportation (MTO), Ministry of the Environment, conservation and Parks (MECP), South Nation Conservation Authority (SNC) and Local Emergency Services were all kept in circulation throughout the process for feedback and consultation.

The consultation process ensured that key stakeholders were informed and had opportunities to provide feedback throughout the study. The preferred solution addressed concerns raised by eliminating all connectivity to Eadie Road for the surrounding residents. Additionally, any environmental mitigation will take place during the detailed design and construction of the roadways. Stakeholder input will continue to be considered in future project phases, including detailed design and implementation.

6 IMPACTS AND MITIGATION MEASURES

The proposed road extension is expected to have minimal social and cultural impacts, as it is primarily located within a currently vacant area designated for transportation and development.

The potential impacts to natural features that might reasonably be expected to occur as a result of the proposed 417 Industrial Park roadway expansion are identified and discussed in this section. Specific focus is on the impact of the actual construction of the roadway, with mention of mitigation measures to be considered during the detailed design of the roadway.

6.1 Standard Environmental Mitigation Measures

To minimize potential impacts on natural heritage features during construction, the following standard mitigation measures and best practices should be implemented:

- Wash, refuel, and service equipment at least 30 meters away from surface waters to prevent contamination. Regularly inspect machinery for fluid leaks.
- Prepare a Spill Management Plan and keep it on-site for immediate implementation in case of spills. An emergency spill kit should also be readily available.
- Thoroughly clean construction machinery before bringing it to the site to prevent the introduction of invasive species.
- As outlined in the DFO Review for the Municipal Drain Re-alignment taking place in this area, Plan in-water works, undertakings and activities to respect that no in water work take place between March 15th and July 15th. windows to protect fish,
- including their eggs, juveniles, spawning adults and/or the organisms upon which they feed and

6.2 Erosion and Sediment Control

An Erosion and Sediment Control (ESC) plan should be developed and implemented during construction to minimize erosion and prevent sediment from entering surface water and natural areas. The plan should include the following measures:

- Install temporary, project-specific ESC measures (e.g., silt fences, straw bale dams) before starting work.
- Maintain a contingency supply of additional ESC materials on-site for emergency use.
- Regularly monitor and maintain ESC measures, ensuring they remain in place until construction soils have stabilized, and vegetation has re-established.
- Secure stockpiled materials (such as fill and topsoil) and keep them at least 30 meters away from watercourses.

6.3 Stormwater and Drainage Impacts

During the detailed design, appropriate collection and conveyance of runoff from the roadway will be required. This would include:

- Roadside ditch to be designed with a grade to ensure all drainage collected is conveyed to a defined outlet location.

6.4 Noise

The contractor will be required to abide by the municipal noise control by-laws and ensure that all construction equipment is kept in good working order to limit additional noise. The contractor shall also ensure that the idling of construction equipment is kept to a minimum. Additional noise control measures will be addressed during detailed design and included in the construction contract

6.5 Air Quality

During construction, best management practices will be applied to mitigate any air quality impacts caused by construction dust (non-chloride dust suppressants).

6.6 Climate Change

The MECP's guide, Consideration of Climate Change in the Environmental Assessment Process, outlines two approaches for consideration and addressing climate change in project planning including:

- Reducing a project's impact on climate change (climate change mitigation).
- Increasing the project's and local ecosystem's resilience to climate change (climate change adaptation).

6.7 Preferred Alternative Feedback Mitigation

The table below summarizes critical impacts raised during this study and the mitigation measures proposed.

Table 5: Public Concerns and Design Considerations

Concern	Proposed Mitigation Measure and Considerations
Impact of road intersection on Eadie Road impacting residential homes on Eadie Road	The alignment option selected does not continue to Eadie Road. It will be terminated with a cul-de-sac east of Eadie Road.
Safety of Industrial Vehicles and emergency Vehicles Turning at Round about	The detailed design will incorporate an appropriate radius for full turning movements of large trucks and fire trucks in the municipality.
Industrial uses of the land in close proximity to residential settlement.	The purpose of this Class EA is to confirm the project need and recommend a preferred roadway alignment to service the existing land use designation for the subject lands.

	All aspects of the land planning and acceptable site development is outside of this scope and will be addressed at the time of individual Site Plan Approval applications for lands surrounding the road right of ways.
Noise Impacts on Nearby Residents	This will be mitigated during construction through best management practices and appropriate timing windows of work. Once constructed.
Light pollution to lands outside of the 417 Industrial Park.	During the detailed design stage, appropriate streetlight selections will be specified to ensure that lumens are distributed to the critical locations within the ROW's. Individual site lighting design is not detailed through the roadway design, however; this will be addressed during the Township's Site Plan application process at the time of individual site development.
Concerns for wells in proximity to the 417 Industrial Park and quality of water.	This does not fall within the scope of the road network expansion.
General comments on the land value of the industrial lots.	This does not fall within the scope of the road network expansion.

7 PRELIMINARY DESIGN CONSIDERATIONS

The preliminary design for the proposed road extension has been developed to align with the existing roadway designed within the Highway 417 Industrial Park while ensuring proper drainage and utility coordination. Key design elements include the roadway cross-section and roadside ditch drainage, which are described below.

7.1 Proposed Roadway Design and Cross-Section

The road extension will feature a rural cross-section, consistent with the surrounding i417 Industrial Park. The roadway will be designed within a 24-metre right-of-way (ROW), providing adequate space for vehicular traffic, drainage features, and utility placement. The design will accommodate the necessary lane widths and turning radii for industrial vehicles, ensuring safe and efficient movement of goods and services. The cross section below is the expected cross section to be used for this length of road.

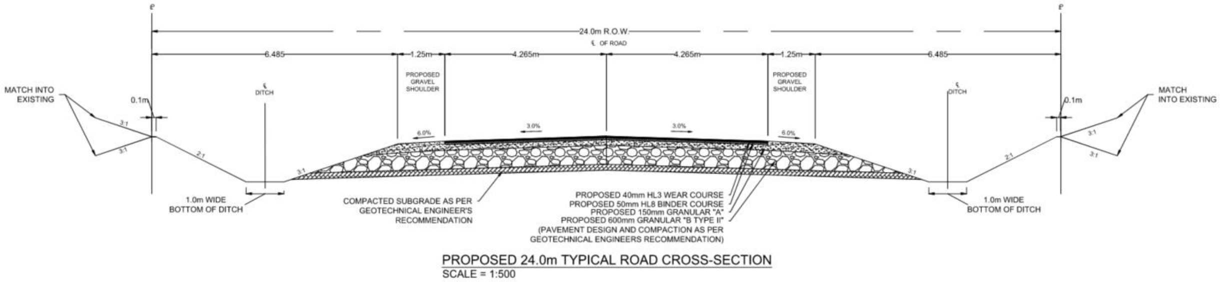


Figure 6: Typical 24.0 m Industrial Roadway Cross-Section

Given the subject area within the park is unserviced, there will be no storm sewer, sanitary sewer or watermain within the asphalt travel ways. For stormwater management, all drainage will be directed across the asphalt roadway into the roadside ditches and ultimately conveyed to either the west branch or east branch of the Wood Eadie Municipal Drain.

7.2 Utility Relocations and Drainage Improvements

Roadside Drainage:

- To manage stormwater effectively, roadside ditches will be designed with a minimum slope of 0.5%, ensuring proper drainage collection and conveyance to an appropriate outlet point.
- The drainage system will consider the proposed grade raise and existing topography, ensuring that the design integrates seamlessly with the surrounding landscape.
- Where possible, drainage directions will mimic pre-development flow patterns, minimizing impacts on existing hydrology and adjacent properties.
- All site developments contributing stormwater runoff to the roadside ditches will be required to control and manage their own stormwater in major storm events.
- All intersections and site entrances will be developed with culverts, designed to ensure consistent and non-impeded drainage paths throughout the ditch network.
- Riprap will be places in all areas of concern for erosion and sediment control, such as ditch bends and culvert inlets/outlets.

Utility Coordination:

- The final ROW dimensioning will account for hydro and utility trenching, ensuring adequate space for existing and future services.
- Coordination with utility providers will be conducted to identify necessary relocations or extensions of hydro, telecommunications, and other infrastructure to support continued service in the area.

The preliminary design prioritizes efficient roadway function, effective stormwater drainage management, and coordinated utility planning, ensuring a seamless integration of the road extension into the 417 Industrial Park's existing infrastructure. Further refinements will be made during the detailed design phase to optimize performance and minimize potential impacts.

8 NEXT STEPS AND IMPLEMENTATION

With the completion of the Municipal Class Environmental Assessment (MCEA) Schedule B process and finalizing the Project File Report (PFR), this report will be made available for a minimum 30-day public review period on the Township's website. This ensures stakeholders have an opportunity to provide final input before proceeding with implementation.

Following the EA process, the project will advance to the detailed design phase, where final engineering plans, road profiles, grading details, and utility coordination will be completed. All necessary approvals from regulatory agencies will be obtained to ensure compliance with municipal and provincial standards during the detailed design and approval stage.

Cost estimates will be refined during the detailed design phase, with funding expected to come from a combination of municipal capital budgets and potential grant programs.

Construction will be planned to minimize disruption to existing road users and businesses. The anticipated timeline for construction will be determined based on contractor procurement, with work expected to begin in the summer months of 2025, subject to final approvals. The municipality will continue to coordinate with stakeholders to ensure a smooth transition from planning to implementation.

9 CONCLUSION

The proposed road network expansion, developed through the Municipal Class Environmental Assessment (MCEA) Schedule B process, addresses key transportation needs within the 417 Industrial Park by enhancing road connectivity, improving traffic flow, and supporting future development by providing access to the future lots. The preferred solution—extending Emard Road with a cul-de-sac and providing a north connection to Burton Road via the existing Robot Street alignment—balances transportation efficiency with future lotting compatibility, environmental considerations, and stakeholder concerns.

Through a comprehensive evaluation of alternatives, public and agency consultation, and technical assessments, the preferred design has been selected to minimize impacts on existing residential properties, maintain pre-development drainage patterns, and provide flexibility for future lotting configurations within the 417 industrial park.

It is recommended that the project now proceed to the detailed design phase, where final engineering plans, utility placements, and construction details will be refined. The Project File Report (PFR) will be filed for the mandatory 30-day public review period, allowing for any final stakeholder input before implementation.

APPENDIX A

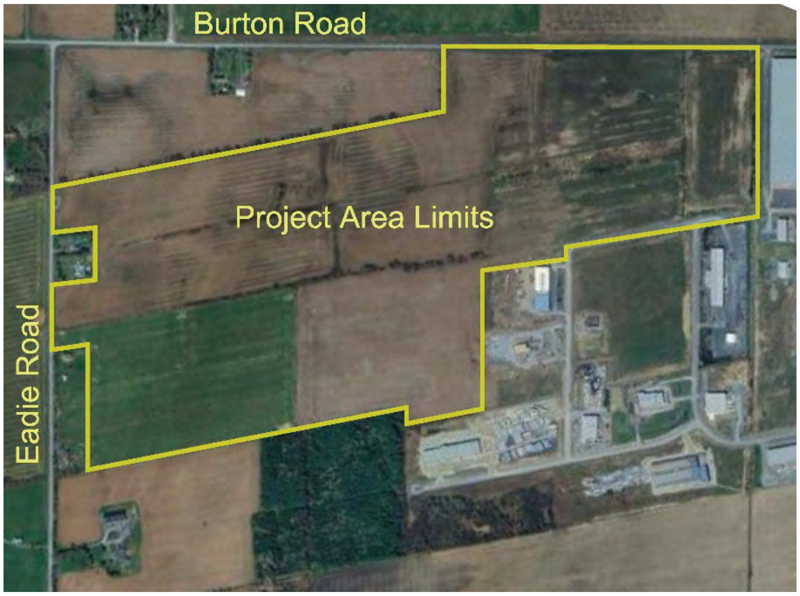
Public and Agency Consultation Documentation

Municipal Class Environmental Assessment Study
Road Network Expansion, Vars Industrial Park, Township of Russell

Notice of Study Commencement

March 13, 2024 **Public Notice**

This notice is to inform stakeholders and interested parties that the Corporation of the Township of Russell is initiating a Schedule B Class Environmental Assessment (Class EA) to review and study the proposed expansion of the road network within the Vars Industrial Park. The road network expansion intends to provide access to subject lands, optimize new lot configuration and improve transportation efficiency to and within the park, all while considering existing conditions and constraints.



The Schedule B Class EA (Environmental Assessment) process aims to thoroughly review the expansion of the roadway infrastructure within the industrial park. The expansions would involve the construction of new road ROWs (Right of Way), and implementing associated drainage infrastructure, to expand the current road network and to assess potential connections to Burton Road and Eadie Road.

The purpose of the Environmental Assessment is to assess the project area existing conditions, design alternatives and identify potential environmental impacts associated with the roadway expansion, and ensure design is compliant with relevant regulatory agencies.

The Process
In compliance with Schedule B Activities, the Township of Russell will be conducting a screening process and engaging in consultations with directly affected parties (including the public and Indigenous groups), relevant stakeholders and pertinent review agencies. The Township will perform an evaluation of alternative solutions, an assessment of potential impacts associated with the proposed expansion of road network and development of measures to mitigate identified impacts.

Public Consultation
Public consultation is an integral component of the Class EA process, and we value your input during the planning process. A Public Information Center (PIC) will be held in association with the proposed road network expansion. Once a date for the PIC has been scheduled, notices will be published in local newspapers, on the Township's website (www.russell.ca) and distributed to all individuals and agencies who express an interest in this project.

If you wish to be placed on the project contact list to receive notices and information, or to provide comments at any time during the process, you can do so by contacting:

Francois Landry
Project Manager
Municipalité de Russell Township
613.443.1747
francoislandry@russell.ca

Kyle Herold
Civil Engineering Designer
LRL Engineering
613.842.3434
kherold@lrl.ca

Under the Freedom of Information and Protection of Privacy Act and the Environmental Assessment Act, unless otherwise stated in the submission, any personal information such as name, address, telephone number and property location included in a submission will become part of the public record files for this matter and may be released, if requested, to any person.

Étude d'évaluation environnementale municipale de portée générale

Expansion du réseau routier, parc industriel de Vars, Municipalité de Russell

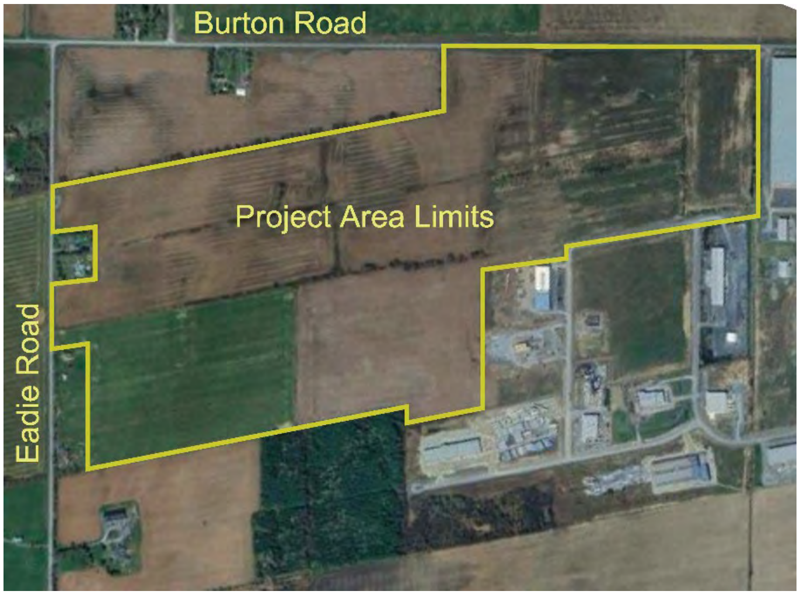
Municipalité de
RUSSELL
Township

Avis de début d'études

13 mars 2024 **Avis public**

L'avis présent a pour but d'informer les intervenants et les parties intéressées que la corporation de la municipalité de Russell entreprend une évaluation environnementale de portée générale selon l'annexe B (ÉE de portée générale) afin d'examiner et d'étudier le projet d'expansion du réseau routier dans le parc industriel de Vars. L'expansion du réseau routier vise à fournir un accès aux terrains visés, à optimiser la configuration des nouveaux lots et à améliorer l'efficacité du transport vers le parc et à l'intérieur de celui-ci, tout en tenant compte des conditions et des contraintes existantes.

Le processus d'évaluation environnementale de classe Schedule B vise à examiner en profondeur l'expansion de l'infrastructure routière au sein du parc industriel. Les extensions impliqueraient la construction de nouvelles emprises routières et la mise en place de l'infrastructure de drainage associée, afin d'étendre le réseau routier actuel et d'évaluer les connexions potentielles avec le chemin Burton Road et le chemin Eadie.



L'objectif de l'évaluation environnementale est d'évaluer les conditions existantes dans la zone du projet, les alternatives de conception et d'identifier les impacts environnementaux potentiels associés à l'extension de la route, et de s'assurer que la conception est conforme aux agences réglementaires concernées.

Le processus

Conformément aux activités de l'annexe B, la municipalité de Russell mènera un processus d'examen préalable et entreprendra des consultations avec les parties directement touchées (y compris le public et les groupes autochtones), les intervenants pertinents et les organismes d'examen pertinents. La municipalité procédera à une évaluation des solutions de rechange, à une évaluation des impacts potentiels associés à l'expansion proposée du réseau routier et à l'élaboration de mesures visant à atténuer les impacts identifiés.

Consultation publique

La consultation du public fait partie intégrante du processus d'évaluation environnementale de portée générale, et votre contribution au processus de planification nous est précieuse. Un centre d'information du public (CIP) sera organisé en association avec le projet d'extension du réseau routier. Une fois la date du CIP fixée, les avis seront publiés dans les journaux locaux, sur le site web de la municipalité (www.russell.ca) et distribués à toutes les personnes et agences qui expriment un intérêt pour ce projet.

Si vous souhaitez figurer sur la liste de contact du projet afin de recevoir des avis et des informations, ou si vous souhaitez faire part de vos commentaires à tout moment au cours du processus, vous pouvez le faire en vous adressant à

Francois Landry
Directeur de projet
Municipalité de Russell Township
613.443.1747
francoislandry@russell.ca

Kyle Herold
Concepteur de génie civil
LRL Engineering
613.842.3434
kherold@lrl.ca

En vertu de la loi sur l'accès à l'information et la protection de la vie privée et de la loi sur l'évaluation environnementale, sauf indication contraire dans la demande, toute information personnelle telle que le nom, l'adresse, le numéro de téléphone et l'emplacement de la propriété incluse dans une demande fera partie des dossiers publics pour cette affaire et pourra être divulguée, sur demande, à toute personne.

Municipalité de
RUSSELL
Township

Welcome

Public Information Centre

Road Network Expansion, 417 Industrial Park, Township of Russell

Thursday, May 30th, 2024

6:00PM to 8:00PM

Council Chambers, Township of Russell Office,
717 Notre-Dame St, Embrun, ON K0A 1W1

LRL ENGINEERING

MUN RUSSELL TWP

Municipalité de
RUSSELL
Township

BIENVENUE

Centre d’information publique

Expansion du réseau routier, parc industriel du 417, Municipalité de Russell

Jeudi 30 mai 2024

18:00 à 20:00

Salle du Conseil, bureau de la Municipalité de Russell
717 rue Notre-Dame , Embrun, ON K0A 1W1

LRL ENGINEERING

Key Instructions For The Meeting

1 Please sign-in at the front entrance if you have not already done so.

2 Review the display material and feel free to discuss the study or any questions with the team representatives in attendance.

3 We value your feedback! Please fill in and drop off the Comment and Feedback form provided to you.

Please do not hesitate to let us know if you have any accessibility requirements, our team will be more than happy to help accommodate!

Instructions pour la rencontre

1 Si ce n’est pas déjà fait, veuillez vous enregistrer à l’accueil.

2 Visualisez la présentation sur l’étude réalisée et si requis, n'hésitez pas à poser des questions aux membres de notre équipe.

3 Votre avis est important pour nous ! Veuillez compléter le formulaire de commentaires qui vous a été remis et nous le transmettre.

N’hésitez pas de nous à nous faire part de vos besoins en matière d’accessibilité, notre équipe se fera un plaisir de vous aider!

MCEA Process and Intent

Purpose of the MCEA Process

- Assess the project area existing conditions and design alternatives
- Assessment of potential impacts related to technical, environmental, social & financial criteria
- Ensure design compliance with relevant regulatory agencies.

Purpose of Public Information Centre

- To present the proposed alternatives and design options,
- Answer questions and seek community feedback to help guide the road network expansion process.

You will be able to review:

- Project Approach
- Planning Process & Overview of Ongoing & Future Applicable Studies
- Existing Conditions
- Evaluation Methodology
- Roadway Network Design Options
- Tentative Timelines
- Next Steps

Processus et intention

Objectif de la procédure environnementale

- Déterminer les conditions existantes dans la zone du projet et déterminer les alternatives de conception;
- Identifier les impacts environnementaux potentiels associés à l'expansion du réseau routier;
- S'assurer que la conception est conforme aux agences réglementaires concernées.

Objectif du Centre d'Information Publique

- Présenter les améliorations proposées et les options de conception;
- Répondre aux questions et solliciter l'avis de la communauté afin d'aider à orienter le processus d'expansion.

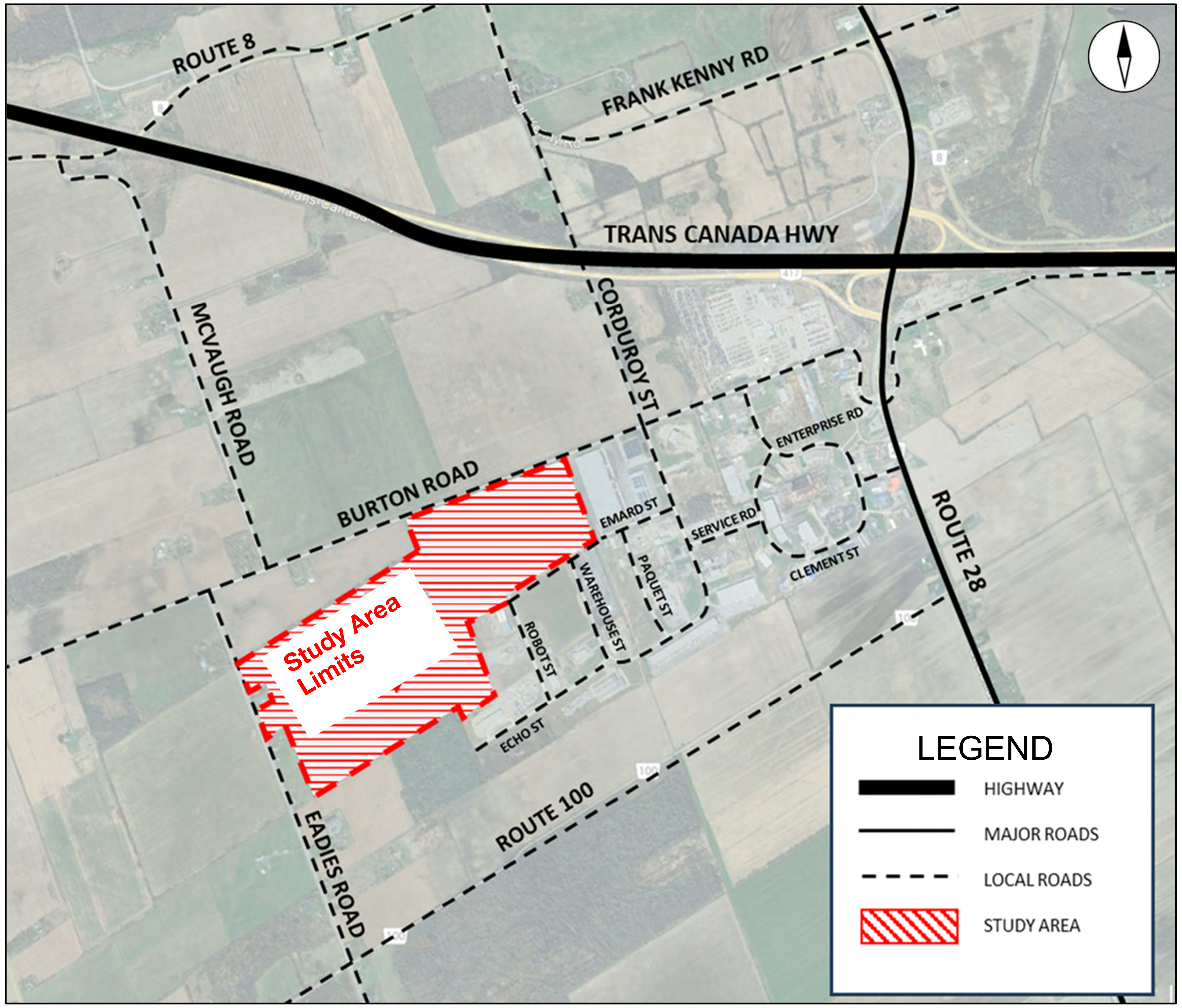
Vous pourrez donner votre avis sur :

- L'approche du projet;
- Le processus de planification et les études de base;
- Les conditions existantes;
- La méthodologie d'évaluation;
- Les options de conception pour le réseau routier;
- Le calendrier provisoire;
- Les prochaines étapes prévues.

Introduction

The Corporation of the Township of Russell is initiating a **Schedule B Municipal Class Environmental Assessment (Class EA)** to review and study the proposed expansion of the road network within the Vars Industrial Park.

The road network expansion intends to provide access to subject lands, optimize new lot configuration and improve transportation efficiency to and within the park, all while considering existing conditions and constraints.

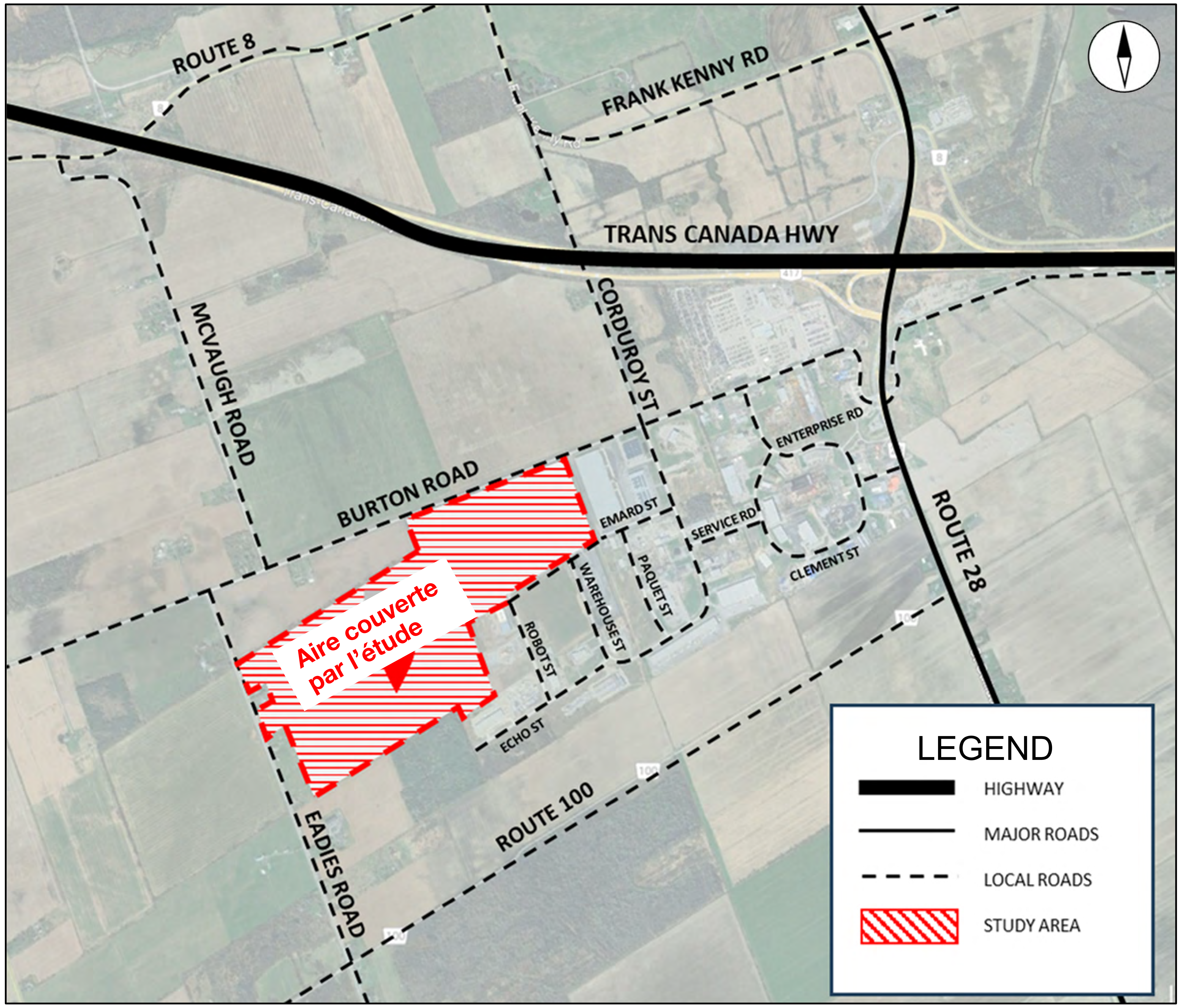


Study Area Limits

Introduction

La Municipalité de Russell entreprend une **Évaluation Environnementale Municipale de portée générale (ÉE de portée générale)** afin d'examiner et d'étudier l'expansion proposée du réseau routier à l'intérieur du Parc Industriel de Vars.

L'expansion du réseau routier vise à fournir un accès aux terrains visés, à optimiser la configuration des nouveaux lots et à améliorer l'efficacité du transport à l'intérieur et vers le Parc, tout en tenant compte des conditions et des contraintes existantes.

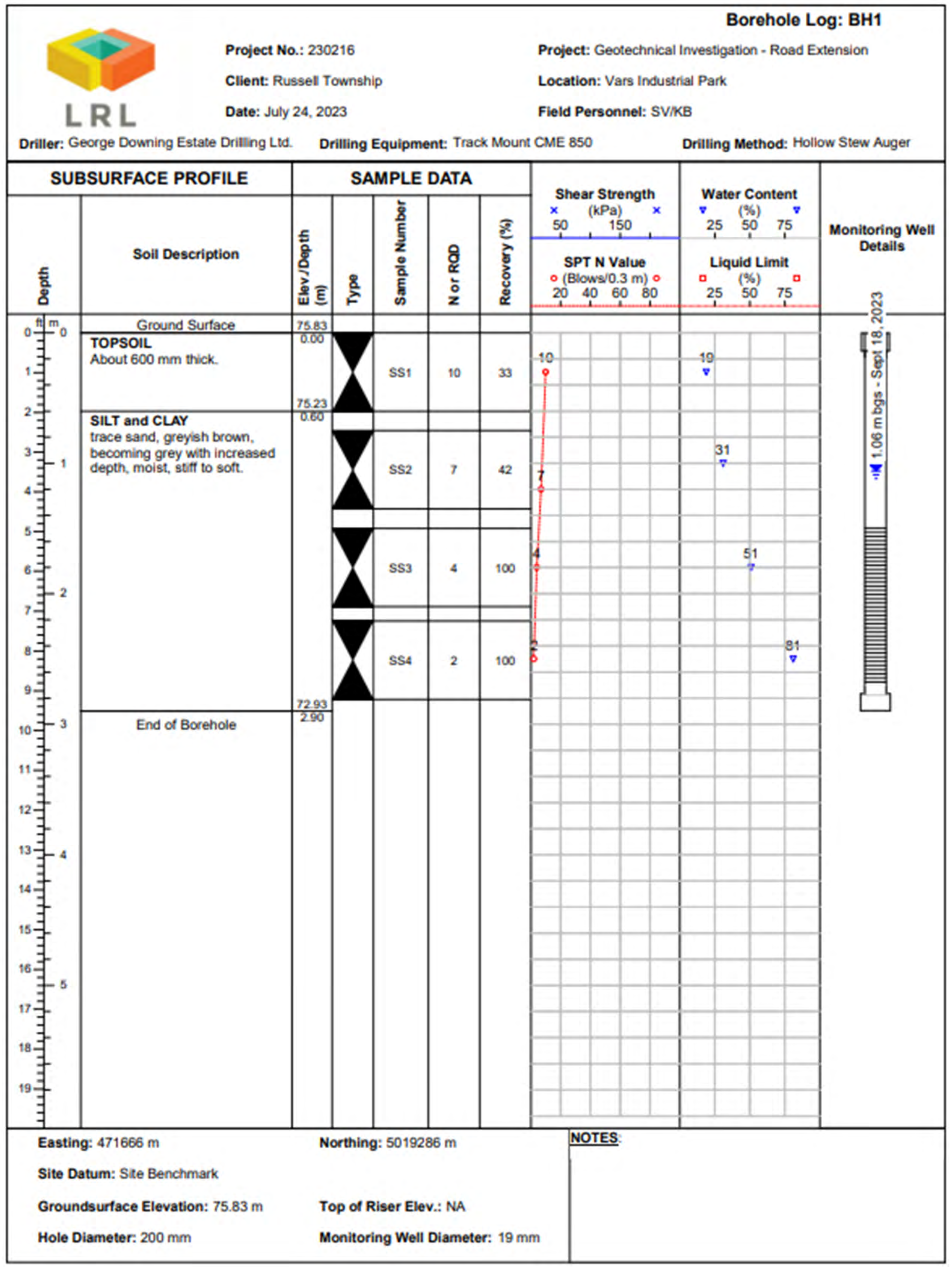


Limites de l'aire couverte par l'étude

Ongoing Studies - Geotechnical Investigation

Within the study area limits, a Geotechnical Investigation has been initiated. The investigation will serve to provide;

- An assessment of the sub-surface soil properties and groundwater conditions of the overburden soils.
- A formulation of a recommendation for a robust subgrade capable of withstanding traffic and proposed pavement structure loads.
- Recommendations on excavation, geotechnical parameters, along with groundwater control for the installation of the proposed pavement structure.
- Insights on backfilling requirements and evaluating the suitability of on-site soils for backfilling purposes.



Borehole Log: BH1

Project No.: 230216
Client: Russell Township
Date: July 24, 2023
Project: Geotechnical Investigation - Road Extension
Location: Vars Industrial Park
Field Personnel: SV/KB
Driller: George Downing Estate Drilling Ltd.
Drilling Equipment: Track Mount CME 850
Drilling Method: Hollow Stew Auger

SUBSURFACE PROFILE		SAMPLE DATA				
Depth	Soil Description	Elev./Depth (m)	Type	Sample Number	N or RQD	Recovery (%)
0	Ground Surface	75.83				
	TOPSOIL About 600 mm thick.	0.00		SS1	10	33
	SILT and CLAY trace sand, greyish brown, becoming grey with increased depth, moist, stiff to soft.	75.23 0.60		SS2	7	42
				SS3	4	100
				SS4	2	100
	End of Borehole	72.93 2.90				

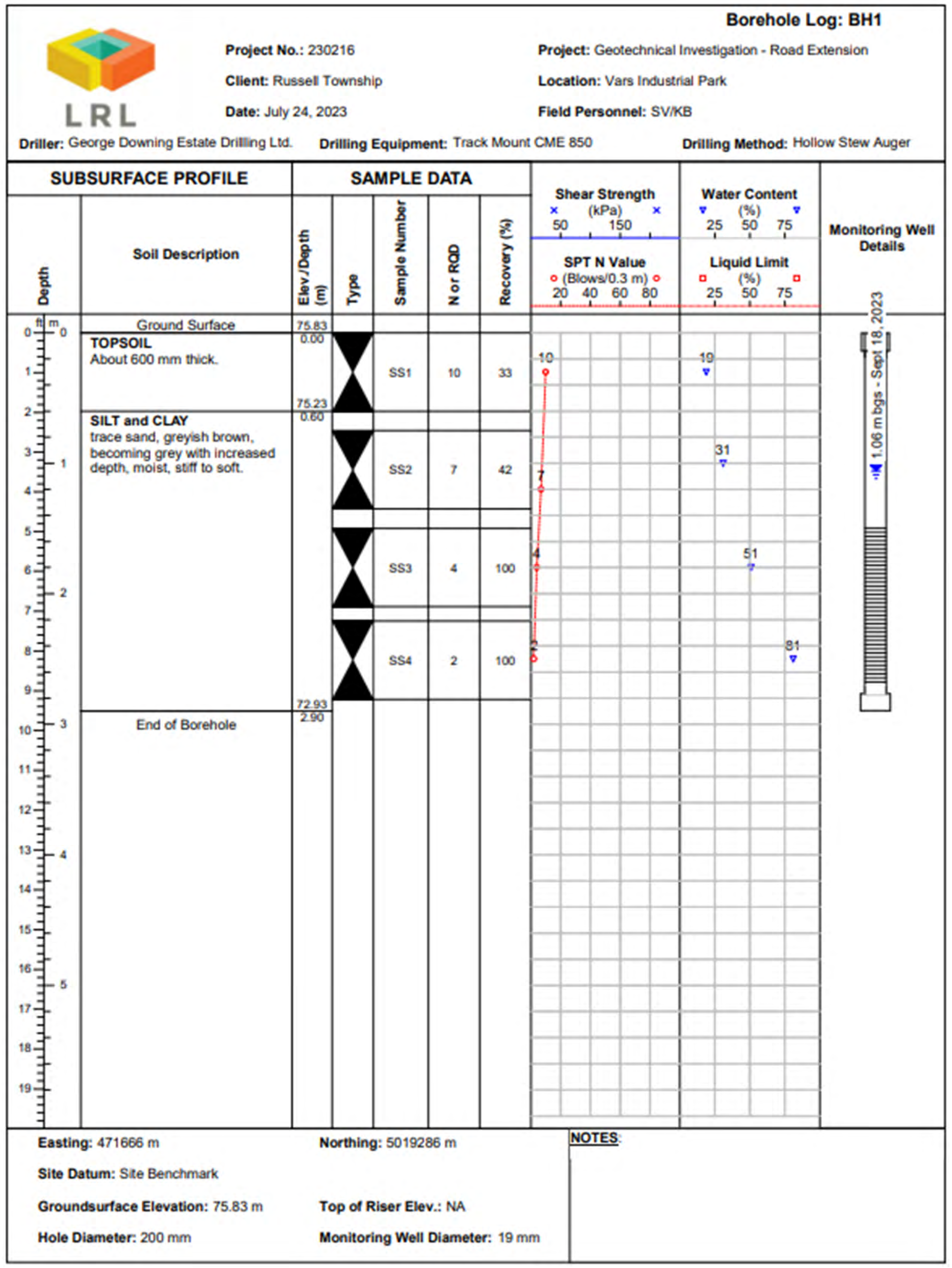
Easting: 471666 m
Northing: 5019286 m
Site Datum: Site Benchmark
Groundsurface Elevation: 75.83 m
Top of Riser Elev.: NA
Hole Diameter: 200 mm
Monitoring Well Diameter: 19 mm
NOTES:

Sample Borehole Log from Site

Études en cours- investigation géotechnique

Le Municipalité a commencé l'investigation géotechnique à l'intérieur des limites de la zone d'étude. L'étude géotechnique comprend :

- L'évaluation des propriétés du sol et des eaux souterraines.
- Une recommandation pour une structure de chaussée robuste, capable de résister au trafic et aux charges prévues.
- Des recommandations sur l'excavation, la pression des terres, les paramètres géotechniques ainsi que le contrôle des eaux souterraines lors de la construction des chemins.
- Des informations sur les exigences de remblayage et l'évaluation des sols en place à des fins de réutilisation en tant que remblai.



Borehole Log: BH1

Project No.: 230216
Client: Russell Township
Date: July 24, 2023
Project: Geotechnical Investigation - Road Extension
Location: Vars Industrial Park
Field Personnel: SV/KB
Driller: George Downing Estate Drilling Ltd.
Drilling Equipment: Track Mount CME 850
Drilling Method: Hollow Stew Auger

SUBSURFACE PROFILE		SAMPLE DATA				
Soil Description	Elev./Depth (m)	Type	Sample Number	N or RQD	Recovery (%)	Monitoring Well Details
Ground Surface	75.83					
TOPSOIL About 600 mm thick.	0.00		SS1	10	33	
	75.23					
SILT and CLAY trace sand, greyish brown, becoming grey with increased depth, moist, stiff to soft.	0.60		SS2	7	42	
			SS3	4	100	
			SS4	2	100	
	72.93					
End of Borehole	2.90					

Easting: 471666 m
Northing: 5019286 m
Site Datum: Site Benchmark
Groundsurface Elevation: 75.83 m
Top of Riser Elev.: NA
Hole Diameter: 200 mm
Monitoring Well Diameter: 19 mm
NOTES:

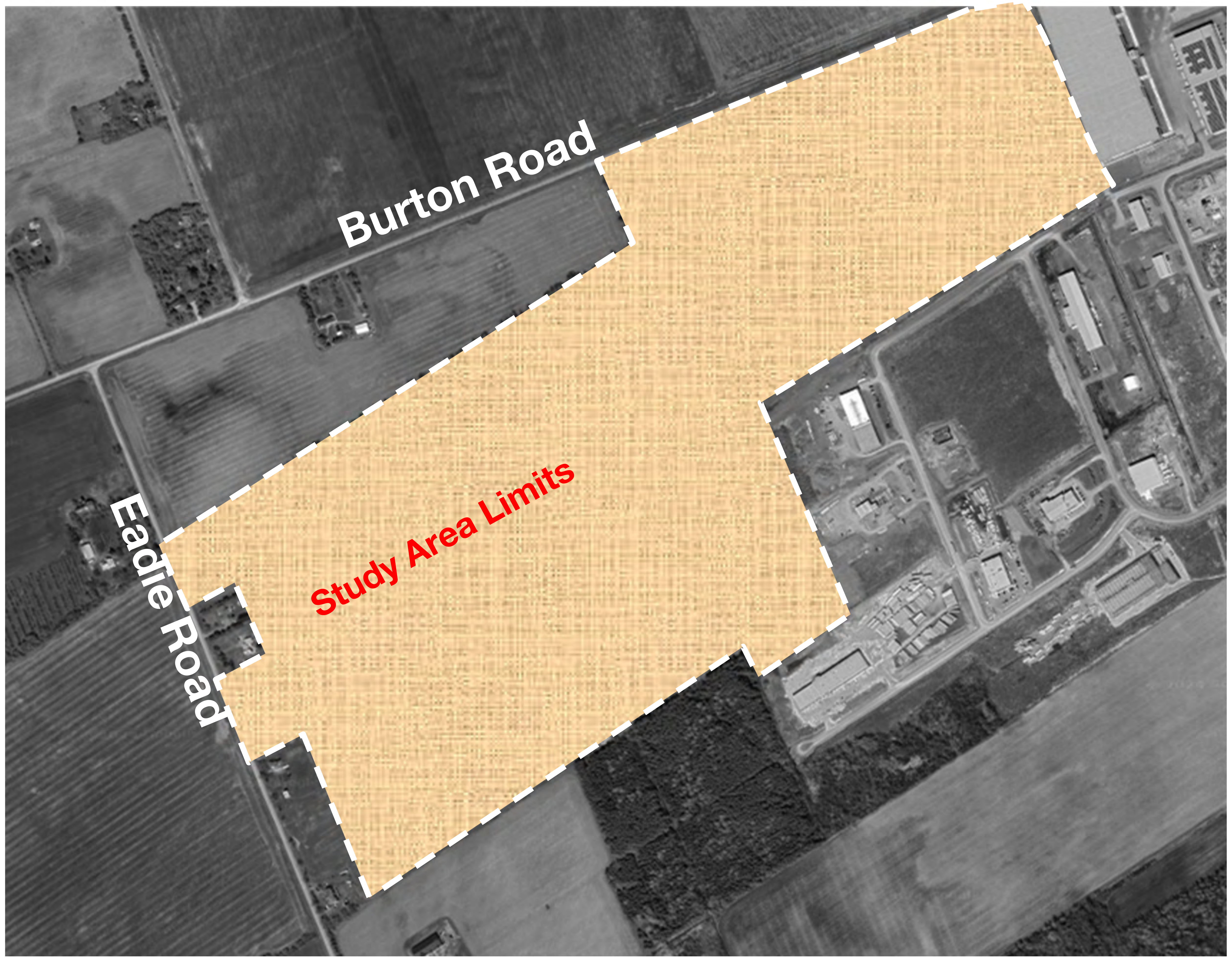
Exemple de journal de forage du site

Ongoing Studies - Archaeological Assessment

The Township is currently undertaking an archaeological assessment for the project area.

The Archaeological assessment will aim to identify, preserve and protect any findings on Cultural/Historical significance, if any within the study area limits.

The engaged archaeologists are currently progressing on the Stage 1 Archaeological Assessment. The Stage 1 study aims to determine if there are any known archaeological sites within the study area, and to assess the potential of the property(s) for archaeological resources.



Études en course – évaluation archéologique

La Municipalité réalise présentement une évaluation archéologique de la zone du projet, qui est en cours d'achèvement à ce jour.

L'évaluation archéologique vise à identifier, préserver et protéger toute découverte d'importance culturelle ou historique, le cas échéant, dans les limites de la zone d'étude.

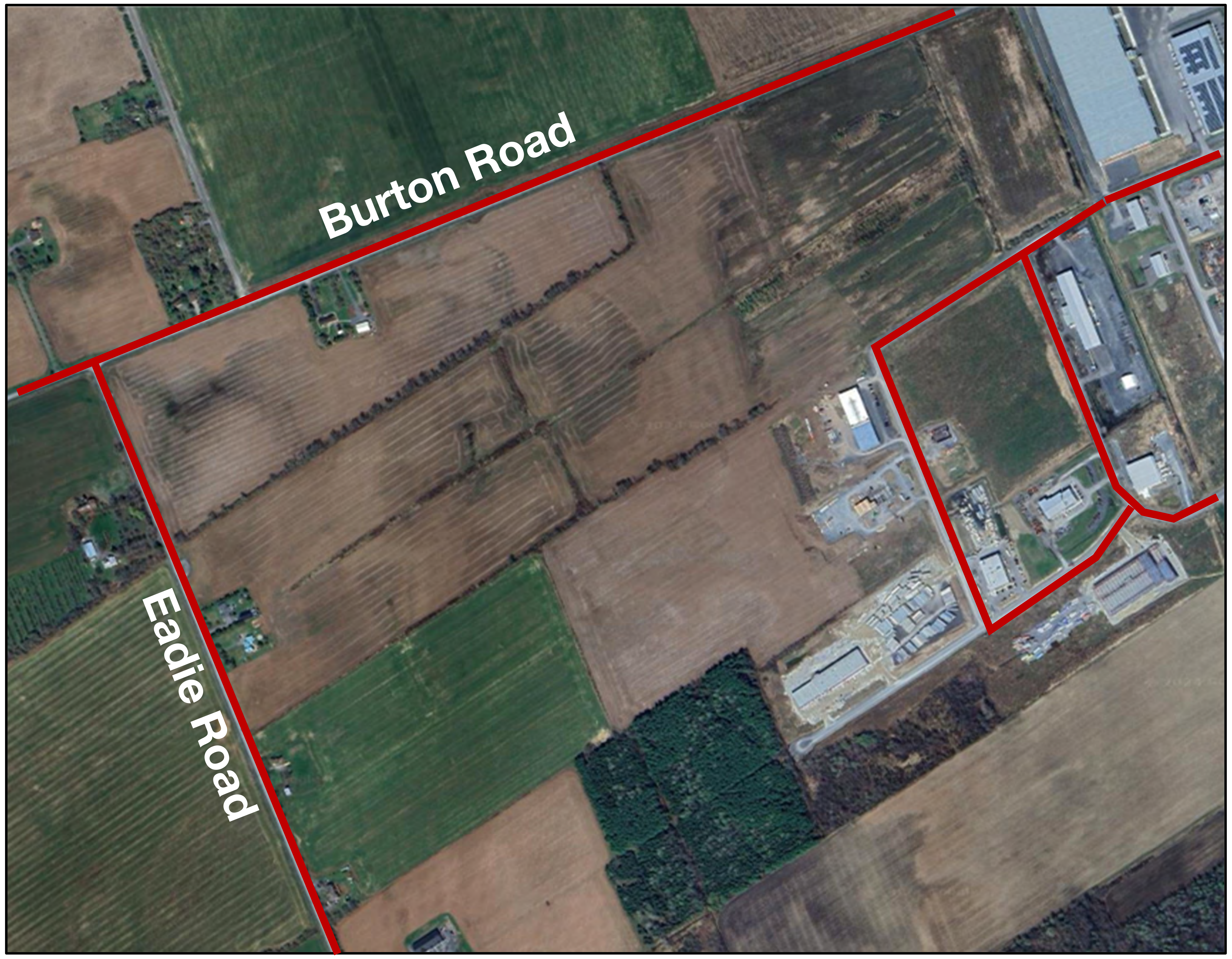
Les archéologues engagés progressent en ce moment dans la phase 1 de l'évaluation archéologique. L'étude de phase 1 vise à déterminer s'il existe des sites archéologiques connus dans la zone d'étude et à évaluer le potentiel de ressources archéologiques de la propriété.

Future Studies - Transportation/Traffic Study

A Traffic Study will be conducted to model the expected traffic from Burton Road and Eadie Road for the project area (pending the preferred design alternative). Special emphasis will be given to :

- Modelling the traffic volumes
- Simulating and analysing travel patterns
- Recommending mitigation measures for increased commercial/industrial vehicles.
- Integrating data in Municipal Transportation Master Plan

The Traffic analysis is anticipated to be completed in 2024.

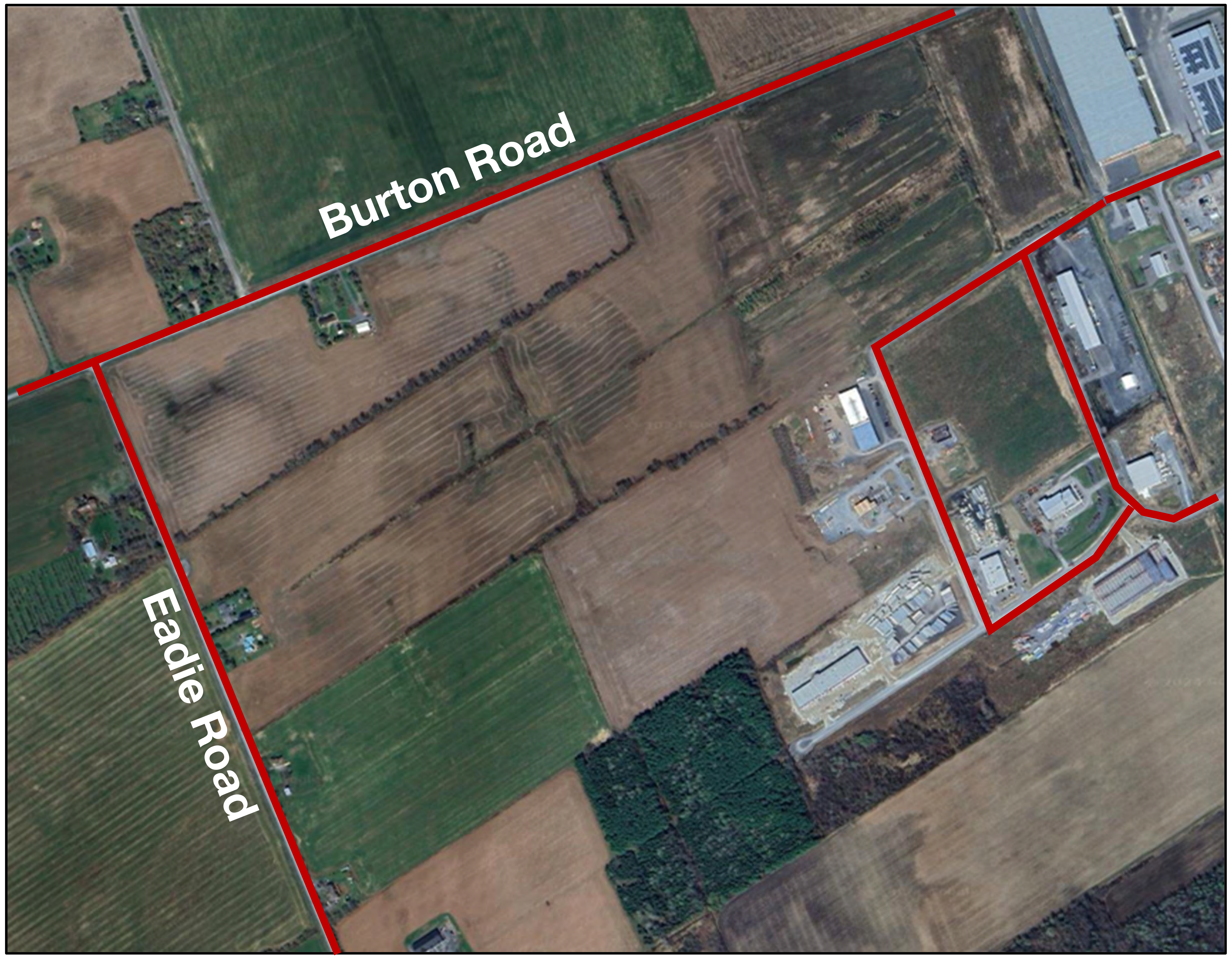


Études futures – étude transport et circulation

Une étude de circulation est proposée pour modéliser le trafic attendu sur les rues Burton et Eadie dans le secteur du projet. Un accent particulier sera porté sur :

- La modélisation des volumes de traffic;
- La simulation et l'analyse des déplacements possibles;
- La recommendation de mesures de mitigation pour minimiser les effets de l'accroissement des véhicules commerciaux et industriels;
- L'intégration des données à l'intérieur du Plan de Mobilité Municipal.

L'étude de circulation est prevue être finalisée en 2024.



Municipalité de
RUSSELL
Township

Overview Of Activities Under The Class EA Process

Phase 1 Getting Started

- Review available information/data
- Identify Problem / Opportunity Statement

NOTICE OF COMMENCEMENT
March 13, 2024

Phase 2 Exploring the Options

- Consider ways to address traffic needs and identify potential impacts
- Assess and shortlist **Option(s)**

PUBLIC INFORMATION CENTRE
MAY 30, 2024

WE ARE HERE

- Evaluate and select **Preliminary Preferred Option(s)**
- Confirm Preferred option based on **public and review agency input**

NOTICE OF COMPLETION
(Future)

Phase 3 Conceptualizing the Preferred Option

- Develop design concepts to implement the Preferred Option from Phase 2
- Identify impacts and mitigation measures
- Evaluate options and select the recommended **Preliminary Preferred Design Concepts**

Phase 4 Documenting the Process

- **Prepare a Report** and satisfy the documentation requirements of the Class EA process
- Make report available for **public review**

Phase 5 Implementing the Recommendations

- Complete detailed design of recommended solution
- Initiate construction

Phases 1 and 2 of the Class EA Process will be completed during initial stages. Projects identified as Exempt will proceed to implementation. Projects identified as Schedule B require filing of the Project File for public review. Projects identified as Schedule C will require completion of Phase 3 and 4 of the Class EA Process.

Aperçu des activités du processus d'évaluation environementale

Phase 1
Commencement

- Révision des informations disponibles / intrants
- Identification de la problématique / Énoncé du problème

AVIS DE DÉMARRAGE
March 13, 2024

Phase 2
Exploration des options

- Déterminer les besoins en terme de circulation et identifier les impacts potentiels.
- Évaluer et pré-sélectionner des options

CENTRE D' INFORMATION PUBLIQUE
30 MAI 2024

NOUS SOMMES ICI

- Évaluer et sélectionner les options préliminaires préconisées.
- Confirmer l'option préconisée, basée sur les intrants du public et de l'Agence de revision.

AVIS D'ACHÈVEMENT
(À venir))

Phase 3
Conceptualisation de l'option préconisée

- Développer des concepts pour mettre en place l'option retenue à la phase 2.
- Identifier les impacts et les mesures de mitigation.
- Évaluer les concepts développés et retenir les mieux adaptées en vue de la conception préliminaire.

Phase 4
Documentation des résultats

- **Préparer un rapport** qui satisfait aux exigences en vue d'une Évaluation environnementale (ÉE) de portée générale.
- Rendre le rapport accessible en vue de la révision par le public

Phase 5
Implémentation des recommandations

- Réalisation de la conception détaillée de la solution recommandée.
- Débuter la construction

Les phases 1 et 2 de l'ÉE de portée générale seront complétées au cours des premières étapes. Les projets identifiés comme 'Exempté' pourront poursuivre directement vers la mise en oeuvre. Les projets identifiés comme 'Niveau B' nécessiteront une consultation publique. Les projets identifés comme 'Niveau C' nécessiteront que les Phases 3 & 4 de l'ÉE de portée générale soient complétées.

Evaluation Criteria & Methodology

Road network design alternatives were assessed using the following criteria to ensure they effectively meet future transportation and servicing requirements while minimizing adverse impacts on the natural, cultural, social, and economic environment

Technical Aspects

- Roadway connectivity & impact on existing network.
- Geometric design and drainage
- Potential to improve active transportation
- Municipal drain considerations

Socio-Economic Environment

- Impacts to archaeological, built & cultural resources
- Impact to agricultural lands
- Compatibility with future development opportunities
- Potential effects on existing residential & commercial properties
- Potential effects on air quality & noise

Environmental Concerns

- Impacts to terrestrial vegetation
- Impact to wildlife/species at risk
- Impact to aquatic habitat
- Impact to watercourses
- Climate changes

Cost & Constructability

- Utility relocation
- Cost/benefit
- Capital cost
- Opportunity to phase construction
- Maintenance cost

Evaluation Criteria

1	Potential impacts are significant, implementation of substantial mitigation measures are required. Risk cannot be eliminated.
2	Potential impacts are major, implementation of extensive mitigation measures required to reduce/eliminate risks.
3	Potential impacts are moderate, implementation of many mitigation measures required to reduce/eliminate risks.
4	Potential impacts are minor and can be easily mitigated through implementation of standard mitigation measures.
5	Potential impacts are negligible, no mitigation required.

Least Preferred → Most Preferred

Municipalité de
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Critères et métholodogie d’évaluation

Les critères suivants ont été utilisés pour la détermination des différentes alternatives pour l’expansion du réseau routier. Ces derniers ont permis de s’assurer du respect des exigences en matière de circulation et de desserte, tout en minimisant les impacts sur l’environnement, le patrimoine et l’économie.

Aspects techniques

- Connexion entre les chemins et impact sur le réseau existant.
- Géométrie routière.
- Possibilité d’amélioration du transport actif.
- Nécessité de ponceaux.

Environnement socio-économique

- Impacts sur le patrimoine archéologique.
- Impact sur les terrains agricoles.
- Compatible avec les futures orientations de développement.
- Impacts potentiels sur les résidences et commerces existants.
- Impacts potentiels sur la qualité de l’air et le bruit.

Préoccupations environnementales

- Impacts sur la flore
- Impact sur la faune / espèces menacées ou à risque
- Impact sur l’habitat aquatique
- Impact sur le cheminement de l’eau de ruissellement
- Changements climatiques

Coûts & Faisabilité

- Déplacement des utilités publiques.
- Ratio coûts/bénéfices.
- Coût d’investissement.
- Possibilité de construire en phases.
- Coûts d’entretien.

Critères d’évaluation

1 Impacts potentiels significatifs nécessitant l’application de mesures de mitigation substancielles. Les risques ne peuvent être éliminés.

2 Impacts potentiels majeurs requierant l’application de mesures de mitigation importantes pour être réduits ou éliminés.

3 Impacts potentiels modérés pouvant être réduits ou éliminés par l’applications de certaines mesures de mitigation.

4 Impacts potentiels mineurs pouvant facilement être réduits ou éliminés par l’application de mesures de mitigation courantes.

5 Impacts potentiels négligeables, aucune mesure de mitigation requise.

Least Preferred → Most Preferred

Road Network Expansion, 417 Industrial Park

Public Information Centre

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Option 1: Emard Street and Warehouse Street Extension

	Criteria/ Alternative	Rationale	Evaluation
Technical Aspects	Safety	Improved connectivity, traffic flow and regulation, continuous road alignment. Potential congestion on Emard St between Warehouse and Robot.	4
	Traffic Volume/Distribution	Two additional points of entry/exit promotes traffic distribution. Increase in volume of traffic within the industrial park.	4
	Connectivity	Provides access to both Eadie Road and Burton Road. Warehouse-Burton connection is close in proximity to the Corduroy-Burton connection.	4
	Geometric Design & Drainage	Simple geometric design, road and ditch can easily follow existing drainage patterns.	5
Socio Economic Aspects	Impact to surrounding properties	Emard-Eadie connection will increase flow of traffic on Eadie Road, added concerns with property owners in the vicinity of Eadie Road.	1
	Archaeological Impact	Being Evaluated	Being Evaluated
	Efficient Land Use	Simplistic road design leads to flexibility in overall park design and lot configuration, small lots on east of Warehouse Rd.	4
Environmental Aspects	Natural Environment Impact	Emard Street intersects with existing Municipal Drain branch, road construction will have a moderate impact to natural environment.	2
Cost & Constructability	Constructability	Simplistic geometric road layout design aides in buildability.	5
	Construction Cost	Shorter road length results in less construction costs for road.	4

Total	33

__Option 1:__ Full length extension of Emard Street and Warehouse Street

Road Network Expansion, 417 Industrial Park

Public Information Centre

Option 1: Extension rue Emard et rue Warehouse

	Critères	Contexte	Evaluation
Aspects techniques	Sécurité	Connectivité, fluidité du traffic accrue, rues continues. Potentiel de congestion sur Emard, entre Robot et Warehouse.	4
	Volume de circulation & distribution	Deux accès supplémentaires pour favoriser la distribution du traffic. Augmentation du traffic à l'intérieur du Parc industriel.	4
	Connection	Permet des accès par les rues Eadie et Burton. L'intersection Warehouse-Burton est près de l'intersection Corduroy-Burton.	4
	Géométrie routière & drainage	Tracés simples, les rues et les fossés permettent de conserver le drainage actuel.	5
Aspects socio-économiques	Impact sur les propriétés avoisinnantes	L'intersection Emard-Eadie va accroître le traffic sur Eadie et possiblement déranger les propriétaires à proximité.	1
	Impact archéologique	En cours d'évaluation	En cours d'évaluation
	Usage efficace des terrains	Un tracé simple permettra une flexibilité lors de la conception du Parc et la configuration des lots. Petits lots possibles sur Warehouse.	4
Aspects environnementaux	Impact sur l'environnement	La rue Emard intercepte le fossé municipal provenant de Eardie. La construction de la rue aura un impact modéré sur l'environnement.	2
Coûts & faisabilité	Faisabilité	La simplicité de la géométrie permettra plusieurs scénario de construction.	5
	Coûts de construction	Rues plus courtes = coûts moindres	4

Total	**33**

Option 1: Extension des rues Emard et Warehouse

Municipalité de RUSSELL Township

Option 2: Emard Street and Robot Street Extension

	Criteria/ Alternative	Rationale	Evaluation
Technical Aspects	Safety	Improved connectivity, traffic flow and regulation, continuous road alignment.	5
	Traffic Volume/Distribution	Two additional points of entry/exit promotes traffic distribution. Increase in of volume of traffic within the industrial park.	4
	Connectivity	Provides access to both Eadie Road and Burton Road.	5
	Geometric Design & Drainage	Simple geometric design, road and ditch can easily follow existing drainage patterns.	5
Socio Economic Aspects	Impact to surrounding properties	Emard-Eadie connection will increase flow of traffic on Eadie Road, added concerns with property owners in the vicinity of Eadie Road.	1
	Archaeological Impact	Being Evaluated	Being Evaluated
	Efficient Land Use	Simplistic road design leads to flexibility in overall park design and lot configuration.	4
Environmental Aspects	Natural Environment Impact	Emard Street intersects with existing Municipal Drain branch, road construction will have a moderate impact to natural environment.	2
Cost & Constructability	Constructability	Simplistic geometric road layout design aides in buildability.	5
	Construction Cost	Shorter road length results in less construction costs for road.	4

Total	**35**

Option 2: Full length extension of Emard Street and Robot Street

Road Network Expansion, 417 Industrial Park

Public Information Centre

LRL ENGINEERING

Option 2: Extension rue Emard Street et rue Robot

	Critères	Contexte	Evaluation
Aspects techniques	Sécurité	Connectivité, fluidité du traffic accrue, rues continues.	5
	Volume de circulation & distribution	Deux accès supplémentaires pour favoriser la distribution du traffic. Augmentation du traffic à l'intérieur du Parc industriel.	4
	Connection	Permet des accès par les rues Burton et Eadie.	5
	Géométrie routière & drainage	Tracés simples, les rues et les fossés permettent de conserver le drainage actuel.	5
Aspects socio-économiques	Impact sur les propriétés avoisinnantes	L'intersection Emard-Eadie va accroître le traffic sur Eadie et possiblement déranger les propriétaires à proximité.	1
	Impact archéologique	En cours d'évaluation	En cours d'évaluation
	Usage efficace des terrains	Un tracé simple permettra une flexibilité lors de la conception du Parc et la configuration des lots.	4
Aspects environnementaux	Impact sur l'environnement	La rue Emard intercepte un fossé municipal provenant de Eardie. La construction de la rue aura un impact modéré sur l'environnement.	2
Coûts & faisabilité	Faisabilité	La simplicité de la géométrie permet plusieurs scénario de construction.	5
	Coûts de construction	Rues plus courtes = coûts moindres.	4

	Total	**35**

Option 2: *Extension des rues Emard et Robot*

Option 3: Robot Street Extension with Cul-de-sac

	Criteria/ Alternative	Rationale	Evaluation
Technical Aspects	Safety	Poor connectivity, increased traffic flow through Robot Street, no continuity through Emard Street.	2
	Traffic Volume/Distribution	Single point of entry/exit limits traffic distribution, increased volume within cul-de-sac.	2
	Connectivity	Provides access to Burton Road. No access to Eadie Road.	3
	Geometric Design & Drainage	Simple geometric road design. Additional consideration for drainage required for lots around and west of cul-de-sac.	3
Socio Economic Aspects	Impact to surrounding properties	No connection or disruption to Eadie Road.	5
	Archaeological Impact	Being Evaluated	Being Evaluated
	Efficient Land Use	Simplistic road design leads to flexibility in overall park design and lot configuration. Lot configuration around round-a-bout not optimal for industrial sites..	3
Environmental Aspects	Natural Environment Impact	Emard Street intersects with existing Municipal Drain branch, road construction will have a low to moderate impact to natural environment.	3
Cost & Constructability	Constructability	Simplistic geometric road layout design aides in buildability. Consideration required for drainage of site around round-a-bout.	4
	Construction Cost	Shortest road length results in less construction costs for road.	5

Total	**30**

Option 3: Cul-De-Sac at Emard Street and extension of Robot Street

Option 3: Extension rue Robot avec Cul-de-sac

	Critères	Contexte	Evaluation
Aspects techniques	Sécurité	Connectivité limitée. Augmentation du traffic sur Robot. Pas de continuité sur Emard.	2
	Volume de circulation & distribution	Un seul accès supplémentaire limitant la distribution du traffic. Traffic accrue dans le cul-de-sac.	2
	Connection	Permet un accès par Burton. Aucun accès à Eadie.	3
	Géométrie routière & drainage	Tracés simples. Attention particulière à apporter au drainage autours du cul-de-sac..	3
Aspects socio-économiques	Impact sur les propriétés avoisinnantes	Aucune intersection, ni dérangement sur Eadie.	5
	Impact archéologique	En cours d'évaluation	En cours d'évaluation
	Usage efficace des terrains	Un tracé simple permettra une flexibilité lors de la conception du Parc et la configuration des lots. Le rond-point n'est pas optimal pour desservir des sites industriels.	3
Aspects environnementaux	Impact sur l'environnement	La rue Emard intercepte un fossé municipal provenant de Eardie. La construction de la rue aura un impact modéré sur l'environnement	3
Coûts & faisabilité	Faisabilité	La simplicité de la géométrie permet plusieurs scénario de construction. Attention particulière pour le drainage du rond-point.	4
	Coûts de construction	Rues plus courtes = coûts moindres	5

	Total	**30**

Option 3: *Cul-de-sac sur la rue Emard et extension de la rue Robot*

Municipalité de RUSSELL Township

Option 4: Robot Street Extension With Internal Circulation For Future Development

	Criteria/ Alternative	Rationale	Evaluation
Technical Aspects	Safety	Poor connectivity, driveway issues for lots through loop roads, frequent bends/turns.	1
	Traffic Volume/Distribution	Improved flow of traffic with two lanes. Increased traffic volume along Robot Street and at Robot/Burton intersection.	3
	Connectivity	Provides access to Burton Road. No access to Eadie Road.	3
	Geometric Design & Drainage	Complex geometric road design. Additional consideration for drainage required for lots around loops and west-most driveway.	1
Socio Economic Aspects	Impact to surrounding properties	No connection or disruption to Eadie Road.	5
	Archaeological Impact	Being Evaluated	Being Evaluated
	Efficient Land Use	Reduction in potential average lot size , less opportunity for large industrial development, difficulty for large vehicle maneuverability	1
Environmental Aspects	Natural Environment Impact	Emard Street intersects with existing Municipal Drain branch twice, road construction will have a moderate to high impact to natural environment.	2
Cost & Constructability	Constructability	Complex geometric road layout, difficulty for sewer and utility installation and drainage design.	1
	Construction Cost	Long road length results in greater construction costs for road.	1

Total	**18**

__Option 4:__ Extension of Robot Street, and extension of Emard Street to Cover Phase 3 and Future developments

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Option 4: Extension rue Robot avec circulation interne pour un développement futur

	Critères	Contexte	Evaluation
Aspects techniques	Sécurité	Mauvaise connectivité. Problèmes de configuration d'entrées anticipés. Nombreux virages.	1
	Volume de circulation & distribution	Traffic intérieur diminué avec deux rues parallèles. Traffic accrue sur Robot et à l'intersection Robot/Burton.	3
	Connection	Permet un accès par Burton. Aucun accès à Eadie.	3
	Géométrie routière & drainage	Tracés plus compliqués. Additional consideration for drainage required for lots around loops and west-most driveway.	1
Aspects socio-économiques	Impact sur les propriétés avoisinnantes	Aucune intersection, ni dérangement sur Eadie.	5
	Impact archéologique	En cours d'évaluation	En cours d'évaluation
	Usage efficace des terrains	Réduction de la dimension des lots et des gros projets potentiels. Plus de problèmes de manoeuvrabilité pour les gros véhicules.	1
Aspects environnementaux	Impact sur l'environnement	La rue Emard intercepte un fossé municipal provenant de Eardie. La construction de la rue aura un impact modéré à élevé sur l'environnement.	2
Coûts & faisabilité	Faisabilité	Géométrie compliquée. Difficultés anticipées pour la conception des services municipaux, des utilités et du drainage.	1
	Coûts de construction	Rues plus longues = coûts plus élevés	1

Total	**18**

__Option 4:__ Extension de la rue Robot et bouclage de la rue Emard pour couvrir une Phase 3 et en considérant de futurs développements

Option 5: Extension Of Robot Street, And Extension Of Emard Steet Networking Back To Robot

	Criteria/ Alternative	Rationale	Evaluation
Technical Aspects	Safety	Poor connectivity, frequent bends/turns.	2
	Traffic Volume/Distribution	Improved flow of traffic with two east/west roadways. Increased traffic volume along Robot Street and at Robot/Burton intersection.	3
	Connectivity	Provides access to Burton Road. No access to Eadie Road.	3
	Geometric Design & Drainage	Complex geometric road design. Additional consideration for drainage required for lots around west-most driveway.	2
Socio Economic Aspects	Impact to surrounding properties	No connection or disruption to Eadie Road.	5
	Archaeological Impact	Being Evaluated	Being Evaluated
	Efficient Land Use	Reduction in potential average lot size , less opportunity for large industrial development	2
Environmental Aspects	Natural Environment Impact	Emard Street intersects with existing Municipal Drain branch twice, road construction will have a moderate to high impact to natural environment.	2
Cost & Constructability	Constructability	Moderate geometric road layout, some challenge for sewer and utility installation and drainage design.	2
	Construction Cost	Moderate road length results in greater construction costs for road.	2

Total	**23**

Option 5: *Extension of Robot Street, and extension of Emard Steet networking back to Robot*

Municipalité de
RUSSELL
Township

Option 5: Extension rue Robot, bouclage rue Emard jusqu'à Robot

	Critères	Contexte	Evaluation
Aspects techniques	Sécurité	Mauvaise connetivité. Nommbreux virages.	2
	Volume de circulation & distribution	Traffic intérieur diminué avec deux rues parallèles. Traffic accrue sur Robot et à l'intersection Robot/Burton.	3
	Connection	Permet un accès par Burton. Aucun accès à Eadie.	3
	Géométrie routière & drainage	Tracés plus compliqués. Additional consideration for drainage required for lots around west-most driveway.	2
Aspects socio-économiques	Impact sur les propriétés avoisinnantes	Aucune intersection, ni dérangement sur Eadie.	5
	Impact archéologique	En cours d'évaluation	En cours d'évaluation
	Usage efficace des terrains	Réduction de la dimension des lots et des gros projets potentiels.	2
Aspects environnementaux	Impact sur l'environnement	La rue Emard intercepte un fossé municipal provenant de Eardie. La construction de la rue aura un impact modéré à élevé sur l'environnement.	2
Coûts & faisabilité	Faisabilité	Géométrie compliquée. Difficultés anticipées pour la conception des services municipaux, des utilités et du drainage.	2
	Coûts de construction	Rues plus longues = coûts plus élevés	2

Total	**23**

Option 5: *Extension de la rue Robot et bouclage de la rue Emard sur la rue Robot*

Road Network Expansion, 417 Industrial Park

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Alternatives Evaluation Results

	Criteria/ Alternative	Emard Extension	Emard/Robot Extension	Robot Extension & Cul-de-sac	Robot Ext & Future Internal Circulation	Robot Ext & Internal Circulation
Technical Aspects	Safety	4	5	2	1	2
	Traffic Volume/Distribution	4	4	2	3	3
	Connectivity	4	5	3	3	3
	Geometric Design & Drainage	5	5	3	1	2
Socio Economic Aspects	Impact to Private Property	1	1	5	5	5
	Archaeological Impact	Being Evaluated	Being Evaluated	Being Evaluated	Being Evaluated	Being Evaluated
	Efficient Land Use	4	4	3	1	2
Environmental Aspects	Natural Environment Impact	2	2	3	2	2
Cost & Constructability	Constructability	5	5	4	1	2
	Construction Cost	4	4	5	1	2
	Total	33	35	30	18	23

Preferred option

Municipalité de
RUSSELL
Township

Résultats de l'évaluation des alternatives

	Critères	Extension des rues Emard & Warehouse	Extension des rues Emard & Robot	Extension de Robot & cul-de-sac	Extension de Robot & prévision de futurs développements	Extension de Robot & bouclage de Emard
Aspects techniques	Sécurité	4	5	2	1	2
	Volume de circulation & distribution	4	4	2	3	3
	Connection	4	5	3	3	3
	Géométrie routière & drainage	5	5	3	1	2
Aspects socio-économiques	Impact sur les propriétés avoisinnantes	1	1	5	5	5
	Impact archéologique	En cours d'évaluation	En cours d'évaluation	En cours d'évaluation	En cours d'évaluation	En cours d'évaluation
	Usage efficace des terrains	4	4	3	1	2
Aspects environnementaux	Impact sur l'environnement	2	2	3	2	2
Coûts & Faisabilité	Faisabilité	5	5	4	1	2
	Coûts de construction	4	4	5	1	2
	Total	**33**	**35**	**30**	**18**	**23**

Option préconisée

Road Network Expansion, 417 Industrial Park

Public Information Centre

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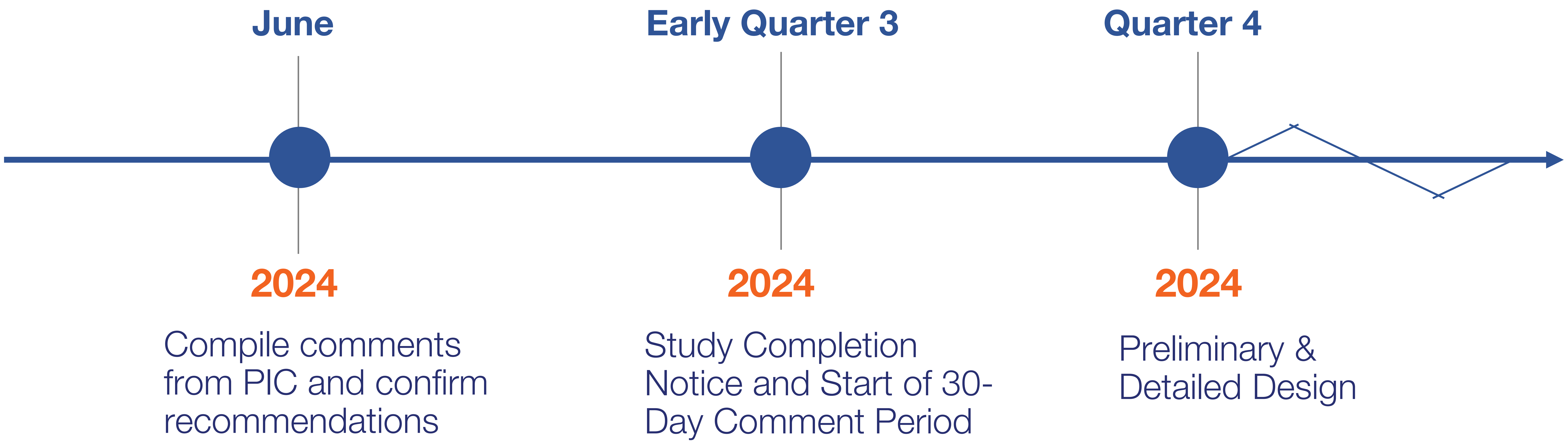
Next Steps

After this Public Information Centre, the project team will:

- Review and consider input received during this meeting.
- Confirm the preliminary recommendations presented tonight for the roadway layouts
- Completion of all background studies for final consideration.
- Notice of Study Completion and Report on the public record for comments during a 30-day comment period.
- Move into detailed design to ensure roadway is appropriately engineered.



June
2024
Compile comments from PIC and confirm recommendations

Early Quarter 3
2024
Study Completion Notice and Start of 30-Day Comment Period

Quarter 4
2024
Preliminary & Detailed Design

Prochaines étapes

Suite à cette séance d'information publique, l'équipe de projet procèdera à :

- La compilation et la prise en considération des intrants reçus durant cette séance d'information.
- La validation des recommandations préliminaires présentées ce soir concernant le tracé des chemins.
- La finalisation des études de base en vue de la conception détaillée.
- Publication de l'avis d'achèvement des études et du rapport et début de la période de commentaires de 30 jours.
- La conception détaillée afin de s'assurer que les chemin seront conçus adéquatement et respecteront les règles en vigueur.

Juin

2024

Compilation des commentaires reçus à la scéance et validation des recommandations

Trimestre 3

2024

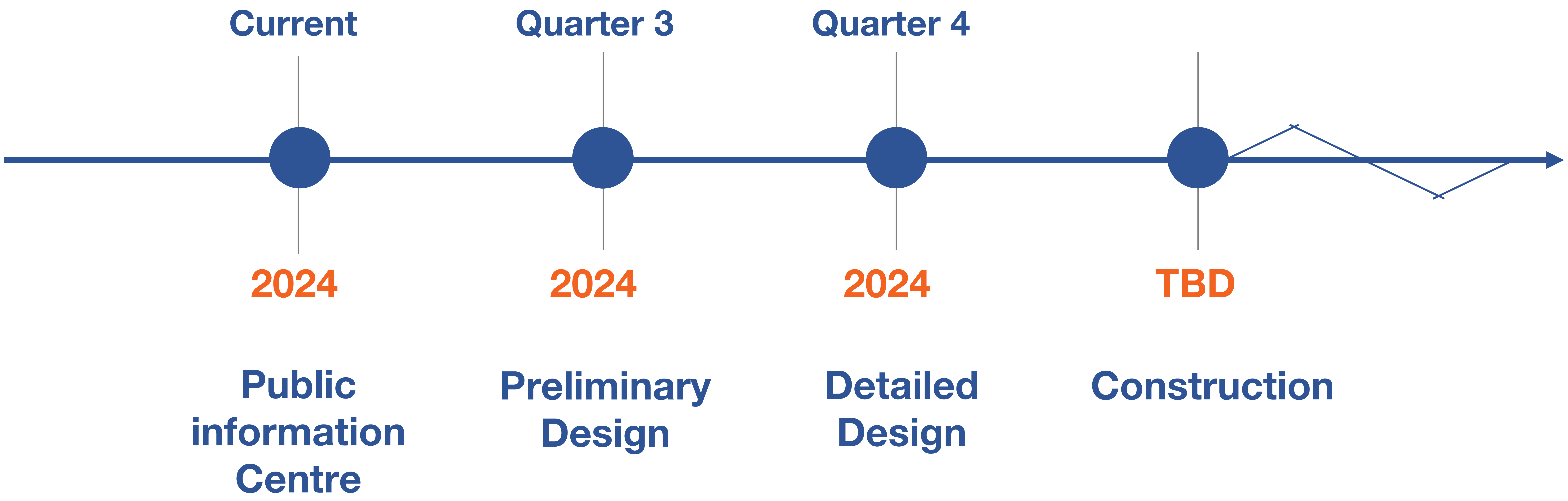
Finalisation des études et début de la période de commentaires de 30 jours

Trimestre 4

2024

Conception détaillée préliminaire

Timelines



Current
2024
Public information Centre

Quarter 3
2024
Preliminary Design

Quarter 4
2024
Detailed Design

TBD
Construction

Calendrier

Aujourd'hui	Trimestre 3	Trimestre 4	
2024	2024	2024	À DÉT.
Centre d'information publique	Conception préliminaire	Conception détaillée	Construction

Questions or comments?

Should you have any questions about this presentation or the project, please fill out a comment sheet tonight or contact:

Municipalité de
RUSSELL
Township

LRL

Francois Landry

Project Manager
Infrastructure Services
RUSSELL Township
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Phone: 613-443-1747
Email: FrancoisLandry@Russell.ca

Kyle Herold

Project Manager
LRL Engineering
5430 Canotek road,
Ottawa, Ontario, K1J 9G2
Phone: (613) 915-2988
Email: kherold@lrl.ca

Please provide your comments and questions by June 29, 2024

Questions ou commentaires ?

Pour toutes questions ou commentaires concernant cette présentation, SVP remplir le formulaire prévu à cet effet ou contacter:

Municipalité de
RUSSELL
Township

Francois Landry

Gestionnaire de projets
Services d’infrastructure
Municipalité de RUSSELL
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Kyle Herold

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Ottawa, Ontario, K1J 9G2
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Courriel: kherold@lrl.ca

SVP, nous transmettre vos questions ou commentaires avant le 29 juin 2024

Municipalité de
RUSSELL
Township

ROAD NETWORK EXPANSION, 417 INDUSTRIAL PARK

TOWNSHIP OF RUSSELL

Public Information Centre (PIC)

Meeting in Township of Russell Office | Thursday, May 30th, 2024, from 6:00pm to 8:00pm
Council Chambers, Township of Russell Office, 717 Notre-Dame St, Embrun, ON K0A 1W1

COMMENT & FEEDBACK FORM

Any personal information collected through this study will be used in accordance with the Municipal Freedom of Information and Protection of Privacy Act. With the exception of personal information, including your name and email address, all comments received throughout the study will become part of the public record. If you have any questions about the collection and use of information as part of this study, please contact Francois Landry at (613) 443-1747 or francoislandry@russell.ca.

Please print all responses

Name: ____________________

Email: ____________________

COMMENTS:

Municipalité de
RUSSELL
Township

ROAD NETWORK EXPANSION, VARS INDUSTRIAL PARK
TOWNSHIP OF RUSSELL

Public Information Centre (PIC)

Meeting in Township of Russell Office | Thursday, May 30th, 2024, from 6:00pm to 8:00pm
Council Chambers, Township of Russell Office, 717 Notre-Dame St, Embrun, ON K0A 1W1

SIGN-IN SHEET

Any personal information collected through this study will be used in accordance with the Municipal Freedom of Information and Protection of Privacy Act. With the exception of personal information, including your name and email address, all comments received throughout the study will become part of the public record. If you have any questions about the collection and use of information as part of this study, please contact please contact Francois Landry at (613) 443-1747 or francoislandry@russell.ca.

Please print clearly:

Name	Email	Do you wish to stay informed on the study by being added to the study contact list? (Y/N)

Municipal Class Environmental Assessment Study
Road Network Expansion, 417 Industrial Park, Township of Russell

Public Notice – Update

Date: November 13th, 2024

Project Overview

The Corporation of the Township of Russell has progressed with a Schedule B Class Environmental Assessment (Class EA) to review and study the proposed expansion of the road network within the 417 Industrial Park. The road network expansion intends to provide access to subject lands, optimize new lot configuration by providing frontage for future site developments, and improve transportation efficiency to and within the park, all while considering existing conditions and constraints.

This project is being carried out in accordance with the requirements of the Municipal Class EA, following a clear, phased planning process with public and stakeholder engagement.

Project Status Update

The Municipality is committed to an inclusive approach that incorporates public feedback and ensures environmental and community considerations are prioritized. A Public Information Centre was held on May 30th, 2024 where alignment options were presented to the public for feedback. There has been significant progress in addressing public input and advancing studies that are central to the project. Key updates include:

1. Consideration of Public Feedback

Feedback from public consultations and community input has been carefully reviewed and integrated into the EA process. Public concerns regarding traffic impacts, environmental sensitivity, and overall community well-being have been instrumental in refining the study scope and identifying specific areas requiring further assessment.

2. Further Environmental Investigations

In response to environmental concerns raised by residents and stakeholders, additional review of available documentation has been completed. An Environmental Assessment Study and Natural Environment Assessment Report for the subject land was reviewed to screen for potential sensitive environmental features such as significant woodlands, unevaluated wetlands, and identified ecological land classifications. Findings from the referenced report do not identify any ecological constraints in the proposed roadway alignment location.

3. Traffic Study Initiation

To ensure traffic management aligns with community needs and end users within the 417 Industrial Park, a comprehensive traffic study is being conducted for the intersections impacted by the selected road network alignments. This study aims to evaluate current and projected traffic patterns, assess the impact of potential roadway expansion to the overall Industrial Part, and identify improvements that enhance safety and reduce congestion. Data from the traffic study will help optimize roadway design and provide recommendations on intersections, and any other vehicular accommodations.

4. Revised Roadway Layout Configuration

Based on public feedback and further analysis, the technical, socio economic, environmental, cost and constructability aspects have been further reviewed for the previously presented options.

Rationale specifically related to the impact on the surrounding properties and internal park connectivity have impacted the evaluation of the potential alternatives for the alignment of the roadways. The updated preferred option proposes terminating the roadway extension of Emard Street with a cul-de-sac prior to reaching Eadie Road. This configuration will meet minimum requirements for emergency vehicle access as per NFPA (National Fire Protection Association) Standards and consider efficient snow removal practices for improved winter accessibility. Additionally, the cross-section design will reflect a rural cross-section with roadside ditches to manage stormwater and maintain a natural setting.

Access into the Industrial Park from Burton Road will extend between Emard Street and Burton Road aligned with the current right of way of Robot Street. Figure 1 below provides a Sketch of this alignment.

Figure 1: Cul-de-sac at Emard Street and Extension of Robot Street

(Presented as Option 3 at the Public Information Centre in May 2024)

Additional considerations in the detailed design of the roadways include:

- The Wood Eadie Municipal Drain, which intersects the roadway alignment, has undergone an update to the Engineer's Report under section 78 of the Drainage Act, detailing what the culvert crossing details would be in the drain profile to ensure there will be no negative impacts to the natural features or ecological functions within the area surrounding the proposed Right-of-way.
- Optimization of Roadway Profiles to support the Ontario Regulation 406/19 and improve management of excess construction soil.
- Appropriately design sediment and erosion control measures in place during construction to mitigate risk to downstream waterways/Municipal Drain.

5. Archaeological Assessment

A Stage 1 Archaeological Assessment has been completed, and it was determined that the study area exhibits potential for the presence of archaeological resources. A Stage 2 Archaeological Assessment is now underway.

Next Steps

The Municipality will continue with the Environmental Impact Study and Traffic Study, and results will be made available to the public as they become available. Public engagement remains a priority, and we will continue to provide opportunities for feedback as the studies progress.

Contact Information

We appreciate the community's feedback If you have any questions, concerns, or require additional information, please contact:

Francois Landry
Project Manager
Russell Township
613-443-1747
francoislandry@russell.ca

Kyle Herold
Civil Engineering Designer
LRL Engineering
613-842-3434
kherold@lrl.ca

Thank you for your continued participation and engagement in this process.

APPENDIX B
Wood-Eadie Municipal Drain Report and Permits

WOOD-EADIE MAIN DRAIN

INCL. WEST BRANCH

S. 78 ENGINEER'S REPORT

RUSSELL TOWNSHIP

PREPARED BY

SHADE GROUP INC
4625 MARCH ROAD
ALMONTE, ON
K0A 1A0

PREPARED FOR

RUSSELL TOWNSHIP
717 NOTRE-DAME STREET
EMBRUN, ON
K0A 1W1

JULY 2024

EXECUTIVE SUMMARY

This Engineer's Report has been prepared under Section 78 of the *Drainage Act, R.S.O. 1990, c. D. 17* (henceforth referred to as *the Act*). Section 78 refers to 'major improvements', which refer in this case to the intention to relocate a portion of the existing Wood-Eadie Main Drain through Lot 22, Concession 4, Township of Russell, to accommodate future development. In addition to accommodating a partial re-alignment of the Wood-Eadie Main Drain, this report also serves as an overall update to the Wood-Eadie Main Drain, with new Plan and Profile drawings for the entire length of the Wood-Eadie Main Drain, and new assessment schedules for the Wood-Eadie Main Drain and the Wood-Eadie West Branch. Updates include upgrading culverts to meet current standards and incorporation of permanent erosion and sediment control practices to facilitate the on-going protection of the watercourse.

This report includes:

- Updated Schedules of Assessment for future maintenance of the Wood-Eadie Main Drain and Wood-Eadie West Branch (**Appendix B**);
- A Plan View Drawing for the Wood-Eadie Main Drain (**Appendix C**);
- Profile Drawings for the 2.4km long Wood-Eadie Main Drain (**Appendix C**);
- A Plan View Drawing for the Wood-Eadie West Branch – for reference to the Assessment Schedule (**Appendix C**);
- A Maintenance Plan outlining recommended maintenance to the system (**Appendix C**),
- A recommended Erosion and Sediment Control Plan for the system **(Appendix C)** and
- Additional details relating to the ongoing maintenance of the system in perpetuity.

A map showing the location of the Wood-Eadie Main Drain (including the West Branch) has been enclosed in **Appendix A**.

The Township of Russell was consulted about the history of the Wood-Eadie Main Drain prior to the commencement of this report. Per the supplied information, the most recent Engineer's Report for the Wood-Eadie Main Drain is the Wood-Eadie Drain Report prepared by L.P. Stidwill, dated October 19, 1955. Further historical information has been detailed in **Section 2.0**.

Shade Group Inc. (Shade Group) was appointed by resolution on August 28, 2023 to "*update the Engineer's Report of the Wood-Eadie Municipal Drain"* A copy of the resolution has been enclosed in **Appendix G**.

Hydrology and hydraulics analysis was completed for the various culverts on the system, and a hydrology and capacity analysis was completed for the channel cross-section. The recommended channel cross-section is generally consistent with existing conditions, primarily proposing maintenance works on the sections of the system downstream of the realignment. Design calculations are discussed in **Section 6.0**.

Future maintenance works shall be assessed in accordance with the assessment schedules enclosed within **Appendix B**. Discussion over distribution of project costs, including assessment for the realignment, can be found in **Section 10.0**.

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REVISIONS & SUBMISSIONS

Revision #	Comments	Date
00	Preliminary Draft Submission to Township	February 26, 2024
01	Revised per Township Comments + Submitted to DFO + SNCA for Comment	March 11, 2024
02	Revised per SNCA Comments (April 29, 2024)	May 2, 2024
03	Submission to Township	July 19, 2024
04	Revised per Township comments	July 29, 2024
05	Added Roll No. to Prop. Id 2, 3+4	July 30, 2024

1.0 INTRODUCTION

This Engineer's Report has been prepared under Section 78 of the *Drainage Act, R.S.O. 1990, c. D. 17* (henceforth referred to as *the Act*). Section 78 refers to 'major improvements', which in this case is the intention to relocate a portion of the existing Wood-Eadie Main Drain through Lot 22, Concession 4, Township of Russell, to accommodate future development. In addition to accommodating a partial re-alignment of the Wood-Eadie Main Drain, this report also serves as an overall update to the Wood-Eadie Main Drain, with new Plan and Profile drawings for the entire length of the Wood-Eadie Main Drain, and new assessment schedules for the Wood-Eadie Main Drain and the Wood-Eadie West Branch. Updates include upgrading culverts to meet current standards and incorporation of permanent erosion and sediment control practices to facilitate the on-going protection of the watercourse.

All proceedings associated with the preparation of this report have been completed in accordance with the specifications of *the Act*.

2.0 DRAIN HISTORY

The Township of Russell was consulted about the history of the Wood-Eadie Main Drain prior to the commencement of this report. Per the supplied information, the most recent Engineer's Report for the Wood-Eadie Main Drain is understood to be the Wood-Eadie Drain Report prepared by L.P. Stidwill, dated October 19, 1955.

Per the 1955 Engineer's Report, the Wood-Eadie Drain was constructed in 1902 and maintained in 1922. The 1955 Wood-Eadie Drain Report included a Main Drain and two Branches (the East Branch and West Branch), with the outlet of the system being the Sparks Champagne Municipal Drain.

An update was later made to the East Branch through a report authored by McNeely Engineering Limited (March 21, 1977). It is understood that a simultaneous update has also been completed for the East Branch, available under separate cover, prepared by Robinson Consultants Inc.

This report is limited to updates to the Main Drain (plan, profiles and assessments) and the West Branch (assessments). All works associated with the East Branch shall continue to be governed by the most current applicable By-Law and associated Engineer's Report.

3.0 EXISTING CONDITIONS

3.1 DESCRIPTION OF THE WATERSHED

The watershed for the Wood-Eadie Main Drain encompasses:

- Lot 19-23, Concession 4, Township of Russell, and
- Lot 19-22, Concession 3, Township of Russell.

A plan view illustrating the watershed boundary is enclosed in **Appendix C**.

The Wood-Eadie Main Drain watershed encompasses approximately 240 hectares.

The Wood-Eadie West Branch subwatershed encompasses approximately 119 hectares.

3.2 AREA REQUIRING DRAINAGE

For the purposes of this report, the "area requiring drainage" shall be considered Lot 22, Concession 4, Township of Russell, which accounts for the area where the realignment and improvements are required for future proposed development.

Improvements downstream of Lot 22, Concession 4 are generally limited to maintenance works to allow for continued conveyance of flows throughout the system, and improvements to permanent erosion and sediment control practices to facilitate the on-going health of the watercourse.

For more information on the improvements, refer to **Section 4.0**.

3.3 ALIGNMENT OF THE DRAIN

WOOD-EADIE MAIN DRAIN

The Wood-Eadie Main Drain starts at the northern property line between Lot 22 and 23, Concession 4, approximately 200m south of the centerline of Burton Road. The current alignment zigzags in a southerly directly across the north half of Lot 22, Concession 4 for approximately 720m. The drain then enters Lot 21, Concession 4 and continues southerly for approximately 610m before turning easterly and running parallel to Route 100 for approximately 135m. The drain continues under Route 100 and travels southeasterly for approximately 550m before turning northeasterly and continuing for another approximately 530m and outletting to the Wood-Eadie East Branch.

The existing alignment of the Wood-Eadie Main Drain has a total length of approximately 2,550m.

Major improvements are proposed to the uppermost limits of the Wood-Eadie Main Drain. The zig-zagging portion through Lot 22, Concession 4 is proposed to be straightened to accommodate future development of the lands.

With the proposed realignment, the total length of the Wood-Eadie Main Drain will be approximately 2,476m.

A plan view illustrating the existing and proposed drain alignment can be found in **Appendix C**.

WOOD-EADIE WEST BRANCH

The start of the Wood-Eadie West Branch is the upstream limits of the road crossing culvert under Eadie Road (municipal road between Concession 3 and 4). The drain flows from southwest to northeast, meandering through the south half of Lot 20, Concession 4. The total length of the Wood-Eadie West Branch is approximately 1,054m.

No construction works are proposed on the Wood-Eadie West Branch at this time. Maintenance works may be undertaken in the future at the discretion of the Township's Drainage Superintendent.

4.0 PROPOSED IMPROVEMENTS

The primary purpose of this report is to address a request for a partial realignment of the Wood-Eadie Main Drain through Lot 22, Concession 4, Township of Russell. The approximately 720m zig-zagging stretch through Lot 22, Concession 4 is to be straightened, with the realigned length to be approximately 639m. The uppermost start point of the Main Drain is to be maintained to continue to allow for outlet of the existing tile drain from Lot 23, Concession 4. With that, the drain will extend for approximately 33m parallel to the property line between Lot 22 and Lot 23, Concession 4 in order to ensure the continued outlet for this tile.

The proposed realignment has been designed in consultation with Township staff as the Township is the developer for Lot 22, Concession 4.

In addition to the proposed realignment, new plan and profile drawings have been prepared for the downstream section of the drain; from Lot 21, Concession 4 to the outlet at the Wood-Eadie East Branch. Works along the downstream portion are generally limited to maintenance and improvements to upgrade a number of culverts within the system to meet current day standards. General improvements to erosion and sediment control measures are also proposed, also to bring the system up to current day design standards.

A plan view illustrating the existing and proposed drain alignment can be found in **Appendix C**. Profile drawings, an Erosion and Sediment Control Plan, and a Maintenance Plan have also been included in **Appendix C**.

5.0 DRAINAGE ACT, 1990, PROCESS

5.1 TO DATE

Shade Group Inc. ("Shade Group") was appointed by resolution on August 28, 2023 to "*update the Engineer's Report of the Wood-Eadie Municipal Drain"* A copy of the resolution has been enclosed in **Appendix G**.

Invitations to the on-site meeting were mailed to landowners within the watershed by October 2, 2023 inviting them to attend a meeting at the Camille Piché Community Center in Embrun on October 18, 2023.

In the time leading up to the meeting, the Township's Drainage Superintendent fielded calls with respect to the intentions of the on-site meeting and inquiries about the proposed project. Three landowners attended the on-site meeting. No further correspondence has been brought forth from other landowners within the watershed following the on-site meeting, to the best of Shade Group's knowledge.

No concerns were brought forth at the on-site meeting with respect to the capacity or performance of the existing Main Drain. One landowner highlighted concerns with beaver activity on the West Branch, and the Township's Drainage Superintendent stated they would be in contact to discuss maintenance options.

5.2 NEXT STEPS

Following the formal submission of this report to the Township, the report will be brought to a Meeting to Consider (Section 42).

The clerk of the municipality shall send a copy of the report and a notice stating the date on which the report was filed, the name or designation of the drainage works; and the date of the council meeting at which the report will be considered, to the prescribed people (Section 41).

The Meeting to Consider is held by council, and council may then adopt the report by provisional by-law by giving two readings (Section 45(1)).

Following the Meeting to Consider, and assuming a provisional by-law is adopted by two readings, a notice is sent, including a copy of the provisional by-law (exclusive of the Engineer's Report) of the time and place for the first sitting of the Court of Revision. This notice is sent to each body or person as entitled under Section 41 of the Drainage Act.

Following the completion of addressing all appeals; or the time for appealing has expired, the council may pass the provisional by-law by a third reading. Work may then be commenced as early as ten days after the by-law is passed, if no notice of intention to make an application to quash the by-law has been filed with the clerk of the council (Section 58(1)), assuming the limitations for construction can be met at such a time (e.g. compliance with any permitting restrictions with respect to timing windows).

Through discussions with Township staff, it is understood that the Township's Drainage Superintendent will oversee any hiring of a contractor. The Township's Drainage Superintendent is also understood to be undertaking any contract administration, construction supervision, and final walkthrough, as required. No engineering involvement from Shade Group is anticipated during construction.

5.3 RESOLUTION AND BY-LAW

Appendix G has been included in this report as a place to attach the applicable resolution and by-law associated with this Section 78(1) undertaking. The resolution from Shade Group's initial appointment has been enclosed with this submission; and it is recommended that the Drainage Superintendent (or applicable Township Staff) attach a copy of the report adoption by-law following its third reading for ease of future reference.

5.4 LIMITATIONS

The process overview provided in **Section 5.2** is provided as a general summary of the next steps to completion. Should the process described conflict with the specifications of the Drainage Act, the Drainage Act shall govern. The process described is provided as a summary only, the Township clerk shall be responsible for ensuring that the applicable administration works are completed in accordance with the specifications of the Drainage Act.

6.0 DESIGN CONSIDERATIONS

6.1 SOIL CONDITIONS

As part of the preparation of this report, the author conducted a review of AgMaps, the Geographic Information System managed by the Ministry of Agriculture, Food and Rural Affairs, for reference to the soils conditions of the watershed. AgMaps identifies the Hydrologic Soil Group within the Wood-Eadie watershed as a combination of Class B (moderate) and Class C (slow) draining soils.

The soils are also described as Castor, Vars and Bearbrook. A description of the characteristics of these soils is noted below, as extracted from the Soil Survey of Russell & Prescott Counties (Report No. 33 of the Ontario Soil Survey, Soils Research Institute, Ontario Agricultural College, Guelph, 1962):

Table 1: Soil Descriptions (Report No. 33 of the Ontario Soil Survey, Guelph, 1962)

Soil Name	Description
Vars	Gravelly Sand Slight stony, gravelly loam soils with reddish gravelly or shaly parent material Good drainage
Castor	Fine sandy loam Dark grey, fine sandy loam with layered silt and fine sand parent materials Imperfect drainage
Bearbrook	Clay Stonefree, dark grey clay soils with non-calcareous, layered, red and grey clay parent materials. Poor drainage.

6.2 HYDROLOGY – CHANNEL DESIGN

Hydrology design of the channel was completed using Visual OTTHYMO 6.2. Calculations were completed using a William hydrograph. Intensities were determined from the MTO IDF Curve Lookup. Peak flow rates were calculated for the 2, 5, 10, 25, 50 and 100-year storm events.

The existing channel cross-section was reviewed against the peak flow results and verified to convey (at minimum) the 2-year storm event through Stations 0+638 – 2+476 and the 10-year storm through Stations 0+000 – 0+638. At Stations 0+000 through 0+638 are anticipated to be surrounded by development, it was warranted to review against a higher storm event, as the risk of impact would be higher in a developed area. The remainder of the drain (0+638 – 2+476) is through rural or agricultural lands, where the impacts from flooding would be less. Design of the system to convey (at minimum) the 2-year storm is considered consistent with industry specifications. It should be noted that while the system is intended to convey a minimum of the 2-year (or 10-year) storm event – the system *may* have the capacity to convey greater storm events.

Peak flows calculated at 0+793, 1+383 and 2+476 were as per Table 2 below. Stations 0+793 and 1+383 correspond to the location of culverts on the drain, for which calculations were completed as well (see Section 6.3), and as such, these peak flow results were used as reference to verify capacity of the open channel at various locations throughout the system.

Table 2: Peak Flow Results – Channel Capacity Review – Wood-Eadie Main Drain

Return Period	Station 0+793 Results (m^3/s)	Station 1+383 Results (m^3/s)	Station 2+476 Results (m^3/s)
	Contributing Drainage Area: 48 ha	Contributing Drainage Area: 92 ha	Contributing Drainage Area: 240 ha
2-Year	0.30	0.44	0.55
5-Year	0.54	0.78	1.07
10-Year	0.72	1.05	1.48
25-Year	0.96	1.40	2.05
50-Year	1.15	1.67	2.50
100-Year	1.34	1.96	2.97

Capacity was calculated using Manning's Equation where:

$$Q = VA = \frac{1}{n} A R^{\frac{2}{3}} \sqrt{S}$$

Where

Q = flow rate (m^3/s)
V = velocity (m/s)
A = flow area (m^2)
n = Manning's Roughness coefficient
R = Hydraulic Radius (m)
S = Channel Slope (m/m)

Table 3: Channel Capacity – Wood-Eadie Main Drain

	Station 0+793	Station 1+383	Station 2+476
	Contributing Drainage Area: 48 ha	Contributing Drainage Area: 92 ha	Contributing Drainage Area: 240 ha
Max Capacity (m^3/s)	4.51	2.60	2.97

The results presented in Table 2 are based on the following cross-section design:

Table 4: Proposed Channel Specifications – Wood-Eadie Main Drain

Design Criteria	Specification
Side Slopes	2 Horizontal to 1 Vertical
Bottom Width	1m (Station 0+000 – 0+683) 1.2m (Station 0+638 to 2+476)

The proposed cross-section is generally consistent with existing conditions as observed on-site, suggesting a reinstatement to generally match like-for-like. With that, the system would be expected to provide appropriate conveyance to meet current standards; and continue to operate as it has for the past ~70 years.

For more details on the channel design capacity review – please refer to the calculations as enclosed in **Appendix D**. Detailed Visual OTTHYMO and HY-8 results are available by request.

6.3 HYDROLOGY & HYDRAULICS – CROSSINGS

Hydrology design of the crossings was completed using Visual OTTHYMO 6.2, while a hydraulic analysis was performed using HY-8. Calculations in Visual OTTHYMO were completed using a William hydrograph. Intensities were determined from the MTO IDF Curve Lookup. Peak flow rates were calculated for the 2, 5, 10, 25, 50 and 100-year storm events.

The Wood-Eadie Main Drain is proposed to include the following crossings:

Table 5: Wood-Eadie Main Drain – Culvert Inventory

Culvert ID #	Property ID Reference	Station No.	Inventory Details
1	Road (Emard Street)	0+349	600mmø x 21m HDPE
2	6	0+793	750mmø x 9m HDPE
3	10	1+233	750mmø x 12m HDPE
4	Road (Route 100)	1+383	900mmø x 12m HDPE

The proposed hydrology and hydraulic analysis for the open channel and crossings has been completed in consideration of the upstream lands becoming industrial through development, and as such, the system accounts for the anticipated future increase in flow rates. While no changes are required to the channel to accommodate these increases – some of the culverts are recommended to be increased in size to account for the increased flow.

Culvert #1 will be a new culvert and as such, shall be installed with the above specifications at the time of the Emard Street extension construction.

Culvert #2 appears to have been recently replaced and that the existing pipe is approximately 6.1m long with a 600mm diameter. As the culvert remains in good shape, the only immediate works proposed at this location are maintenance and the addition of permanent erosion and sediment control measures. In the future – either at the end of life of the current 600mm diameter pipe – or at a time when the current 600mm diameter pipe presents a capacity concern, the pipe is to be replaced with a 750mm diameter, 9m long HDPE culvert.

Culvert #3 was observed to be nearing end of life and is recommended for replacement at the time of the specified maintenance works as outlined in **Appendix C**.

Culvert #4 was noted as having been recently replaced and as such, no works are proposed at this time.

Hydrology and hydraulics calculations have been enclosed in **Appendix D**. Detailed Visual OTTHYMO and HY-8 results are available by request.

6.4 FUTURE MAINTENANCE AND REPLACEMENT – PRIVATE CROSSINGS

Future maintenance of crossings is to be completed by the Township, as per the Section 74 of *the Act*. Per *the Act:*

"Maintenance of drainage works and cost

74. *Any drainage works constructed under a by-law passed under this Act or any predecessor of this Act, relating to the construction or improvement of a drainage works by local assessment, shall be maintained and repaired by each local municipality through which it passes, to the extent that such drainage works lies within the limits of such municipality, at the expense of all the upstream lands and roads in any way assessed for the construction or improvement of the drainage works and in the proportion determined by the then current by-law pertaining thereto until, in the case of each municipality, such provision for maintenance or repair is varied or otherwise determined by an engineer in a report or on appeal therefrom. R.S.O. 1990, c. D.17, s. 74."*

The maintenance and replacement of farm crossings (crossings 2 and 3) are to be at the expense of the upstream landowners, in the same apportionments as distributed in the enclosed assessment schedule (**Appendix B**).

The maintenance and replacement of the road crossings (crossings 1 and 4) are to be at the expense of the road authority with ownership of the road, in fitting with Section 26 of *the Act*.

6.4 PRIVATE BRIDGES

There are a number of wooden private bridges constructed along the drain, in various states of disrepair. These bridges shall remain the responsibility of the respective property owner on which the bridge is located. The property owner will be responsible for on-going maintenance of these bridges and is to ensure that these bridges do not cause blockages on the system. When conducting maintenance in sections where a bridge is found, the property owner is to be notified as to the proposed maintenance and temporary removal of the bridge may be required to conduct maintenance of the channel below.

6.5 EROSION CONSIDERATIONS

Erosion is most notably a concern in open channels where there are sudden changes in direction of flow (e.g. 90-degree turns in the channel) or where there are areas of restriction (e.g. culverts or enclosures). Side slopes at steep inclines can also be a concern for erosion. The alignment of the Wood-Eadie Main Drain, following the realignment, will have 3 sharp bends, and one confluence from where the West Branch intersects with the Main Drain. Permanent erosion protection is proposed in these locations, as well as at the ends (both inlet and outlet) of culverts along the drain. Furthermore, three sediment traps have been proposed within the channel, which will offer additional means of flow attenuation and serve as a permanent erosion and sediment control measure. These erosion control measures are considered part of the drainage infrastructure and should be restored and maintained as part of the continued future maintenance works, with costs assessed to the upstream landowners in fitting with the enclosed assessment schedule.

An Erosion and Sediment Control Plan has been enclosed in **Appendix C** and should be considered in both current construction and maintenance practices as well as future maintenance. Erosion and Sediment Control Plans are considered to be living documents, meaning that additional temporary erosion and sediment control measures may be required on a case-by-case basis, depending on the site conditions at the time of the works (current + future maintenance/construction).

For more information, refer to the Erosion and Sediment Control Plan as enclosed in **Appendix C**.

7.0 PLAN, PROFILE & SPECIFICATIONS

It is intended that the accompanying Plan, Profile and Specifications form part of this report, and that they together govern the performance of the work.

The enclosed plans (**Appendix C**) shows:

- The watershed boundary;
- The general course of proposed works (existing alignment between Station 0+000 to 0+639 to be abandoned, new alignment for Station 0+000 to 0+639, and alignment of Station 0+639 to 2+476);
- Turns and intersections have been referenced;
- Crossings have been labeled;
- Property ID numbers have been assigned to each property for ease of reference to the assessment schedule. The use of Property IDs rather than names offers protection of private information and affords continuity of use as property ownership can change over time.

8.0 EXISTING ALIGNMENT (LOT 22, CON 4) – ABANDONMENT

As the intention is to re-align a portion of the existing system, not to create a diversion or overflow channel, the existing alignment within Lot 22, Concession 4, Township of Russell is to be abandoned, as per the attached plan (see **Appendix C**). The new alignment is to be adopted under a new by-law and maintained as per the specifications provided herein. The former alignment through Lot 22, Concession 4 is to be abandoned, filled in and will no longer be maintained by the municipality.

9.0 ASSESSMENTS

The 1955 Engineer's Report included only a single assessment schedule for the entire drainage scheme. As changes have been made to the drain under a separate report authored by McNeely Engineering Limited (March 21, 1977), an update was proposed to be made to the Wood-Eadie Main Drain and West Branch assessment schedules to offer more clarity on future assessment of costs for maintenance.

As per Section 21 of *the Act*, "*The engineer in the report shall assess for benefit, outlet liability and injuring liability, and shall insert in an assessment schedule, in separate columns, the sums assessed for each opposite each parcel of land and road liable therefor."* As this is an existing drain and the scope of works does not include any works that would be considered injuring to lands or roads, injuring liability is not considered applicable for this project.

Some of the lands within the watershed have been assessed for benefit liability. Under *the Act*, lands eligible for benefits assessment are defined as those "*lands, roads, buildings, utilities, or other structures that are increased in value or are more easily maintained as a result of the construction, improvement, maintenance or repair of a drainage works may be assessed for benefit. R.S.O. 1990, c. D.17, s. 22."*

Finally, all lands within the watershed are assessed outlet liability, which is defined as "*lands and roads that use a drainage works as an outlet, or for which, when the drainage works is constructed or improved, an improved outlet is provided either directly or indirectly through the medium of any other drainage works or of a swale, ravine, creek or watercourse, may be assessed for outlet liability. R.S.O. 1990, c. D.17, s. 23 (1)."*

The method for determining the appropriate apportionment of benefit and outlet liability assessment is the responsibility of the appointed Drainage Engineer. The Drainage Engineer shall use their best judgement to determine an apportionment that is considered fair to all those assessed.

For the purposes of assessing outlet and benefit across the lands within the watershed, the Drainage Engineer has generally followed the Factored Areas Method. Under this method, the areas of land within the watershed are assigned factors based on land use, proximity to the drain (distance factor), and general location in the watershed (sub-section factor). The summation of these factors provides a factored area that allows lands within the watershed to be compared on what has been considered a fair basis. The appropriate factors are assigned by the engineer, on a case-by-case basis, as deemed appropriate and fair by the engineer.

9.1 LAND USE FACTORS

Each property was assigned a land use factor based on current aerial mapping. The assigned values for the respective land use have been summarized in Table 6.

Table 6: Wood-Eadie Main Drain + West Branch Land Use Factors

Land Use Description	Factor
Agricultural / Vacant Land / Unprotected Forests	1.0
Commercial	4.0
Managed Forest	0.7
Large Lot Residential (>2ha)	1.0
Small Residential (<2ha)	2.0
Roads	4.0

Unprotected forest refers to undeveloped lands that may include significant tree cover. Given that the Municipality does not have a tree clearing by-law, these lands are considered to have the potential for development, unless otherwise registered as a Managed Forest (Managed Forest Tax Incentive Program); or designated as Provincially Significant Wetland by the Province's mapping. As such, they are assigned the same factor as agricultural or vacant lands as they are not protected by current legislation.

9.2 DISTANCE FACTORS

Each property within the drain was assigned a distance factor based on offsetting measurements from the applicable channel. The distance factors for the Wood-Eadie Main Drain and West Branch were as follows:

Table 7: Wood-Eadie Main Drain + West Branch Distance Factors

Offset (m)	Factor
0 – 100	1.0
100 – 200	0.75
200 – 300	0.50
300 – 400	0.25
>400	0.10

9.3 SUB-SECTION FACTORS

Each property was assigned a factor between 1.0 and 0.24 based on their relative location in the watershed. Properties farthest upstream (top of the watershed) benefit from the entire length of the drain and were assigned a factor of 1.0, while properties at the outlet of the drain only make use of a small relative apportionment of the total system; and were assigned a smaller factor. Properties throughout the watershed were then assigned factors between 1.0 and 0.24 based on their relative location within the watershed. Factors were determined based on the approximate outlet station of where water from the property would be expected to enter the respective drain, and pro-rated accordingly.

For example, when calculating the assessments for the Main Drain – for lands that drain directly into the West Branch, these properties are assigned a factor of 0.24 as the West Branch outlets to the Main Drain at approximately Station 1+888 (with the outlet of the Main Drain being Station 2+476).

This would be calculated as follows:

(2,476 – 1,888) / 2,476 = 0.24

This calculation equates the total linear length of drain used (2,476 – 1,888; where 2,476 is the total length of the Main Drain in meters, and 1,888 is the point at which the West Branch enters the Main Drain) and assigns that value as a factor.

Sub-section factors were assigned to each drain respectively. A property located on the Wood-Eadie West Branch would be assessed to the West Branch Assessment Schedule – and also to the Main Drain Assessment Schedule – with different factors for each based on the calculations associate with the respective drains.

The summation of these factors (land use, distance and sub-section) was used to determine an equivalent area, which was used to determine the apportionment of the associated outlet liability for each property.

9.4 BENEFIT ASSESSMENT

Lands adjacent to the drain were assessed for benefit liability. Benefit liability was calculated based on the land areas adjacent the drain, within the 200m offset of the drain. These areas were then factored to take into consideration the land use. The final benefit assessment was calculated based on the percentage of the total factored benefit area.

The breakdown of benefit vs. outlet liability costs was split as follows:

Wood-Eadie Main Drain:

70% Outlet Liability
30% Benefit Liability

Wood-Eadie West Branch:

80% Outlet Liability
20% Benefit Liability

10.0 COSTS

10.1 REALIGNMENT CONSTRUCTION COSTS

The following has been prepared as an estimate for construction costs associated with the realignment between Station 0+000 and 0+638. As the realignment has been requested by the Municipality, the Municipality has agreed to pay for all construction costs associated with the realignment.

Table 8: Wood-Eadie Main Drain Partial Realignment – Estimated Construction Cost

Scope	Estimated Cost (Excl. tax)
Mobilization and Site Preparation Activities	$5,000
Earth Works (Excavation + Backfill + Spreading)	$33,120
600mm HDPE Culvert	$7,980
ESC Measures (incl. seeding)	$7,500
Sub-Total	**$53,600**
Construction Contingency (10%)	$5,360
SNCA Permit Fees	$2,330
Total Estimated New Construction Cost (Excl. tax)	**$61,290**

*SNCA permitting fees are an estimate only and have been estimated based on the 2024 Fee Schedule, and has been calculated for a new culvert installation and the drain realignment (>500m).

**This estimate is based on 2023/2024 costing, assumed for construction in 2024. Should there be delays in construction, the construction costs may be higher. Adjustments should be made to the construction cost to account for annual inflation. Final construction costs may be higher or lower than those estimated herein.

Per Section 59(1) of the Drainage Act, should the contract price exceed the engineer's estimate by more than 133%, council of the initiating municipality shall call a meeting in the manners prescribed under Section 41 to consider whether or not the project will proceed.

Construction specifications and standard drawings have been included in **Appendix E** for the proposed realignment works.

A more detailed breakdown of costs can be found in **Appendix F**.

10.2 ANTICIPATED MAINTENANCE COSTS

Proposed maintenance works have been outlined on the Maintenance Plan enclosed in **Appendix C**. The following outlines the recommended maintenance works and their anticipated estimated costs.

Table 9: Wood-Eadie Main Drain Maintenance – Estimated Construction Cost

Scope	Estimated Cost (Excl. tax)
Mobilization and Site Preparation Activities	$13,620
Earth Works (Excavation + Spreading)	$22,056
750mm HDPE Culvert	$5,400
ESC Measures (incl. seeding)	$19,700
Sub-Total	**$60,776**
Construction Contingency (10%)	$6,077.60
Total Estimated Maintenance Construction Cost (Excl. tax)	**$66,853.60**

**This estimate is based on 2023/2024 costing. Should there be delays in construction, the construction costs may be higher. Adjustments should be made to the construction cost to account for annual inflation. Final construction costs may be higher or lower than those estimated herein.

Per Section 59(1) of the Drainage Act, should the contract price exceed the engineer's estimate by more than 133%, council of the initiating municipality shall call a meeting in the manners prescribed under Section 41 to consider whether or not the project will proceed.

Construction specifications and standard drawings have been included in **Appendix E** for the proposed maintenance works.

A more detailed breakdown of costs can be found in **Appendix F**.

An estimated maintenance cost has also been prepared for the West Branch, solely for the purposes of developing an updated assessment schedule. Maintenance specifications are to be completed in accordance with the specifications outlined in the 1955 Engineer's Report, which includes design specifications for the West Branch of the Wood-Eadie Drain.

Table 10: Wood-Eadie West Branch Maintenance – Estimated Construction Cost

Scope	Estimated Cost (Excl. tax)
Mobilization and Site Preparation Activities	$8,750
Earth Works (Excavation + Spreading)	$15,810
Seeding	$1,500
Sub-Total	**$26,060**
Construction Contingency (15%)	$2,606
Total Estimated Maintenance Construction Cost (Excl. tax)	**$28,666**

Maintenance requirements for the West Branch are not yet defined, and would be determined by the Township's Drainage Superintendent in consultation with the applicable landowners. Costs would be assessed in accordance with the updated schedule of assessment enclosed herein, while maintenance works would be conducted in accordance with the specifications from the 1955 Engineer's Report.

This estimate is based on 2023/2024 costing and is based on an estimate for a full cleanout, which may (or may not) be required. Anticipated maintenance works will be determined based on the recommendations of the Drainage Superintendent, with final maintenance costs to be assessed according to those works required.

A more detailed breakdown of costs can be found in **Appendix F**.

10.3 ENGINEERING COSTS

The engineering costs associated with this project are estimated to be $53,300 + HST. This estimate does not factor in any appeals or revisions to the report following its formal submission. Should there be appeals or requests for revisions, the total cost will be amended prior to the final adoption of this report.

It is understood that the initiating landowner (Russell Township) has agreed to pay for the associated engineering fees for the preparation of this report and the associated cost has been assigned to the Township in the enclosed assessment schedule as a one time Special Benefit Assessment.

11.0 PERMITTING & SPECIAL CONSIDERATIONS

AgMaps was also reviewed for reference to the adopted Drain Classification. AgMaps identifies the Wood-Eadie Main Drain (and West Branch) as "Not Rated", however the downstream receivers (both the East Branch and the Sparks Champagne Municipal Drain) are both 'Class F' Drains. Based on observed site conditions, and the classification of the downstream receivers, it would reasonably be concluded that the subject drain would also be considered a 'Class F' Drain. 'Class F' drains are defined as intermittent watercourses that are dry for at least 3 months of the year.

No fisheries studies were conducted as part of Shade Group's scope however Shade Group's ecologist did conduct a site visit and prepare a Natural Heritage Screening Report to assess for any environmental constraints that could impact the property. A copy of the Natural Heritage Screening Report is enclosed in **Appendix I.**

11.1 SOUTH NATION CONSERVATION AUTHORITY

The Engineer's Report was circulated to the South Nation Conservation Authority (SNCA) for review and permit. SNCA provides permits under the Conservation Authorities Act regarding the Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses.

A copy of the permit has been enclosed in **Appendix H**. Note this permit is intended for current works – future maintenance works would be subject to applicable permitting at the time of works, depending on legislative requirements.

11.2 DEPARTMENT OF FISHERIES AND OCEANS

Consultation and permitting with Fisheries and Oceans Canada (DFO) was completed concurrent with the preparation of this report. A "Request for Review" application was submitted along with a draft copy of this Engineer's Report (and associated drawings). Projects in or near water may require authorization under the Fisheries Act.

A copy of the recommendations from DFO have been included in **Appendix H**. No Fisheries Act authorization was required.

11.3 OTHER CONSIDERATIONS

WORKING PLATFORM

The following table outlines which side of the drain work is expected to occur on. These recommendations are based on current site conditions. As development is anticipated to occur in the lands adjacent Station 0+000 through 0+638, adjustments may be required to accommodate changing site conditions. Through treed areas, every effort shall be made by the Contractor to limit removal of trees, and only such works as required to accommodate equipment is permitted.

Table 11: Wood-Eadie Main Drain Working Platform

Location	Working Platform
Station 0+000 – 2+476	Minimum 15m offset for any structures on either side of the drain to allow for access to remove obstructions and conduct cleanouts.
Station 0+000 – 0+360	Excavation for realignment to be conducted on the west side of the new alignment. Maintenance may occur from either side, depending on site conditions at the time of maintenance.
Station 0+360 – 0+638	Excavation for realignment to be conducted on the east side of the new alignment. Maintenance may occur from either side, depending on site conditions at the time of maintenance.
Station 0+638 – 1+246	Maintenance to be performed from the east side.
Station 1+246 – 1+383	Maintenance to be performed from south side (Route 100)
Station 1+383 – 1+945	Maintenance to be performed from west side
Station 1+945 – 2+476	Maintenance to be performed from south side

EROSION AND SEDIMENT CONTROL

Permanent erosion and sediment control measures have been shown on the enclosed Erosion and Sediment Control Plan and include the installation of sediment traps, rock protection, end treatments on culverts, etc. Banks are to be seeded following excavation. Refer to **Appendix E**, Construction Specifications, for additional information.

Temporary erosion and sediment control measures shall include the erection of silt fencing around the base of excavated stockpiles (for the realignment). Connection of the realignment to the existing channel shall not occur until after the entire realignment has been excavated. It is recommended that maintenance be conducted on the channel prior to the realignment works to ensure proper tie in between the two stretches. Additional temporary erosion and sediment control measures shall include the placement of strawbale check dams and consideration for the installation of turbidity curtain, if required. Recommended spacing for straw bale check dams has been shown on the attached ESC Plan, found in **Appendix C**. The consideration for turbidity curtain shall depend on the site conditions at the time of the works, and the determination of whether it's warranted or not shall be at the discretion of SNCA, the Township's Drainage Superintendent and/or a Drainage Engineer.

It shall be the contractor's responsibility to maintain the temporary erosion and sediment control measures after every rainfall event (>10mm) and as required throughout construction (realignment + maintenance works) until such a time as sufficient vegetation has established to stabilize the banks and the bottom of the system; to the satisfaction of the engineer, permitting agencies or Drainage Superintendent. Eventual removal and proper disposal of the temporary erosion and sediment control measures shall be considered part of the contractor's works.

Maintenance of all erosion and sediment control measures, both permanent and temporary, shall conform with the Ministry of Transportation of Ontario's Environmental Guide for Erosion and Sediment Control (February 2007), or applicable governing provincial guidelines for the maintenance of erosion and sediment control measures on construction sites.

Additional erosion and sediment control measures may be required at the direction of the engineer, municipality, SNCA or DFO, as needed to address site conditions at the time of the work. The review and implementation of erosion and sediment control measures is intended to be a living practice, where additional measures may be required depending on the conditions at the time of the work, including maintenance activities.

UTILITIES

The contractor shall acquire applicable utility clearance prior to excavation as per the Ontario Underground Infrastructure Notification System Act. Should utility conflicts be identified, Shade Group shall be notified.

ADDITIONAL CONSTRUCTION SPECIFICATIONS

Additional construction specifications have been included in **Appendix E**.

12.0 ADIP GRANTS

Properties that are registered with the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) for the Farm Property Class Tax Rate Program may be eligible for a 1/3 grant from the Province. Current eligibility as reflected in the assessment schedules has been assumed based on AgMaps 2023/2024 mapping for eligible properties however depending on the time of works, eligibility may differ from that reflected on the enclosed assessment schedules.

13.0 CLOSING

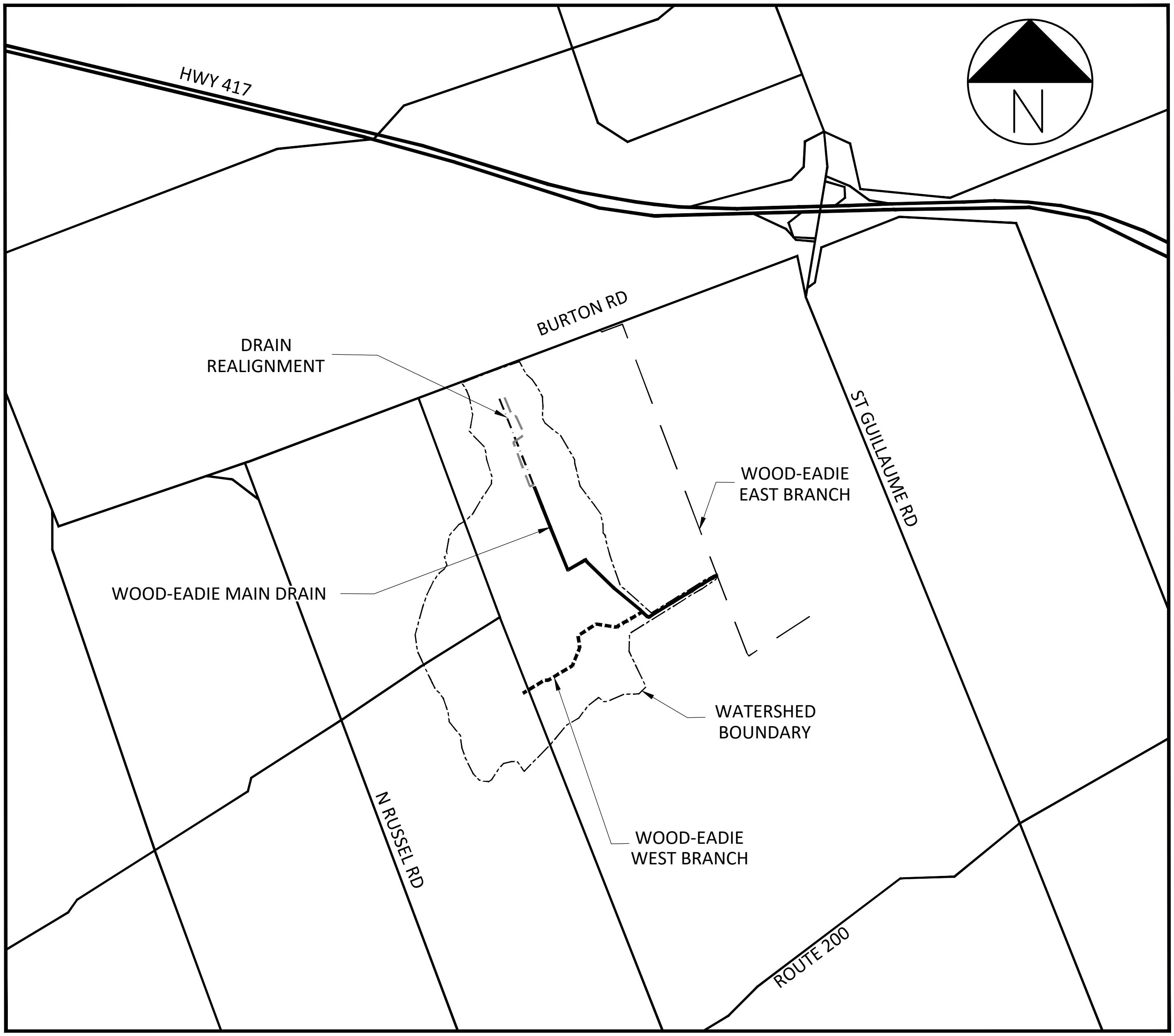
This final version of the Engineer's Report for the Wood-Eadie Main Drain (and West Branch) is respectfully submitted to the Council of the Township of Russell for consideration, in fitting with the processes outlined under the Drainage Act.

LICENSED PROFESSIONAL ENGINEER
M. K. SHADE
100170995
JULY 30, 2024
PROVINCE OF ONTARIO

Monica Shade, P. Eng.
Drainage Engineer
Shade Group Inc.

APPENDIX A

LOCATION PLAN



LOCATION PLAN
N.T.S.

WOOD-EADIE DRAIN
RUSSEL TOWNSHIP
2024

SHADE GROUP INC

APPENDIX B

ASSESSMENT SCHEDULES

Assessment Schedule - Updated 2024

Schedule 'A'

Wood-Eadie Main Drain - Real Properties

Property ID No.	Roll No.	Con	Lot	Area Drained (ha)	Outlet	Benefit	Farm Tax Class (Y/N)	FTC Grant (1/3)	Est. Net Assess.
1	30600000406800	4	23	7.41	$ 2,106.18	$ 964.27	Y	$ 1,023.48	$ 2,046.97
2	30600000406700	4	22	15.13	$ 17,541.64	$ 7,871.82	N	$ -	$ 25,413.46
3 + 4	30600000406700	4	22	16.32	$ 14,084.09	$ 4,938.75	N	$ -	$ 19,022.84
5	30600000406610	4	22	0.22	$ 2.73	$ -	N	$ -	$ 2.73
6	30600000406500	4	21	20.23	$ 3,471.61	$ 1,562.52	Y	$ 1,678.04	$ 3,356.09
7	30600000406407	4	21	1.14	$ 549.50	$ -	N	$ -	$ 549.50
8	30600000406418	4	21	1.26	$ 604.45	$ -	N	$ -	$ 604.45
9	30600000406301	4	21	6.07	$ 715.88	$ 317.61	N	$ -	$ 1,033.49
10	30600000406300	4	21	19.09	$ 2,770.70	$ 1,492.70	Y	$ 1,421.13	$ 2,842.26
11	30600000406305	4	21	0.47	$ 11.64	$ -	N	$ -	$ 11.64
12	30600000406200	4	20	0.21	$ 2.36	$ -	N	$ -	$ 2.36
13	30600000406150	4	20	0.59	$ 11.21	$ -	N	$ -	$ 11.21
14	30600000406208	4	20	0.49	$ 9.20	$ -	N	$ -	$ 9.20
15	30600000406100	4	20	22.11	$ 1,248.24	$ 985.20	N	$ -	$ 2,233.44
16	30600000406000	4	20	24.28	$ 991.96	$ 779.58	N	$ -	$ 1,771.54
17	30600000405900	4	20	1.67	$ 203.45	$ 217.65	N	$ -	$ 421.10

Assessment Schedule - Updated 2024

Schedule 'A'

Wood-Eadie Main Drain - Real Properties

Property ID No.	Roll No.	Con	Lot	Area Drained (ha)	Outlet	Benefit	Farm Tax Class (Y/N)	FTC Grant (1/3)	Est. Net Assess.
18	30600000405800	4	19	20.34	$ 355.28	$ 209.33	Y	$ 188.20	$ 376.40
19	30600000405700	4	19	0.75	$ 13.13	$ -	Y	$ 4.38	$ 8.75
20	30600000307200	3	22	0.15	$ 1.25	$ -	Y	$ 0.42	$ 0.83
21	30600000307100	3	21	6.84	$ 57.77	$ -	Y	$ 19.26	$ 38.51
22	30600000306905	3	21	2.02	$ 22.40	$ -	N	$ -	$ 22.40
23	30600000306900	3	21	12.10	$ 85.93	$ -	N	$ -	$ 85.93
24	30600000307000	3	21	0.11	$ 0.98	$ -	N	$ -	$ 0.98
25	30600000306800	3	20	14.88	$ 125.72	$ -	N	$ -	$ 125.72
26	30600000306400	3	20	15.81	$ 133.56	$ -	N	$ -	$ 133.56
27	30600000306000	3	19	13.98	$ 118.11	$ -	N	$ -	$ 118.11
28	30600000306300	3	19	0.82	$ 6.90	$ -	N	$ -	$ 6.90

Sub-Total	**$ 45,245.87**	**$ 19,339.42**		**$ 4,334.91**	$ 60,250.38

Assessment Schedule - Updated 2024

Schedule 'A'

Wood-Eadie Main Drain - Roads

ID/Name	Outlet	Benefit	Special Benefit	Est Net Assess.
Eadie Road	$ 77.43	$ -	$ -	$ 77.43
Route 100	$ 34.27	$ -	$ -	$ 34.27
Emard Street	$ 1,139.68	$ 589.49	$ -	$ 1,729.17
Unmaintained Route 100	$ 200.93	$ 127.16	$ -	$ 328.09
Echo Street	$ 99.34	$ -	$ -	$ 99.34
Special Benefit Assessment - Township of Russell - Construction	$ -	$ -	$ 61,290.00	$ 61,290.00
Special Benefit Assessment - Township of Russell - Engineering	$ -	$ -	$ 53,300.00	$ 53,300.00

Summary

Real Properties	$ 45,245.87	$ 19,339.42	$ -	**$ 64,585.29**
Township Roads	$ 1,551.65	$ 716.66	$ -	**$ 2,268.31**
Special Benefit Assessment - Township of Russell - Construction	$ -	$ -	$ 61,290.00	**$ 61,290.00**
Special Benefit Assessment - Township of Russell - Engineering	$ -	$ -	$ 53,300.00	**$ 53,300.00**
Sub-Total	**$ 46,797.52**	**$ 20,056.08**	**$ 114,590.00**	**$ 181,443.60**
Estimated Grant (Based on 2023/2024 Eligibility)	**$ 4,334.91**			
Estimated Total (After Grant, Excl. Tax)	**$ 177,108.69**			

Assessment Schedule - Updated 2024

Schedule 'B'

Wood-Eadie West Branch - Real Properties

Construction - For Future Maintenance

Property ID No.	Roll No.	Con	Lot	Area Drained (ha)	Outlet	Benefit	Farm Tax Class (Y/N)	FTC Grant	Est. Net Assess.
15	30600000406100	4	20	1.33	$ 193.88	$ -	N	$ -	$ 193.88
16	30600000406000	4	20	25.39	$ 10,751.71	$ 1,146.64	N	$ -	$ 11,898.35
18	30600000405800	4	19	18.85	$ 2,510.79	$ -	Y	$ 836.93	$ 1,673.86
19	30600000405700	4	19	0.75	$ 15.80	$ -	Y	$ 5.27	$ 10.53
20	30600000307200	3	22	0.15	$ 6.85	$ -	Y	$ 2.28	$ 4.57
21	30600000307100	3	21	6.84	$ 315.30	$ -	Y	$ 105.10	$ 210.20
22	30600000306905	3	21	2.02	$ 122.23	$ -	N	$ -	$ 122.23
23	30600000306900	3	21	12.10	$ 468.95	$ -	N	$ -	$ 468.95
24	30600000307000	3	21	0.11	$ 5.35	$ -	N	$ -	$ 5.35
25	30600000306800	3	20	14.88	$ 1,196.88	$ 859.98	N	$ -	$ 2,056.86
26	30600000306400	3	20	15.81	$ 3,362.42	$ 2,866.60	N	$ -	$ 6,229.02
27	30600000306000	3	19	13.98	$ 1,771.99	$ -	N	$ -	$ 1,771.99
28	30600000306300	3	19	0.82	$ 43.03	$ -	N	$ -	$ 43.03

Sub-Total	**$ 20,765.18**	**$ 4,873.22**		**$ 949.58**	**$ 24,688.82**

Assessment Schedule - Updated 2024

Schedule 'B'

Wood-Eadie West Branch - Roads

Construction - For Future Maintenance

ID/Name	Outlet ($)	Benefit ($)	Est Net Assess.
Eadie Road	$ 1,980.59	$ 859.98	$ 2,840.57
Route 100	$ 187.03	$ -	$ 187.03

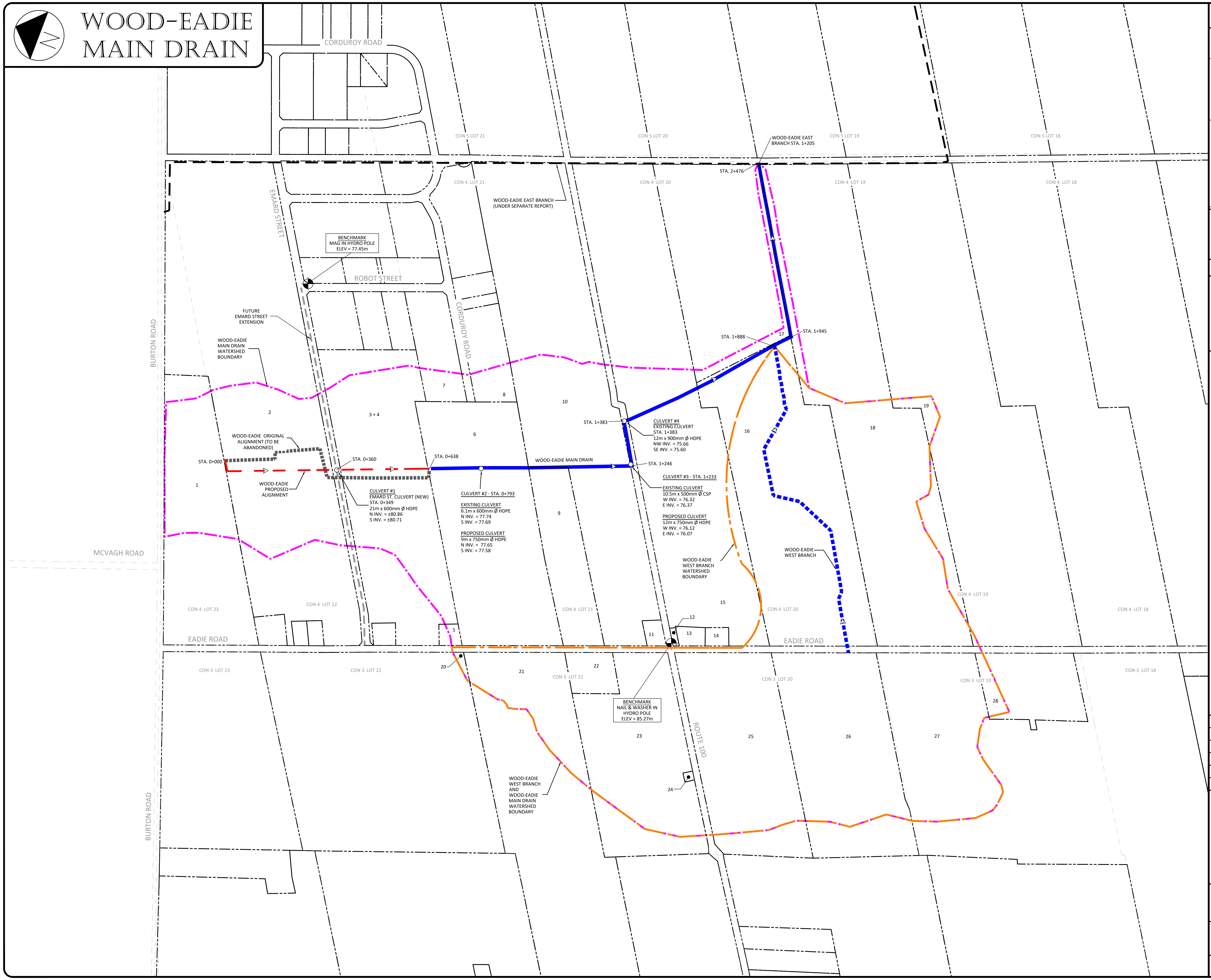
Summary

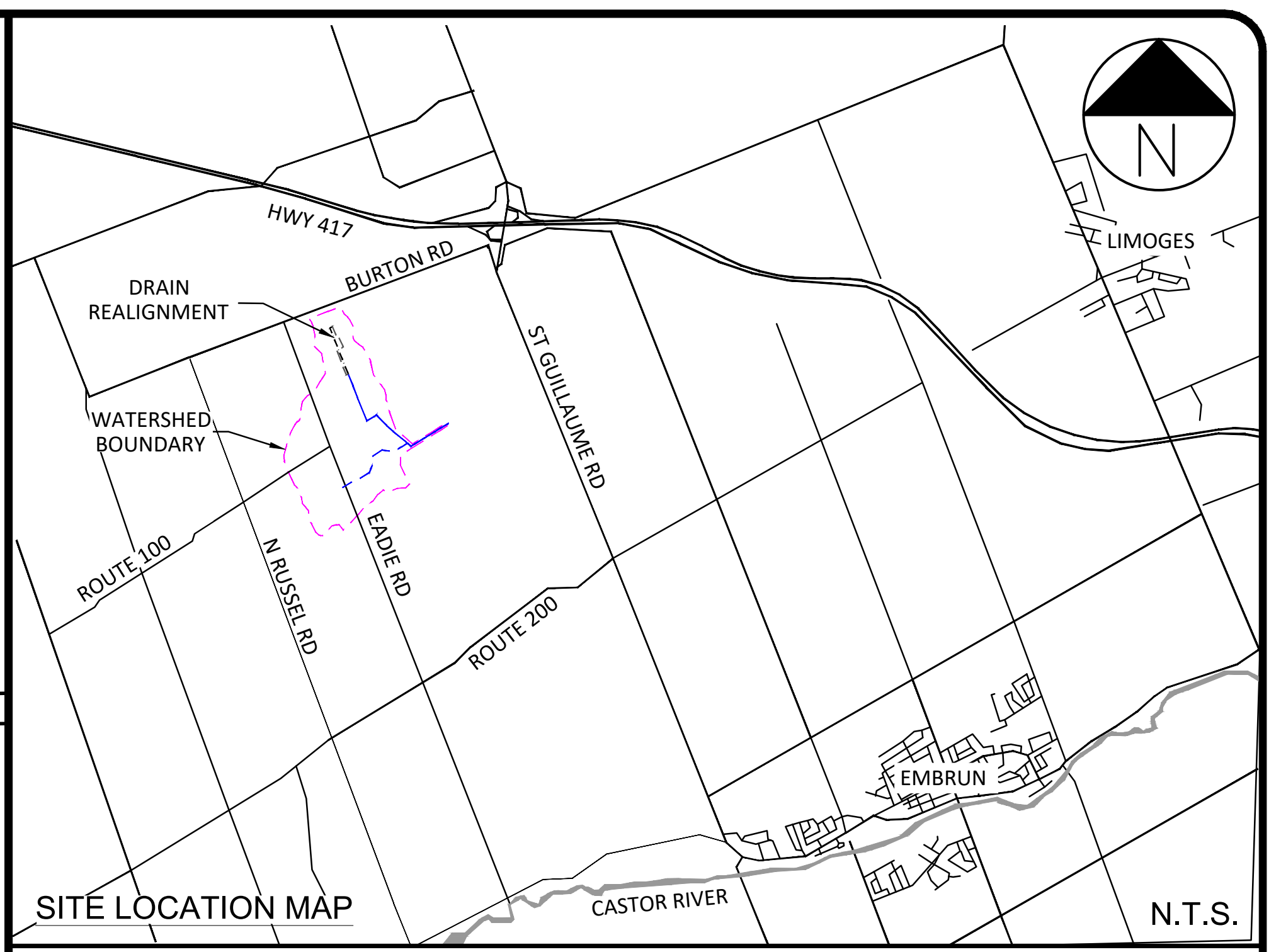
Real Properties	$ 20,765.18	$ 4,873.22	$ 25,638.40
Township Roads	$ 2,167.62	$ 859.98	$ 3,027.60
Sub-Total	$ 22,932.80	$ 5,733.20	**$ 28,666.00**
Estimated Grant (Based on 2023/2024 Eligibility)	$		949.58
Estimated Total (After Grant, Excl. Tax)	**$**		**27,716.42**

APPENDIX C

DRAWINGS

WOOD-EADIE MAIN DRAIN





SITE LOCATION MAP

N.T.S.

SCALE BAR

0 250 500m

ALL DIMENSIONS ARE IN METRES. DO NOT SCALE DRAWING

PAGE SIZE	24" x 36"	SCALE	1:5,000

SHADE GROUP INC.
4625 MARCH ROAD
ALMONTE, ONTARIO
K0A 1A0

LEGEND

— - —	APPROX. PROPERTY LINES (GIS DATA)
▬ ▬ ▬	FUTURE ROAD EXTENSION
▬▬▬	WOOD-EADIE MAIN DRAIN ALIGNMENT
■ ■ ■ ■ ■	WOOD-EADIE WEST BRANCH ALIGNMENT
▬ · ▬	WOOD-EADIE MAIN DRAIN WATERSHED BOUNDARY
▬ ▬ ▬	WOOD-EADIE WEST BRANCH SUBCATCHMENT WATERSHED BOUNDARY
▬ ▬ ▬	WATERCOURSES
STA. 0+000	STATIONS (m)
■■■■■■■■■	WOOD-EADIE MAIN DRAIN ALIGNMENT TO BE ABANDONED
▬ ▬ ▬	PROPOSED REALIGNMENT OF WOOD-EADIE MAIN DRAIN
— · —	LOT AND CONCESSION LINES
○	LOCATION OF CULVERT
1	PROPERTY I.D. NUMBER
⊕	SITE BENCHMARK
▷	DIRECTION OF FLOW

GENERAL NOTES

1. THIS IS NOT A LEGAL SURVEY, PROPERTY LINES SHOWN ARE PER INFORMATION SUPPLIED FROM THE UNITED COUNTIES OF PRESCOTT-RUSSEL GIS SYSTEM AND IMPLY NO GUARANTEE OF ACCURACY FOR EXACT PROPERTY LINES.
2. NEW CONSTRUCTION AND MAINTENANCE WORKS SHALL BE COMPLETED IN LOW OR NO FLOW CONDITIONS.
3. CONTRACTOR OR TOWNSHIP TO ACQUIRE PERMITS FROM APPLICABLE AGENCIES PRIOR TO CONSTRUCTION.
4. ANY CHANGES MADE TO THIS PLAN ARE TO BE VERIFIED AND APPROVED BY SHADE GROUP INC. CHANGES MAY BE SUBJECT TO PROPER PROCESS TO ADOPT UNDER THE DRAINAGE ACT.

01	COMBINED ID 3+4	JULY 29, 2024
00	ISSUED WITH ENGINEER'S REPORT	JULY 19, 2024
REV. #	**REVISION DESCRIPTION**	**DATE**

STAMP

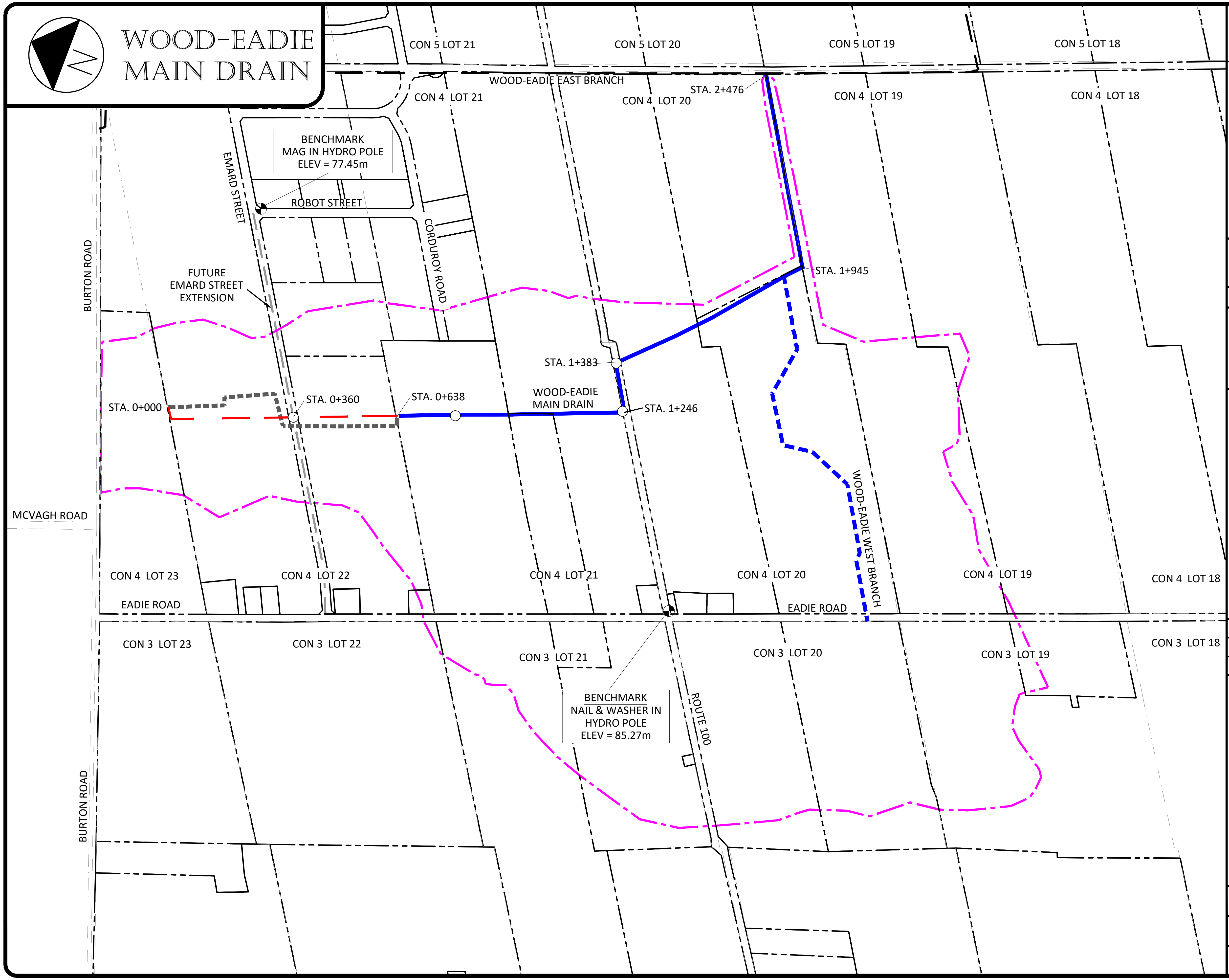
LICENSED PROFESSIONAL ENGINEER
M. K. SHADE
100170995
JULY 29, 2024
PROVINCE OF ONTARIO

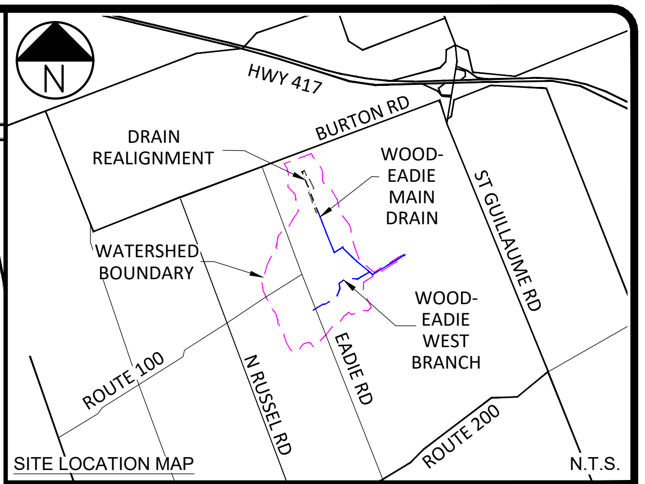
PROJECT TITLE
WOOD-EADIE MAIN DRAIN

DRAWING TITLE
PLAN VIEW

DRAWING NO.
1 OF 1

WOOD-EADIE MAIN DRAIN





SITE LOCATION MAP

N.T.S.

SCALE BAR 0 125 250 500m

ALL DIMENSIONS ARE IN METRES. DO NOT SCALE DRAWING

PAGE SIZE	11" x 17"	SCALE	1:10,000

SHADE GROUP INC.
4625 MARCH ROAD
ALMONTE, ONTARIO
K0A 1A0

SHADE GROUP INC

LEGEND

— · —	APPROX. PROPERTY LINES (GIS DATA)
— —	FUTURE ROAD EXTENSION
——	WOOD-EADIE MAIN DRAIN ALIGNMENT
▬ ▬	WOOD-EADIE WEST BRANCH ALIGNMENT
— · —	WOOD-EADIE DRAIN WATERSHED BOUNDARY
— —	WATERCOURSES
— · —	PROPOSED REALIGNMENT OF WOOD-EADIE MAIN DRAIN
▪▪▪▪	ALIGNMENT OF WOOD-EADIE MAIN DRAIN TO BE ABANDONED
STA. 0+000	NEW STATIONS (m)
— · —	LOT AND CONCESSION LINES
○	LOCATION OF CULVERT
◐	SITE BENCHMARK

REV.	DESCRIPTION	DATE
00	ISSUED WITH ENGINEER'S REPORT	JULY 19, 2024

STAMP

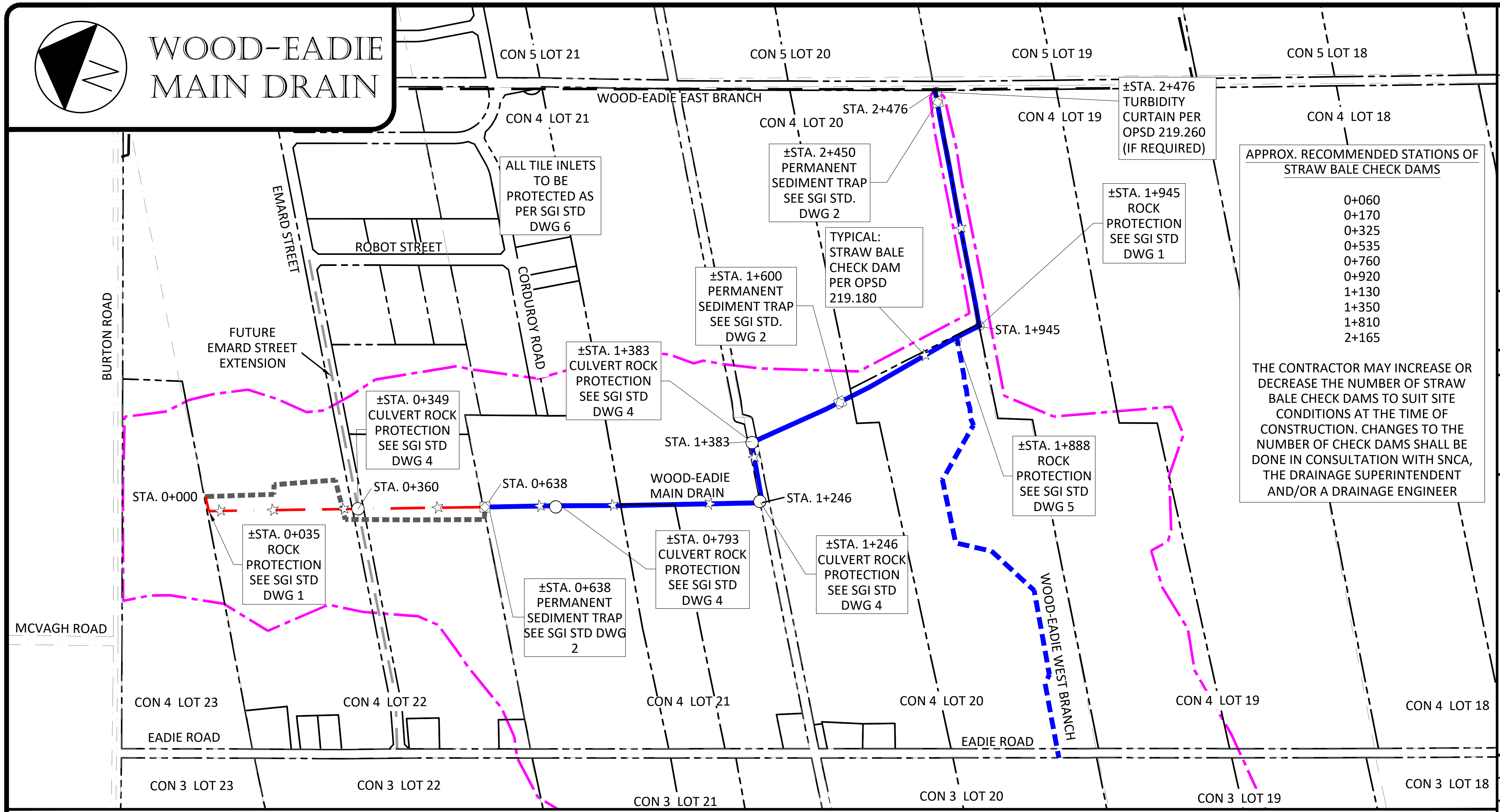
LICENSED PROFESSIONAL ENGINEER
M. K. SHADE
100170995
JULY 19, 2024
PROVINCE OF ONTARIO

PROJECT TITLE WOOD-EADIE MAIN DRAIN

DRAWING TITLE MAINTENANCE PLAN

DRAWING NO. 1 OF 1

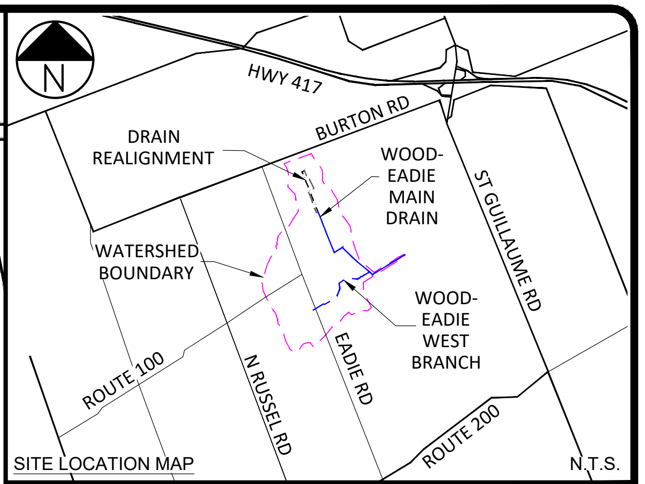
WOOD-EADIE MAIN DRAIN



APPROX. RECOMMENDED STATIONS OF STRAW BALE CHECK DAMS

0+060
0+170
0+325
0+535
0+760
0+920
1+130
1+350
1+810
2+165

THE CONTRACTOR MAY INCREASE OR DECREASE THE NUMBER OF STRAW BALE CHECK DAMS TO SUIT SITE CONDITIONS AT THE TIME OF CONSTRUCTION. CHANGES TO THE NUMBER OF CHECK DAMS SHALL BE DONE IN CONSULTATION WITH SNCA, THE DRAINAGE SUPERINTENDENT AND/OR A DRAINAGE ENGINEER



SITE LOCATION MAP

N.T.S.

SCALE BAR 0 125 250 500m

ALL DIMENSIONS ARE IN METRES. DO NOT SCALE DRAWING

PAGE SIZE	11" x 17"	SCALE	1:10,000

SHADE GROUP INC.
4625 MARCH ROAD
ALMONTE, ONTARIO
K0A 1A0

LEGEND

— · —	APPROX. PROPERTY LINES (GIS DATA)
— —	FUTURE ROAD EXTENSION
——	WOOD-EADIE MAIN DRAIN ALIGNMENT
■ ■ ■	WOOD-EADIE WEST BRANCH ALIGNMENT
— · —	WOOD-EADIE DRAIN WATERSHED BOUNDARY
— —	WATERCOURSES
— · —	PROPOSED REALIGNMENT OF WOOD-EADIE MAIN DRAIN
▪▪▪▪	ALIGNMENT OF WOOD-EADIE MAIN DRAIN TO BE ABANDONED
STA. 0+000	NEW STATIONS (m)
— —	LOT AND CONCESSION LINES
○	LOCATION OF CULVERT
⊠	PERMANENT SEDIMENT TRAP W. ROCK FLOW CHECK DAM
☆	TEMPORARY STRAW-BALE CHECK DAM PER OPSD 219.180

REV.	DESCRIPTION	DATE
00	ISSUED WITH ENGINEER'S REPORT	JULY 19, 2024

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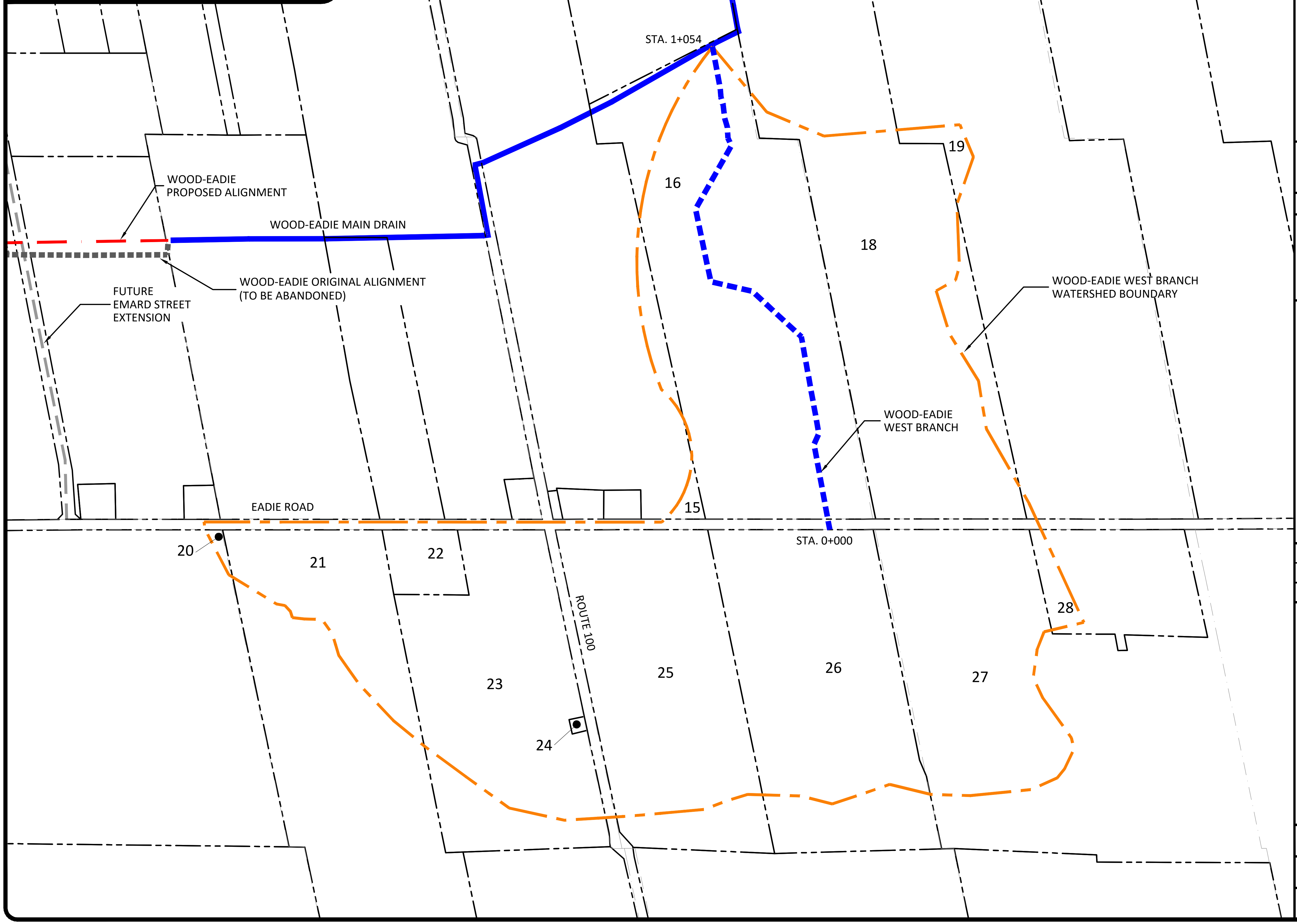
LICENSED PROFESSIONAL ENGINEER
M. K. SHADE
100170995
JULY 19, 2024
PROVINCE OF ONTARIO

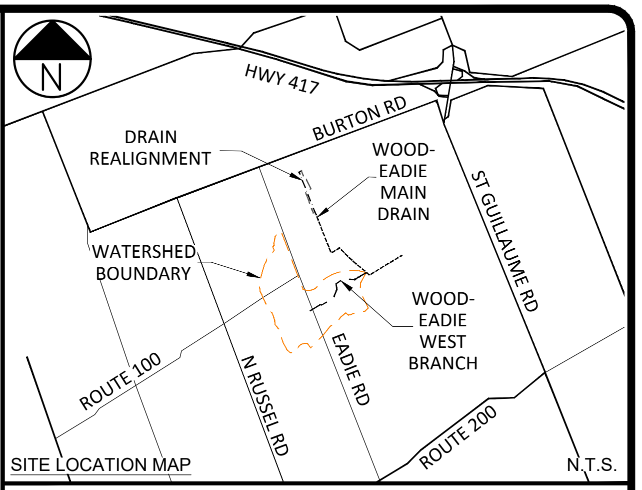
PROJECT TITLE	WOOD-EADIE MAIN DRAIN
DRAWING TITLE	EROSION AND SEDIMENT CONTROL PLAN
DRAWING NO.	1 OF 1

EROSION AND SEDIMENT CONTROL NOTES

1. THIS PLAN INCLUDES PERMANENT AND TEMPORARY EROSION CONTROL MEASURES WHICH ARE TO BE APPLIED DURING CONSTRUCTION, INCLUDING FUTURE MAINTENANCE WORKS.
2. IN ADDITION TO THOSE SPECIFICATIONS PROVIDED ON THE PLAN VIEW, THE CONTRACTOR SHALL ALSO INCLUDE FOR THE ERECTION OF SILT FENCE AROUND THE BASE OF THE EXCAVATED STOCKPILES DURING THE INITIAL REALIGNMENT CONSTRUCTION; PRIOR TO THE FILLING IN OF THE PREVIOUS ALIGNMENT.
3. DURING THE INITIAL CONSTRUCTION (REALIGNMENT), THE PREVIOUS ALIGNMENT IS NOT TO BE FILLED IN UNTIL AFTER THE NEW ALIGNMENT HAS BEEN CONSTRUCTED IN FULL AND IS DEEMED ADEQUATELY STABILIZED BY THE ENGINEER, CONSERVATION AUTHORITY OR DRAINAGE SUPERINTENDENT.
4. EROSION AND SEDIMENT CONTROL PLANS ARE CONSIDERED TO BE LIVING DOCUMENTS, AND ADDITIONAL MEASURES MAY BE REQUIRED AT THE DIRECTION OF THE ENGINEER, MUNICIPALITY, SNCA OR DFO, AS NEEDED TO ADDRESS SITE CONDITIONS AT THE TIME OF CONSTRUCTION (BOTH DURING THE INITIAL REALIGNMENT CONSTRUCTION AND FUTURE MAINTENANCE).
5. MAINTENANCE OF THE TEMPORARY EROSION CONTROL MEASURES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR DURING AND IMMEDIATELY FOLLOWING CONSTRUCTION. THE CONTRACTOR SHOULD REVIEW AND DOCUMENT THE CONDITION OF THE TEMPORARY EROSION CONTROL MEASURES THROUGHOUT CONSTRUCTION, AT THE START OF EACH DAY OF ON-SITE WORKS AND AFTER EVERY RAINFALL EVENT (>10mm). CORRECTIVE MEASURES TO REMOVE SEDIMENT BUILD UP, RESTORE EROSION CONTROL MEASURES, ETC. SHALL BE PERFORMED WITHIN NO MORE THAN 24 HOURS FOLLOWING THE RAINFALL EVENT, FOLLOWING OBSERVATION OF THE FAILED MEASURE, OR FOLLOWING NOTIFICATION FROM THE DRAINAGE SUPERINTENDENT, ENGINEER OR CONSERVATION AUTHORITY REGARDING A DEFICIENCY. CONTINUED MAINTENANCE OF TEMPORARY MEASURES MAY STILL BE REQUIRED IMMEDIATELY FOLLOWING FUTURE MAINTENANCE AND/OR THE INITIAL CONSTRUCTION, UP UNTIL SUCH A TIME AS THE SITE CONDITIONS ARE DEEMED TO BE ADEQUATELY STABILIZED AS PER THE ENGINEER, SNCA, DFO OR MUNICIPALITY. EVENTUAL REMOVAL OF TEMPORARY MEASURES, AS APPLICABLE, FOLLOWING ACCEPTANCE OF SITE CONDITIONS, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
6. THE ON-GOING MONITORING AND CORRECTIVE ACTION ASSOCIATED WITH THE PERMANENT EROSION CONTROL MEASURES SHALL BE THE RESPONSIBILITY OF THE LANDOWNERS ADJACENT THE DRAIN, AND THE MUNICIPALITY (DRAINAGE SUPERINTENDENT). IT IS EXPECTED THAT LANDOWNERS WOULD PROVIDE NOTIFICATION TO THE MUNICIPALITY WHEN CORRECTIVE ACTION IS REQUIRED, WHILE THE MUNICIPALITY WOULD COORDINATE THE HIRING A CONTRACTOR TO COMPLETE MAINTENANCE WORKS AS REQUIRED, IN FITTING WITH THE DIRECTIVES OF THE DRAINAGE ACT.
7. CONSTRUCTION WORKS (INITIAL + FUTURE MAINTENANCE) ARE TO BE COMPLETED IN LOW OR NO FLOW CONDITIONS, OUTSIDE OF ANY TIMING WINDOW RESTRICTIONS.
8. SCHEDULING OF CONSTRUCTION WORKS SHOULD AVOID WET, WINDY OR RAINY PERIODS (AND HEED WEATHER ADVISORIES) AS THESE MAY RESULT IN HIGH FLOW VOLUMES AND/OR INCREASED EROSION AND SEDIMENTATION.
9. THE CONTRACTOR SHALL OPERATE MACHINERY ON LAND IN STABLE, DRY AREAS.
10. THE CONTRACTOR SHALL DEVELOP AND IMPLEMENT A RESPONSE PLAN TO AVOID A SPILL OF DELETERIOUS SUBSTANCES.
11. TURBIDITY CURTAIN (PER OPSD 219.260) HAS BEEN SPECIFIED AT THE OUTLET OF THE WOOD-EADIE MAIN DRAIN, IF REQUIRED. SHOULD SITE CONDITIONS WARRANT, TURBIDITY CURTAIN SHALL BE INSTALLED. FOR CONFIRMATION ON WHETHER SITE CONDITIONS WARRANT, CONSULT WITH THE SNCA, DRAINAGE SUPERINTENDENT OR A DRAINAGE ENGINEER AT THE TIME OF THE CONSTRUCTION/MAINTENANCE WORKS.
12. PLAN VIEW LOCATION OF STRAW BALE CHECK DAMS ARE APPROXIMATE ONLY AND IT IS RECOMMENDED THAT THE NUMBER OF SBCDS BE INCREASED OR DECREASED AS NEEDED TO SUIT SITE CONDITIONS AT THE TIME OF THE WORKS. DRY SUMMER MONTHS MAY REQUIRE FEWER SBCDS, WETTER CONDITIONS MAY REQUIRE MORE. IT IS RECOMMENDED THAT IMPLEMENTATION BE ADJUSTED TO SUIT, AS NEEDED.

WOOD-EADIE WEST BRANCH





SCALE BAR 0 100 200 400m

ALL DIMENSIONS ARE IN METRES. DO NOT SCALE DRAWING

PAGE SIZE	11" x 17"	SCALE	1:7,500

SHADE GROUP INC.
4625 MARCH ROAD
ALMONTE, ONTARIO
K0A 1A0

SHADE GROUP INC

LEGEND

- APPROX. PROPERTY LINES (GIS DATA)
- FUTURE ROAD EXTENSION
- WOOD-EADIE MAIN DRAIN ALIGNMENT
- WOOD-EADIE WEST BRANCH ALIGNMENT
- WOOD-EADIE WEST BRANCH WATERSHED BOUNDARY
- WATERCOURSES
- PROPOSED REALIGNMENT OF WOOD-EADIE MAIN DRAIN
- ALIGNMENT OF WOOD-EADIE MAIN DRAIN TO BE ABANDONED
- STA. 0+000 STATIONS (m)
- LOT AND CONCESSION LINES

REV.	DESCRIPTION	DATE
00	ISSUED WITH ENGINEER'S REPORT	JULY 19, 2024

STAMP

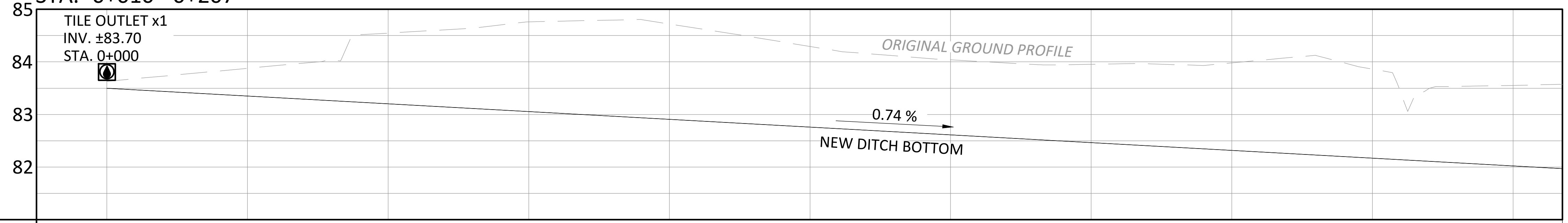
LICENSED PROFESSIONAL ENGINEER
M. K. SHADE
100170995
JULY 19, 2024
PROVINCE OF ONTARIO

PROJECT TITLE WOOD-EADIE WEST BRANCH

DRAWING TITLE PLAN VIEW

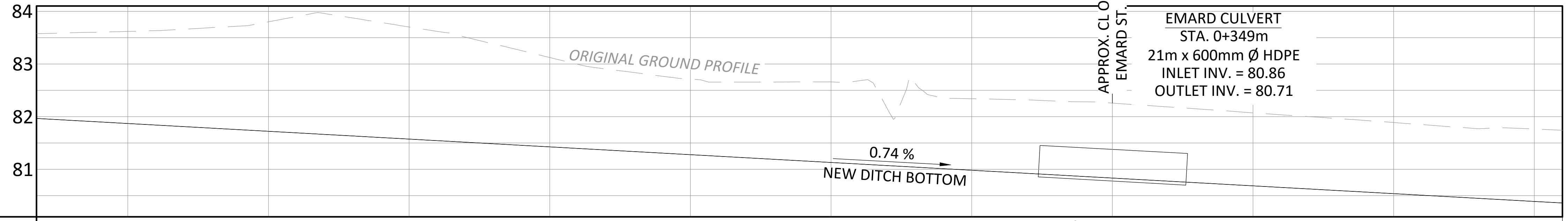
DRAWING NO. 1 OF 1

WOOD-EADIE MAIN DRAIN
PROFILE
STA. -0+010 - 0+207



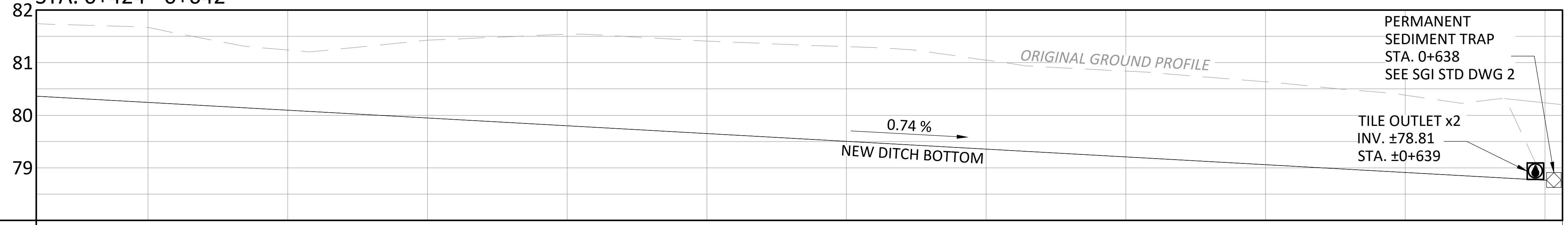
STATIONS	ELEVATIONS EX. GROUND	ELEVATIONS PR. DITCH INV.
0+000	83.63	83.50
0+020	83.88	83.35
0+040	84.55	83.20
0+060	84.76	83.06
0+080	84.72	82.91
0+100	84.29	82.76
0+120	84.04	82.61
0+140	83.95	82.46
0+160	83.98	82.32
0+180	83.86	82.17
0+200	83.55	82.02

WOOD-EADIE MAIN DRAIN
PROFILE
STA. 0+207 - 0+424

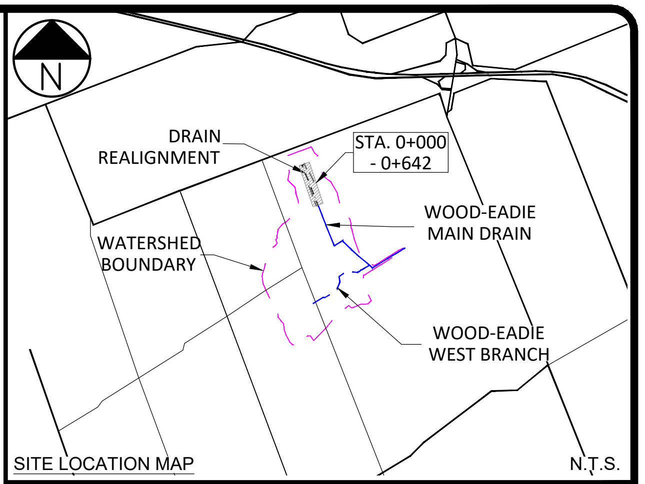


STATIONS	ELEVATIONS EX. GROUND	ELEVATIONS PR. DITCH INV.
0+220	83.62	81.87
0+240	83.80	81.72
0+260	83.70	81.58
0+280	83.12	81.43
0+300	82.71	81.28
0+320	82.66	81.13
0+340	82.34	80.98
0+360	ROAD CL 82.60 82.26	80.84
0+380	82.07	80.69
0+400	81.89	80.54
0+420	81.77	80.39

WOOD-EADIE MAIN DRAIN
PROFILE
STA. 0+424 - 0+642



STATIONS	ELEVATIONS EX. GROUND	ELEVATIONS PR. DITCH INV.
0+440	81.67	80.24
0+460	81.24	80.10
0+480	81.43	79.95
0+500	81.54	79.80
0+520	81.41	79.65
0+540	81.31	79.50
0+560	81.05	79.36
0+580	80.84	79.21
0+600	80.64	79.06
0+620	80.38	78.91
0+640	78.85	78.76



SITE LOCATION MAP

PAGE SIZE 11" x 17"
SCALE H: 1:750 V: 1:100

SHADE GROUP INC.
4625 MARCH ROAD
ALMONTE, ONTARIO
K0A 1A0

DRAIN CROSS-SECTION

SIDE SLOPES 2 HORIZONTAL TO 1 VERTICAL

BOTTOM WIDTH

STATION 0+000 TO 0+638	1m
STATION 0+638 TO 2+476	1.2m

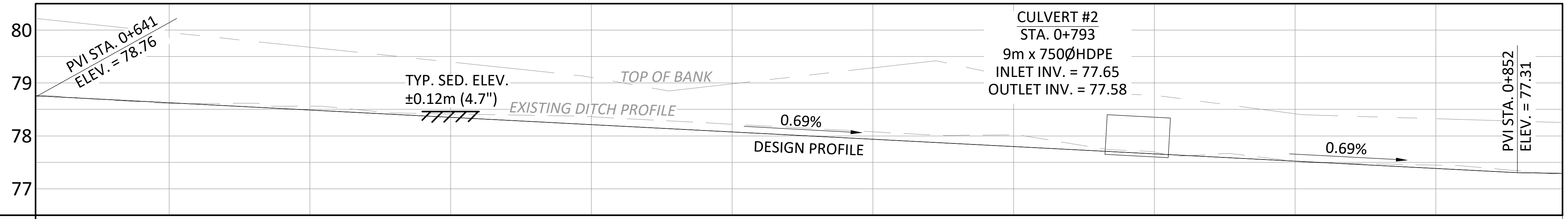
REV.	DESCRIPTION	DATE
00	ISSUED WITH ENGINEER'S REPORT	JULY 19, 2024

STAMP

LICENSED PROFESSIONAL ENGINEER
M. K. SHADE
100170995
JULY 19, 2024
PROVINCE OF ONTARIO

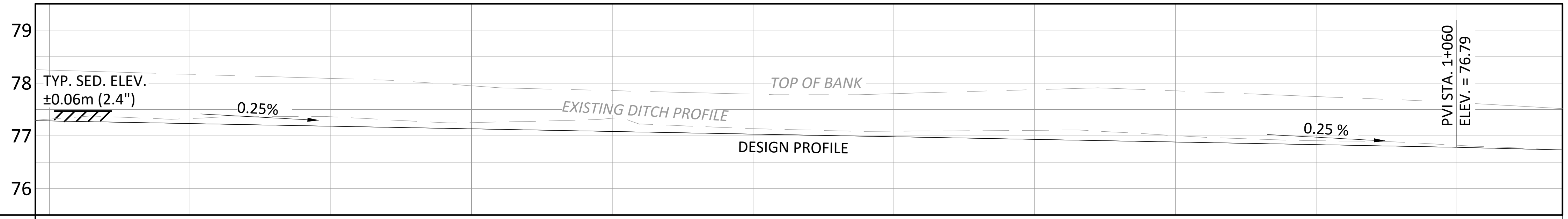
PROJECT TITLE WOOD-EADIE MAIN DRAIN
DRAWING TITLE PROFILE VIEW
STATION 0+000 TO 0+642
DRAWING NO. 1 OF 4

WOOD-EADIE MAIN DRAIN
PROFILE
STA. 0+641 - 0+858



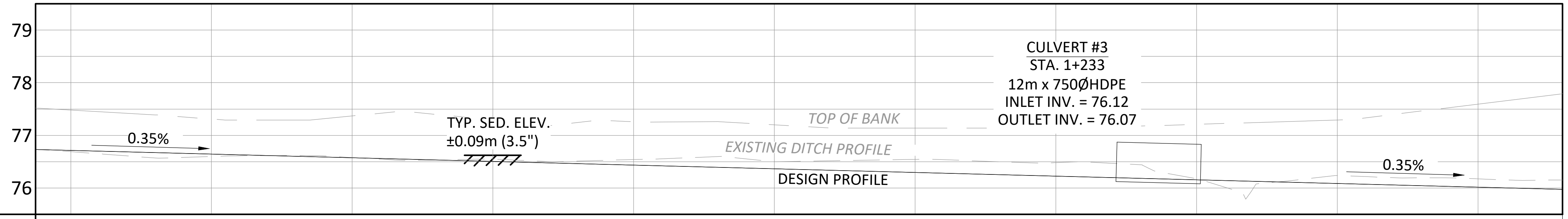
ELEVATIONS EX. GROUND	78.61	78.56	78.42	78.36	78.22	78.08	78.02	77.69	77.52	77.45
ELEVATIONS PR. DITCH INV.	78.63	78.49	78.35	78.21	78.07	77.94	77.80	77.66	77.52	77.39
STATIONS	0+660	0+680	0+700	0+720	0+740	0+760	0+780	0+800	0+820	0+840

WOOD-EADIE MAIN DRAIN
PROFILE
STA. 0+858 - 1+075

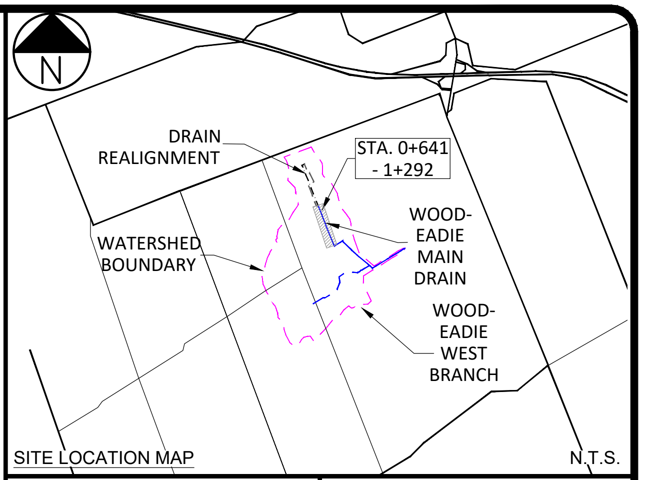


ELEVATIONS EX. GROUND	77.31	77.33	77.36	77.25	77.34	77.14	77.09	77.10	77.01	76.91	76.82
ELEVATIONS PR. DITCH INV.	77.28	77.23	77.18	77.13	77.08	77.03	76.98	76.93	76.88	76.83	76.79
STATIONS	0+860	0+880	0+900	0+920	0+940	0+960	0+980	1+000	1+020	1+040	1+060

WOOD-EADIE MAIN DRAIN
PROFILE
STA. 1+075 - 1+292



ELEVATIONS EX. GROUND	76.69	76.60	76.58	76.55	76.54	76.50	76.55	76.48	76.18	76.24	76.17
ELEVATIONS PR. DITCH INV.	76.72	76.65	76.58	76.51	76.44	76.37	76.30	76.23	76.16	76.09	76.02
STATIONS	1+080	1+100	1+120	1+140	1+160	1+180	1+200	1+220	1+240	1+260	1+280



SITE LOCATION MAP

PAGE SIZE 11" x 17"
SCALE H: 1:750 V: 1:100

SHADE GROUP INC.
4625 MARCH ROAD
ALMONTE, ONTARIO
K0A 1A0

DRAIN CROSS-SECTION

SIDE SLOPES 2 HORIZONTAL TO 1 VERTICAL

BOTTOM WIDTH

STATION 0+000 TO 0+638	1m
STATION 0+638 TO 2+476	1.2m

REV.	DESCRIPTION	DATE
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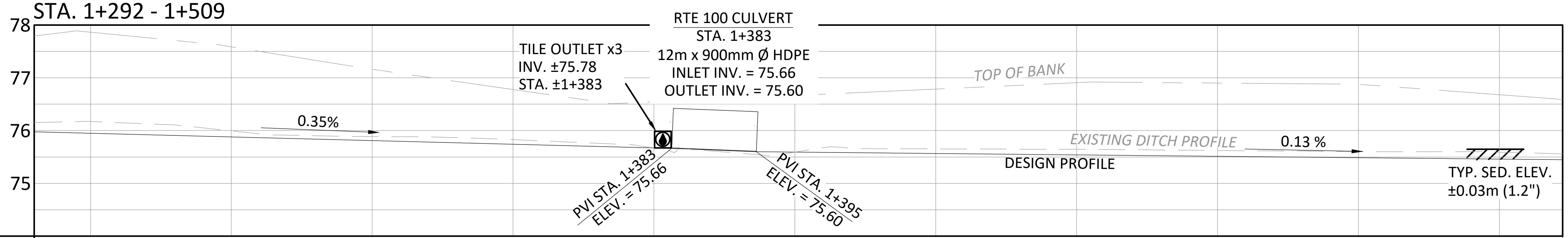
LICENSED PROFESSIONAL ENGINEER
MKShade
M. K. SHADE
100170995
JULY 19, 2024
PROVINCE OF ONTARIO

PROJECT TITLE WOOD-EADIE MAIN DRAIN

DRAWING TITLE PROFILE VIEW
STATION 0+641 TO 1+292

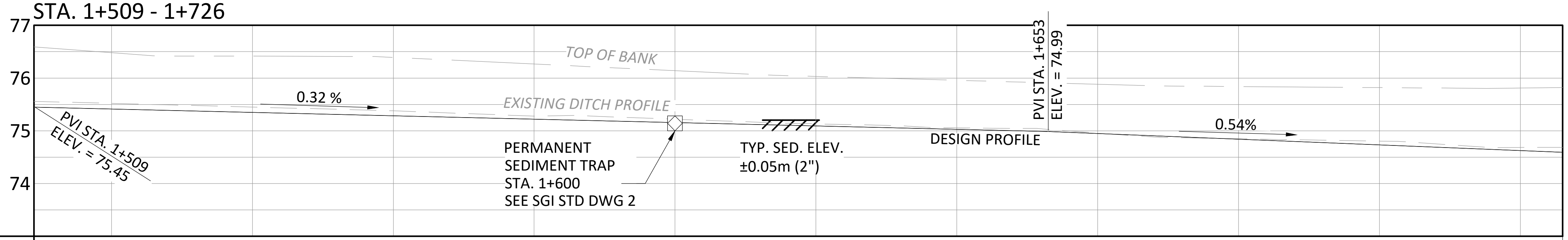
DRAWING NO. 2 OF 4

WOOD-EADIE MAIN DRAIN
PROFILE
STA. 1+292 - 1+509



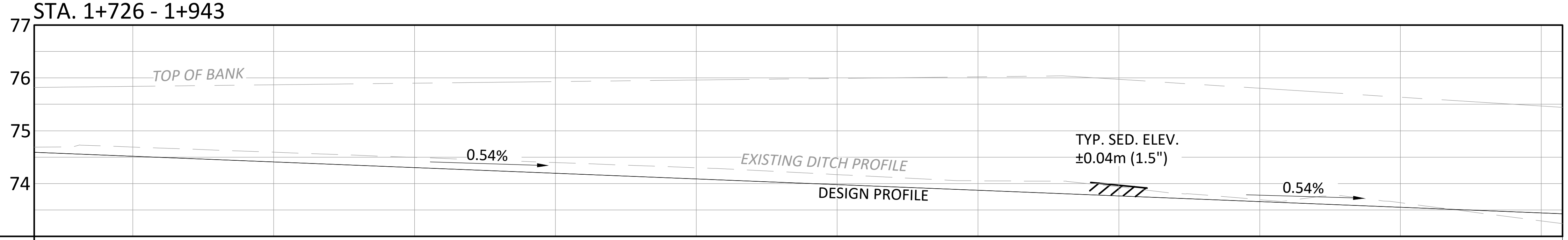
ELEVATIONS	EX. GROUND	76.17	75.99	75.89	75.83	75.67	75.59	75.65	75.65	75.62	75.60	75.59
	PR. DITCH INV.	75.95	75.88	75.81	75.74	75.67	75.59	75.56	75.54	75.51	75.49	75.46
STATIONS		1+300	1+320	1+340	1+360	1+380	1+400	1+420	1+440	1+460	1+480	1+500

WOOD-EADIE MAIN DRAIN
PROFILE
STA. 1+509 - 1+726

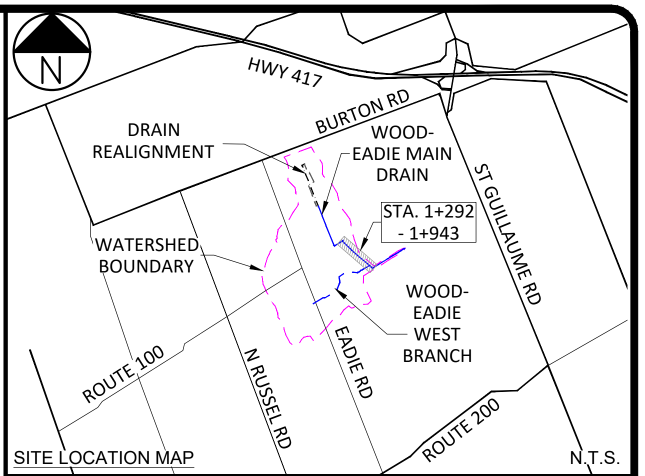


ELEVATIONS	EX. GROUND	75.52	75.45	75.38	75.28	75.22	75.13	75.06	74.96	74.85	74.81	74.68
	PR. DITCH INV.	75.41	75.35	75.28	75.22	75.16	75.09	75.03	74.95	74.84	74.73	74.63
STATIONS		1+520	1+540	1+560	1+580	1+600	1+620	1+640	1+660	1+680	1+700	1+720

WOOD-EADIE MAIN DRAIN
PROFILE
STA. 1+726 - 1+943



ELEVATIONS	EX. GROUND	74.69	74.59	74.50	74.40	74.30	74.17	74.05	73.94	73.70	73.64	73.29
	PR. DITCH INV.	74.52	74.41	74.30	74.20	74.09	73.98	73.87	73.76	73.66	73.55	73.44
STATIONS		1+740	1+760	1+780	1+800	1+820	1+840	1+860	1+880	1+900	1+920	1+940



SITE LOCATION MAP

PAGE SIZE 11" x 17"

SCALE H: 1:750 V: 1:100

SHADE GROUP INC.
4625 MARCH ROAD
ALMONTE, ONTARIO
K0A 1A0

DRAIN CROSS-SECTION

SIDE SLOPES 2 HORIZONTAL TO 1 VERTICAL

BOTTOM WIDTH

STATION 0+000 TO 0+638	1m
STATION 0+638 TO 2+476	1.2m

REV.	DESCRIPTION	DATE
00	ISSUED WITH ENGINEER'S REPORT	JULY 19, 2024

STAMP

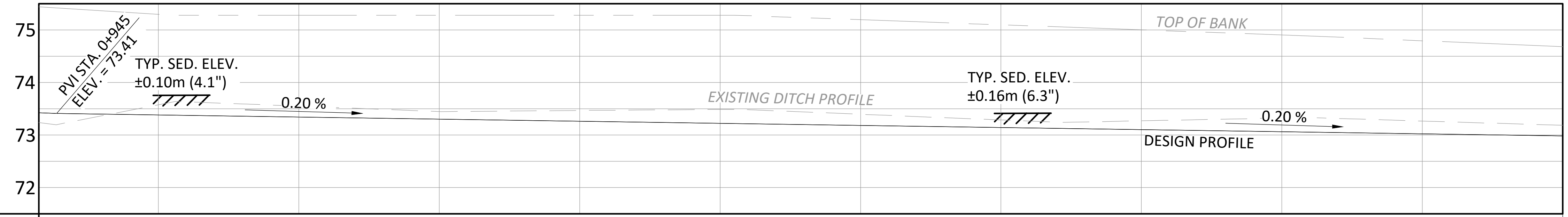
LICENSED PROFESSIONAL ENGINEER
M. K. SHADE
100170995
JULY 19, 2024
PROVINCE OF ONTARIO

PROJECT TITLE: WOOD-EADIE MAIN DRAIN

DRAWING TITLE: PROFILE VIEW
STATION 1+292 TO 1+943

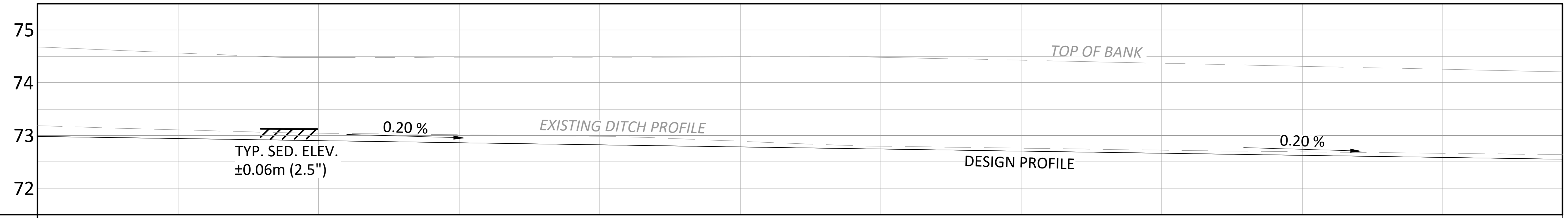
DRAWING NO. 3 OF 4

WOOD-EADIE MAIN DRAIN
PROFILE
STA. 1+943 - 2+160



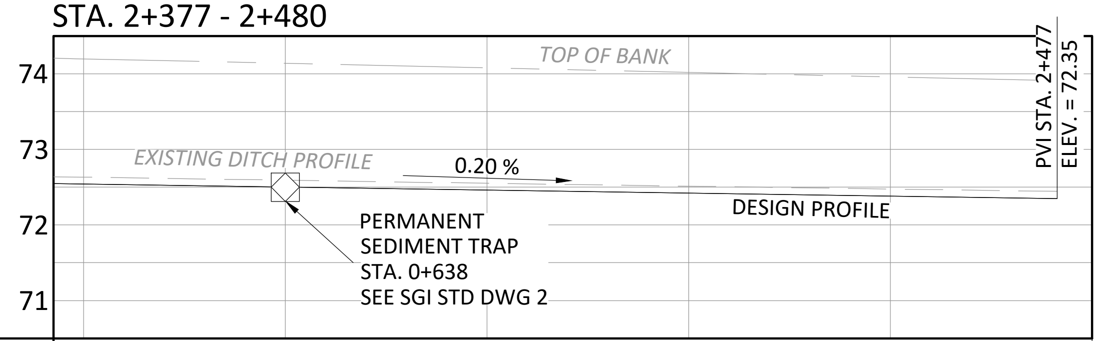
ELEVATIONS EX. GROUND	73.58	73.55	73.45	73.47	73.49	73.40	73.29	73.27	73.32	73.27
ELEVATIONS PR. DITCH INV.	73.38	73.34	73.30	73.26	73.22	73.18	73.14	73.10	73.06	73.02
STATIONS	1+960	1+980	2+000	2+020	2+040	2+060	2+080	2+100	2+120	2+140

WOOD-EADIE MAIN DRAIN
PROFILE
STA. 2+160 - 2+377



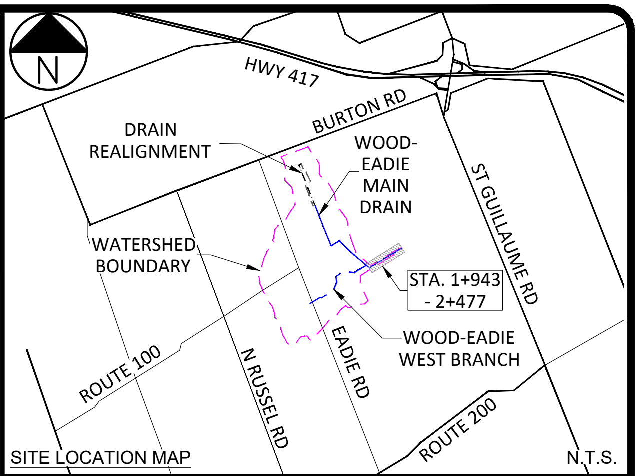
ELEVATIONS EX. GROUND	73.11	73.04	73.01	72.98	72.89	72.80	72.76	72.72	72.69	72.66
ELEVATIONS PR. DITCH INV.	72.94	72.90	72.86	72.82	72.78	72.74	72.70	72.66	72.62	72.58
STATIONS	2+180	2+200	2+220	2+240	2+260	2+280	2+300	2+320	2+340	2+360

WOOD-EADIE MAIN DRAIN
PROFILE
STA. 2+377 - 2+480



OUTLET TO EAST
BRANCH OF THE
WOOD-EADIE
MUNICIPAL DRAIN
(SEPARATE REPORT)

ELEVATIONS EX. GROUND	72.63	72.59	72.55	72.51	72.48	72.44
ELEVATIONS PR. DITCH INV.	72.54	72.50	72.46	72.42	72.38	72.35
STATIONS	2+380	2+400	2+420	2+440	2+460	2+477



SITE LOCATION MAP

PAGE SIZE 11" x 17"
SCALE H: 1:750 V: 1:100

SHADE GROUP INC.
4625 MARCH ROAD
ALMONTE, ONTARIO
K0A 1A0

SHADE GROUP INC

DRAIN CROSS-SECTION

SIDE SLOPES 2 HORIZONTAL TO 1 VERTICAL

BOTTOM WIDTH	
STATION 0+000 TO 0+638	1m
STATION 0+638 TO 2+476	1.2m

REV.	DESCRIPTION	DATE
00	ISSUED WITH ENGINEER'S REPORT	JULY 19, 2024

STAMP

LICENSED PROFESSIONAL ENGINEER
M. K. SHADE
100170995
JULY 19, 2024
PROVINCE OF ONTARIO

PROJECT TITLE WOOD-EADIE MAIN DRAIN

DRAWING TITLE PROFILE VIEW
STATION 1+940 TO 2+477

DRAWING NO. 4 OF 4

APPENDIX D

HYDROLOGY & HYDRAULICS CALCULATIONS

Methodology	**VISUAL OTTHYMO**	
Unit Hydrograph	**William's**	
Description	**Emard Street Crossing**	
Station	**0+360**	
Use	**Municipal Road Crossing - Local Road**	
Design Storm	10-Year	HW/D < 1.5
Check Storm	100-Year	<0.3m overtopping

Watershed Area A= 24.76 ha

Curve Number

Land Use	Curve Number	Area (ha)	Balanced Curve Number
Meadow	58.00	0.000	82.49
Future Industrial Lands	88.00	14.256	
Treed	55.00	0.000	
Farmed Lands	75.00	10.502	

*Reference Source: Central Oregon Stormwater Manual, Table 5-1

Runoff Coefficient

Land Use	Runoff Coefficient	Area (ha)	Balanced Runoff Coefficient
Meadow	0.20	0.000	0.46
Future Industrial Lands	0.68	14.256	
Treed	0.10	0.000	
Farmed Lands	0.15	10.502	

*Reference Source: Hydrological Analysis + Design, Richard McCuen, 2006, Table 7.9

Initial Abstraction

CN > 80<90	Ia = 0.15S
S =	53.93
Ia =	8.09

Time of Concentration

Total Overland Flow Distance (m)	Slope of Land (%)	Overland Flow Tc (min)
252	0.74	37

Ditch Length (m)	Ditch Slope (%)	Ditch Velocity (m/s)	Ditch Tc (min)
320	0.74	0.39	14

Total Tc (min)	Total Tp (hr)
50	**0.56**

Methodology	**VISUAL OTTHYMO**	
Unit Hydrograph	**William's**	
Description	**Emard Street Crossing**	
Station	**0+360**	
Use	**Municipal Road Crossing - Local Road**	
Design Storm	10-Year	HW/D < 1.5
Check Storm	100-Year	<0.3m overtopping

Shape Factor

Area (sq. miles)	Elevation Change (ft)	Watershed Length (miles)	Shape Factor
0.10	4.92	0.34	2.41

Peak Flow

Return Period	Results (m^3/s)	
2-Year	0.15	
5-Year	0.26	
10-Year	0.35	Design Storm
25-Year	0.46	
50-Year	0.55	
100-Year	0.64	Check Storm

Methodology **HY-8 RESULTS**
Description **Emard Street Crossing**
Culvert Details **600mm Ø HDPE**
Design Storm 10-Year HW/D < 1.5
Check Storm 100-Year <0.3m overtopping

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth(m)	Outlet Control Depth(m)	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.15	0.15	81.30	0.32	0.44	0.38	0.25	0.25	0.17	1.36	0.72
0.20	0.20	81.38	0.39	0.52	0.44	0.29	0.29	0.20	1.48	0.78
0.25	0.25	81.45	0.45	0.59	0.52	0.32	0.32	0.22	1.60	0.84
0.30	0.30	81.53	0.50	0.67	0.60	0.36	0.36	0.24	1.70	0.88
0.35	0.35	81.66	0.57	0.80	0.60	0.39	0.39	0.27	1.82	0.92
0.40	0.40	81.87	0.62	1.01	0.60	0.41	0.41	0.28	1.91	0.95
0.44	0.44	82.05	0.69	1.19	0.60	0.44	0.44	0.30	2.02	0.98
0.49	0.49	82.27	0.76	1.41	0.60	0.46	0.46	0.32	2.12	1.01
0.54	0.54	82.46	0.84	1.60	0.60	0.48	0.48	0.33	2.24	1.04
0.59	0.58	82.61	0.90	1.75	0.60	0.50	0.50	0.35	2.32	1.06
0.64	0.58	82.62	0.90	1.76	0.60	0.50	0.50	0.36	2.32	1.09

10-Year Check
Design Criteria HW/D < 1.5
HW = 0.57 m
D = 0.6 m
HW/D = 0.95 **Pass**

100-Year Check
Design Criteria Centerline overtopping < 0.3m
HW Elev = 82.62 m
CL Elev = 82.60 m
Overtopping = 0.02 m **Pass**

Methodology	**VISUAL OTTHYMO**	
Unit Hydrograph	**William's**	
Description	**Culvert 2**	
Station	**0+793**	
Use	**Private Recreational**	
Design Storm	5-Year	HW/D < 1.5
Check Storm	100-Year	<0.3m overtopping

Watershed Area A= 48.41 ha

Curve Number

Land Use	Curve Number	Area (ha)	Balanced Curve Number
Meadow	58.00	0.000	81.77
Future Industrial Lands	88.00	32.58	
Treed	55.00	4.79	
Farmed Lands	75.00	11.03	

*Reference Source: Central Oregon Stormwater Manual, Table 5-1

Runoff Coefficient

Land Use	Runoff Coefficient	Area (ha)	Balanced Runoff Coefficient
Meadow	0.20	0.00	0.50
Future Industrial Lands	0.68	32.58	
Treed	0.10	4.79	
Farmed Lands	0.15	11.03	

*Reference Source: Hydrological Analysis + Design, Richard McCuen, 2006, Table 7.9

Initial Abstraction

CN > 80<90	Ia = 0.15S
S =	56.63
Ia =	8.49

Time of Concentration

Total Overland Flow Distance (m)	Slope of Land (%)	Overland Flow Tc (min)
252	0.74	34

Ditch Length (m)	Ditch Slope (%)	Ditch Velocity (m/s)	Ditch Tc (min)
641	0.74	0.39	27
152	0.73	0.39	6

Total Tc (min)	Total Tp (hr)
68	**0.76**

Methodology	**VISUAL OTTHYMO**	
Unit Hydrograph	**William's**	
Description	**Culvert 2**	
Station	**0+793**	
Use	**Private Recreational**	
Design Storm	5-Year	HW/D < 1.5
Check Storm	100-Year	<0.3m overtopping

Shape Factor

Area (sq. miles)	Elevation Change (ft)	Watershed Length (miles)	Shape Factor
0.19	16.40	0.60	2.06

Peak Flow

Return Period	Results (m^3/s)	
2-Year	0.30	
5-Year	0.54	Design Storm
10-Year	0.72	
25-Year	0.96	
50-Year	1.15	
100-Year	1.34	Check Storm

Methodolo **HY-8 RESULTS**
Description **Culvert 2**
Culvert Det **750mm Ø HDPE**
Design Stor 5-Year HW/D < 1.5
Check Stor 100-Year <0.3m overtopping

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth(m)	Outlet Control Depth(m)	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.30	0.3	78.18	0.50	0.53	0.44	0.29	0.31	0.25	1.46	0.88
0.40	0.40	78.29	0.61	0.64	0.54	0.35	0.35	0.29	1.71	0.95
0.54	0.54	78.43	0.77	0.78	0.68	0.41	0.41	0.33	1.95	1.03
0.61	0.61	78.52	0.86	0.85	0.68	0.44	0.44	0.36	2.05	1.07
0.72	0.72	78.68	1.03	0.99	0.68	0.48	0.48	0.38	2.20	1.12
0.82	0.82	78.87	1.22	1.19	0.68	0.51	0.51	0.41	2.36	1.16
0.92	0.89	79.01	1.36	1.32	0.68	0.53	0.53	0.44	2.46	1.19
1.03	0.89	79.03	1.37	1.33	0.68	0.54	0.54	0.46	2.47	1.23
1.13	0.9	79.04	1.39	1.35	0.68	0.54	0.55	0.48	2.45	1.26
1.24	0.9	79.05	1.40	1.35	0.68	0.54	0.57	0.50	2.39	1.29
1.34	0.91	79.06	1.41	1.37	0.68	0.54	0.59	0.52	2.34	1.32

5-Year Check
Design Crite HW/D < 1.5
HW = 0.77 m
D = 0.75 m
HW/D = 1.03 **Pass**

100-Year Check
Design Crite Centerline overtopping < 0.3m
HW Elev = 79.06 m
CL Elev = 79.03 m
ertopping = 0.03 m **Pass**

Methodology	**VISUAL OTTHYMO**	
Unit Hydrograph	**William's**	
Description	**Culvert 3**	
Station	**1+233**	
Use	**Farm Access**	
Design Storm	5-Year	HW/D < 1.5
Check Storm	100-Year	<0.3m overtopping

Watershed Area A= 91.87 ha

Curve Number

Land Use	Curve Number	Area (ha)	Balanced Curve Number
Meadow	58.00	0.000	77.48
Future Industrial Lands	88.00	32.58	
Treed	55.00	9.78	
Farmed Lands	75.00	49.51	

*Reference Source: Central Oregon Stormwater Manual, Table 5-1

Runoff Coefficient

Land Use	Runoff Coefficient	Area (ha)	Balanced Runoff Coefficient
Meadow	0.20	0.00	0.33
Future Industrial Lands	0.68	32.58	
Treed	0.10	9.78	
Farmed Lands	0.15	49.51	

*Reference Source: Hydrological Analysis + Design, Richard McCuen, 2006, Table 7.9

Initial Abstraction

CN > 70<80	Ia = 0.10S
S =	73.82
Ia =	7.38

Time of Concentration

Total Overland Flow Distance (m)	Slope of Land (%)	Overland Flow Tc (min)
252	0.74	44

Ditch Length (m)	Ditch Slope (%)	Ditch Velocity (m/s)	Ditch Tc (min)
641	0.74	0.39	27
159	0.73	0.39	7
433	0.34	0.27	27

Total Tc (min)	Total Tp (hr)
105	**1.17**

Methodology	**VISUAL OTTHYMO**	
Unit Hydrograph	**William's**	
Description	**Culvert 3**	
Station	**1+233**	
Use	**Farm Access**	
Design Storm	5-Year	HW/D < 1.5
Check Storm	100-Year	<0.3m overtopping

Shape Factor

Area (sq. miles)	Elevation Change (ft)	Watershed Length (miles)	Shape Factor
0.35	22.97	0.86	2.44

Peak Flow

Return Period	Results (m^3/s)	
2-Year	0.44	
5-Year	0.78	Design Storm
10-Year	1.05	
25-Year	1.40	
50-Year	1.67	
100-Year	1.96	Check Storm

Methodology **HY-8 RESULTS**
Description **Culvert 3**
Culvert Detail **750mm Ø HDPE**
Design Storm 5-Year HW/D < 1.5
Check Storm 100-Year <0.3m overtopping

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth(m)	Outlet Control Depth(m)	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.44	0.44	76.89	0.65	0.70	0.68	0.36	0.39	0.36	1.67	0.74
0.59	0.59	77.06	0.84	0.87	0.68	0.43	0.45	0.42	1.94	0.80
0.78	0.72	77.32	1.04	1.12	0.68	0.48	0.51	0.48	2.10	0.86
0.90	0.73	77.33	1.05	1.14	0.68	0.48	0.54	0.52	1.99	0.89
1.05	0.72	77.35	1.04	1.16	0.68	0.48	0.58	0.56	1.87	0.93
1.20	0.71	77.37	1.02	1.17	0.68	0.48	0.62	0.60	1.77	0.96
1.35	0.70	77.38	1.00	1.19	0.68	0.47	0.65	0.63	1.69	0.99
1.50	0.67	77.39	0.96	1.20	0.68	0.46	0.68	0.66	1.62	1.02
1.66	0.66	77.41	0.94	1.21	0.68	0.46	0.68	0.69	1.59	1.05
1.81	0.65	77.42	0.93	1.22	0.68	0.45	0.68	0.72	1.57	1.07
1.96	0.64	77.43	0.91	1.23	0.68	0.45	0.68	0.75	1.54	1.09

5-Year Check

Design Criteri HW/D < 1.5
HW = 1.04 m
D = 0.75 m
HW/D = 1.39 **Pass**

100-Year Check

Design Criteri Centerline overtopping < 0.3m
HW Elev = 77.43 m
CL Elev = 77.30 m
)vertopping = 0.13 m **Pass**

SHADE GROUP INC

Methodology	**VISUAL OTTHYMO**	
Unit Hydrograph	**William's**	
Description	**Route 100**	
Station	**1+383**	
Use	**Farm Access**	
Design Storm	10-Year	HW/D < 1.5
Check Storm	100-Year	<0.3m overtopping

Watershed Area A= 91.87 ha

Curve Number

Land Use	Curve Number	Area (ha)	Balanced Curve Number
Meadow	58.00	0.000	77.48
Future Industrial Lands	88.00	32.58	
Treed	55.00	9.78	
Farmed Lands	75.00	49.51	

*Reference Source: Central Oregon Stormwater Manual, Table 5-1

Runoff Coefficient

Land Use	Runoff Coefficient	Area (ha)	Balanced Runoff Coefficient
Meadow	0.20	0.00	0.33
Future Industrial Lands	0.68	32.58	
Treed	0.10	9.78	
Farmed Lands	0.15	49.51	

*Reference Source: Hydrological Analysis + Design, Richard McCuen, 2006, Table 7.9

Initial Abstraction

CN > 70<80	Ia = 0.10S
S =	73.82
Ia =	7.38

Time of Concentration

Total Overland Flow Distance (m)	Slope of Land (%)	Overland Flow Tc (min)
252	0.74	44

Ditch Length (m)	Ditch Slope (%)	Ditch Velocity (m/s)	Ditch Tc (min)
641	0.74	0.39	27
159	0.73	0.39	7
433	0.34	0.27	27

Total Tc (min)	Total Tp (hr)
105	**1.17**

Methodology	**VISUAL OTTHYMO**	
Unit Hydrograph	**William's**	
Description	**Route 100**	
Station	**1+383**	
Use	**Farm Access**	
Design Storm	10-Year	HW/D < 1.5
Check Storm	100-Year	<0.3m overtopping

Shape Factor

Area (sq. miles)	Elevation Change (ft)	Watershed Length (miles)	Shape Factor
0.35	22.97	0.86	2.44

Peak Flow

Return Period	Results (m^3/s)	
2-Year	0.44	
5-Year	0.78	
10-Year	1.05	Design Storm
25-Year	1.40	
50-Year	1.67	
100-Year	1.96	Check Storm

Methodolog **HY-8 RESULTS**
Description **Route 100**
Culvert Det **900mm Ø HDPE**
Design Stor 10-Year HW/D < 1.5
Check Storn 100-Year <0.3m overtopping

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth(m)	Outlet Control Depth(m)	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.44	0.44	76.21	0.55	0.45	0.35	0.39	0.46	0.46	1.33	0.52
0.59	0.59	76.32	0.66	0.55	0.41	0.45	0.53	0.53	1.50	0.56
0.74	0.74	76.42	0.76	0.66	0.47	0.51	0.60	0.60	1.66	0.60
0.90	0.90	76.57	0.86	0.91	0.53	0.56	0.65	0.65	1.82	0.63
1.05	1.05	76.66	0.96	1.00	0.58	0.61	0.70	0.70	1.98	0.65
1.20	1.20	76.75	1.07	1.09	0.65	0.65	0.74	0.74	2.13	0.67
1.35	1.35	76.85	1.19	1.19	0.72	0.69	0.79	0.79	2.29	0.70
1.50	1.50	76.99	1.33	1.29	0.90	0.72	0.83	0.83	2.46	0.71
1.66	1.66	77.14	1.48	1.41	0.90	0.75	0.86	0.86	2.64	0.73
1.81	1.79	77.29	1.63	1.54	0.90	0.78	0.90	0.90	2.82	0.75
1.96	1.82	77.32	1.66	1.60	0.90	0.78	0.90	0.93	2.87	0.76

10-Year Check
Design Crite HW/D < 1.5
HW = 1.00 m
D = 0.9 m
HW/D = 1.11 Pass

100-Year Check
Design Crite Centerline overtopping < 0.3m
HW Elev = 77.32 m
CL Elev = 77.28 m
ertopping = 0.04 m Pass

SHADE GROUP INC

Methodology	**VISUAL OTTHYMO**	
Unit Hydrograph	**William's**	
Description	**Wood-Eadie Main Drain Watershed**	
Station	**2+476**	
Use	**Cross-Section Design**	
Design Storm	10-Year	0+000 to 0+638
Design Storm	2-Year	0+638 - 2+476
Check Storm	100-Year	

Watershed Area A= 240.09 ha

Curve Number

Land Use	Curve Number	Area (ha)	Balanced Curve Number
Meadow	58.00	0.000	70.40
Future Industrial Lands	88.00	32.580	
Treed	55.00	76.345	
Farmed Lands	75.00	131.167	

*Reference Source: Central Oregon Stormwater Manual, Table 5-1

Runoff Coefficient

Land Use	Runoff Coefficient	Area (ha)	Balanced Runoff Coefficient
Meadow	0.20	0.000	0.21
Future Industrial Lands	0.68	32.580	
Treed	0.10	76.345	
Farmed Lands	0.15	131.167	

*Reference Source: Hydrological Analysis + Design, Richard McCuen, 2006, Table 7.9

Initial Abstraction

CN > 70<80	Ia = 0.10S
S =	106.77
Ia =	10.68

Time of Concentration

Total Overland Flow Distance (m)	Slope of Land (%)	Overland Flow Tc (min)
252	0.74	51

Ditch Length (m)	Ditch Slope (%)	Ditch Velocity (m/s)	Ditch Tc (min)
641	0.74	0.42	25
211	0.69	0.41	9
208	0.25	0.25	14
322	0.35	0.29	18
12	0.53	0.36	1
115	0.13	0.18	11
144	0.32	0.28	9
292	0.54	0.36	13
532	0.20	0.22	40

Total Tc (min)	Total Tp (hr)
191	**2.14**

SHADE GROUP INC

Methodology	**VISUAL OTTHYMO**	
Unit Hydrograph	**William's**	
Description	**Wood-Eadie Main Drain Watershed**	
Station	**2+476**	
Use	**Cross-Section Design**	
Design Storm	10-Year	0+000 to 0+638
Design Storm	2-Year	0+638 - 2+476
Check Storm	100-Year	

Shape Factor

Area (sq. miles)	Elevation Change (ft)	Watershed Length (miles)	Shape Factor
0.93	32.81	1.48	3.37

Peak Flow

Return Period	Results (m^3/s)	
2-Year	0.55	
5-Year	1.07	
10-Year	1.48	Design Storm
25-Year	2.05	
50-Year	2.50	
100-Year	2.97	Check Storm

Cross-Section Capacity Review
Wood-Eadie Main Drain

Peak Flow Calculations	Visual Otthymo
Capacity Calculations	Manning's Equation

Station 0+793

Peak Flow

Return Period	Results (m^3/s)
2-Year	0.15
5-Year	0.26
10-Year	0.35
25-Year	0.46
50-Year	0.55
100-Year	0.64

Bottom Width =	1.00	m	
Depth =	0.91	m	
Side Slopes	50.00	%	(2:1)

Rougness Coeff	0.03	
Channel Slope	0.69	%
Area	2.57	m^2
Wetted Perimeter	5.07	m
R	0.51	m
Q	4.51	m^3/s

Cross-Section Capacity Review
Wood-Eadie Main Drain

Peak Flow Calculations	Visual Otthymo
Capacity Calculations	Manning's Equation

Station 1+383

Peak Flow

Return Period	Results (m^3/s)
2-Year	0.44
5-Year	0.78
10-Year	1.05
25-Year	1.40
50-Year	1.67
100-Year	1.96

Bottom Width =	0.91	m	
Depth =	0.91	m	
Side Slopes	50.00	%	(2:1)

Rougness Coeff	0.03	
Channel Slope	0.25	%
Area	2.48	m^2
Wetted Perimeter	4.98	m
R	0.50	m
Q	2.60	m^3/s

Cross-Section Capacity Review
Wood-Eadie Main Drain

Peak Flow Calculations	Visual Otthymo
Capacity Calculations	Manning's Equation

Station 2+476

Peak Flow

Return Period	Results (m^3/s)
2-Year	0.55
5-Year	1.07
10-Year	1.48
25-Year	2.05
50-Year	2.50
100-Year	2.97

Bottom Width =	1.20	m	
Depth =	0.91	m	
Side Slopes	50.00	%	(2:1)

Rougness Coeff	0.03	
Channel Slope	0.25	%
Area	2.75	m^2
Wetted Perimeter	5.27	m
R	0.52	m
Q	2.97	m^3/s

APPENDIX E

CONSTRUCTION SPECIFICATIONS
AND STANDARD DRAWINGS

Please refer to the following construction specifications and instructions for the proposed realignment and maintenance works.

Earth Moving Operations (Realignment – Station 0+000 – 0+638)

Earth moving operations shall be considered all works associated with the excavation of the new channel and backfill of the existing channel, as per the supplied engineered plans enclosed in Appendix C of this Engineer's Report.

Payment for this item shall be a lump sum price presented by the contractor for all labour and equipment required to complete the prescribed works, or by hourly rates if otherwise agreed upon by the Township's Drainage Superintendent and the proponent. Layout is to be the responsibility of the contractor and is to be approved by the Township's Drainage Superintendent or the Drainage Engineer prior to commencement of construction.

Excavation of New Ditch (Realignment – Station 0+000 – 0+638)

The new bottom of the ditch shall be excavated to an even grade so that no water may lie stagnant therein.

The new channel shall be excavated in conformance with the specifications outlined herein and in conformance with the engineered plans included in Appendix C of the Engineer's Report.

Design Criteria	Specification
Side Slopes	2 Horizontal to 1 Vertical
Grade	0.74%
Bottom Width	1m

The excavated material shall be used to backfill the existing channel alignment; but only after the entire length of the new channel has been constructed, so as not to block flow within the existing channel, and to ensure continued positive outlet for the upstream landowner's tile outlet. This order of construction may be altered only through written approval from the applicable permitting agencies.

Works shall be completed in low or no flow conditions. Works shall be completed as efficiently as possible; works should not be left partially started and unattended for long periods of time. It is expected that the duration of the realignment works shall be no more than 2 weeks from start-to-finish, unless otherwise authorized by the Township's Drainage Superintendent, Township's staff, the applicable permitting agencies or the engineer.

Works shall be completed in conformance with the permit specifications from the applicable approval agencies. Permits received have been enclosed with **Appendix H** and are to be read in full by the contractor prior to commencing construction. Copies of the permits are to be kept on-site during construction.

All construction works are to be overseen by the Township's Drainage Superintendent, qualified Township staff or by the Engineer.

Backfill of Existing Ditch (Realignment – Station 0+000 – 0+638)

The contractor shall fill in the abandoned ditch (throughout its entire length from shoulder to shoulder with the excavated material taken from the drain. In some cases, this work may entail transportation of the excavated material from one end of the field to the other by trucks or other equipment. Estimated cut/fill calculations suggest there should be adequate amount of material generated by the excavation to account for the backfill of the abandoned channel. However, it is acknowledged that these cut/fill calculations are estimates only and additional fill material *may* be required. Where additional fill material is required, material used for fill shall be appropriate clean fill.

Backfill of the existing ditch shall not occur until after the realignment construction is complete so as not to cause any blockages of the existing channel.

The proposed channel relocation is expected to move the channel away from the natural depression of the land, which may mean that lands to the east of the relocation will no longer naturally drain to the channel. As the area is slated for development, it is expected that regrading works would occur as part of the development process, during which time the lands would be regraded to allow for overland sheet flow towards the realigned channel. Regrading of the adjacent lands does not form part of the scope of work associated with the channel relocation and shall be considered the responsibility of the private land owner (or to be addressed as part of future development of the lands).

Maintenance (Station 0+638 – 2+476)

Maintenance works shall include for all labour and equipment to complete the works outlined on the enclosed engineering plans. That shall include works such as reshaping of banks (where specified), bottom only cleanout, removal of large obstructions (e.g. trees that have fallen into or onto the drain), etc.

Additional maintenance works may be specified by the Drainage Superintendent. Maintenance works shall conform with the limitations of the applicable permit, both for pending maintenance, and future maintenance.

Disposal of Materials

The excavated earth/silt material taken from the drain shall be disposed of by spreading it over the adjoining lands of the same owner, unless otherwise noted within this Report. In cultivated lands, the depth of spread material shall not exceed 6 inches above grade and relief channels shall be cut to allow surface water to continue to sheet flow into the drain – so as not to berm the adjacent lands by the excavated materials. Materials shall be taken to a minimum of 3m back from the top of slope in wooded areas, and a minimum of 5m from top of bank on agricultural lands.

In wooded areas, brush shall be cut and grubbed (see brushing for equipment access item) prior to spreading, with spreading not to exceed 12 inches.

Hardpan or rock are not anticipated to be encountered; however should they be – the disposal as required would be as a change order to the contract with costs assessed to the drain in fitting with the assessment schedule for maintenance.

Brushing for Equipment Access (Including Tree Removal)

At locations along the drain it may be necessary to conduct brushing activities or minor tree cutting to clear a path to allow equipment to access the drain and conduct current and future maintenance works.

Brushing and tree removal for equipment access is to be completed on the working platform side as dictated in Table 11 of the Engineer's Report. Tree removal may also include the downing of dead trees near the drain that appear as though they may, in time, fall into the drain.

The removal of large, healthy trees, should be avoided where possible, and works should be limited to those required to complete the maintenance works.

Trees larger having a diameter of 150mm or larger are to be delimbed and cut in reasonable lengths (max 5m). All shall be stacked neatly away from the drain so that the property owners may salvage or dispose of the material as they so choose.

Relocation of the material and/or removal/disposal may be negotiated between the Contractor and the property owner, but any additional incurred costs would be the responsibility of the landowner, and such additional incurred costs should be billed under separate contract, directly between the Contractor and the requesting landowner.

Tile Outlet Protection

Rock protection shall be installed at all tile outlets. It shall be the landowner's responsibility to mark tile outlets. Observed tile outlets have been marked on the enclosed plans (Appendix C). Tile outlets may require extension and rodent grates; but such works shall only be completed at the direction of the Drainage Engineer or Township Drainage Superintendent during site works. Tile outlet protection works are to be completed in accordance with the standard drawing (Std. Dwg 6) as enclosed at the end of these written construction specifications.

The tile outlet protection is considered to be a permanent erosion control measure and shall be reinstated as needed during future maintenance practices.

Payment for this item will be per meter squared with measurements made in place. Payment will only be made for the area of rock protection as denoted on the engineered plans, or as agreed to in advance by the Drainage Engineer or Drainage Superintendent. Payment will be per the unit price tendered and shall include for all labour, equipment and material required to complete the works as prescribed.

Rip-Rap for Bank Stabilization

Rock protection shall be installed at those locations shown on the enclosed plans (Appendix C) to provide bank stabilization. The rock shall be underlain with geotextile and shall be placed with machinery capable of controlling the drop of the rock, rather than dumped over the edge of the bank. The rock shall be placed immediately following preparation of the banks. The minimum thickness of the rock shall be 300mm unless otherwise specified in the engineered plans. The rock shall be angular in nature. It shall be installed along both the inner and outer bank, as well as along the bottom width and is to be embedded. A standard drawing for the rock protection for bank stabilization has been included at the end of these written construction specifications.

The rock protection is considered to be a permanent erosion control measure and shall be reinstated as needed during future maintenance practices.

Payment for this item will be per meter squared with measurements made in place. Payment will only be made for the area of rock protection as denoted on the engineered plans, or as agreed to in advance by the Drainage Engineer or Drainage Superintendent. Payment will be per the unit price tendered and shall include for all labour, equipment and material required to complete the works as prescribed.

End-Treatment for Culverts

Rock protection shall be installed as per the enclosed specifications (Standard Drawing enclosed at the end of these construction specifications). End treatments serve to prevent erosion and scour at the upstream and downstream limits of the culvert.

The end treatment rock protection is considered to be a permanent erosion control measure and shall be reinstated as needed during future maintenance practices.

Payment shall include all materials, labour, and equipment, including rock and geotextile in accordance with the enclosed standard drawing.

Culvert Installation

Culvert crossings to be installed (new) or replaced have been shown on the enclosed engineering plans. Culverts are to be installed with an embedment of 10% of the height or the diameter of the pipe, below the invert of the drain. All bedding, back fill and surface courses shall be in accordance with the applicable provincial standards.

Sediment Trap Installation

Sediment traps have been proposed in various locations throughout the project.

A standard drawing for the sediment traps has been included at the end of these written construction specifications. Installation of the sediment traps includes the installation of a rock check dam, as per the specifications found on the enclosed standard drawing. Standard drawings for the rock check dam are also enclosed and construction is to be completed in conformance with these specifications.

These sediment traps are considered as permanent erosion control measures and shall be reinstated during future maintenance works.

Payment for the sediment traps and their associated rock flow check dams will be on a per unit basis. Unit pricing should account for all labour, equipment and materials required to install the sediment traps and their associated check dams.

Seeding

The newly excavated channel is to be seeded as soon as possible after excavation. Seed may be hand spread or hydroseeded, whichever is most economical.

Seed mix shall be in conformance with OPSS.Muni 804: Crown Vetch Mix or Lowland Mix. Should the contractor wish to deviate from the specifications, it will need to be demonstrated that the proposed seed mix is appropriate for the intended application.

Seed shall not be placed from November 1 through April 30 of any calendar year. Should excavation occur between November 1 and April 30, seeding shall be done as soon as possible after April 30, or as directed by the Township's Drainage Superintendent or the Drainage Engineer.

Payment for this item shall be by the square meter for placement within the prescribed areas. The prescribed area is limited to the banks and bottom of the excavated channel. Payment will not be made for any areas seeded outside the prescribed area. The unit pricing is to account for all labour, materials and equipment required to complete the seeding.

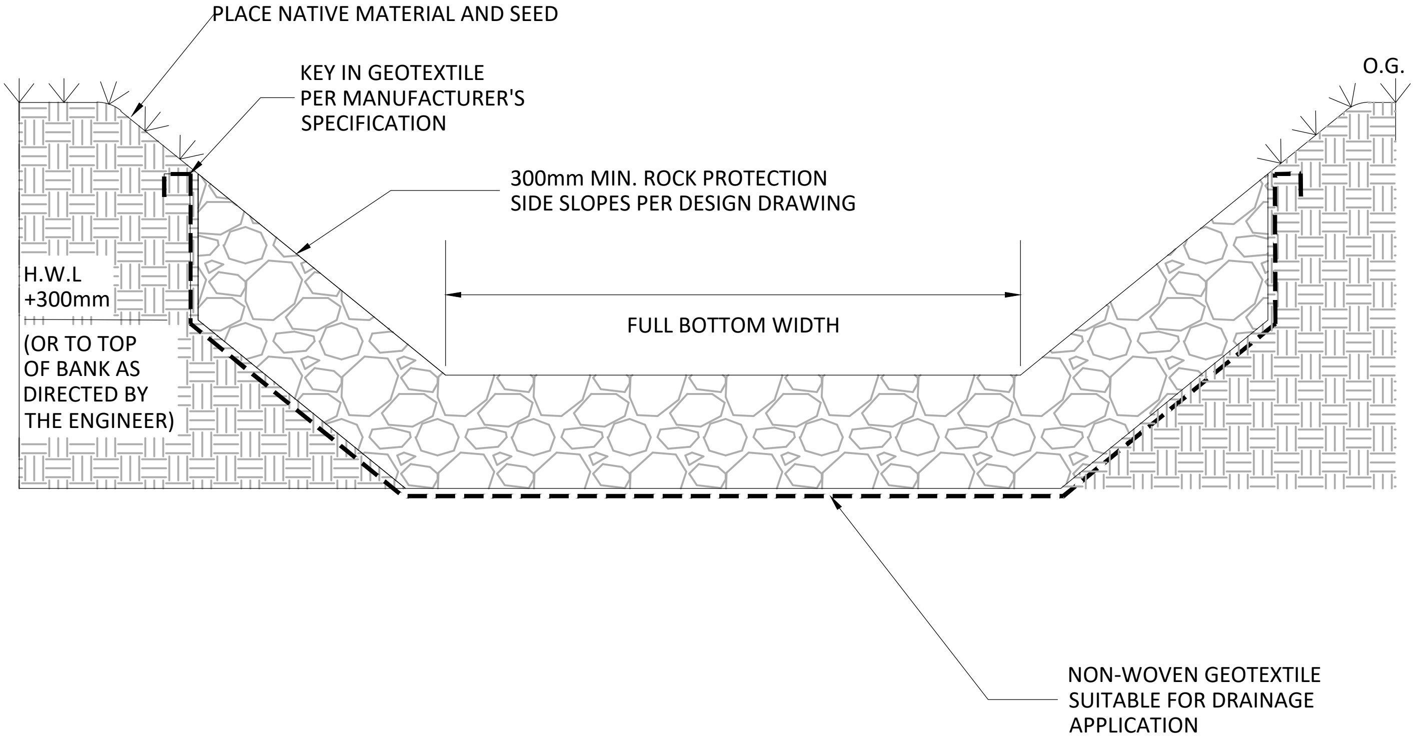
The contractor will not be paid for reinstatement of other areas disturbed by construction activities.

Temporary Erosion and Sediment Control Measures

Temporary erosion and sediment control measures shall include the erection of silt fencing around the base of excavated stockpiles. Connection of the realignment to the existing channel shall not occur until after the entire realignment has been excavated. Additional temporary erosion and sediment control measures shall include the placement of a strawbale check dam at the downstream end of the newly excavated channel.

Additional temporary measures may also be required to the satisfaction of the permitting agencies or at the direction of the engineer or Drainage Superintendent. It shall be the contractor's responsibility to maintain these measures after every rainfall event (>10mm) and as required throughout construction to ensure they are operating as per standard industry practice. On-going maintenance of the temporary erosion and sediment control measures is to be continued until such a time as sufficient vegetation has established to stabilize the banks and bottom of the system; to the satisfaction of the engineer, permitting agencies or Drainage Superintendent. Eventual removal and proper disposal of the erosion and sediment control measures, following site stabilization, shall be considered part of the contract.

Payment for this item shall include all supply, installation, and on-going maintenance until such a time as the Drainage Engineer or Drainage Superintendent deems it appropriate to remove the erosion control measures.



NOTE:

1. SURFACE OF ROCK PROTECTION TO BE FLUSH WITH THE FINISHED SURFACE OF DRAIN UPSTREAM AND DOWNSTREAM OF THE EROSION CONTROL. MIN. SIDE SLOPE AS SPECIFIED IN THE ENGINEER'S REPORT OR THE CONTRACT DRAWINGS.

2. ROCK TO BE R-50 PER OPSS 1004.05.05.02 OR OPSS 1004.05.05.03. BLAST ROCK MAY BE SUBSTITUTED SUBJECT TO ENGINEER APPROVAL.

PETITION DRAIN STANDARD DRAWING

TYPICAL ROCK PROTECTION EROSION CONTROL

DETAIL DWG.NO.
SGI STD. DWG. 1

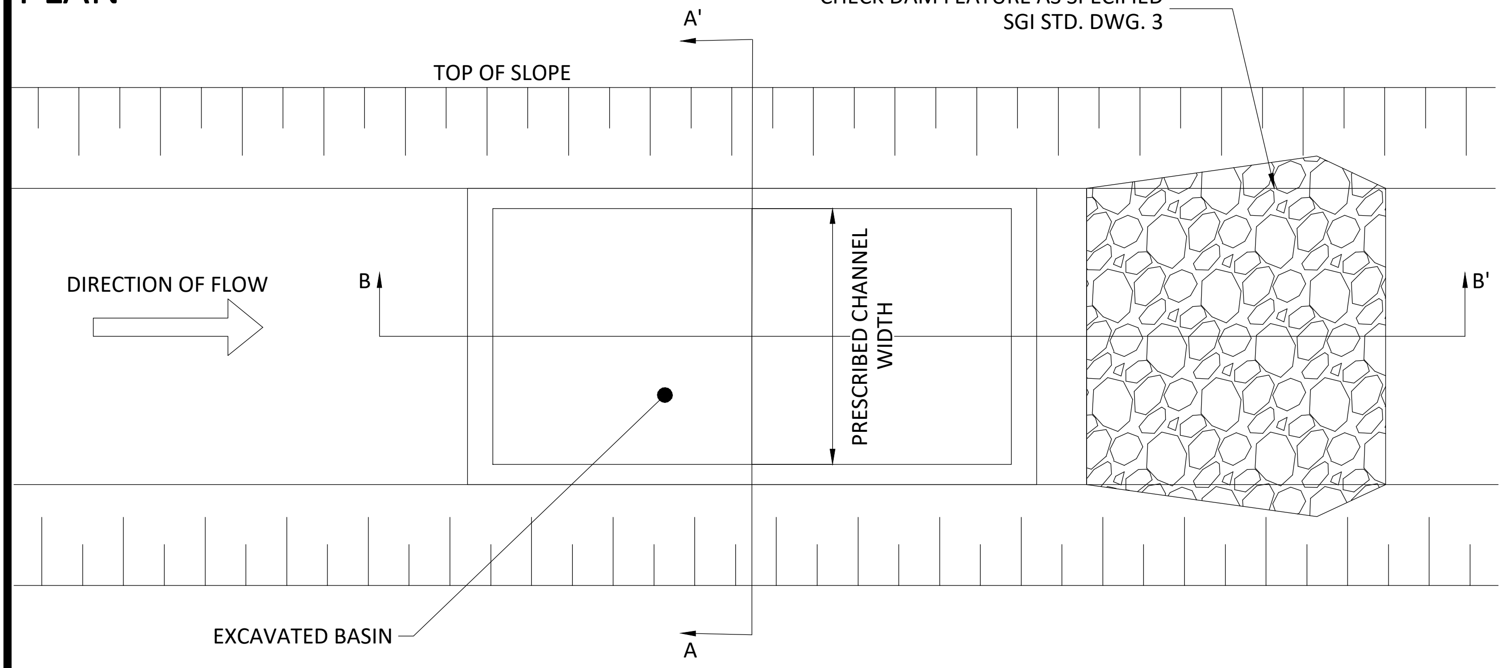
REVISION
1.0

DATE
Jan/24

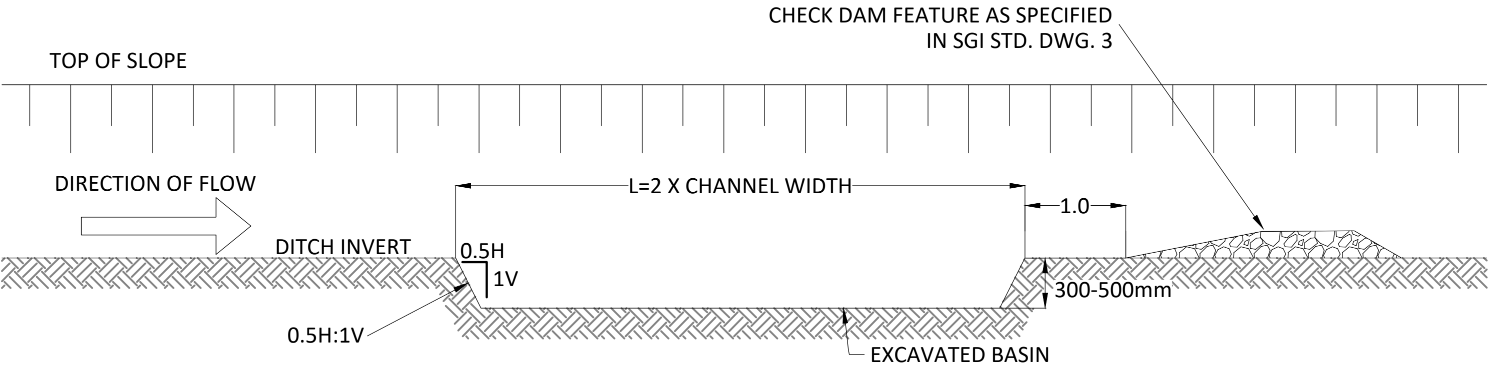
SCALE
N.T.S

SHADE GROUP INC

PLAN



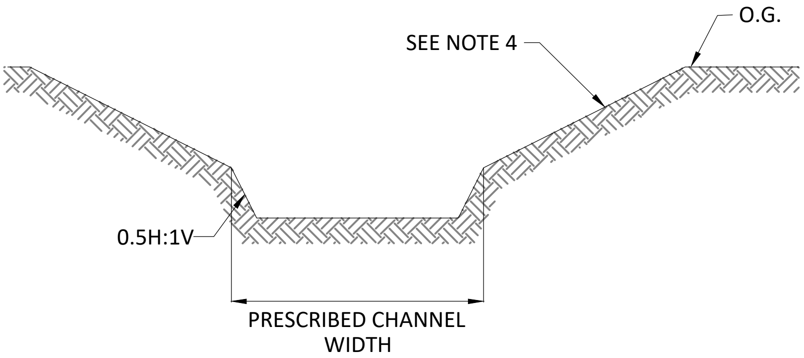
SECTION B-B'



NOTES:

1. THIS DRAWING MODIFIES OPSD 219.220
2. DITCH CROSS-SECTION UPSTREAM OR DOWNSTREAM OF SEDIMENT TRAP MAY BE FLAT BOTTOM OR V-SHAPED, FLAT BOTTOM SHOWN.
3. THIS STANDARD DRAWING SHALL BE READ IN CONJUNCTION WITH OPSD 219.180 OR 219.191 OR 219.211 FOR THE SPECIFIED CHECK DAM FEATURE.
4. MIN. SIDE SLOPES AS SPECIFIED IN ENGINEER'S REPORT OR CONTRACT DRAWINGS
5. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

SECTION A-A'



PETITION DRAIN STANDARD DRAWING

EXCAVATED SEDIMENT TRAP

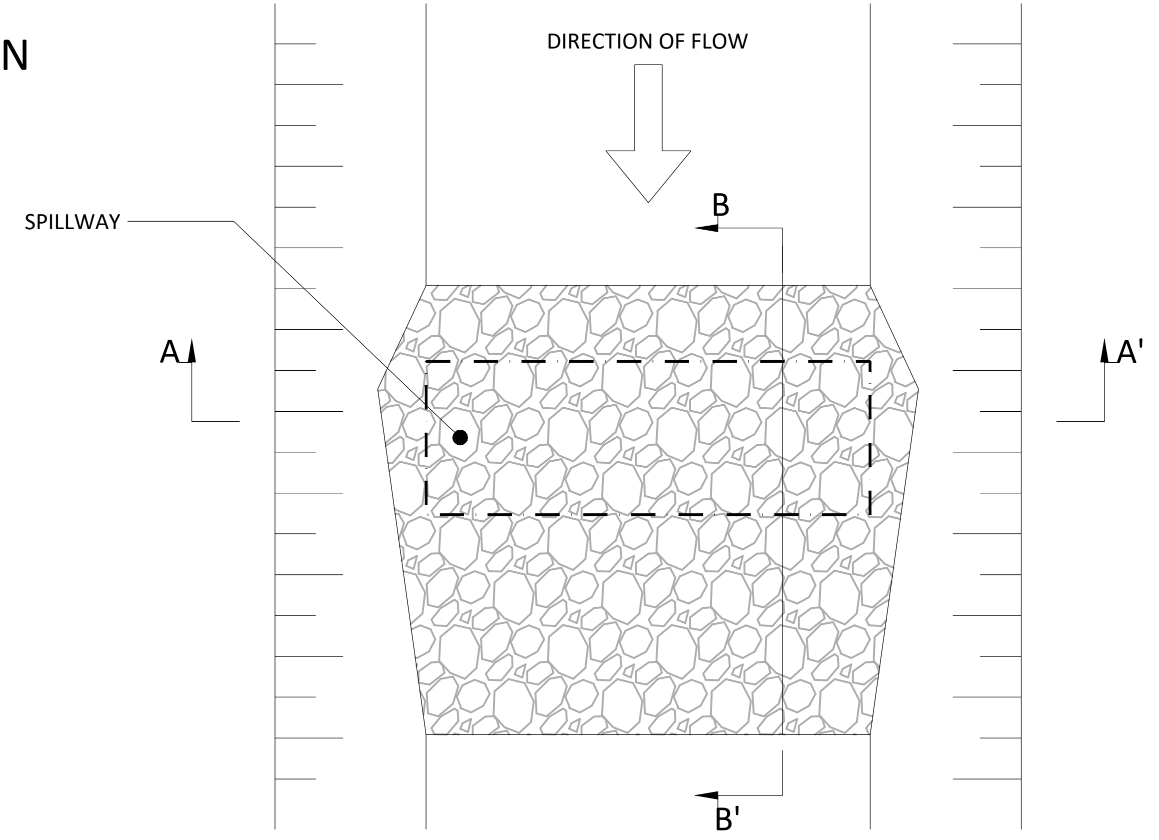
DETAIL DWG.NO.
SGI STD. DWG. 2

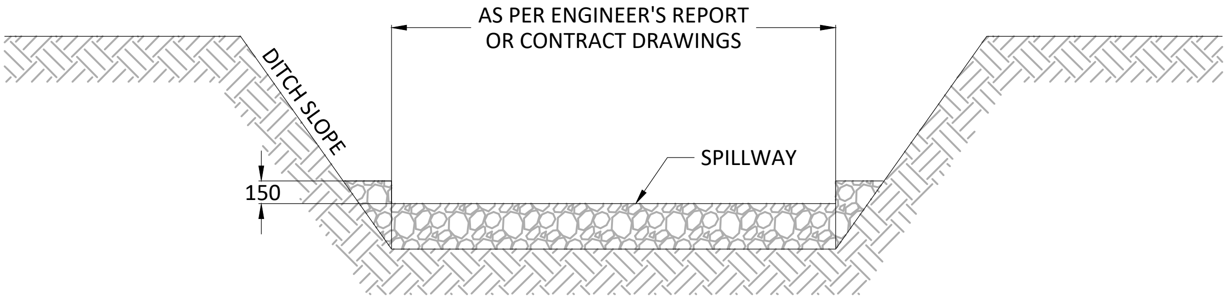
REVISION
1.0

DATE
Jan/24

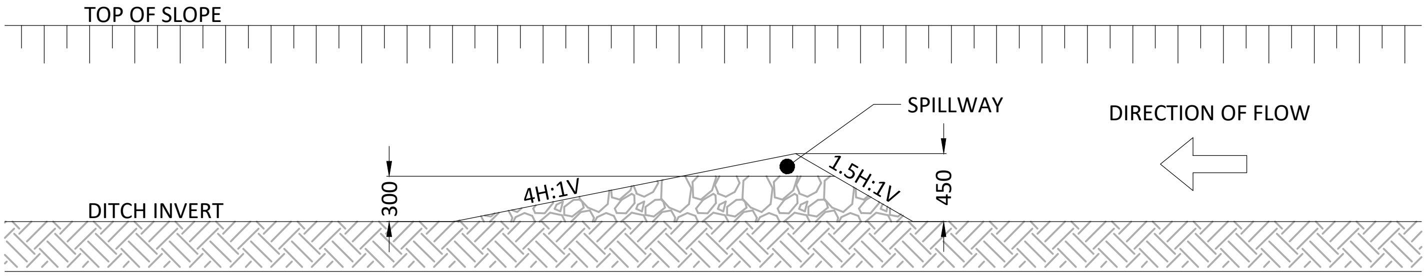
SCALE
N.T.S

PLAN





SECTION A-A'



SECTION B-B'

NOTE:

1. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
2. THIS DRAWING IS A MODIFICATION OF OPSD 219.211

PETITION DRAIN STANDARD DRAWING

ROCK FLOW CHECK DAM

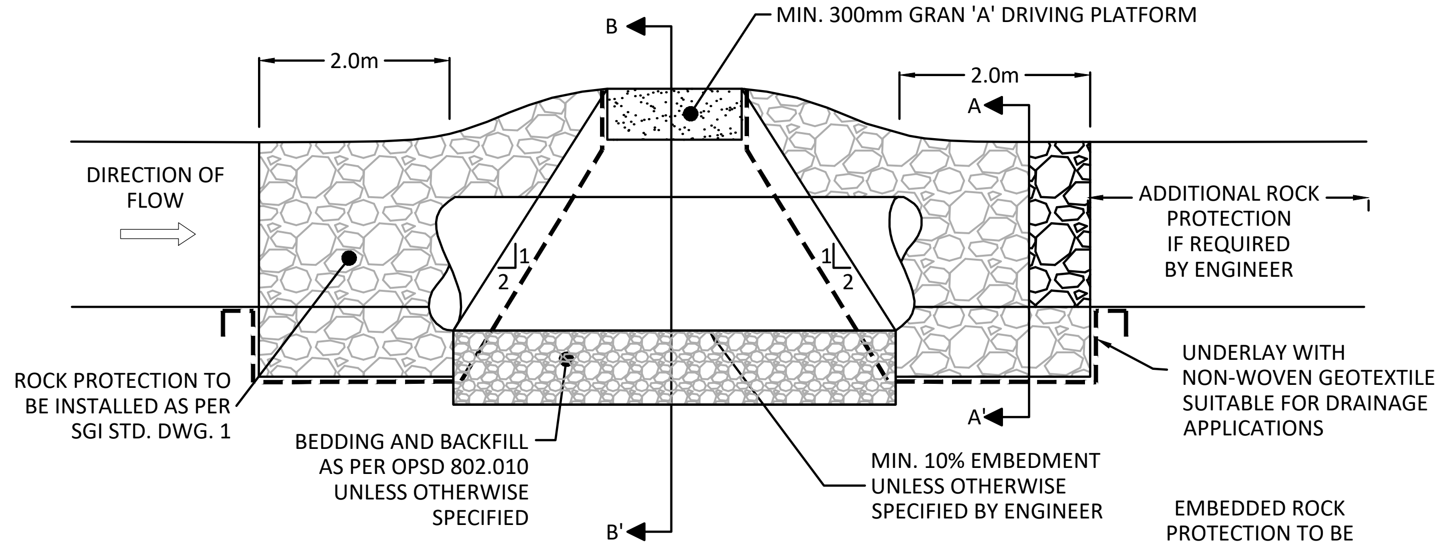
DETAIL DWG.NO.
SGI STD. DWG. 3

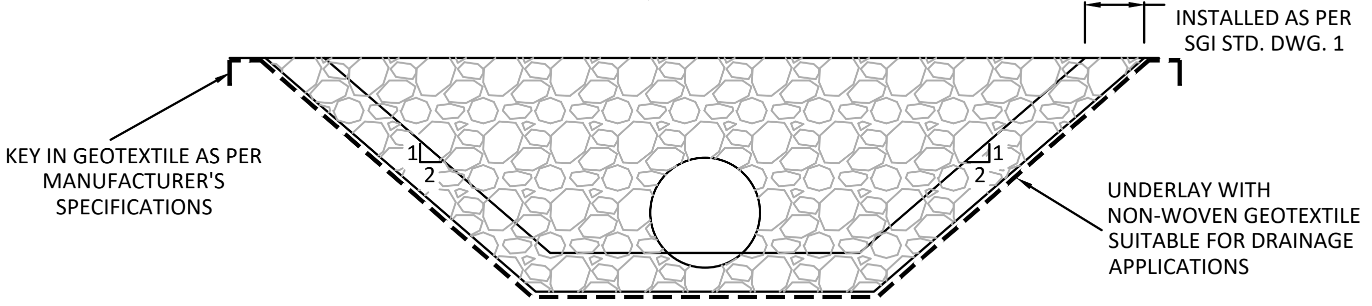
REVISION
1.0

DATE
Jan/24

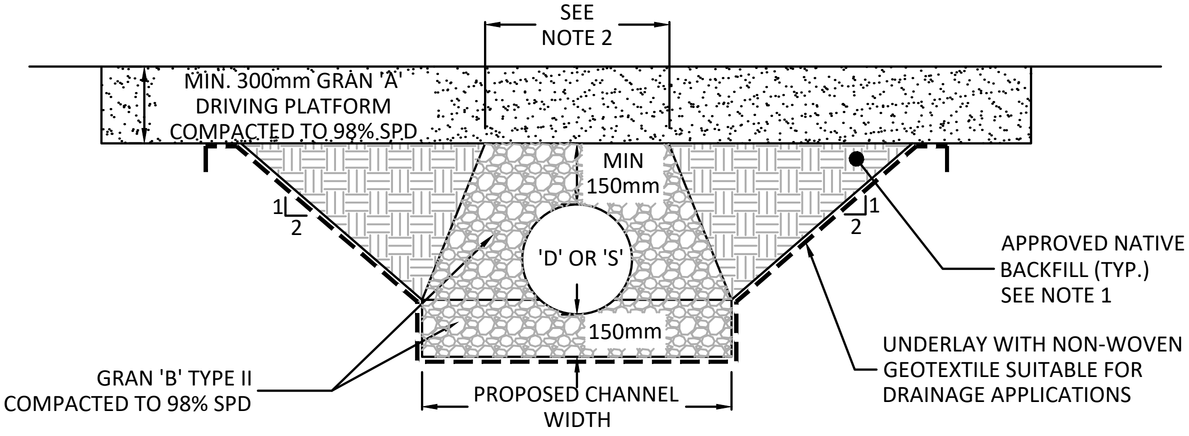
SCALE
N.T.S

SHADE GROUP INC





SECTION A-A'

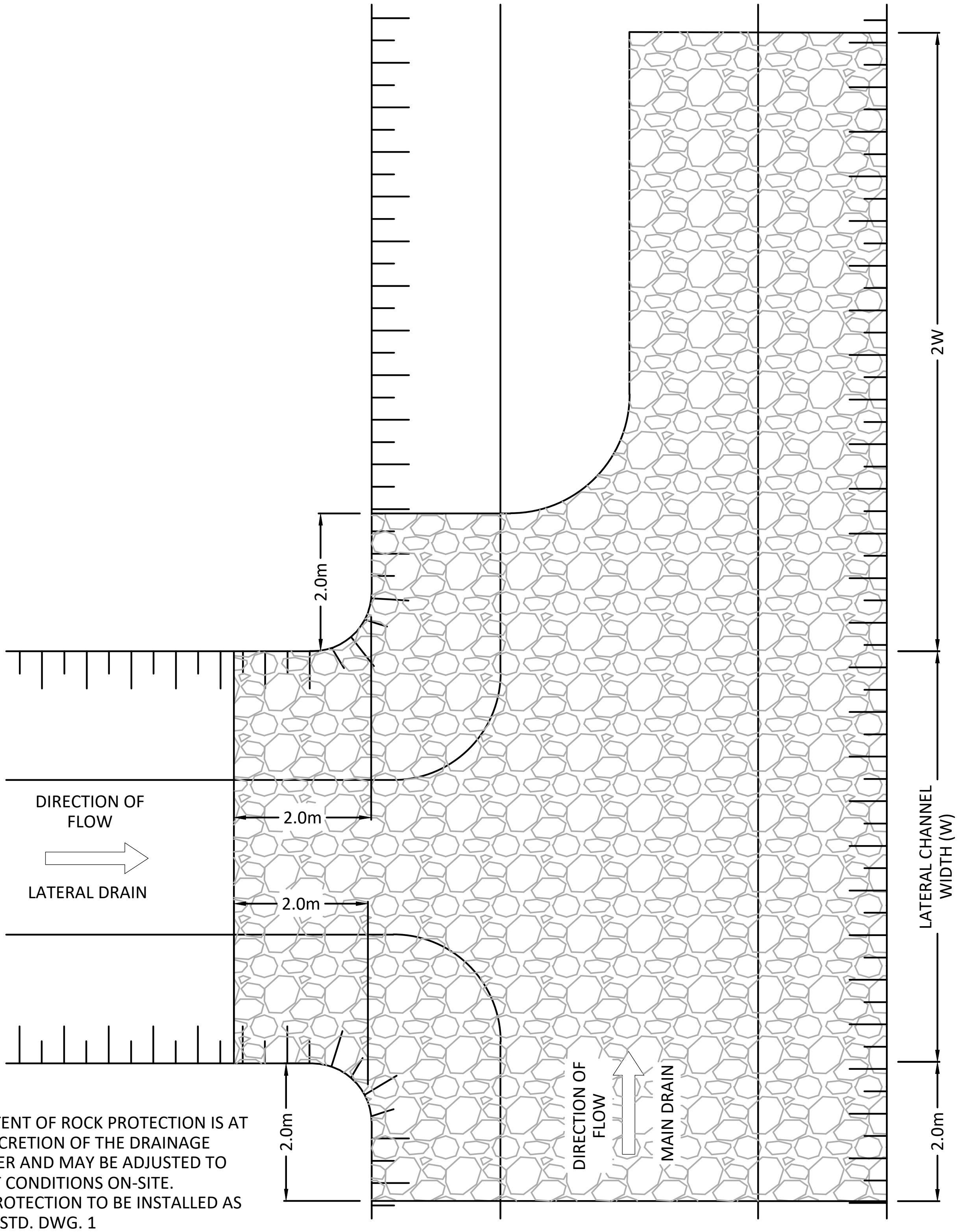


SECTION B-B'

NOTES:

1. APPROVED NATIVE BACKFILL MATERIAL MAY CONSIST OF DRY CLAY, SAND OR GRANULAR MATERIAL WITH NO LARGE STONES, BOULDERS, DEBRIS OR ORGANIC MATERIAL. BACKFILL MUST BE PLACED IN LIFTS NOT EXCEEDING 300mm IN THICKNESS AND COMPACTED. ALL REQUIREMENTS FOR GRANULAR BEDDING, COVER AND SURFACE COURSE MUST BE MET PRIOR TO PLACING ANY BACKFILL.
2. FOR CIRCULAR CULVERTS, THE TOP-WIDTH OF COVER MATERIAL SHALL BE A MINIMUM OF THE DIAMETER OF THE PIPE ('D') PLUS 0.5 X 'D' EACH WAY FOR A TOTAL OF 2.0 X 'D'. FOR ARCH CULVERTS, THE TOP-WIDTH OF COVER MATERIAL SHALL BE A MINIMUM OF THE SPAN OF THE PIPE ('S') PLUS 0.75 X 'S' EACH WAY FOR A TOTAL OF 2.5 X 'S'. THE MINIMUM BOTTOM WIDTH SHALL CONFORM WITH THE PROPOSED CHANNEL WIDTH UPSTREAM/DOWNSTREAM OF THE CULVERT.
3. FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR ALL PIPES.

PETITION DRAIN STANDARD DRAWING	DETAIL DWG.NO. SGI STD. DWG. 4		SHADE GROUP INC
CULVERT INLET/END PROTECTION	REVISION 00	DATE FEB/24	
	SCALE N.T.S		



NOTE:

1. THE EXTENT OF ROCK PROTECTION IS AT THE DISCRETION OF THE DRAINAGE ENGINEER AND MAY BE ADJUSTED TO REFLECT CONDITIONS ON-SITE.
2. ROCK PROTECTION TO BE INSTALLED AS PER SGI STD. DWG. 1

PETITION DRAIN STANDARD DRAWING

ROCK PROTECTION AT INTERSECTIONS

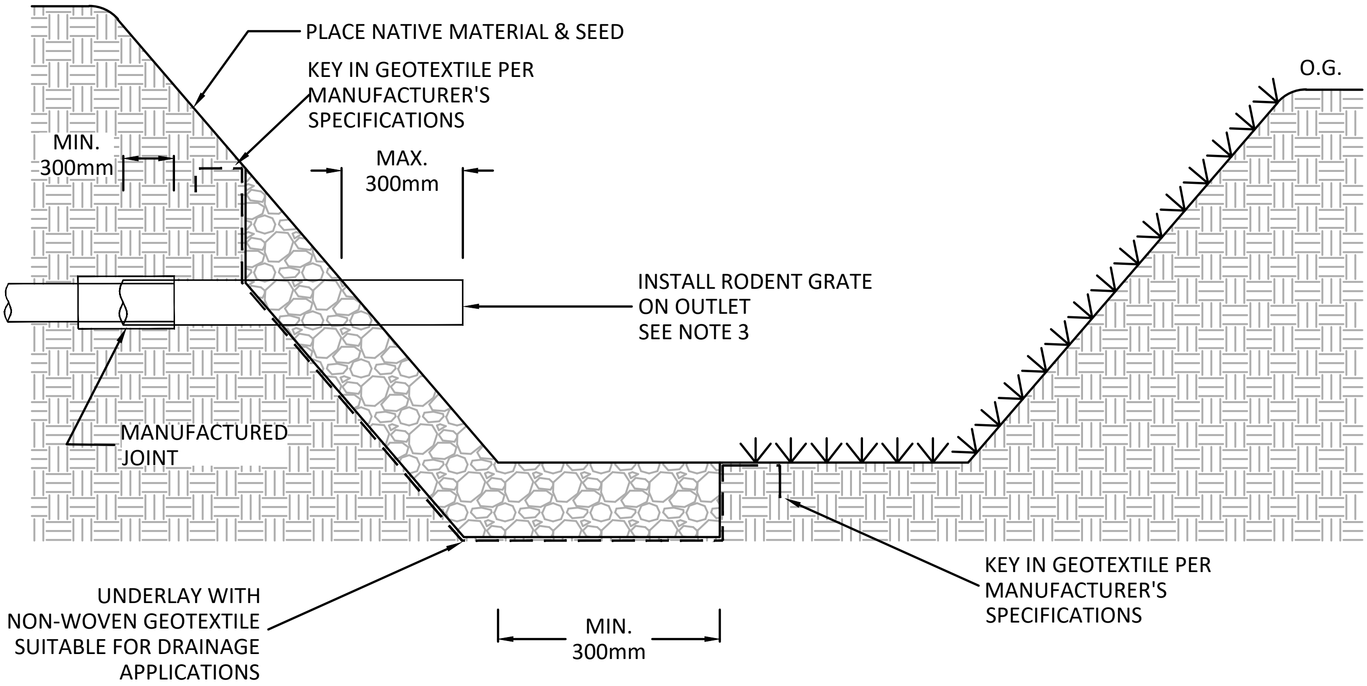
DETAIL DWG.NO.
SGI STD. DWG. 5

REVISION
00

DATE
FEB/24

SCALE
N.T.S

SHADE GROUP INC



NOTES:

1. ROCK PROTECTION TO BE PLACED AS REQUIRED TO PREVENT EROSION. THE SURFACE TO BE FLUSH WITH THE STREAM BED AND BANK. ROCK PROTECTION TO EXTEND A MINIMUM OF 1m UPSTREAM AND 1m DOWNSTREAM OF THE TILE OUTLET.
2. THE PREFERRED CONNECTION BETWEEN THE OUTLET AND THE FIELD TILE IS TO BE A LOCKING MANUFACTURED JOINT, OTHER METHODOLOGY INCLUDES A TAPE SEALED JOINT ENCASED IN CONCRETE OR OVERLAP JOINT (MIN. 300mm) ENCASED IN CONCRETE.
3. A RODENT GRATE IS TO BE INSTALLED AT THE END OF THE TILE OUTLET WITHIN 48 HOURS OF CONNECTION COMPLETION.
4. MIN. SIDE SLOPE IS 1 VERTICAL TO 2 HORIZONTAL OR AS SPECIFIC IN THE ENGINEER'S REPORT.
5. FOR ROCK PROTECTION, USE R-50 RIP-RAP AS PER OPSS MUNI 1004.05.05.02

PETITION DRAIN STANDARD DRAWING

TYPICAL TILE OUTLET PROTECTION

DETAIL DWG.NO.
SGI STD. DWG. 6

REVISION
00

DATE
FEB/24

SCALE
N.T.S

SHADE GROUP INC

APPENDIX F

CONSTRUCTION COST ESTIMATES

Rev 01 - July 2024

Project Cost Estimate
Wood-Eadie Drain - Partial Realignment

Construction Estimate

Item	Unit	Quantity	Cost/Unit	Total
Site Preparation Activities				
Mobilization	Lump Sum	100%	$ 2,500.00	$ 2,500.00
Silt Fence (around excavation stockpiles)	m	300	$ 5.00	$ 1,500.00
Strawbale Check Dam	ea	4	$ 250.00	$ 1,000.00
Excavation Activities				
Earth Excavation - New Channel	m^3	2285	$ 10.00	$ 22,850.00
Earth Moving - Backfill	m^3	1900	$ 5.00	$ 9,500.00
Earth Moving - Excess Material *Spreading*	m^3	385	$ 2.00	$ 770.00
Reinstatement Activities				
Seeding	m^2	5000	$ 0.50	$ 2,500.00
Sediment Trap w. Rock Check Dam	ea	1	$ 1,000.00	$ 1,000.00
600mm HDPE Culvert	m	21	$ 380.00	$ 7,980.00
Rip-rap - end treatment culvert	ea	2	$ 500.00	$ 1,000.00
Rock Protection - Bank Stabilization	m^2 (P)	50	$ 60.00	$ 3,000.00
Sub-Total - Construction Costs				**$ 53,600.00**
Contingency Allowance - Construction	10%			$ 5,360.00
Sub-Total - Construction Costs (Pre-Tax)				**$ 58,960.00**

Administration/Engineering Estimate

Item	Unit	Quantity	Cost/Unit	Total
Permitting				
SNCA	Lump Sum	100%	$ 2,330.00	$ 2,330.00
Engineering				
Engineer's Report	Lump Sum	1	$ 53,300.00	$ 53,300.00
Sub-Total - Administration/Engineering Costs (Pre-Tax)				**$ 55,630.00**

Summary

Sub-Total - Construction Costs (Pre-Tax)	$ 58,960.00
Sub-Total - Administration/Engineering Costs (Pre-Tax)	$ 55,630.00
Estimated Project Total	**$ 114,590.00**

SHADE GROUP INC

Project Cost Estimate
Wood-Eadie Drain - Maintenance

Construction Estimate

Item	Unit	Quantity	Cost/Unit	Total
Site Preparation Activities				
Mobilization	Lump Sum	100%	$ 2,500.00	$ 2,500.00
Turbidity Curtain	ea	1	$ 1,000.00	$ 1,000.00
Strawbale Check Dam	ea	6	$ 250.00	$ 1,500.00
Clearing for Access through Wooded Areas	m	862	$ 10.00	$ 8,620.00
Excavation Activities				
Earth Excavation - Maintenance	m	1838	$ 10.00	$ 18,380.00
Earth Moving - Spreading	m	1838	$ 2.00	$ 3,676.00
Reinstatement Activities				
Seeding	m^2	9000	$ 0.50	$ 4,500.00
Sediment Trap w. Rock Check Dam	ea	2	$ 1,000.00	$ 2,000.00
750mm HDPE Culvert	m	12	$ 450.00	$ 5,400.00
Rip-rap - culvert end treatment (1 each per end of cvt)	ea	4	$ 750.00	$ 3,000.00
Rip-rap - tile outlets	ea	2	$ 600.00	$ 1,200.00
Rock Protection - Bank Stabilization	m^2 (P)	150	$ 60.00	$ 9,000.00
Sub-Total - Construction Costs				**$ 60,776.00**
Contingency Allowance - Construction	10%			$ 6,077.60
Sub-Total - Construction Costs (Pre-Tax)				**$ 66,853.60**

Rev 01 - July 2024

Project Cost Estimate

Wood-Eadie Drain - West Branch - Maintenance

Construction Estimate

Item	Unit	Quantity	Cost/Unit	Total
Site Preparation Activities				
Mobilization	Lump Sum	100%	$ 2,500.00	$ 2,500.00
Strawbale Check Dam	ea	3	$ 250.00	$ 750.00
Clearing for Access through Wooded Areas	m	550	$ 10.00	$ 5,500.00
Excavation Activities				
Earth Excavation - Maintenance	m	1054	$ 10.00	$ 10,540.00
Earth Moving - Spreading	m	1054	$ 5.00	$ 5,270.00
Reinstatement Activities				
Seeding	m^2	2500	$ 0.60	$ 1,500.00
Sub-Total - Construction Costs				$ 26,060.00
Contingency Allowance - Construction	10%			$ 2,606.00
Sub-Total - Construction Costs (Pre-Tax)				**$ 28,666.00**

APPENDIX G

RESOLUTION + BY-LAW

TOWNSHIP OF

RUSSELL

CERTIFIED RESOLUTION

Date: August 28, 2023 **Item no.:** 15 (ref. 11 k)

Subject: Appointment of an Engineer to Update the Municipal Drain Report - Report IS-PW-16-2023

Moved by: Mike Tarnowski
Seconded by: Marc Lalonde

That Council receive report IS-PW-16-2023 dated August 28, 2023 and approve to appoint Shade Group Inc under Section 78 of the Drainage Act R.S.O. 1990 to be the engineer firm updating the engineer report of the Wood Eadie Municipal Drain.

MOTION APPROVED

I, Joanne Camiré Laflamme, Clerk of the Corporation of the Township of Russell, hereby certify that the foregoing is a true copy of the resolution adopted by the Council of the Corporation of the Township of Russell on the 28th day of August 2023.

Joanne Camiré Laflamme

Joanne Camiré Laflamme
Greffière

APPENDIX H

PERMITS

SOUTH NATION
CONSERVATION
DE LA NATION SUD

Permit No. 2024-RUS-R057

PERMIT FOR DEVELOPMENT ACTIVITY WITHIN A REGULATED AREA

Section 28.1 of the *Conservation Authorities Act*, R.S.O. 1990, c. C.27
& Ontario Regulation 41/24: Prohibited Activities, Exemptions and Permits

Permit Holder:

Russell Township
Care of: Jonathan Bourgon
851 Route 400
Russell, ON
K4R 1E5

Decision: **Approved With Conditions**

Issued: June 13, 2024
Expires: June 13, 2026

Work Description: Realignment of Wood-Eadie Municipal Drain

Location:

Lots 20, 21, and 22, Concession 4, Former Township of Russell
Roll Nos. 030600000406700, 030600000406605,
030600000406500, 030600000406301, 030600000406300,
030600000406100, 030600000406000
Eadie Road, Vars
Russell Township

The attached Schedules form part of this permit for the approved work and must be implemented in accordance with the stated conditions. A copy of this permit must be kept at the worksite.

The Permit Holder, by acceptance and in consideration of the issuance of this permit, agrees to the permit conditions.

Dated at Finch, Ontario, this 13 day of June 2024.

Sandra Mancini,
Managing Director, Natural Hazards
and Infrastructure
smancini@nation.on.ca

SCHEDULE A: WORK DESCRIPTION

SNC understands the following work will be completed (the “Work”):

1. Realignment of open channel of a portion of the Wood-Eadie Municipal Drain and maintenance and improvements on existing channel of Wood-Eadie Municipal Drain West Branch and Main Drain.
2. Maintenance and realignment includes the replacement of 3 culverts and installation of 1 new culvert to the following specifications:
    a. Culvert #1: Emard St. Culvert (New), 21m long x 600mm diameter HDPE
    b. Culvert #2: Existing culver to be removed and replaced with 9m long x 750mm diameter HDPE
    c. Culvert #3: Existing culver to be removed and replaced with 12m long x 750mm diameter HDPE
    d. Culvert #4: Existing Route 100 culvert to be removed and reinstalled (same dimensions): 12m long x 900mm diameter HDPE
3. The section of the drain to be realigned is approximately 720m in length, located on Lot 22, Concession 4. The current alignment contains a zig-zag pattern and is proposed to be straightened.
4. Improvements include installation of rip-rap for erosion protection at the bends in the channel as well as at the inlet and outlet of culverts along the drain.
5. New channel cross-sectional design will have side slopes of 2 horizontal to 1 vertical with bottom width of 1m and 1.2m.
6. Temporary erosion and sediment control measures will be in place throughout the duration of the maintenance and realignment work.

The details of the Work are outlined in the following documents forwarded to SNC:

1. South Nation Conservation Section 28.1 Permit Application Form - Received March 11, 2024, signed by Jonathan Bourgon and Monica Shade.

2. Report: “Wood-Eadie Main Drain Incl. West Branch. S.78 Engineer’s Report – Russell Township”, prepared by Shade Group Inc. for Russell Township, dated March 2024.

SCHEDULE B: CONDITIONS

The Permit Holder must adhere to the following conditions for permit compliance:

1. The permit holder is responsible for providing SNC with a copy of the final approved Engineer's Report for the project.

2. Any changes to the proposed design will require resubmission to SNC for review.

3. Erosion Control

    a) The Permit Holder must ensure no erosion occurs in or near a watercourse or waterbody that is in proximity to the Work.

    b) In the event of unexpected rainfall, any fill that is removed from the site and placed on the shore (above the high-water mark) is to be properly stabilized as required through the implementing of appropriate erosion control measures.

    c) SNC may visit the Work location anytime from application submittal through to the expiration of the permit to inspect the implementation of erosion control measures on site. SNC shall give reasonable notice of the entry to the Permit Holder or occupier of the property.

    d) Disturbed areas must be stabilized and revegetated as required upon completion of Work and restored to a pre-disturbed state or better.

SCHEDULE C: ADDITIONAL COMMENTS

SNC makes the following additional comments:

1. This permit does not review, certify, or provide permission for any works that may be located outside the above noted property boundary.

2. Nothing in this permit relieves the Permit Holder(s) from obtaining, where necessary, regulatory approval from any other agency, government including the Majesty the King in Right of Ontario, municipality, landowner, or authority having legal jurisdiction regarding development at the above noted location or any adjacent lands that may be impacted by the Work. SNC makes no representation and has made no representation as to whether the Permit Holder(s) must obtain any other approval(s) regarding the Work. SNC hereby confirms that it is the Permit Holder(s)' sole and complete responsibility to ensure that it applies for and obtains all necessary regulatory approvals prior to undertaking the Work.

3. Permit review completed by C. Lemay. Technical review completed by M. Rajaie and F. Forough.

SCHEDULE D: GENERAL CONDITIONS

1. Term

This permit is valid for 24 months from the date of issuance. No notice will be issued on expiration. It is the responsibility of the Permit Holder to ensure a valid permit is in effect at the time the Work is occurring. The Permit Holder may, at least 60 days before the expiry of the permit, apply to SNC and pay a fee for an extension of the permit.

2. Other Permits and Permissions

This permit does not relieve the Permit Holder of the responsibility to obtain any other documents or permits that the Work may require from the Government of Canada, the Government of Ontario, or the local municipality. It is the responsibility of third-party agents to secure property owner permission to undertake the Work.

3. Right to Hearing

A Permit Holder who disagrees with the conditions attached to their permit has the right to request a hearing before the SNC Board of Directors. Please contact our office for further details.

4. Property Entry

SNC may enter the subject property where the Work is taking place during the permit's period of validity to ensure compliance with the conditions of the permit. SNC shall give reasonable notice of the entry to the Permit Holder or occupier of the property.

5. Cancellation of Permit

SNC may cancel a permit or change the permit conditions if:

a) false information was submitted as part of the permit application; or
b) the Work deviates from the conditions of the permit without SNC's prior written approval.

6. Offences

It is an offence to undertake work in a regulated area without a permit or to contravene the conditions of a permit. A person who commits an offence under the *Conservation Authorities Act* is liable on conviction:

a) in the case of an individual,
   (i) to a fine of not more than $50,000 or to a term of imprisonment of not more than three months, or to both, and

(ii) to an additional fine of not more than $10,000 for each day or part of a day on which the offence occurs or continues; and

b) in the case of a corporation,

(i) to a fine of not more than $1,000,000, and

(ii) to an additional fine of not more than $200,000 for each day or part of a day on which the offence occurs or continues.

Despite the maximum fines, a court that convicts a person of an offence may increase the fine it imposes on the person by an amount equal to the amount of the monetary benefit that was acquired by the person, or that accrued to the person, as a result of the commission of the offence.

In addition to any other remedy or penalty provided by law, the court, upon convicting a person of an offence, may order the convicted person to,

a) remove, at the convicted person’s expense, any development within such reasonable time as the court orders; and
b) take such actions as the court directs, within the time the court may specify, to repair or rehabilitate the damage that results from or is in any way connected to the commission of the offence.

7. Liability

The Permit Holder acknowledges that the sole function of this permit is to confirm the Work is consistent with Part VI of the *Conservation Authorities Act*, O. Reg. 41/24, and SNC policies. SNC makes no representations or warranties regarding any other aspect of the Work.

By accepting this permit, the Permit Holder agrees:

a) to indemnity and save harmless, SNC and its officers, employees, and agents, from and against all damage, injury, loss, costs, claims, demands, actions, and proceedings, arising out of or resulting from any act or omission of the Permit Holder or of any of their agents, employees, or contractors relating to any of the particular terms or conditions of this permit; and
b) that this permit shall not release the Permit Holder from any legal liability or obligation and remains in force subject to all limitations, requirements, and liabilities imposed by law.

SNC assumes no responsibility or liability for flood, erosion, or slope failure damage that may occur to the subject property, nor any activity undertaken by the Permit Holder affecting the property interests of adjacent landowners.

RE: 24-HCAA-00608 - Request for Drain Relocation & Improvements - Russell Township - Wood-Eadie Main Drain

1 message

OP Habitat (DFO/MPO) <DFO.OPHabitat.MPO@dfo-mpo.gc.ca> Thu, May 16, 2024 at 10:39 AM
To: Monica Shade <monica@shadegroup.ca>
Cc: Sean MacDonald <macdonaldtechnical@gmail.com>, "Landry, Francois" <FrancoisLandry@russell.ca>

Fisheries and Oceans Canada	Pêches et Océans Canada
Ontario and Prairie Region	Région de l'Ontario et des Prairies
Fish and Fish Habitat Protection Program	Programme de protection du poisson et de son habitat
867 Lakeshore Rd.	867 chemin Lakeshore
Burlington, ON	Burlington, ON
L7S 1A1	L7S 1A1

Dear Monica:

Subject: [Drain Realignment, Wood-Eadie Drain, Class Unrated, Russell] (24-HCAA-00608) – Implementation of Measures to Avoid and Mitigate the Potential for Prohibited Effects to Fish and Fish Habitat

The Fish and Fish Habitat Protection Program (the Program) of Fisheries and Oceans Canada (DFO) received your proposal on March 11, 2024. We understand that you propose to:

- Decommission approximately 400m of exiting open channel drain and excavate new 300m open channel; and
- Backfill existing drain with native material from new channel construction; and
- Cleanout remainder of drain removing built-up sediment; and
- Work under dry conditions to avoid sedimentation of the watercourse.

Our review considered the following information:

- Request for Review form and associated documents.

Your proposal has been reviewed to determine whether it is likely to result in:

- the death of fish by means other than fishing and the harmful alteration, disruption or destruction of fish habitat which are prohibited under subsections 34.4(1) and 35(1) of the *Fisheries Act*;
- effects to listed aquatic species at risk, any part of their critical habitat or the residences of their individuals in a manner which is prohibited under sections 32, 33 and subsection 58(1) of the *Species at Risk Act*; and,

- the introduction of aquatic species into regions or bodies of water frequented by fish where they are not indigenous, which is prohibited under section 10 of the *Aquatic Invasive Species Regulations*.

The aforementioned impacts are prohibited unless authorized under their respective legislation and regulations.

To avoid and mitigate the potential for prohibited effects to fish and fish habitat (as listed above), we recommend implementing the measures listed below:

- Plan in-water works, undertakings and activities to respect timing windows to protect fish, including their eggs, juveniles, spawning adults and/or the organisms upon which they feed and migrate;
  - No inwater works between March 15 – July 15
  - If the drain is dry/frozen to the bottom, works can begin at any time during the year
- Aquatic invasive species are introduced and spread through transporting sands and sediments and using contaminated construction equipment. To prevent the spread of aquatic invasive species during construction in aquatic environments:
  - Clean, drain and dry any equipment used in the water; and,
  - Never move organisms or water from one body of water to another;
- Maintain an undisturbed vegetated riparian zone between areas of on-land activity and the High Water Mark of any water body;
- Develop and implement an erosion and sediment control plan to avoid the introduction of sediment into any waterbody during all phases of the work, undertaking or activity;
  - Schedule work to avoid wet, windy and rainy periods (and heed weather advisories) that may result in high flow volumes and/ or increase erosion and sedimentation;
  - Regularly monitor the watercourse for signs of sedimentation during all phases of the work, undertaking or activity and take corrective action;
  - Operate machinery on land in stable dry areas; and,
- Develop and implement a response plan to avoid a spill of deleterious substances.

Provided that you incorporate these measures into your plans, the Program is of the view that your proposal will not require an authorization under the *Fisheries Act*, the *Aquatic Invasive Species Regulations* or the *Species at Risk Act*.

Should your plans change or if you have omitted some information in your proposal, further review by the Program may be required. Consult our website (http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html) or consult with a qualified environmental consultant to determine if further review may be necessary. It remains your responsibility to remain in compliance with the *Fisheries Act*, and the *Species at Risk Act* and the *Aquatic Invasive Species Regulations.*

It is also your *Duty to Notify* DFO if you have caused, or are about to cause, the death of fish by means other than fishing and/or the harmful alteration, disruption or destruction of fish habitat. Such notifications should be directed to FisheriesProtection@dfo-mpo.gc.ca or 1-855-852-8320.

Please notify this office at least 10 days before starting any in-water works. Send your notification to the assessor (contact information below) and the DFO 10 notification mailbox: DFO.OP.10DayNotification-Notification10Jours.OP.MPO@dfo-mpo.gc.ca. We recommend that a copy of this letter be kept on site while the work is in progress. It remains your responsibility to meet all other federal, territorial, provincial and municipal requirements that apply to your proposal.

If you have any questions with the content of this letter, please contact Lucas Coletti at Lucas.Coletti@dfo-mpo.gc.ca. Please refer to the file number referenced above when corresponding with the Program.

Yours sincerely,

Lucas Coletti

Biologist | Biologiste

Fisheries and Oceans Canada| Pêches et Océans Canada

Fish and Fish Habitat Protection Program | Programme de Protection du Poisson et de Son Habitat

M: (905)-317-1541

Email/Courriel: Lucas.Coletti@dfo-mpo.gc.ca

From: Monica Shade <monica@shadegroup.ca>
Sent: Monday, March 11, 2024 4:46 PM
To: OP Habitat (DFO/MPO) <DFO.OPHabitat.MPO@dfo-mpo.gc.ca>
Cc: Sean MacDonald <macdonaldtechnical@gmail.com>; Landry, Francois <FrancoisLandry@russell.ca>
Subject: 24-HCAA-00608 - Request for Drain Relocation & Improvements - Russell Township - Wood-Eadie Main Drain

Hello,

Please find enclosed the following:

- Request for Review form
- Draft Engineer's Report outlining the proposed project, including Plan and Profile drawings for the proposed works.

The project involves a partial relocation of an open channel (Class F Drain) as well as proposed maintenance of the existing channel to remove obstructions and sediment buildup and implement permanent erosion and sediment control practices.

The project has also been sent to the local Conservation Authority for review and comment.

Works are proposed to be completed in dry or low/no flow conditions - outside of any timing windows (e.g. after July 15; before March 15).

Please let me know if you have any questions or concerns.

Thank you,

Monica Shade, P. Eng.

V.P. of Engineering & Sales

Shade Group Inc.

Shade Group Inc. is also the parent company to

Nepean General Contractors

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APPENDIX I

NATURAL HERITAGE SCREENING

SHADE GROUP INC

February 7, 2024

Re. Wood-Eadie Main Drain – Natural Heritage Screening

Shade Group Inc. (Shade Group) was retained by the Township of Russell to prepare an update to the Wood-Eadie Main Drain. As part of the scope, Shade Group's environmental team conducted a site visit to assess for any environmental constraints that may impact the project.

One (1) site visit was conducted within the proposed work area for the Wood-Eadie Main Drain during the growing season (the growing season is considered between mid-May and mid-September, of any year). The site visit focused on reviewing the forested habitat within the work area to document significant and sensitive natural heritage features potentially present within and adjacent (i.e., within 120 m) to the study area. The site visit did not include a review of any active farmland (corn and soy crops), present within the work area. Active farmland was not considered a concern as it would not contain any sensitive natural heritage features. Details of this site visit can be found below in **Table 1**.

Table 1: Site Visit Details

Date	Time	Personnel	Weather	Purpose of Visit
September 10, 2023	Start: 9:30 a.m. End: 10:30 a.m.	Heather Lunn (Shade Group), Biologist	Overcast, 17°C	Evaluate existing conditions and presence of natural heritage features

The site visit included a walk-through of the section of the Wood-Eadie Main Drain within the proposed work area. Observations of flora, fauna, habitat characteristics and other natural heritage features were documented through written notes and photographs. Wildlife observations were made through sight, sound, and physical evidence (e.g., footprints, scat, features, etc.).

The north section of the drain flowed through a white spruce (*Picea glauca*) plantation. Vegetation species observed within this area included: white spruce, large-toothed aspen (*Populus grandidentata*), glossy buckthorn (*Rhamnus frangula*), grey dogwood (*Cornus racemosa*), black elderberry (*Sambucus nigra*), purple-flowering raspberry (*Rubus odoratus*), sensitive fern (*Onoclea sensibilis*), and jewelweed (*Impatiens capensis*).

Photo 1: North section of Wood Eadie Municipal Drain, facing north, September 10, 2023.

The south section of the drain flowed through a heavily vegetated moist deciduous forest. The following vegetation species were observed within this area: red maple (*Acer rubra*), American elm (*Ulmus americanum*), trembling aspen (*Populus tremuloides*), black cherry (*Prunus serotina*), green ash (*Fraxinus pennsylvanica*), basswood (*Tilia americana*), white birch (*Betula papyrifera*), red osier dogwood (*Cornus sericea*), glossy buckthorn, black elderberry, red raspberry (*Rubus idaeus*), gooseberry sp. (*Ribes* sp.), poison ivy (*Toxicodendron radicans*), Virgin's bower (*Clematis virginiana*), Virginia creeper (*Parthenocissus quinquefolia*), ostrich fern (*Matteuccia struthiopteris*), sensitive fern, stinging nettle (*Urtica dioica*), common burdock (*Arctium minus*), enchanter's nightshade (*Circaea lutetiana*), foam flower (*Tiarella cordifolia*), goldenrod sp. (*Solidago* sp.), jewelweed, snakeroot (*Ageratina altissima*), Canada anemone (*Anemonastrm canadense*), avens sp. (*Geum* sp.), aster sp. (*Asteraceae* sp.), and Joe-pye weed (*Eutrochium purpureum*).

Photo 2: South section of Wood Eadie Municipal Drain, facing southeast, September 10, 2023.

Wildlife species observed within the study area during the site visit included: Black-capped Chickadee (*Poecile atricapillus*), American Crow (*Corvus brachyrhynchos*), White-tailed Deer (*Odocoileus virginianus*), and Northern Leopard Frog (*Lithobates pipiens*). The habitat on both ends of the study area would be appropriate for many species of migratory and resident bird species in addition to resident mammal and herptile species, such as the Red-eyed Vireo (*Vireo olivaceus*), Scarlet Tanager (*Piranga olivacea*), Black-throated Green Warbler (*Setophaga virens*), Song Sparrow (*Melospiza melodia*), Blue Jay (*Cyanocitta cristata*), Northern Raccoon (*Procyon lotor*), Striped Skunk (*Mephitis mephitis*), Red Squirrel (*Tamiasciurus hudsonicus*), Groundhog (*Marmota monax*), Eastern Gray Treefrog (*Hyla versicolor*), Eastern Gartersnake (*Thamnophis sirtalis*), Common Watersnake (*Nerodia sipedon*), and Common Snapping Turtle (*Chelydra serpentina*).

RECOMMENDATIONS

The following are mitigation measures recommended to prevent harm to migratory birds and species at risk turtles that may be present within and adjacent to the municipal drain during the growing season.

- Avoid clearing vegetation from March through late September to prevent harm to breeding wildlife and nesting migratory bird species.
- Avoid in-water works and bank disturbance from May to September, of any year to prevent harm to species at risk turtles.
- If construction takes place between May and September, of any year, a sweep for the presence of turtles within the construction area should be conducted prior to the start of construction each day.

Heather Lunn, B.A.
Vice President of Environmental Services
Shade Group Inc.
T: 343-262-4769
E: heather@shadegroup.ca

APPENDIX C

Geotechnical investigation Reports

Geotechnical Investigation

Robot Street Extension
Vars Industrial Park
Vars, Ontario

Prepared for:

Township of Russell
717 Notre Dame Street
Embrun, Ontario
K0A 1W0

Attention: Francois Landry

LRL File No.: 230216

December 2024

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APPENDICES

Appendix A Site and Borehole Location Plans

Appendix B Borehole Logs

Appendix C Symbols and Terms Used in Borehole Logs

Appendix D Laboratory Analysis

1 INTRODUCTION

LRL Associates Ltd. (LRL) was retained by the Township of Russell to perform a Geotechnical Investigation for the proposed Robot Street Extension, located in the Vars Industrial Park.

The scope of the Geotechnical Investigation consisted of:

- Establishing the geotechnical and groundwater conditions of the overburden soils underlying the proposed road;
- Preparing a recommendation for a suitable subgrade to withstand the traffic and pavement structure load;
- Preparation of recommendations for the installation of the pavement structure;
- Comment on backfilling requirements and the suitability of the on-site soils for backfilling purposes;

This report has been prepared in consideration of the terms and conditions noted above and with the assumption that the design of the project will satisfy any applicable codes and standards. Should there be any changes in the design features, which may relate to the geotechnical recommendations provided in this report, LRL should be advised in order to review the report recommendations.

2 SITE AND PROJECT DESCRIPTION

The site under investigation is currently vacant land, and can be legally described as Parts of Lot 22 and 23, Concession 4. The site is considered to be relatively flat; The site is currently being used for agricultural purposes.

The proposed Robot Street will be about 375 m in length, and will be constructed between Emard Street and Burton Road.

3 PROCEDURE

The fieldwork for this geotechnical investigation was carried out on November 11, 2024. Prior to the fieldwork, the site was cleared for the presence of any underground services and utilities. A total of nine (9) boreholes were drilled within the proposed roadway, and labelled BH1 through BH9. The approximate locations of the boreholes are shown in Figure 2, included in **Appendix A**.

The boreholes were advanced using a track mounted (CME 55) drill rig equipped with 200 mm diameter continuous flight hollow stem auger supplied and operated by George Downing Estate Ltd. A “two man” crew experienced with geotechnical drilling operated the drill rig and equipment under direct supervision of LRL staff.

Sampling of the overburden materials encountered in the boreholes was carried out at regular intervals using a split spoon sampler of 50.8 mm diameter drive open conventional spoon sampler in conjunction with standard penetration testing (SPT) “N” values. The SPT tests were conducted in accordance with the requirements **ASTM D1586** and the results of SPT, in terms of the number of blows per 0.3 m of split-spoon sampler penetration after the first 0.15 m designated as “N” value. Results of the SPT test (N-value) are shown on the Boring Logs under the “Sample Data” column.

The boreholes were advanced to depths ranging from 1.50 to 2.90 m below ground surface (bgs). Upon completion, the boreholes were backfilled and compacted using the overburden cuttings.

Piezometers were installed in three (3) of the boreholes to measure the ground water level. The piezometers consisted of 19 mm diameter PVC pipe with a slotted bottom to allow for water infiltration, backfilled with silica sand and sealed with bentonite.

The fieldwork was supervised throughout by a member of our engineering staff who oversaw the drilling activities, cared for the samples obtained and logged the subsurface conditions encountered within each of the boreholes. Samples of the subsurface materials were extruded from the samplers in the field, labeled according to location and depth, and sealed in plastic bags to prevent moisture loss. The recovered soil samples collected from the boreholes were classified based on visual examination of the materials recovered and the results of the in-situ testing. All soil samples were transported to our office for further examination by our geotechnical engineer.

Furthermore, all boreholes were surveyed and located using a Garmin Etrex Legend GPS (Global Positioning System) receiver using NAD 83 datum (North American Datum). LRL's field personnel determined the existing grade elevations at the borehole locations through a topographic survey carried out using the site bench mark. Ground surface elevations of the boring locations are shown on their respective boreholes logs.

4 SUBSURFACE SOIL AND GROUNDWATER CONDITIONS

4.1 Published Geology

A review of local surficial geology maps provided by the Department of Energy, Mines and Resources Canada suggest that this site is located at a transition zone between two different deposits: offshore marine deposits (consisting of clay, silty clay, and silt), and a sandy to silty till material.

The soil descriptions presented in this report are based on commonly accepted methods of classification and identification employed in geotechnical practice. Classification and identification of soil were conducted according to the procedure **ASTM D2487** and judgement, and LRL does not guarantee descriptions as exact, but infers accuracy to the extent that is common in current geotechnical practice.

The subsurface soil conditions encountered at boreholes are given in their respective logs presented in **Appendix B**. A greater explanation of the information presented in the borehole logs can be found in **Appendix C** of this report. These logs indicate the subsurface conditions encountered at a specific boring locations only. Boundaries between zones on the logs are often not distinct, but are rather transitional and have been interpreted as such.

4.2 Soil Stratigraphy

The below tables provide a summary of the soils encountered in each borehole location including the depths of each soil interface.

Table 1a: Soil Stratigraphy Summary (1 of 2)

Soil Encountered	Depth of Soil Interface (m)				
	BH-1	BH-2	BH-3	BH-4	BH-5
Elevation (m)	76.90	76.99	77.05	76.85	77.90
Topsoil	0 – 0.20	0 – 0.20	0 – 0.20	0 – 0.20	0 – 0.20
Sandy Silt to Sandy Clay	1.45	NE	NE	NE	NE
Silty Sand	NE	NE	0.20 - 1.45	NE	NE
Silt and Clay	NE	NE	1.45 – 2.21	NE	NE
Silty Clay	2.21	NE	NE	NE	NE
Glacial Till	2.90	0.20 – 2.90	2.21 – 2.90	0.20 – 1.88	0.20 – 2.90
End of Borehole (Depth/Elevation (m))	2.90 / 74.00	2.90 / 74.09	2.90 / 74.15	1.88 / 74.97	2.90 / 75.00

NE: Not Encountered

Table 1b: Soil Stratigraphy Summary (2 of 2)

Soil Encountered	Depth of Soil Interface (m)			
	BH-6	BH-7	BH-8	BH-9
Elevation (m)	78.20	77.58	77.60	77.70
Topsoil	0 – 0.20	0 – 0.20	0 – 0.20	0 – 0.20
Silt and Clay	NE	NE	0.20 – 2.90	NE
Glacial Till	0.20 – 1.85	0.20 – 1.50	NE	0.20 – 2.90
End of Borehole (Depth/Elevation)	1.85 / 76.35	1.50 / 76.08	2.90 / 74.70	2.90 / 74.80

NE: Not Encountered

4.3 Laboratory Analysis

Atterberg limits and moisture contents were conducted on two (2) samples. A summary of these values are provided below in **Table 2.**

Table 2: Summary of Atterberg Limits and Water Contents

Sample Location	Parameter					
	Depth (m)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Water Content (%)	USCS Group Symbol
BH1	0.76 – 1.37	52	25	27	31	CH
BH1	1.52 – 2.13	79	31	48	55	CH

Six (6) soil samples were collected for gradation analyses consisting of a sieve and hydrometer analysis. Details of laboratory analyses are reflected in **Table 3**.

Table 3: Gradation Analysis Summary

Sample Location	Depth (m)	Percent for Each Soil Gradation							Est. Hydraulic Conductivity K (cm/s)
		Gravel		Sand			Silt (%)	Clay (%)	
		Coarse (%)	Fine (%)	Coarse (%)	Medium (%)	Fine (%)			
BH1	0.76 – 1.37	0.0	11.1	4.7	9.1	11.4	33.5	30.2	1 x 10^{-4}
BH1	1.52 – 2.13	0.0	0.0	0.1	0.7	1.9	28.0	69.3	5 x 10^{-6}
BH3	1.52 – 2.13	0.0	0.0	0.4	2.9	6.3	38.0	52.4	5 x 10^{-6}
BH5	2.29 – 2.90	2.7	27.7	9.0	13.2	17.1	23.9	6.4	1 x 10^{-4}
BH7	0.76 – 1.37	5.4	28.1	12.8	9.8	6.0	28.2	9.7	1 x 10^{-4}
BH8	0.76 – 1.37	0.0	0.5	0.3	0.3	1.5	53.1	44.3	5 x 10^{-6}
BH9	1.52 – 2.13	5.6	29.4	11.6	8.8	6.8	30.8	7.0	1 x 10^{-4}

4.4 Groundwater Conditions

Three (3) piezometers were installed in the boreholes upon completion of drilling. The groundwater were measured on December 02, 2024. The groundwater was found ranging between 1.30 and 2.70 m bgs. Groundwater levels can be found on the Borehole Logs attached in **Appendix B.**

It is anticipated that a higher water table may be encountered during wet conditions (i.e. spring). It should be noted that the groundwater levels could fluctuate with seasonal weather conditions, (i.e. rainfall, droughts, spring thawing).

5 GEOTECHNICAL CONSIDERATIONS AND RECOMMENDATIONS

This section of the report provides general geotechnical recommendations for the design aspect of the project based on our interpretation of the information gathered from the boreholes performed at this site and from the project requirements.

It is our understanding that the scope of work for this street includes full construction of the street including an open ditch drainage system, and pavement structure.

5.1 Temporary Excavation

It is anticipated that temporary excavations will be required for installation of some storm culverts. The overburden soils that will be excavated will consist of a silty clay to silt and clay material, and/or glacial till. Excavations must be carried out in accordance with Occupational Health and Safety Act.

According to the Ontario's Occupational Health and Safety Act (OHSA), O. Reg. 213/91 and its amendments, the surficial overburden expected to be excavated into at this site can be classified as Type 3. Therefore, shallow temporary excavations in the overburden soil can be cut at 1 horizontal to 1 vertical (1H: 1V) for a fully drained excavation starting at the base of the excavation and as per requirements of the OHSA regulations. Gentler slopes could be required under undrained excavations, where local water infiltrations occur and where the excavations are exposed for prolonged period of time.

In the event that the aforementioned slopes are not possible to achieve due to space restrictions, the excavation shall be shored according to OHSA O. Reg. 213/91 and its amendments. A geotechnical engineer shall be on site during construction to assess the nature of soil at excavated area, design and approve the shoring and establish the shoring depth under the excavation profile.

5.2 Earth Pressure and Geotechnical Parameters

The following equation should be used to estimate the intensity of the lateral earth pressure acting against any earth retaining structure.

$$P = K (\gamma h + q)$$

Where;

K = Appropriate co-efficient of earth pressure

γ = Unit weight of compacted backfill

h = Depth (below adjacent highest grade) at which P is calculated

q = Intensity of any surcharge distributed uniformly over the backfill surface (usually surcharge from traffic, equipment or soil stockpiled and typically considered 10 kPa).

The coefficient earth pressure at rest (k_0) should be used in the calculation of the earth pressure on the manhole/or any earth retaining structure, which is expected to be rather rigid and not to deflect.

For the on-site soil, the following geotechnical parameter may be assumed as summarized in **Table 4**:

Table 4: Geotechnical Parameters of Materials

Type of Material	Bulk Density (kN/m^3)	Angle of internal friction	Pressure Coefficient		
			At Rest (K_0)	Active (K_A)	Passive (K_P)
Silty Sand to Sandy Silt	17.5	25	0.52	0.41	2.46
Silt and Clay to Silty Clay	17.5	25	0.52	0.41	2.46
Glacial Till	19.5	38	0.38	0.24	4.20

5.3 Groundwater Control

It is anticipated that any excavation within the native overburden material may experience some infiltration of ground water. This will able to be controlled by pumping from open sump pumps. Surface water runoff into the excavation should be avoided and diverted away from the excavation.

5.4 Suitability of On-site Soils

The existing overburden soils consists of silty sand to sandy silt, silty clay, silt and clay, and glacial till. These materials may be used for backfilling purposes below the pavement structure where grade raises are required, provided they're free from organic or any other objectionable material.

It shall be noted that the adequacy of a material for reuse as backfill will depend on its water content at the time of its use and on the weather conditions prevailing prior and during that time. Therefore, all excavated materials to be reused shall be stockpiled in a manner that will prevent any significant changes in their moisture content, especially during wet conditions.

6 CULVERT BEDDING REQUIREMENTS AND BACKFILLING

For any culverts being installed for the proposed road, they will most likely be founded within the silty sand, silty clay or silt and clay, and/or glacial till material. The grade below any culverts, if required, may be raised using OPSS Granular B Type II or an approved equivalent. Bedding, and thickness of cover material requirements for culverts shall conform to the manufacturers design requirements and to the requirements and detail installations outlined in the Ontario Provincial Standard Specifications (OPSS), drawings OPSD 802.010 for flexible pipes and any other applicable standard and requirements from the Township of Russell/City of Ottawa, Ontario.

The bedding, and cover materials should be compacted in maximum 300 mm thick lifts to at least 95% of its Standard Proctor Maximum Dry Density (SPMDD) using suitable vibratory compaction equipment.

In the event that the culvert will be founded below the groundwater table, the bedding may consist of 19 mm clear stone. It is recommended to keep the sump pump in place as long as possible during installation of the culvert if this condition persists.

6.1 Frost Protection - Culvert Base

Frost protection requirements to the culverts depend on the anticipated water conditions during the winter season. If the water flows continuous throughout the winter season, the bedding should be considered to provide sufficient frost protection to subgrade soil. If the water flows are intermittent, the bedding itself may not be sufficient to provide frost protection and may result in heaving of the subsoil. In this case, it is recommended, the subgrade soil to be protected against frost heaving with additional insulation using extruded polystyrene insulation.

6.2 Trench Backfill

The trench should be backfilled using compactable material, free of organics, debris and large cobbles or boulders. Where native backfill is used, it should match the native materials exposed on the trench walls. Backfill below the zone of seasonal frost penetration could consist of either acceptable native material or imported granular material conforming to OPSS Granular B Type I or II. Any boulders larger than 150 mm in size should not be used as trench backfill

To minimize future settlement of the backfill and achieve an acceptable subgrade for the roadway, the trench should be compacted in maximum 300 mm thick lifts to at least 95% SPMDD. The specified density may be reduced where the trench backfill is not located within or in close proximity to existing roadways or any other structures.

Where asphaltic concrete is present, it should be cut back to a minimum of 150 mm from the edge of the excavation to allow for proper compaction between the new and existing pavement structures.

7 PAVEMENT DESIGN

The below pavement structure thicknesses shown below in **Table 5** are recommended to be constructed for the proposed Robot Street extension.

Table 5: Recommended Pavement Structure

Course	Material	Thickness (mm)
Surface	HL3/SP12.5 A/C	40
Binder	HL8/SP19.0 A/C	50
Base course	Granular "A"	150
Subbase	Granular “B" Type II	450
Total:		690

Performance Graded Asphalt Cement (PGAC) **58-34** is recommended for this project.

The base and subbase granular materials shall conform to OPSS 1010 material specifications. They shall be tested and approved by geotechnical personnel prior to delivery to the site and shall be compacted to at least 98% of its SPMDD.

Asphalt concrete shall conform to OPSS 1150 and be placed and compacted to at least 94% of the Marshall Density. The mix and its constituents shall be reviewed, tested and approved by geotechnical personnel prior to delivery to the site.

Transverse butt or stepped joints between the new Hot Mix Asphalt (HMA) pavement and the existing pavement shall be constructed by trimming the existing pavement edge to a straight cleaning vertical surfaces of at least 40 mm. In the event of matching a compacted joint, the depth of the un-compacted mat shall be set to allow for compaction.

Transverse Joints between new HMA and the existing asphaltic concrete shall be constructed as follows:

Binder course should be flushed against the existing asphaltic concrete and a butt joint should be made.

Surface course should be flushed against the existing asphaltic concrete, a stepped joint shall be made by removing the existing asphaltic concrete surface course to its full depth for a minimum length of 0.5 m and the remaining face shall be trimmed to straight vertical surface.

If the binder and surface course are not placed flush against the existing asphaltic concrete, the binder course shall be feathered out and the surface course shall be butted by removing the existing surface course to a minimum depth of 40 mm for a minimum longitudinal distance of 3.0 m.

7.1 Subgrade Preparation

On completion of the applicable culvert installations, and following the backfilling and satisfactory compaction up to the subgrade level; the subgrade shall be shaped, crowned and proof-rolled in the presence of LRL's geotechnical personnel. A "Tandem Axle", dual wheel loaded dump truck shall be used. Any resulting soft areas should be sub-excavated down to an adequate bearing layer and replaced with approved backfill. Any grade raise or void resulted from sub-excavation shall be filled using OPSS Granular B Type I or II, or an approved existing onsite material. Any subgrade fill needed should be placed in maximum 300 mm lifts and compacted to 95% of its SPMDD.

The preparation of subgrade shall be scheduled and carried out in a manner so that a protective cover of overlying granular material is placed as quickly as possible in order to avoid unnecessary circulation by heavy equipment, except on unexcavated or protected surfaces. Frost protection of the surface shall be implemented if works are carried out during the winter months. Otherwise, all frozen soil must be identified and removed or fully thawed prior to proceed to the next stage of construction.

The performance of the pavement structure is highly dependent on the subsurface groundwater conditions and maintaining the subgrade and pavement structure in a dry condition. To intercept excess subsurface water within the pavement structure granular materials, sub-drains with suitable outlets should be installed below the pavement area's subgrade. The surface of the pavement should be properly graded to direct runoff water towards suitable drainage features (ie: ditches). It is recommended that the lateral extent of the subbase and base layers not be terminated vertically immediately behind the curb/edge of pavement line but be extended beyond the curb/edge of the pavement.

8 INSPECTION SERVICES

The engagement of the services of the geotechnical consultant during construction is recommended to confirm that the subsurface conditions throughout the proposed site do not materially differ from those given in the report and that the construction activities do not adversely affect the intent of the design.

Any engineered fill areas within the proposed pavement structure should be inspected by LRL to ensure that a suitable subgrade has been reached and properly prepared. The placing and compaction of any granular materials should be inspected to ensure that the materials used conform to the grading and compaction specifications.

If constructed during winter months, the subgrade should be protected from freezing temperatures using suitable construction techniques.

9 REPORT CONDITIONS AND LIMITATIONS

It is stressed that the information presented in this report is provided for the guidance of the designers and is intended for this project only. The use of this report as a construction document or its use by a third party beyond the client specifically listed in the report is neither intended nor authorized by LRL Associates Ltd. Contractors bidding on or undertaking the works should examine the factual results of the investigation, satisfy themselves as to the adequacy of the information for construction, and make their own interpretation of the factual data as it affects their construction techniques, schedule, safety and equipment capabilities.

The professional services for this project include only the geotechnical aspects of the subsurface conditions at this site. The presence or implications of possible contamination resulting from previous uses or activities at this site or adjacent properties, and/or resulting from the introduction onto the site of materials from off-site sources are outside the terms of reference for this report.

The recommendations provided in this report are based on subsurface data obtained at the specific test locations only. Boundaries between zones presented on the borehole logs are often not distinct but transitional and were interpreted. Experience indicates that the subsurface soil and groundwater conditions can vary significantly between and beyond the test locations. For this reason, the recommendations given in this report are subject to a field verification of the subsurface soil conditions at the time of construction.

The report recommendations are applicable only to the project described in the report. Any changes to the project will require a review by LRL Associates Ltd., to insure compatibility with the recommendations contained in this project.

We trust this report provides sufficient information for your present purposes. If you have any questions concerning this report or if we may be of further services to you, please do not hesitate to contact the undersigned.

Yours truly,
LRL Associates Ltd.

Brad Johnson, P.Eng.
Geotechnical Engineer

LICENSED PROFESSIONAL ENGINEER
B. W. JOHNSON
100510537
2024.12.10
PROVINCE OF ONTARIO

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APPENDIX A

Site and Borehole Location Plan

ENGINEERING | INGÉNIERIE
5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

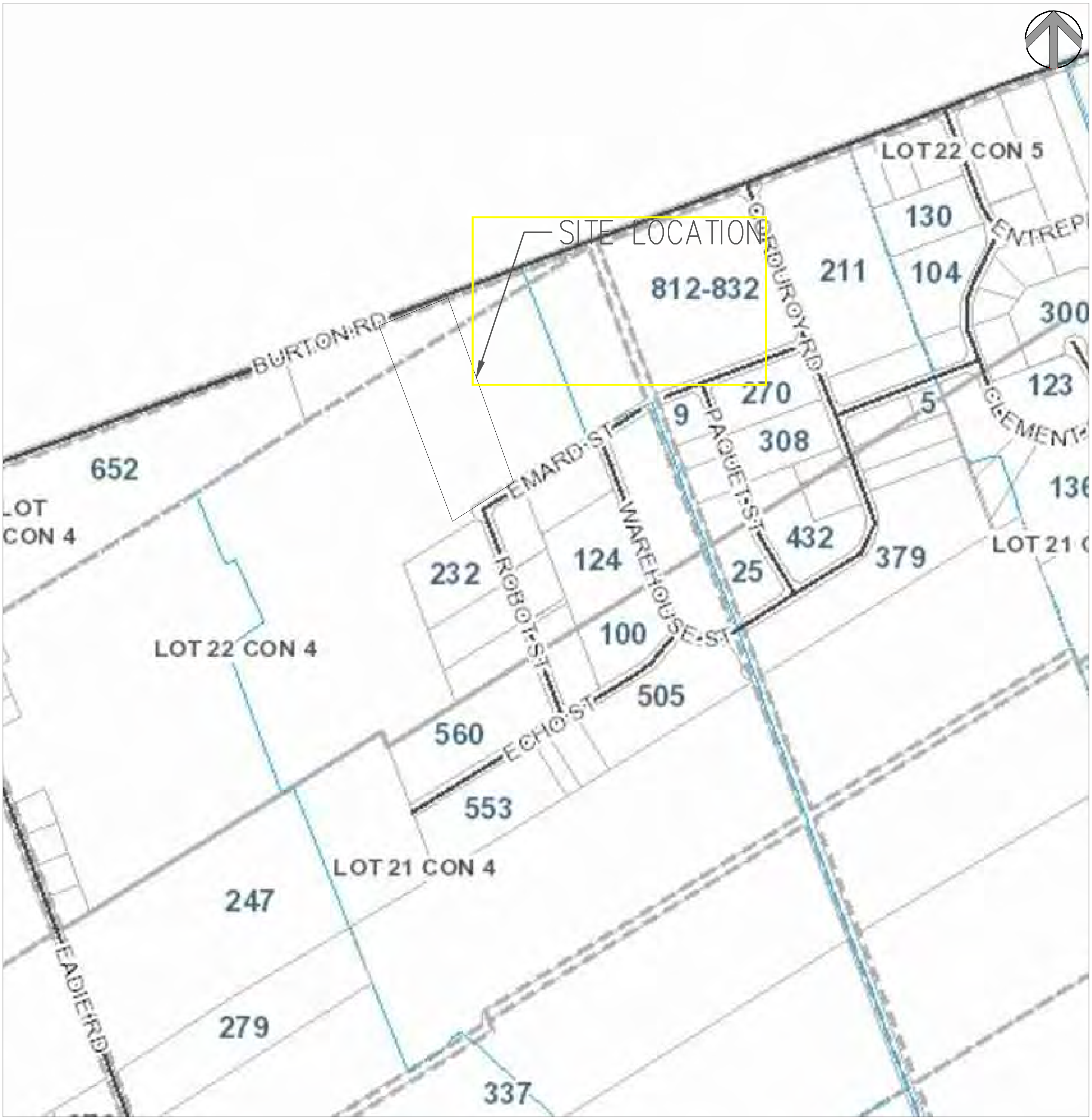
PROJECT

GEOTECHNICAL INVESTIGATION
PROPOSED ROAD EXTENSION
417 INDUSTRIAL PARK
RUSSELL, ONTARIO

DRAWING TITLE

SITE LOCATION
SOURCE: GEOOTTAWA

CLIENT	DATE	PROJECT	
RUSSELL TOWNSHIP	DECEMBER 2024	230216	FIGURE 1



LRL

ENGINEERING | INGÉNIERIE

5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

PROJECT

GEOTECHNICAL INVESTIGATION
PROPOSED ROAD EXTENSION
417 INDUSTRIAL PARK
RUSSELL, ONTARIO

DRAWING TITLE

BOREHOLE LOCATION
SOURCE: GOOGLE AERIAL VIEW

CLIENT

RUSSELL TOWNSHIP

DATE

DECEMBER 2024

PROJECT

230216

FIGURE 2

APPENDIX B

Borehole Logs

Borehole Log: BH-1

Project No.: 230216

Project: GEO Investigation - Robot Street Extension

Client: Township of Russell

Location: Vars Industrial Park

Date: November 11, 2024

Field Personnel: JF

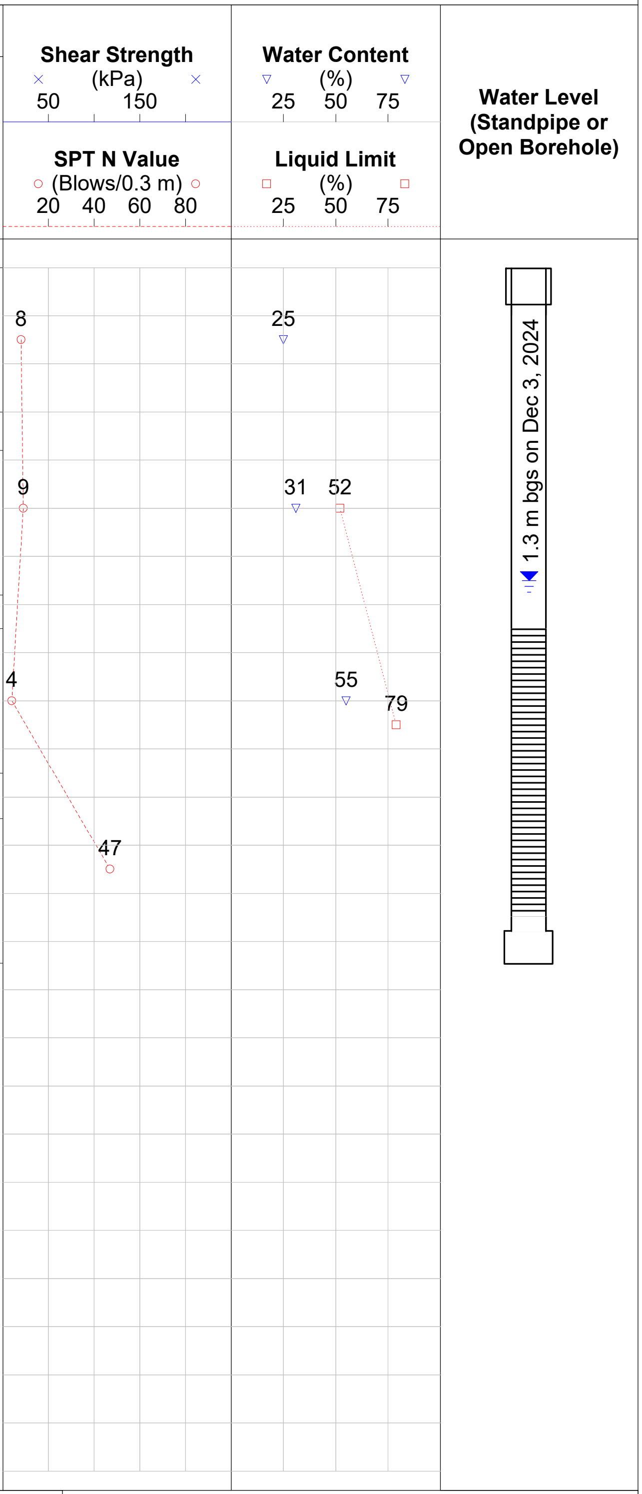
Driller: George Downing Estate Drilling.

Drilling Equipment: Track Mount CME 75

Drilling Method: Hollow Stem Auger

SUBSURFACE PROFILE / SAMPLE DATA

Depth (ft)	Depth (m)	Soil Description	Elev./Depth(m)	Type	Sample Number	N or RQD	Recovery (%)
0	0	Ground Surface	76.90				
		TOPSOIL clayey, about 200 mm thick.	0.00				
		SANDY SILT to SANDY CLAY some gravel, greyish brown, stiff, moist.	76.70 0.20	⧗	SS1	8	100
				⧗	SS2	9	100
		SILTY CLAY trace sand, brownish grey, moist, soft.	75.45 1.45	⧗	SS3	4	100
		GLACIAL TILL silt-sand-gravel, trace clay, moist, dense.	74.69 2.21	⧗	SS4	47	100
		End of Borehole	74.00 2.90				



Easting: 471435

Northing: 5019134

Site Datum: SITE BENCHMARK - Nail in Asphalt - 76.33 m

Groundsurface Elevation: 76.90 m

Top of Riser Elev.: 78.00 m

Hole Diameter: 200mm

NOTES:

No water encountered while drilling.

Borehole Log: BH-2

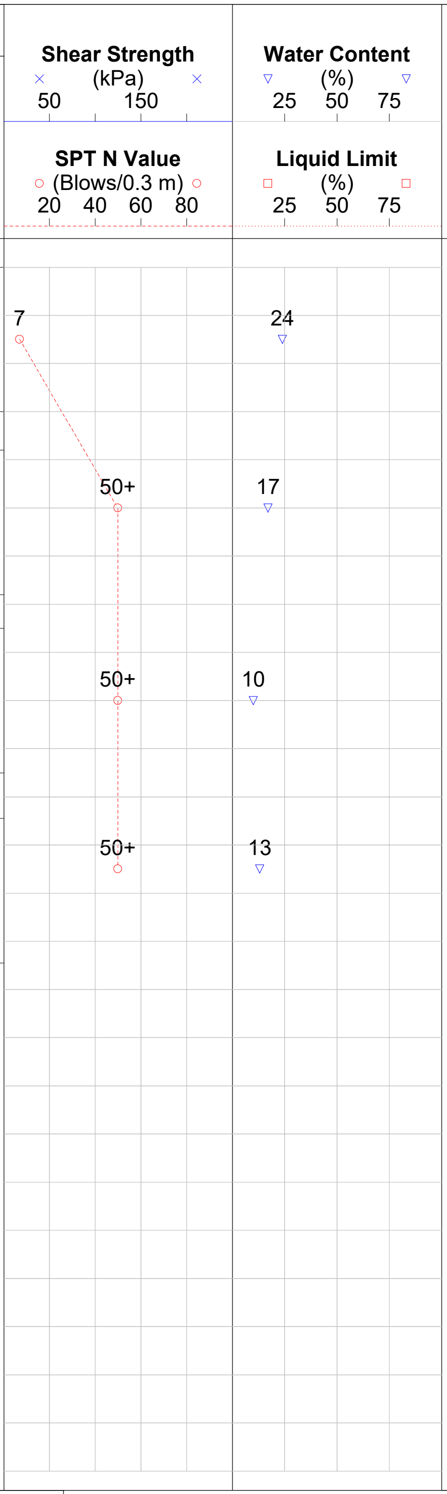
Project No.: 230216
Project: GEO Investigation - Robot Street Extension
Client: Township of Russell
Location: Vars Industrial Park
Date: November 11, 2024
Field Personnel: JF
Driller: George Downing Estate Drilling.
Drilling Equipment: Track Mount CME 75
Drilling Method: Hollow Stem Auger

SUBSURFACE PROFILE

Depth	Soil Description	Elev./Depth(m)
ft 0 / m 0	Ground Surface	76.99
	TOPSOIL clayey, about 200 mm thick.	0.00
	GLACIAL TILL silt-sand-gravel, trace clay, brownish red, moist, very dense.	76.79 0.20
	End of Borehole	74.09 2.90

SAMPLE DATA

Type	Sample Number	N or RQD	Recovery (%)
⧗	SS1	7	71
⧗	SS2	50+	100
⧗	SS3	50+	100
⧗	SS4	50+	100



Water Level (Standpipe or Open Borehole)

Easting: 471415
Northing: 5019174
Site Datum: SITE BENCHMARK - Nail in Asphalt - 76.33 m
Groundsurface Elevation: 76.99 m
Top of Riser Elev.: NA
Hole Diameter: 200mm

NOTES:
No water encountered while drilling.

Borehole Log: BH-3

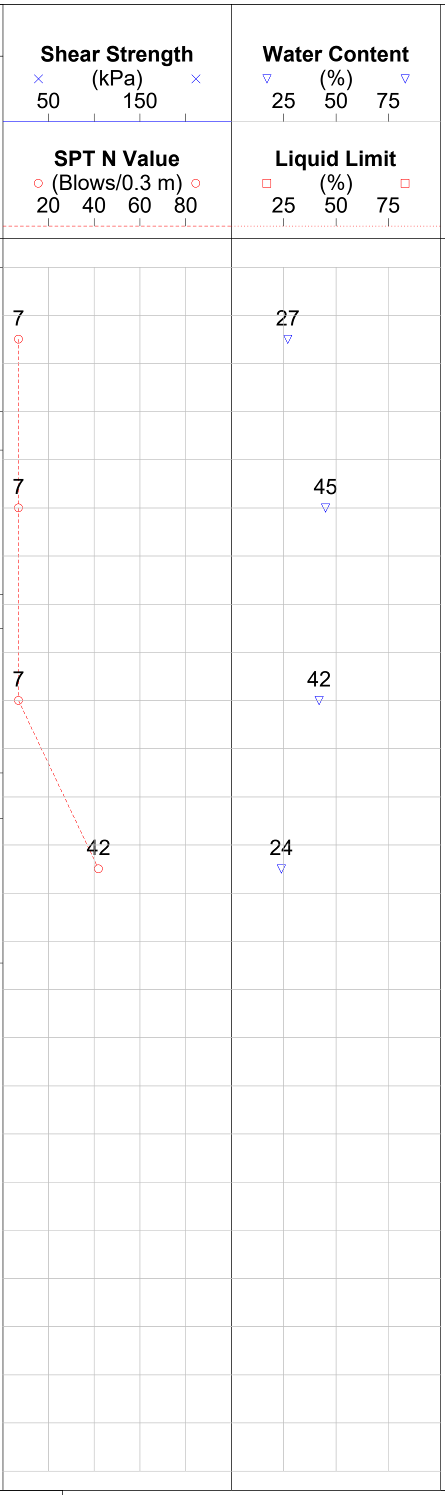
Project No.: 230216
Project: GEO Investigation - Robot Street Extension
Client: Township of Russell
Location: Vars Industrial Park
Date: November 11, 2024
Field Personnel: JF
Driller: George Downing Estate Drilling.
Drilling Equipment: Track Mount CME 75
Drilling Method: Hollow Stem Auger

SUBSURFACE PROFILE

Depth (ft)	Depth (m)	Soil Description	Elev./Depth(m)
0	0	Ground Surface	77.05
0	0	**TOPSOIL** sandy, about 200 mm thick.	0.00
		SILTY SAND brown, moist, loose	76.85 0.20
		SILT and CLAY trace sand, firm, brownish grey, moist	75.60 1.45
		GLACIAL TILL silt-sand-gravel, trace clay, brownish red, moist, dense.	74.84 2.21
		End of Borehole	74.15 2.90

SAMPLE DATA

Type	Sample Number	N or RQD	Recovery (%)	SPT N Value (Blows/0.3 m)	Water Content (%)
⧗	SS1	7	71	7	27
⧗	SS2	7	100	7	45
⧗	SS3	7	100	7	42
⧗	SS4	42	100	42	24



Water Level (Standpipe or Open Borehole)

Easting: 471399
Northing: 5019213
Site Datum: SITE BENCHMARK - Nail in Asphalt - 76.33 m
Groundsurface Elevation: 77.05 m
Top of Riser Elev.: NA
Hole Diameter: 200mm

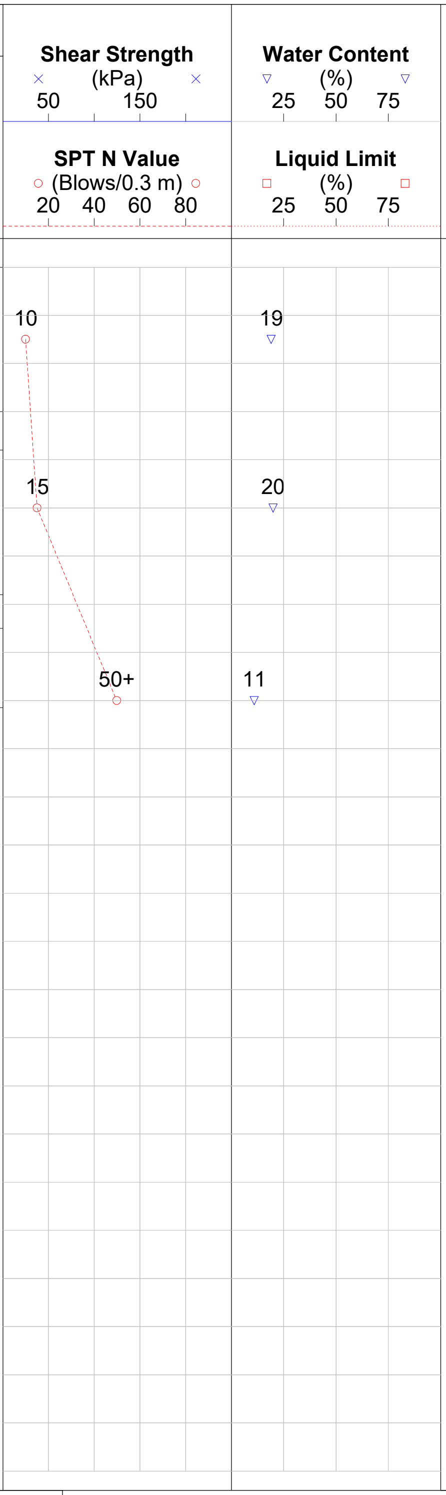
NOTES:
No water encountered while drilling.

Borehole Log: BH-4

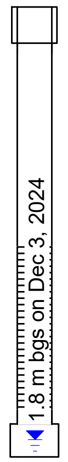
Project No.: 230216
Project: GEO Investigation - Robot Street Extension
Client: Township of Russell
Location: Vars Industrial Park
Date: November 11, 2024
Field Personnel: JF
Driller: George Downing Estate Drilling.
Drilling Equipment: Track Mount CME 75
Drilling Method: Hollow Stem Auger

SUBSURFACE PROFILE / SAMPLE DATA

Depth	Soil Description	Elev./Depth(m)	Lithology	Type	Sample Number	N or RQD	Recovery (%)
0 ft / 0 m	Ground Surface	76.85					
	TOPSOIL clayey, about 200 mm thick.	0.00					
	GLACIAL TILL silt-sand-gravel, trace clay, moist, dense.	76.65 0.20			SS1	10	82
					SS2	15	92
					SS3	50+	100
	End of Borehole Borehole terminated after auger refusal	74.97 1.88					



Water Level (Standpipe or Open Borehole)



Easting: 471382
Northing: 5019243
Site Datum: SITE BENCHMARK - Nail in Asphalt - 76.33 m
Groundsurface Elevation: 76.85 m
Top of Riser Elev.: 78.00 m
Hole Diameter: 200mm

NOTES:
No water encountered while drilling.

Borehole Log: BH-5

Project No.: 230216

Project: GEO Investigation - Robot Street Extension

Client: Township of Russell

Location: Vars Industrial Park

Date: November 11, 2024

Field Personnel: JF

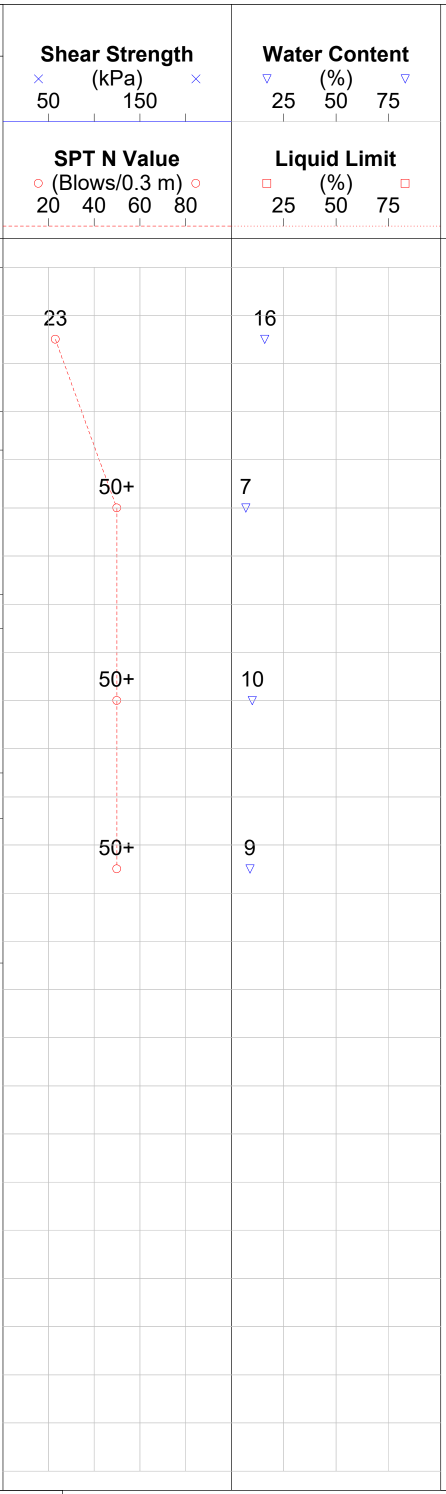
Driller: George Downing Estate Drilling.

Drilling Equipment: Track Mount CME 75

Drilling Method: Hollow Stem Auger

SUBSURFACE PROFILE / SAMPLE DATA

Depth (ft / m)	Soil Description	Elev./Depth(m)	Lithology	Type	Sample Number	N or RQD	Recovery (%)
0 / 0	Ground Surface	77.90					
	TOPSOIL clayey, about 200 mm thick.	0.00					
	GLACIAL TILL silt-sand-gravel, trace clay, brownish red, moist, very dense.	77.70 0.20			SS1	23	63
					SS2	50+	100
					SS3	50+	100
					SS4	50+	100
	End of Borehole	75.00 2.90					



Water Level (Standpipe or Open Borehole)

Easting: 471349

Northing: 5019314

Site Datum: SITE BENCHMARK - Nail in Asphalt - 76.33 m

Groundsurface Elevation: 77.90 m

Top of Riser Elev.: NA

Hole Diameter: 200mm

NOTES:

No water encountered while drilling.

Borehole Log: BH-6

Project No.: 230216

Client: Township of Russell

Date: November 11, 2024

Project: GEO Investigation - Robot Street Extension

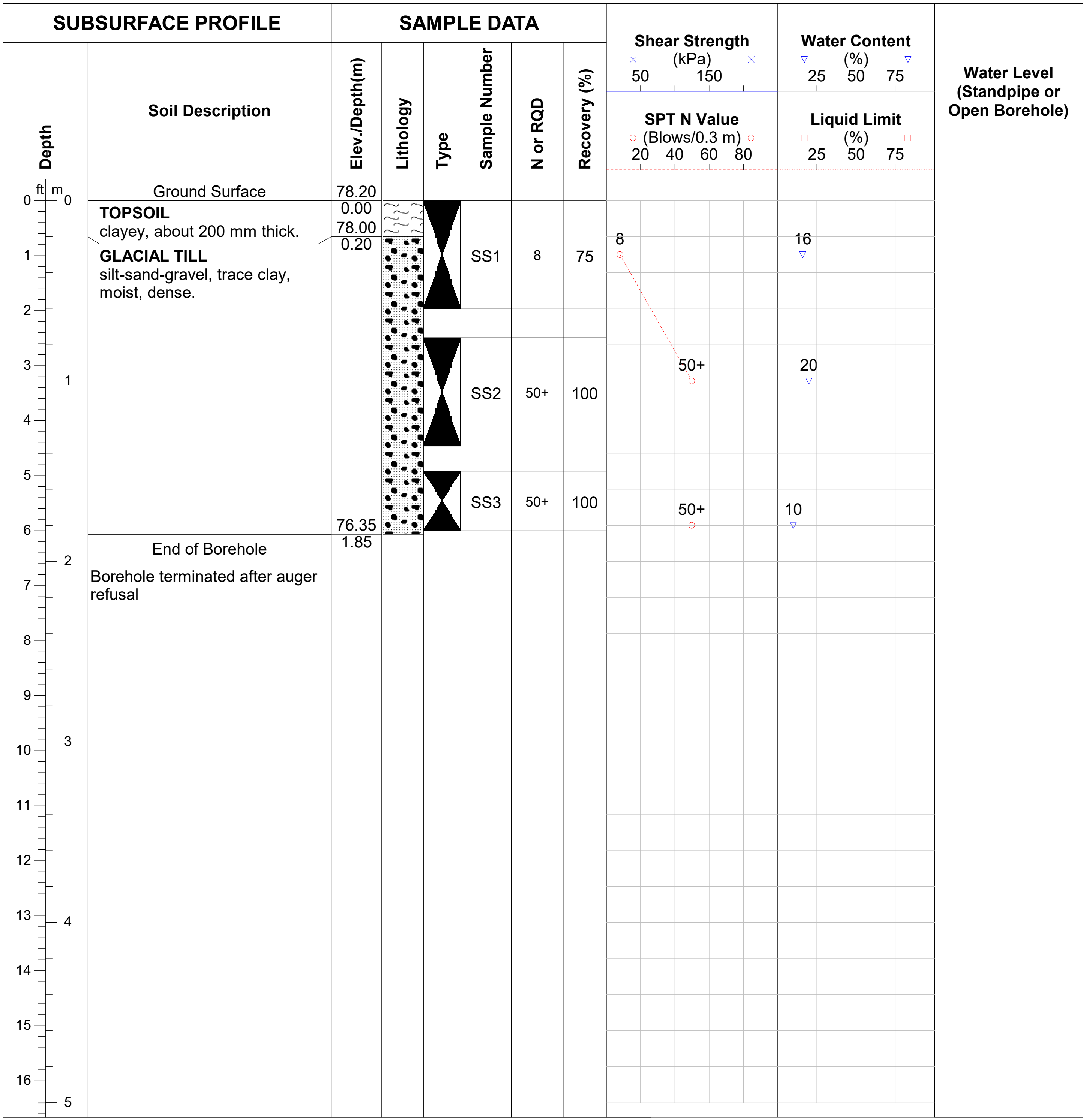
Location: Vars Industrial Park

Field Personnel: JF

Driller: George Downing Estate Drilling.

Drilling Equipment: Track Mount CME 75

Drilling Method: Hollow Stem Auger



Soil Description	Elev./Depth(m)
Ground Surface	78.20 0.00
TOPSOIL clayey, about 200 mm thick.	78.00 0.20
GLACIAL TILL silt-sand-gravel, trace clay, moist, dense.	76.35 1.85
End of Borehole Borehole terminated after auger refusal	

Sample Number	N or RQD	Recovery (%)	SPT N Value	Water Content (%)
SS1	8	75	8	16
SS2	50+	100	50+	20
SS3	50+	100	50+	10

Easting: 471330

Northing: 5019356

Site Datum: SITE BENCHMARK - Nail in Asphalt - 76.33 m

Groundsurface Elevation: 78.20 m

Top of Riser Elev.: NA

Hole Diameter: 200mm

NOTES:

No water encountered while drilling.

Borehole Log: BH-7

Project No.: 230216

Project: GEO Investigation - Robot Street Extension

Client: Township of Russell

Location: Vars Industrial Park

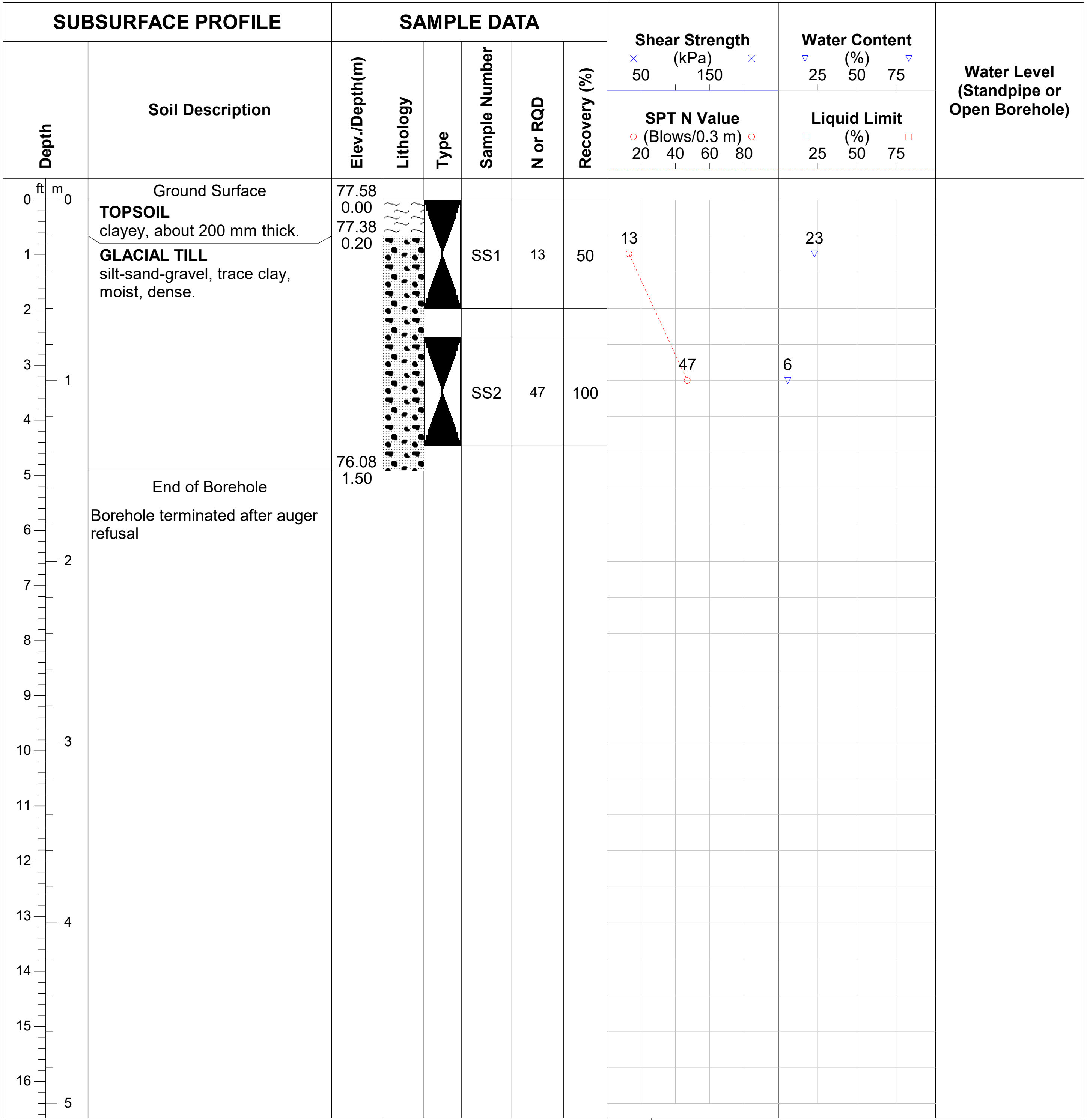
Date: November 11, 2024

Field Personnel: JF

Driller: George Downing Estate Drilling.

Drilling Equipment: Track Mount CME 75

Drilling Method: Hollow Stem Auger



SUBSURFACE PROFILE		SAMPLE DATA					
Depth	Soil Description	Elev./Depth(m)	Lithology	Type	Sample Number	N or RQD	Recovery (%)
	Ground Surface	77.58					
	TOPSOIL clayey, about 200 mm thick.	0.00					
	GLACIAL TILL silt-sand-gravel, trace clay, moist, dense.	77.38 0.20			SS1	13	50
					SS2	47	100
	End of Borehole Borehole terminated after auger refusal	76.08 1.50					

Easting: 471319

Northing: 5019381

Site Datum: SITE BENCHMARK - Nail in Asphalt - 76.33 m

Groundsurface Elevation: 77.58 m

Top of Riser Elev.: NA

Hole Diameter: 200mm

NOTES:

No water encountered while drilling.

Borehole Log: BH-8

Project No.: 230216

Project: GEO Investigation - Robot Street Extension

Client: Township of Russell

Location: Vars Industrial Park

Date: November 11, 2024

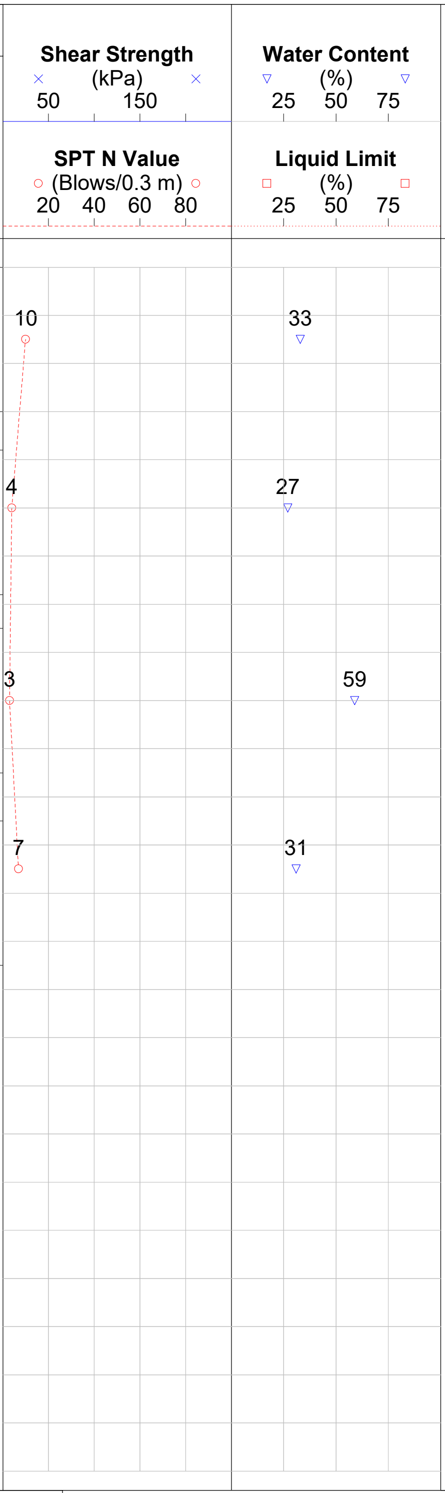
Field Personnel: JF

Driller: George Downing Estate Drilling.

Drilling Equipment: Track Mount CME 75

Drilling Method: Hollow Stem Auger

SUBSURFACE PROFILE		SAMPLE DATA					
Depth (ft / m)	Soil Description	Elev./Depth(m)	Lithology	Type	Sample Number	N or RQD	Recovery (%)
0 ft / 0 m	Ground Surface	77.60					
	TOPSOIL sandy, about 200 mm thick.	0.00 77.40 0.20					
	SILT and CLAY trace sand, greyish brown, moist, firm to soft.				SS1	10	86
					SS2	4	100
					SS3	3	100
					SS4	7	90
	End of Borehole	74.70 2.90					



Water Level (Standpipe or Open Borehole)

Depth scale: ft 0–16; m 0–5

Easting: 471324

Northing: 5019421

Site Datum: SITE BENCHMARK - Nail in Asphalt - 76.33 m

Groundsurface Elevation: 77.60 m

Top of Riser Elev.: NA

Hole Diameter: 200mm

NOTES:

No water encountered while drilling.

Borehole Log: BH-9

Project No.: 230216

Project: GEO Investigation - Robot Street Extension

Client: Township of Russell

Location: Vars Industrial Park

Date: November 11, 2024

Field Personnel: JF

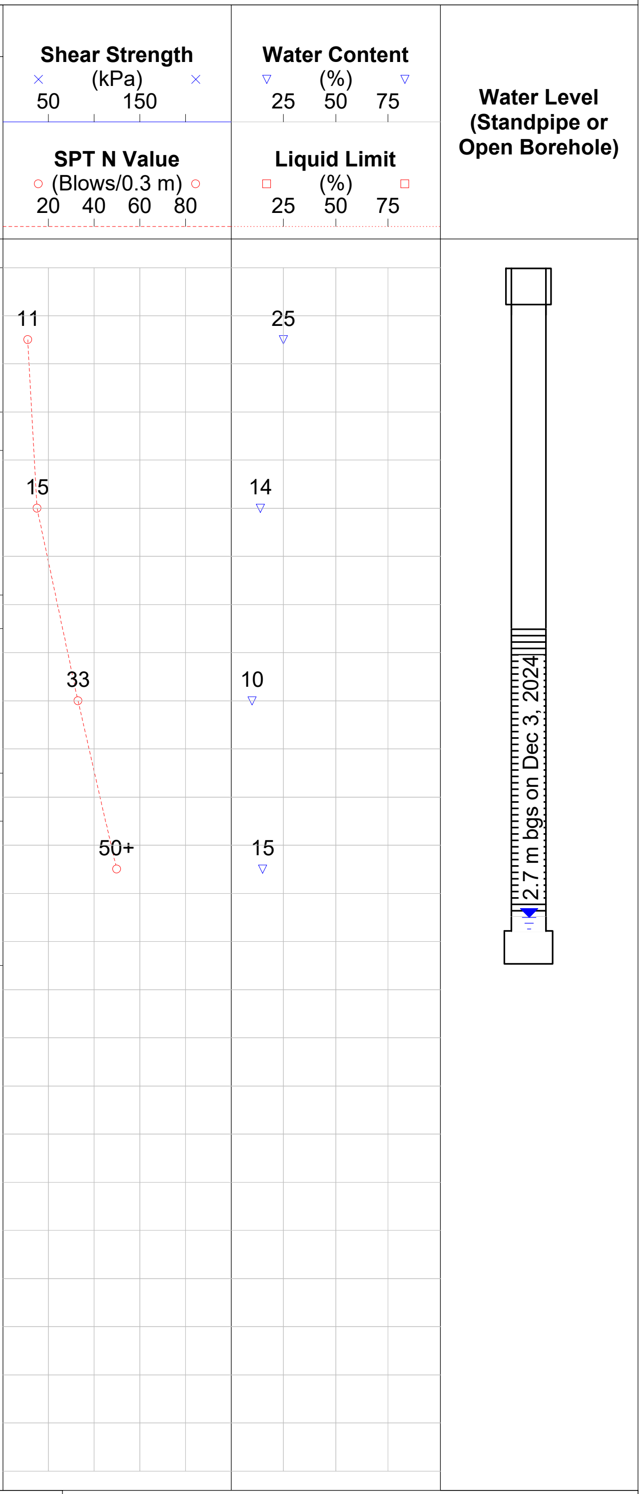
Driller: George Downing Estate Drilling.

Drilling Equipment: Track Mount CME 75

Drilling Method: Hollow Stem Auger

SUBSURFACE PROFILE / SAMPLE DATA

Soil Description	Elev./Depth(m)	Lithology	Type	Sample Number	N or RQD	Recovery (%)
Ground Surface	77.70					
TOPSOIL sandy, about 200 mm thick.	0.00					
GLACIAL TILL silt-sand-gravel, trace clay, moist, compact to very dense.	77.50 0.20			SS1	11	67
				SS2	15	42
				SS3	33	50
				SS4	50+	50
End of Borehole	74.80 2.90					



Easting: 471307

Northing: 5019458

Site Datum: SITE BENCHMARK - Nail in Asphalt - 76.33 m

Groundsurface Elevation: 77.70 m

Top of Riser Elev.: NA

Hole Diameter: 200mm

NOTES:

No water encountered while drilling.

APPENDIX C

Symbols and Terms used in Borehole Logs

Symbols and Terms Used on Borehole and Test Pit Logs

1. Soil Description

The soil descriptions presented in this report are based on commonly accepted methods of classification and identification employed in geotechnical practice. Classification and identification of soil involves some judgement and LRL Associates Ltd. does not guarantee descriptions as exact, but infers accuracy to the extent that is common in current geotechnical practice. Boundaries between zones on the logs are often not distinct but transitional and were interpreted.

a. Proportion

The proportion of each constituent part, as defined by the grain size distribution, is denoted by the following terms:

Term	Proportions
"trace"	1% to 10%
"some"	10% to 20%
prefix (i.e. "sandy" silt)	20% to 35%
"and" (i.e. sand "and" gravel)	35% to 50%

b. Compactness and Consistency

The state of compactness of granular soils is defined on the basis of the Standard Penetration Number (N) as per ASTM D-1586. It corresponds to the number of blows required to drive 300 mm of the split spoon sampler using a metal drop hammer that has a weight of 62.5 kg and free fall distance of 760 mm. For a 600 mm long split spoon, the blow counts are recorded for every 150 mm. The "N" value is obtained by adding the number of blows from the 2nd and 3rd count. Technical refusal indicates a number of blows greater than 50.

The consistency of clayey or cohesive soils is based on the shear strength of the soil, as determined by field vane tests and by a visual and tactile assessment of the soil strength.

The state of compactness of granular soils is defined by the following terms:

State of Compactness Granular Soils	Standard Penetration Number "N"	Relative Density (%)
Very loose	0 – 4	<15
Loose	4 – 10	15 – 35
Compact	10 - 30	35 – 65
Dense	30 - 50	65 - 85
Very dense	> 50	> 85

The consistency of cohesive soils is defined by the following terms:

Consistency Cohesive Soils	Undrained Shear Strength (C_u) (kPa)	Standard Penetration Number "N"
Very soft	<12.5	<2
Soft	12.5 - 25	2 - 4
Firm	25 - 50	4 - 8
Stiff	50 - 100	8 - 15
Very stiff	100 - 200	15 - 30
Hard	>200	>30

c. Field Moisture Condition

Description (ASTM D2488)	Criteria
Dry	Absence of moisture, dusty, dry to touch.
Moist	Dump, but not visible water.
Wet	Visible, free water, usually soil is below water table.

2. Sample Data

a. Elevation depth

This is a reference to the geodesic elevation of the soil or to a benchmark of an arbitrary elevation at the location of the borehole or test pit. The depth of geological boundaries is measured from ground surface.

b. Type

Symbol	Type	Letter Code
	Auger	AU
	Split Spoon	SS
	Shelby Tube	ST
	Rock Core	RC

c. Sample Number

Each sample taken from the borehole is numbered in the field as shown in this column.

LETTER CODE (as above) – Sample Number.

d. Recovery (%)

For soil samples this is the percentage of the recovered sample obtained versus the length sampled. In the case of rock, the percentage is the length of rock core recovered compared to the length of the drill run.

3. Rock Description

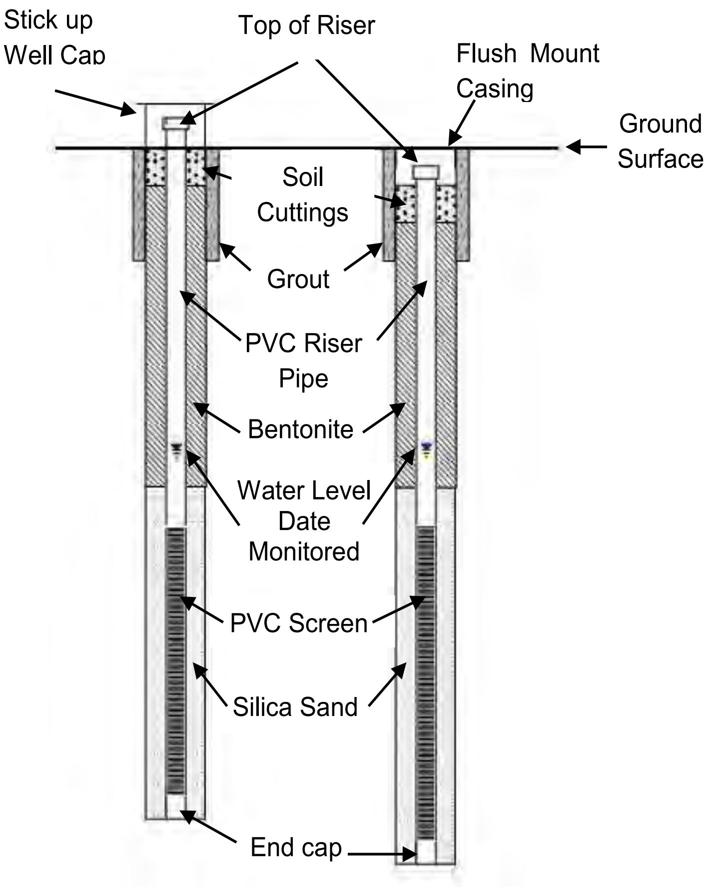
Rock Quality Designation (RQD) is a rough measure of the degree of jointing or fracture in a rock mas. The RQD is calculated as the cumulative length of rock pieces recovered having lengths of 100 mm or more divided by the length of coring. The qualitative description of the bedrock based on RQD is given below.

Rock Quality Designation (RQD) (%)	Description of Rock Quality
0 –25	Very poor
25 – 50	Poor
50 – 75	Fair
75 – 90	Good
90 – 100	Excellent

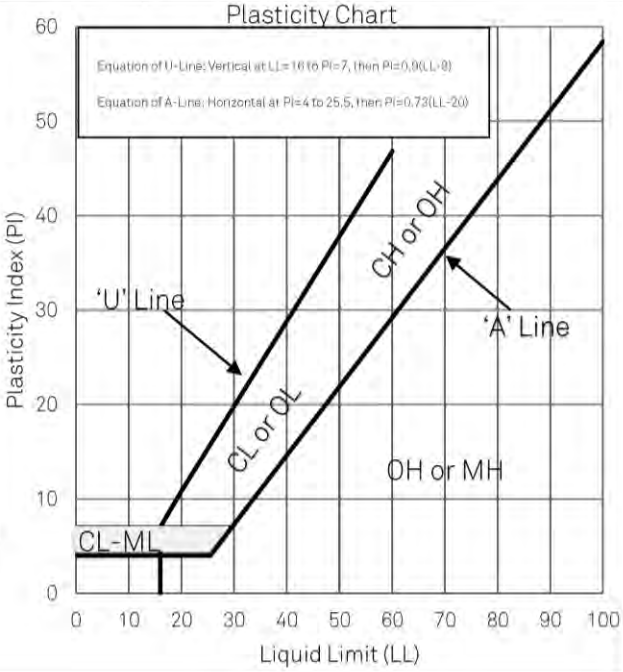
Strength classification of rock is presented below.

Strength Classification	Range of Unconfined Compressive Strength (MPa)
Extremely weak	< 1
Very weak	1 – 5
Weak	5 – 25
Medium strong	25 – 50
Strong	50 – 100
Very strong	100 – 250
Extremely strong	> 250

4. General Monitoring Well Data



5. Classification of Soils for Engineering Purposes (ASTM D2487)
(United Soil Classification System)

Major divisions			Group Symbol	Typical Names	Classification Criteria			
Coarse-grained soils More than 50% retained on No. 200 sieve* (>0.075 mm)	Gravels More than 50% of coarse fraction retained on No. 4 sieve(4.75 mm)	Clean gravels <5% fines	GW	Well-graded gravel	If 15% sand add "with sand" to group name.	Classification on basis of percentage of fines: Less than 5% pass No. 200 sieve - GW, GP, SW, SP More than 12% pass No. 200 sieve - GM, GC, SM, SC 5 to 12% pass No. 200 sieve - Borderline classifications, use of dual symbols	$C_u = \frac{D_{60}}{D_{10}} \geq 4$; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
			GP	Poorly graded gravel			Not meeting either Cu or Cc criteria for GW	
		Gravels with >12% fines	GM	Silty gravel			Atterberg limits below "A" line or PI less than 4	Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols
			GC	Clayey gravel			Atterberg limits on or above "A" line and PI > 7	If fines are organic add "with orgnic fines" to group name
	Sands 50% or more of coarse fraction passes No. 4 sieve(<4.75 mm)	Clean sands <5% fines	SW	Well-graded sand	If 15% gravel add "with gravel to group name		$C_u = \frac{D_{60}}{D_{10}} \geq 6$; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
			SP	Poorly graded sand			Not meeting either Cu or C ccriteria for SW	
		Sands with >12% fines	SM	Silty sand			Atterberg limits below "A" line or PI less than 4	Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols
			SC	Clayey sand			Atterberg limits on or above "A" line and PI > 7	If fines are organic add "with orgnic fines" to group name
Fine-grained soils50% or more passes No. 200 sieve* (<0.075 mm)	Silts and Clays Liquid Limit <50%	Inorganic	ML	Silt	If 15 to 29% coarse-grained, add "with sand" or "with gravel" as appropriate. If >30% coarse-grained, add "sandy" or "gravelly" as appropriate. Class as organic when oven dried liquid limit is < 75% of undried liquid limit.			
			CL	Lean Clay -low plasticity				
		Organic	OL	Organic clay or silt (Clay plots above 'A' Line)				
	Silts and Clays Liquid Limit >50%	Inorganic	MH	Elastic silt				
			CH	Fat Clay -high plasticity				
		Organic	OH	Organic clay or silt (Clay plots above 'A' Line)				
	Highly Organic Soils		PT	Peat, muck and other highly organic soils				

APPENDIX D

Laboratory Analysis

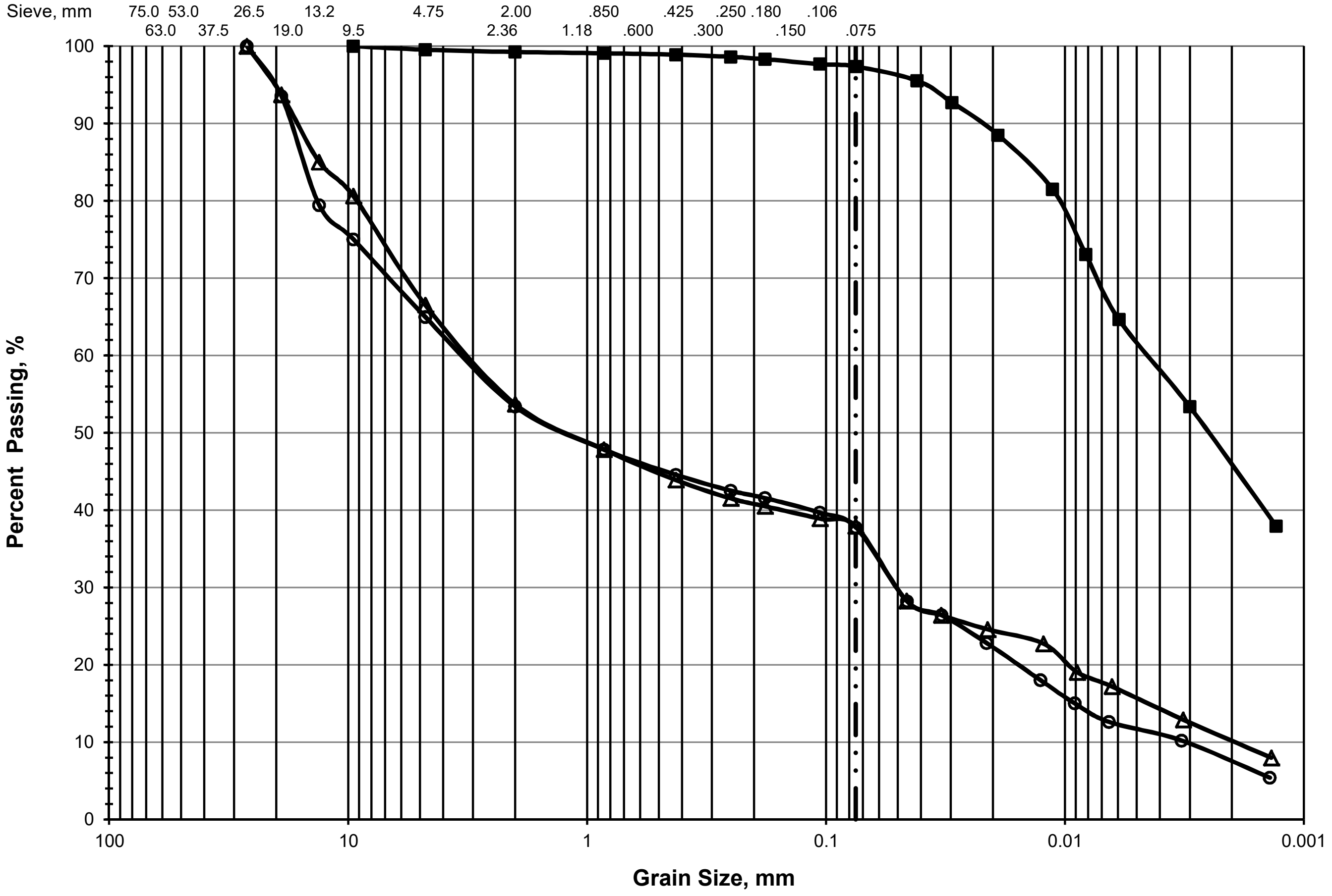
LRL Associates Ltd.

Particle Size Analysis

ASTM D 422 / LS-702

Client: Russell Township
Project: Geotechnical Investigation
Location: Robot Street, Vars, ON.

File No.: 230216
Report No.: 3
Date: November 11, 2024



Unified Soil Classification System

	> 75 mm	% GRAVEL		% SAND			% FINES	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
△	0.0	5.4	28.1	12.8	9.8	6.0	28.2	9.7
■	0.0	0.0	0.5	0.3	0.3	1.5	53.1	44.3
○	0.0	5.6	29.4	11.6	8.8	6.8	30.8	7.0

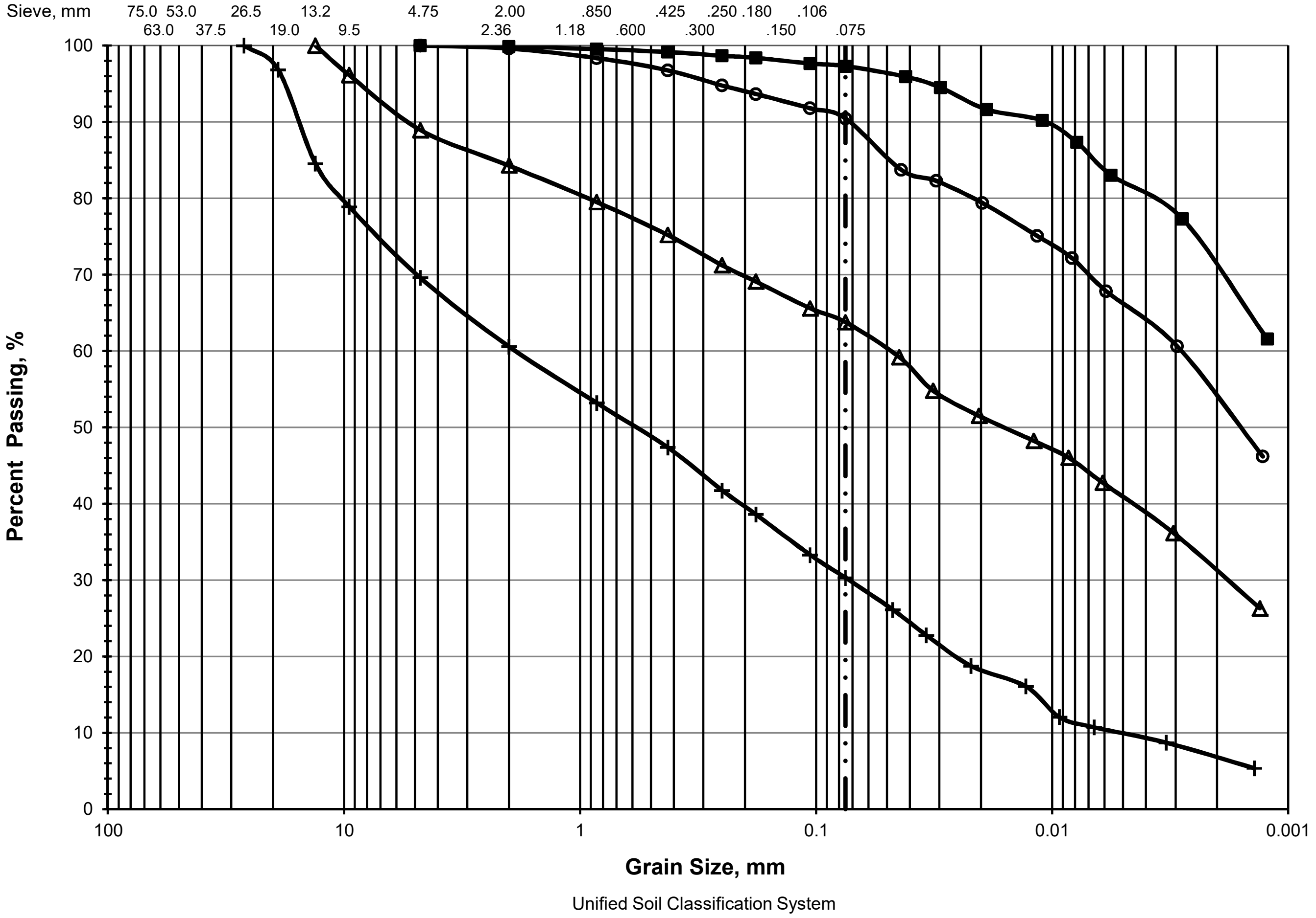
	Location	Sample	Depth, m	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
△	BH 7	SS-2	0.76 - 1.37	3.3500	1.2734	0.0512	0.0047	0.0021	0.4	1595.2
■	BH 8	SS-2	0.76 - 1.37	0.0047	0.0026					
○	BH 9	SS-3	1.52 - 2.13	3.5696	1.2950	0.0512	0.0091	0.0032	0.2	1115.5

LRL Associates Ltd.

Particle Size Analysis

ASTM D 422 / LS-702

Client: Russell Township
Project: Geotechnical Investigation
Location: Robot Street, Vars, ON.
File No.: 230216
Report No.: 2
Date: November 11, 2024



	> 75 mm	% GRAVEL		% SAND			% FINES	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
△	0.0	0.0	11.1	4.7	9.1	11.4	33.5	30.2
■	0.0	0.0	0.0	0.1	0.7	1.9	28.0	69.3
○	0.0	0.0	0.0	0.4	2.9	6.3	38.0	52.4
+	0.0	2.7	27.7	9.0	13.2	17.1	23.9	6.4

	Location	Sample	Depth, m	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
△	BH 1	SS-2	0.76 - 1.37	0.0497	0.0165	0.0018				
■	BH 1	SS-3	1.52 - 2.13							
○	BH 3	SS-3	1.52 - 2.13	0.0029						
+	BH 5	SS-4	2.29 - 2.90	1.9080	0.6162	0.0730	0.0119	0.0054	0.5	353.3

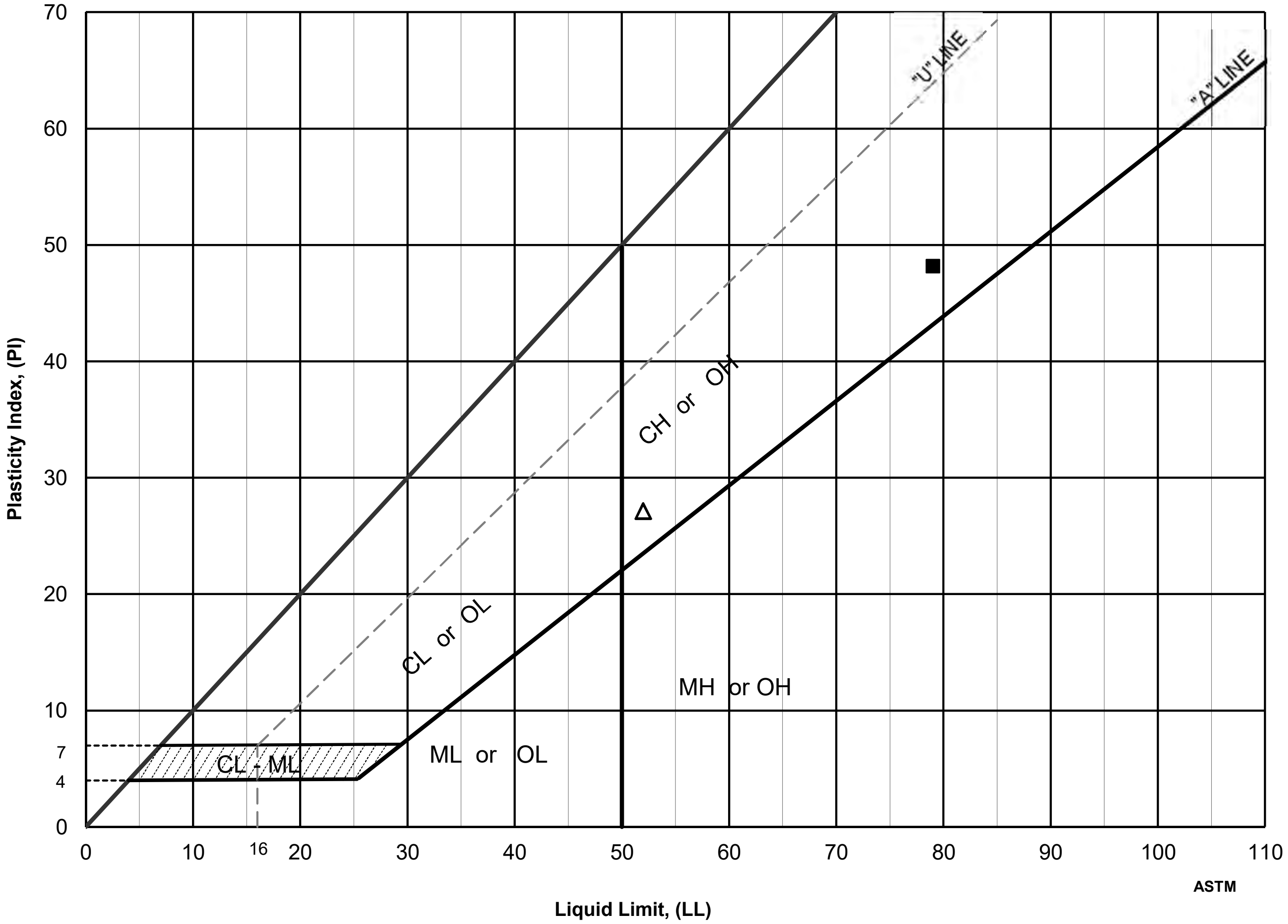
LRL Associates Ltd.

Plasticity Index

ASTM D 4318 / LS-703/704

Client: Russell Township
Project: Geotechnical Investigation
Location: Robot Street, Vars, ON.
File No.: 230216
Report No.: 1
Date: November 11, 2024

Plasticity Chart



	Location	Sample	Depth, m	Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Activity Number	USCS
△	BH 1	SS-2	0.76 - 1.37	31	52	25	27	0.21	0.90	CH
■	BH 1	SS-3	1.52 - 2.13	55	79	31	48	0.49	0.70	CH

Geotechnical Investigation

Emard and Warehouse Street Extensions
Vars Industrial Park
Vars, Ontario

Prepared for:

Township of Russell
717 Notre Dame Street
Embrun, Ontario
K0A 1W0

Attention: Francois Landry

LRL File No.: 230216

September 2023

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APPENDICES

Appendix A	**Site and Borehole Location Plans**
Appendix B	**Borehole Logs**
Appendix C	**Symbols and Terms Used in Borehole Logs**
Appendix D	**Laboratory Analysis**

1 INTRODUCTION

LRL Associates Ltd. (LRL) was retained by the Township of Russell to perform a Geotechnical Investigation for two (2) proposed road extensions; Warehouse and Emard Street, located in the Vars Industrial Park.

The scope of the Geotechnical Investigation consisted of:

- Establishing the geotechnical and groundwater conditions of the overburden soils underlying the proposed road;
- Preparing a recommendation for a suitable subgrade to withstand the traffic and pavement structure load;
- Preparation of recommendations for the installation of the pavement structure;
- Comment on backfilling requirements and the suitability of the on-site soils for backfilling purposes;

This report has been prepared in consideration of the terms and conditions noted above and with the assumption that the design of the project will satisfy any applicable codes and standards. Should there be any changes in the design features, which may relate to the geotechnical recommendations provided in this report, LRL should be advised in order to review the report recommendations.

2 SITE AND PROJECT DESCRIPTION

The site under investigation is currently vacant land, and can be legally described as Part of Lot 22, Concession 4. The Warehouse Street extension is considered to be relatively flat; whereas the Emard Street extension has some rolling grade changes of about 10 m over the entire length of the proposed road. The site is currently being used for agricultural purposes.

The proposed Warehouse Street will be about 350 m, and Emard will be about 1,100 m.

3 PROCEDURE

The fieldwork for this geotechnical investigation was carried out on July 24 and 25, 2023. Prior to the fieldwork, the site was cleared for the presence of any underground services and utilities. At this time, a total of nineteen (19) boreholes were drilled within the proposed roadways, and labelled BH1 through BH19. The approximate locations of the boreholes are shown in Figure 2A and Figure 2B for Warehouse and Emard Street extensions respectively, included in **Appendix A**.

The boreholes were advanced using a track mounted (CME 55) drill rig equipped with 200 mm diameter continuous flight hollow stem auger supplied and operated by George Downing Estate Ltd. A "two man" crew experienced with geotechnical drilling operated the drill rig and equipment under direct supervision of LRL staff.

Sampling of the overburden materials encountered in the boreholes was carried out at regular intervals using a split spoon sampler of 50.8 mm diameter drive open conventional spoon sampler in conjunction with standard penetration testing (SPT) "N" values. The SPT tests were conducted in accordance with the requirements **ASTM D1586** and the results of SPT, in terms of the number of blows per 0.3 m of split-spoon sampler penetration after the first 0.15 m designated as “N” value. Results of the SPT test (N-value) are shown on the Boring Logs under the “Sample Data” column.

The boreholes were advanced to depths ranging from 1.12 to 2.90 m below ground surface (bgs). Upon completion, the boreholes were backfilled and compacted using the overburden cuttings.

Piezometers were installed in six (6) of the boreholes to measure the ground water level. The piezometers consisted of 19 mm diameter PVC pipe with a slotted bottom to allow for water infiltration, backfilled with silica sand and sealed with bentonite.

The fieldwork was supervised throughout by a member of our engineering staff who oversaw the drilling activities, cared for the samples obtained and logged the subsurface conditions encountered within each of the boreholes. Samples of the subsurface materials were extruded from the samplers in the field, labeled according to location and depth, and sealed in plastic bags to prevent moisture loss. The recovered soil samples collected from the boreholes were classified based on visual examination of the materials recovered and the results of the in-situ testing. All soil samples were transported to our office for further examination by our geotechnical engineer.

Furthermore, all boreholes were surveyed and located using a Garmin Etrex Legend GPS (Global Positioning System) receiver using NAD 83 datum (North American Datum). LRL’s field personnel determined the existing grade elevations at the borehole locations through a topographic survey carried out using the site bench mark. Ground surface elevations of the boring locations are shown on their respective boreholes logs.

4 SUBSURFACE SOIL AND GROUNDWATER CONDITIONS

4.1 Published Geology

A review of local surficial geology maps provided by the Department of Energy, Mines and Resources Canada suggest that this site is located at a transition zone between two different deposits: offshore marine deposits (consisting of clay, silty clay, and silt), and a sandy to silty till material.

The soil descriptions presented in this report are based on commonly accepted methods of classification and identification employed in geotechnical practice. Classification and identification of soil were conducted according to the procedure **ASTM D2487** and judgement, and LRL does not guarantee descriptions as exact, but infers accuracy to the extent that is common in current geotechnical practice.

The subsurface soil conditions encountered at boreholes are given in their respective logs presented in **Appendix B**. A greater explanation of the information presented in the borehole logs can be found in **Appendix C** of this report. These logs indicate the subsurface conditions encountered at a specific boring locations only. Boundaries between zones on the logs are often not distinct, but are rather transitional and have been interpreted as such.

4.2 Soil Stratigraphy

The below tables provide a summary of the soils encountered in each borehole location including the depths of each soil interface.

Table 1a: Soil Stratigraphy Summary (1 of 4)

Soil Encountered	Depth of Soil Interface (m)				
	BH-1	BH-2	BH-3	BH-4	BH-5
Elevation (m)	75.83	75.81	75.79	75.78	75.83
Topsoil	0 – 0.60	0 – 0.60	0 – 0.60	0 – 0.60	0 – 0.60
Silt and Clay	0.60 – 2.90	0.60 – 2.90	0.60 – 2.90	NE	NE
Silty Clay	NE	NE	NE	0.60 – 2.90	0.60 – 2.90
Glacial Till	NE	NE	NE	NE	NE
End of Borehole (Depth/Elevation (m))	2.90 / 72.93	2.90 / 72.91	2.90 / 72.89	2.90 / 72.88	2.90 / 72.93

NE: Not Encountered

Table 1b: Soil Stratigraphy Summary (2 of 4)

Soil Encountered	Depth of Soil Interface (m)				
	BH-6	BH-7	BH-8	BH-9	BH-10
Elevation (m)	75.82	76.30	76.45	78.74	78.73
Topsoil	0 – 0.60	0 – 0.60	0 – 0.60	0 – 0.60	0 – 0.60
Silt and Clay	NE	NE	NE	NE	NE
Silty Clay	0.60 – 2.90	0.60 – 1.98	0.60 – 2.21	NE	NE
Glacial Till	NE	1.98 – 2.90	2.21 – 2.90	0.60 – 2.90	0.60 – 2.90
End of Borehole (Depth/Elevation)	2.90 / 72.92	2.90 / 73.40	2.90 / 73.55	2.90 / 75.84	1.12 / 77.61

NE: Not Encountered

Table 1c: Soil Stratigraphy Summary (3 of 4)

Soil Encountered	Depth of Soil Interface (m)				
	BH-11	BH-12	BH-13	BH-14	BH-15
Elevation (m)	78.77	82.38	83.78	84.50	85.93
Topsoil	0 – 0.60	0 – 0.60	0 – 0.60	0 – 0.60	0 – 0.60
Silt and Clay	NE	NE	NE	NE	NE
Silty Clay	NE	NE	NE	NE	NE
Glacial Till	0.60 – 2.90	0.60 – 2.90	0.60 – 2.90	0.60 – 2.90	0.60 – 2.90
End of Borehole (Depth/Elevation)	2.90 / 75.87	2.90 / 79.48	2.90 / 80.88	2.90 / 81.60	2.90 / 83.03

NE: Not Encountered

Table 1d: Soil Stratigraphy Summary (3 of 4)

Soil Encountered	Depth of Soil Interface (m)				
	BH-16	BH-17	BH-18	BH-19	
Elevation (m)	86.42	86.40	87.30	87.12	
Topsoil	0 – 0.60	0 – 0.60	0 – 0.60	0 – 0.60	
Silt and Clay	NE	NE	NE	NE	
Silty Clay	NE	NE	NE	NE	
Glacial Till	0.60 – 2.90	0.60 – 2.90	0.60 – 2.90	0.60 – 2.90	
End of Borehole (Depth/Elevation)	2.90 / 83.52	2.90 / 83.50	2.90 / 84.40	2.90 / 84.22	

NE: Not Encountered

4.3 Laboratory Analysis

Atterberg limits and moisture contents were conducted on two (2) samples. A summary of these values are provided below in **Table 2.**

Table 2: Summary of Atterberg Limits and Water Contents

Sample Location	Parameter					
	Depth (m)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Water Content (%)	USCS Group Symbol
BH2	1.52 – 2.13	85	31	54	47	CH
BH5	2.29 – 2.90	93	31	62	77	CH

Six (6) soil samples were collected for gradation analyses consisting of a sieve and hydrometer analysis. Details of laboratory analyses are reflected in **Table 3**.

Table 3: Gradation Analysis Summary

Sample Location	Depth (m)	Percent for Each Soil Gradation							Estimated Hydraulic Conductivity K (cm/s)
		Gravel		Sand			Silt (%)	Clay (%)	
		Coarse (%)	Fine (%)	Coarse (%)	Medium (%)	Fine (%)			
BH1	0.76 – 1.37	0.0	0.0	0.0	0.3	3.1	50.8	45.8	5 x 10^{-6}
BH4	2.29 – 2.90	0.0	0.0	0.0	0.3	0.7	30.0	69.0	5 x 10^{-6}
BH7	1.52 – 2.13	0.0	3.3	3.7	5.8	8.9	38.6	39.7	5 x 10^{-6}
BH11	0.76 – 1.37	0.0	33.7	8.8	11.7	8.4	28.7	8.7	1 x 10^{-4}
BH14	1.52 – 2.13	8.7	30.5	10.4	11.1	10.7	22.2	6.4	1 x 10^{-4}

BH18	2.29 – 2.90	3.9	22.5	11.9	11.4	9.1	31.4	9.8	1 x 10^{-4}

4.4 Groundwater Conditions

Six (6) piezometers were installed in the boreholes upon completion of drilling. The groundwater was measured on September 18, 2023. The groundwater was found ranging between 0.87 and 2.52 m bgs. Groundwater levels can be found on the Borehole Logs attached in **Appendix B.** It is suspected the measured groundwater within the boreholes along the Warehouse Street extension is perched water, and not the true groundwater level.

It is anticipated that a higher water table may be encountered during wet conditions (i.e. spring). It should be noted that the groundwater levels could fluctuate with seasonal weather conditions, (i.e. rainfall, droughts, spring thawing).

5 GEOTECHNICAL CONSIDERATIONS AND RECOMMENDATIONS

This section of the report provides general geotechnical recommendations for the design aspect of the project based on our interpretation of the information gathered from the boreholes performed at this site and from the project requirements.

It is our understanding that the scope of work for this street includes full construction of the street including an open ditch drainage system, and pavement structure.

5.1 Temporary Excavation

It is anticipated that temporary excavations will be required for installation of some storm culverts. The overburden soils that will be excavated will consist of a silty clay to silt and clay material, and/or glacial till. Excavations must be carried out in accordance with Occupational Health and Safety Act.

According to the Ontario’s Occupational Health and Safety Act (OHSA), O. Reg. 213/91 and its amendments, the surficial overburden expected to be excavated into at this site can be classified as Type 3. Therefore, shallow temporary excavations in the overburden soil can be cut at 1 horizontal to 1 vertical (1H: 1V) for a fully drained excavation starting at the base of the excavation and as per requirements of the OHSA regulations. Gentler slopes could be required under undrained excavations, where local water infiltrations occur and where the excavations are exposed for prolonged period of time.

In the event that the aforementioned slopes are not possible to achieve due to space restrictions, the excavation shall be shored according to OHSA O. Reg. 213/91 and its amendments. A geotechnical engineer shall be on site during construction to assess the nature of soil at excavated area, design and approve the shoring and establish the shoring depth under the excavation profile.

5.2 Earth Pressure and Geotechnical Parameters

The following equation should be used to estimate the intensity of the lateral earth pressure acting against any earth retaining structure.

$$P = K (\gamma h + q)$$

Where;

K = Appropriate co-efficient of earth pressure

ɣ = Unit weight of compacted backfill

h = Depth (below adjacent highest grade) at which P is calculated

q = Intensity of any surcharge distributed uniformly over the backfill surface (usually surcharge from traffic, equipment or soil stockpiled and typically considered 10 kPa).

The coefficient earth pressure at rest (k_0) should be used in the calculation of the earth pressure on the manhole/or any earth retaining structure, which is expected to be rather rigid and not to deflect.

For the on-site soil, the following geotechnical parameter may be assumed as summarized in **Table 4**:

Table 4: Geotechnical Parameters of Materials

Type of Material	Bulk Density (kN/m^3)	Angle of internal friction	Pressure Coefficient		
			At Rest (K_0)	Active (K_A)	Passive (K_P)
Silty Clay	17.5	25	0.52	0.41	2.46
Silt and Clay	17.5	25	0.52	0.41	2.46
Glacial Till	19.5	38	0.38	0.24	4.20

5.3 Groundwater Control

It is anticipated that any excavation within the native overburden material may experience some infiltration of ground water. This will able to be controlled by pumping from open sump pumps. Surface water runoff into the excavation should be avoided and diverted away from the excavation.

5.4 Suitability of On-site Soils

The existing overburden soils consists of silty clay, silt and clay, and glacial till. These materials may be used for backfilling purposes below the pavement structure where grade raises are required, provided they're free from organic or any other objectionable material.

It shall be noted that the adequacy of a material for reuse as backfill will depend on its water content at the time of its use and on the weather conditions prevailing prior and during that time. Therefore, all excavated materials to be reused shall be stockpiled in a manner that will prevent any significant changes in their moisture content, especially during wet conditions.

6 CULVERT BEDDING REQUIREMENTS AND BACKFILLING

For any culverts being installed for the proposed road, they will most likely be founded within the silty clay or silt and clay, and/or glacial till material. The grade below any culverts, if required, may be raised using OPSS Granular B Type II or an approved equivalent. Bedding, and thickness of cover material requirements for culverts shall conform to the manufacturers design requirements and to the requirements and detail installations outlined in the Ontario Provincial Standard Specifications (OPSS), drawings

OPSD 802.010 for flexible pipes and any other applicable standard and requirements from the Township of Russell/City of Ottawa, Ontario.

The bedding, and cover materials should be compacted in maximum 300 mm thick lifts to at least 95% of its Standard Proctor Maximum Dry Density (SPMDD) using suitable vibratory compaction equipment.

In the event that the culvert will be founded below the groundwater table, the bedding may consist of 19 mm clear stone. It is recommended to keep the sump pump in place as long as possible during installation of the culvert if this condition persists.

6.1 Frost Protection - Culvert Base

Frost protection requirements to the culverts depend on the anticipated water conditions during the winter season. If the water flows continuous throughout the winter season, the bedding should be considered to provide sufficient frost protection to subgrade soil. If the water flows are intermittent, the bedding itself may not be sufficient to provide frost protection and may result in heaving of the subsoil. In this case, it is recommended, the subgrade soil to be protected against frost heaving with additional insulation using extruded polystyrene insulation.

6.2 Trench Backfill

The trench should be backfilled using compactable material, free of organics, debris and large cobbles or boulders. Where native backfill is used, it should match the native materials exposed on the trench walls. Backfill below the zone of seasonal frost penetration could consist of either acceptable native material or imported granular material conforming to OPSS Granular B Type I or II. Any boulders larger than 150 mm in size should not be used as trench backfill

To minimize future settlement of the backfill and achieve an acceptable subgrade for the roadway, the trench should be compacted in maximum 300 mm thick lifts to at least 95% SPMDD. The specified density may be reduced where the trench backfill is not located within or in close proximity to existing roadways or any other structures.

Where asphaltic concrete is present, it should be cut back to a minimum of 150 mm from the edge of the excavation to allow for proper compaction between the new and existing pavement structures.

7 PAVEMENT DESIGN

The below pavement structures to be constructed over a stable subgrade is shown in **Table 5a and 5b** for Warehouse and Emard Street respectively.

Table 5a: Recommended Pavement Structure – Warehouse Street

Course	Material	Thickness (mm)
Surface	HL3 A/C	40
Binder	HL8 A/C	50
Base course	Granular "A"	150
Subbase	Granular "B" Type II	600

Total:		840

Table 5b: Recommended Pavement Structure – Emard Street

Course	Material	Thickness (mm)
Surface	HL3 A/C	40
Binder	HL8 A/C	50
Base course	Granular "A"	150
Subbase	Granular “B" Type II	450
Total:		690

Performance Graded Asphalt Cement (PGAC) **58-34** is recommended for this project.

The base and subbase granular materials shall conform to OPSS 1010 material specifications. They shall be tested and approved by geotechnical personnel prior to delivery to the site and shall be compacted to at least 98% of its SPMDD.

Asphalt concrete shall conform to OPSS 1150 and be placed and compacted to at least 94% of the Marshall Density. The mix and its constituents shall be reviewed, tested and approved by geotechnical personnel prior to delivery to the site.

Transverse butt or stepped joints between the new Hot Mix Asphalt (HMA) pavement and the existing pavement shall be constructed by trimming the existing pavement edge to a straight cleaning vertical surfaces of at least 40 mm. In the event of matching a compacted joint, the depth of the un-compacted mat shall be set to allow for compaction.

Transverse Joints between new HMA and the existing asphaltic concrete shall be constructed as follows:

Binder course should be flushed against the existing asphaltic concrete and a butt joint should be made.

Surface course should be flushed against the existing asphaltic concrete, a stepped joint shall be made by removing the existing asphaltic concrete surface course to its full depth for a minimum length of 0.5 m and the remaining face shall be trimmed to straight vertical surface.

If the binder and surface course are not placed flush against the existing asphaltic concrete, the binder course shall be feathered out and the surface course shall be butted by removing the existing surface course to a minimum depth of 40 mm for a minimum longitudinal distance of 3.0 m.

7.1 Subgrade Preparation

On completion of the applicable culvert installations, and following the backfilling and satisfactory compaction up to the subgrade level; the subgrade shall be shaped, crowned and proof-rolled in the presence of LRL’s geotechnical personnel. A “Tandem Axle”, dual wheel loaded dump truck shall be used. Any resulting soft areas should be sub-excavated down to an adequate bearing layer and replaced with approved backfill. Any grade raise or void resulted from sub-excavation shall be filled using OPSS Granular B Type I or II, or an approved equivalent material. Any subgrade fill needed should be placed in maximum 300 mm lifts and compacted to 95% of its SPMDD.

The preparation of subgrade shall be scheduled and carried out in a manner so that a protective cover of overlying granular material is placed as quickly as possible in order to avoid unnecessary circulation by heavy equipment, except on unexcavated or protected surfaces. Frost protection of the surface shall be implemented if works are carried out during the winter months. Otherwise, all frozen soil must be identified and removed or fully thawed prior to proceed to the next stage of construction.

The performance of the pavement structure is highly dependent on the subsurface groundwater conditions and maintaining the subgrade and pavement structure in a dry condition. To intercept excess subsurface water within the pavement structure granular materials, sub-drains with suitable outlets should be installed below the pavement area's subgrade. The surface of the pavement should be properly graded to direct runoff water towards suitable drainage features (ie: ditches). It is recommended that the lateral extent of the subbase and base layers not be terminated vertically immediately behind the curb/edge of pavement line but be extended beyond the curb/edge of the pavement.

8 INSPECTION SERVICES

The engagement of the services of the geotechnical consultant during construction is recommended to confirm that the subsurface conditions throughout the proposed site do not materially differ from those given in the report and that the construction activities do not adversely affect the intent of the design.

Any engineered fill areas within the proposed pavement structure should be inspected by LRL to ensure that a suitable subgrade has been reached and properly prepared. The placing and compaction of any granular materials should be inspected to ensure that the materials used conform to the grading and compaction specifications.

If constructed during winter months, the subgrade should be protected from freezing temperatures using suitable construction techniques.

9 REPORT CONDITIONS AND LIMITATIONS

It is stressed that the information presented in this report is provided for the guidance of the designers and is intended for this project only. The use of this report as a construction document or its use by a third party beyond the client specifically listed in the report is neither intended nor authorized by LRL Associates Ltd. Contractors bidding on or undertaking the works should examine the factual results of the investigation, satisfy themselves as to the adequacy of the information for construction, and make their own interpretation of the factual data as it affects their construction techniques, schedule, safety and equipment capabilities.

The professional services for this project include only the geotechnical aspects of the subsurface conditions at this site. The presence or implications of possible contamination resulting from previous uses or activities at this site or adjacent properties, and/or resulting from the introduction onto the site of materials from off-site sources are outside the terms of reference for this report.

The recommendations provided in this report are based on subsurface data obtained at the specific test locations only. Boundaries between zones presented on the borehole logs are often not distinct but transitional and were interpreted. Experience indicates that the subsurface soil and groundwater conditions can vary significantly between and beyond the test locations. For this reason, the recommendations given in this report are subject to a field verification of the subsurface soil conditions at the time of construction.

The report recommendations are applicable only to the project described in the report. Any changes to the project will require a review by LRL Associates Ltd., to insure compatibility with the recommendations contained in this project.

We trust this report provides sufficient information for your present purposes. If you have any questions concerning this report or if we may be of further services to you, please do not hesitate to contact the undersigned.

Yours truly,
LRL Associates Ltd.

LICENSED PROFESSIONAL ENGINEER
B. W. JOHNSON
100510537
2023.10.02
PROVINCE OF ONTARIO

Brad Johnson, P.Eng.
Geotechnical Engineer

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APPENDIX A

Site and Borehole Location Plan

ENGINEERING | INGÉNIERIE

5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

PROJECT

GEOTECHNICAL INVESTIGATION
PROPOSED ROAD EXTENSION
417 INDUSTRIAL PARK
RUSSELL, ONTARIO

DRAWING TITLE

SITE LOCATION
SOURCE: GEOOTTAWA

CLIENT

RUSSELL TOWNSHIP

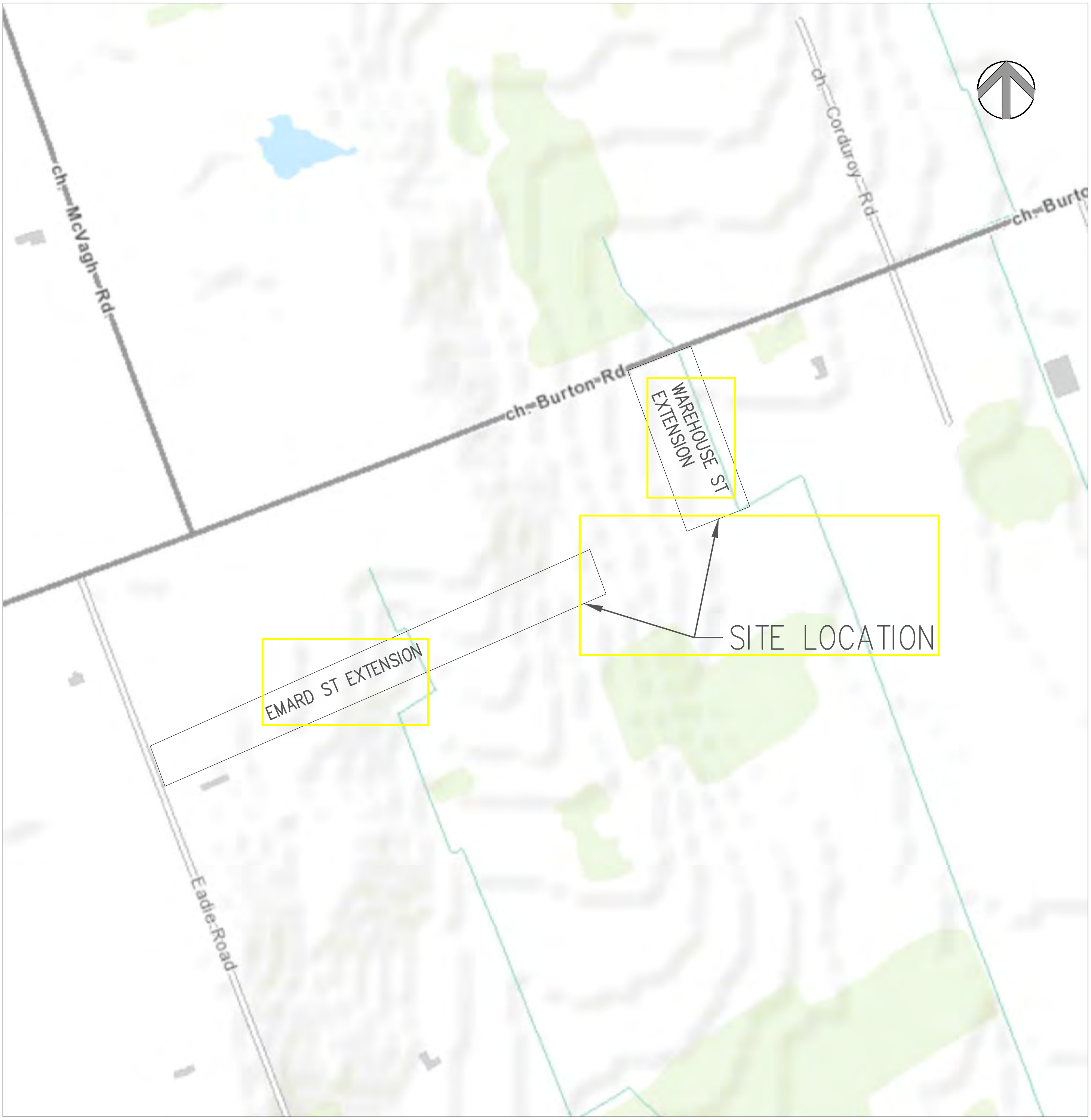
DATE

SEPTEMBER 2023

PROJECT

230216

FIGURE 1



LRL

ENGINEERING | INGÉNIERIE

5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

PROJECT

GEOTECHNICAL INVESTIGATION
PROPOSED ROAD EXTENSION
417 INDUSTRIAL PARK
RUSSELL, ONTARIO

DRAWING TITLE

BOREHOLE LOCATION
SOURCE: GOOGLE AERIAL VIEW

CLIENT	DATE	PROJECT	
RUSSELL TOWNSHIP	SEPTEMBER 2023	230216	FIGURE 2A

LRL

ENGINEERING | INGÉNIERIE

5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

PROJECT

GEOTECHNICAL INVESTIGATION
PROPOSED ROAD EXTENSION
417 INDUSTRIAL PARK
RUSSELL, ONTARIO

DRAWING TITLE

BOREHOLE LOCATION
SOURCE: GOOGLE AERIAL VIEW

CLIENT

RUSSELL TOWNSHIP

DATE

SEPTEMBER 2023

PROJECT

230216

FIGURE 2B

APPENDIX B

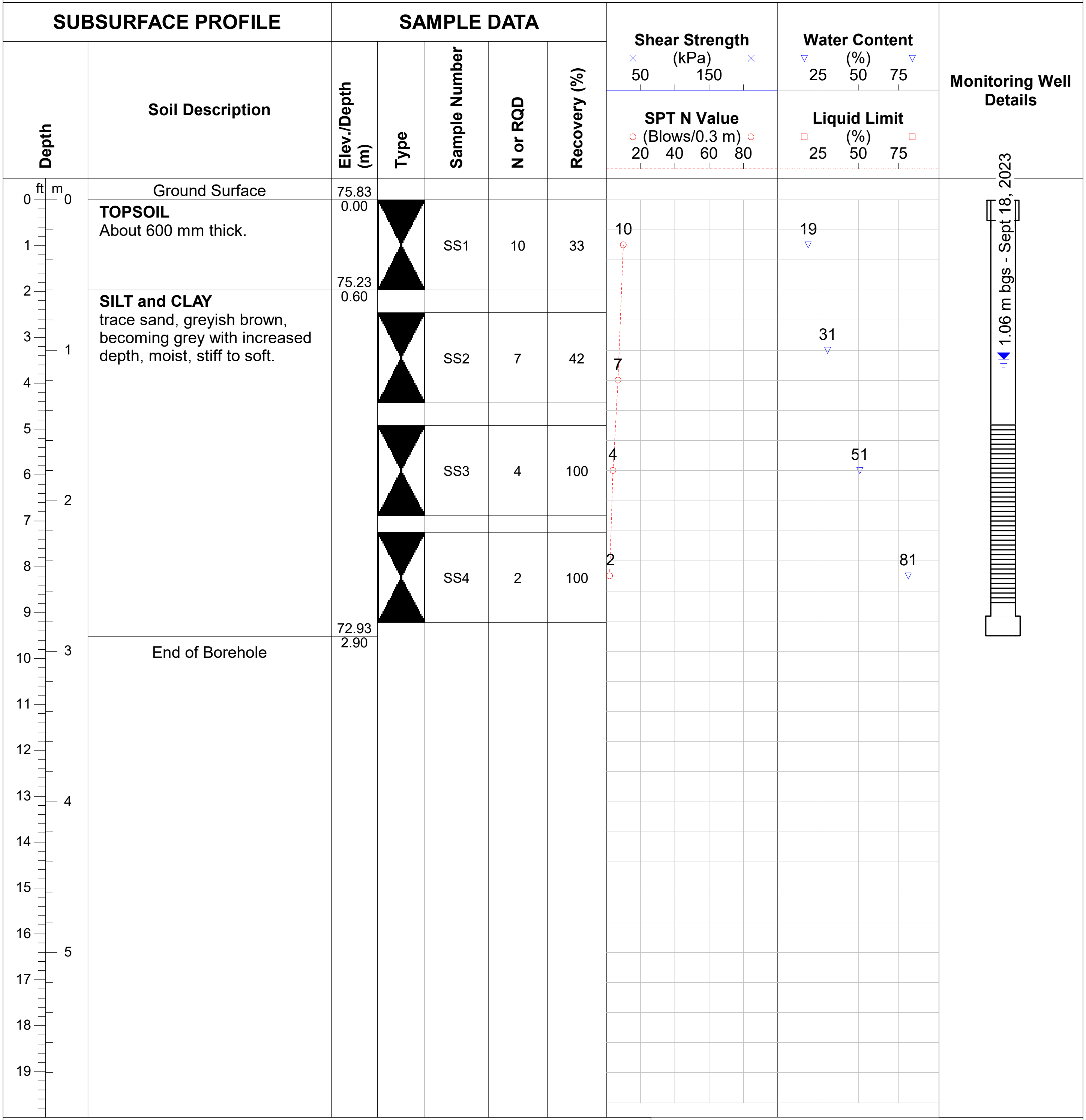
Borehole Logs

Borehole Log: BH1

Project No.: 230216
Project: Geotechnical Investigation - Road Extension
Client: Russell Township
Location: Vars Industrial Park
Date: July 24, 2023
Field Personnel: SV/KB
Driller: George Downing Estate Drillling Ltd.
Drilling Equipment: Track Mount CME 850
Drilling Method: Hollow Stew Auger

SUBSURFACE PROFILE / SAMPLE DATA

Depth (m)	Soil Description	Elev./Depth (m)	Type	Sample Number	N or RQD	Recovery (%)
0	Ground Surface	75.83				
0.00	**TOPSOIL** About 600 mm thick.	0.00	⧗	SS1	10	33
0.60	**SILT and CLAY** trace sand, greyish brown, becoming grey with increased depth, moist, stiff to soft.	75.23 0.60	⧗	SS2	7	42
			⧗	SS3	4	100
			⧗	SS4	2	100
2.90	End of Borehole	72.93 2.90				



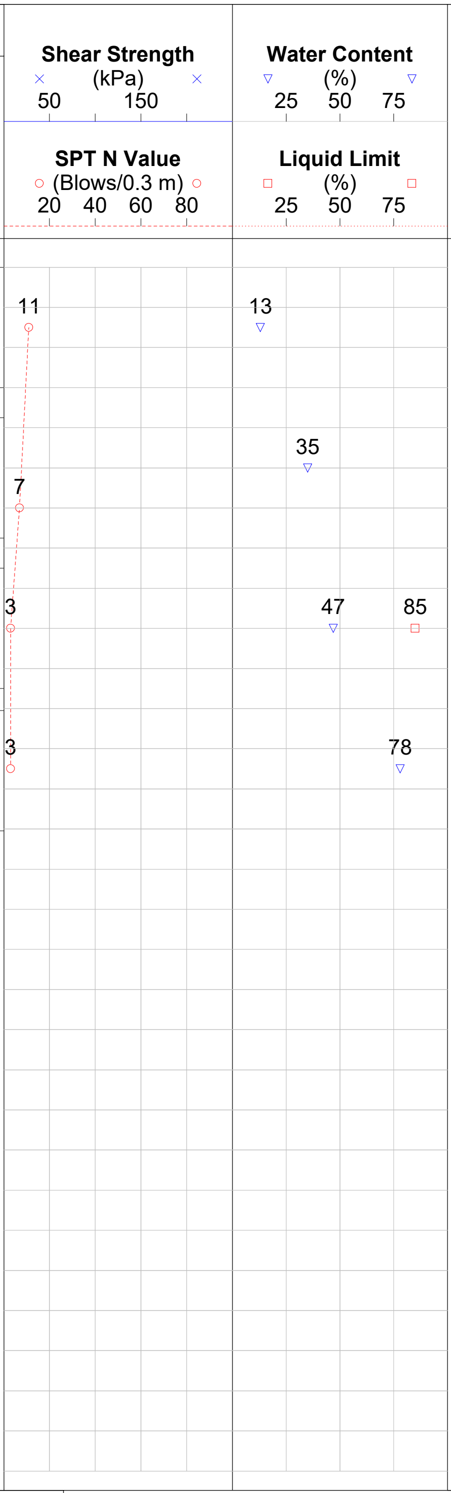
Easting: 471666 m
Northing: 5019286 m
Site Datum: Site Benchmark
Groundsurface Elevation: 75.83 m
Top of Riser Elev.: NA
Hole Diameter: 200 mm
Monitoring Well Diameter: 19 mm

NOTES:

Borehole Log: BH2

Project No.: 230216
Project: Geotechnical Investigation - Road Extension
Client: Russell Township
Location: Vars Industrial Park
Date: July 24, 2023
Field Personnel: SV/KB
Driller: George Downing Estate Drillling Ltd.
Drilling Equipment: Track Mount CME 850
Drilling Method: Hollow Stew Auger

SUBSURFACE PROFILE		SAMPLE DATA				
Depth ft m	Soil Description	Elev./Depth (m)	Type	Sample Number	N or RQD	Recovery (%)
0 0	Ground Surface	75.81				
	TOPSOIL About 600 mm thick.	0.00 75.21		SS1	11	8
	SILT and CLAY trace sand, greyish brown, becoming grey with increased depth, moist, stiff to soft.	0.60		SS2	7	50
				SS3	3	100
		72.91		SS4	3	100
	End of Borehole	2.90				



Monitoring Well Details

Easting: 471653 m
Northing: 5019321 m
Site Datum: Site Benchmark
Groundsurface Elevation: 75.81 m
Top of Riser Elev.: NA
Hole Diameter: 200 mm
Monitoring Well Diameter: N/A

NOTES:

Borehole Log: BH3

Project No.: 230216

Project: Geotechnical Investigation - Road Extension

Client: Russell Township

Location: Vars Industrial Park

Date: July 24, 2023

Field Personnel: SV/KB

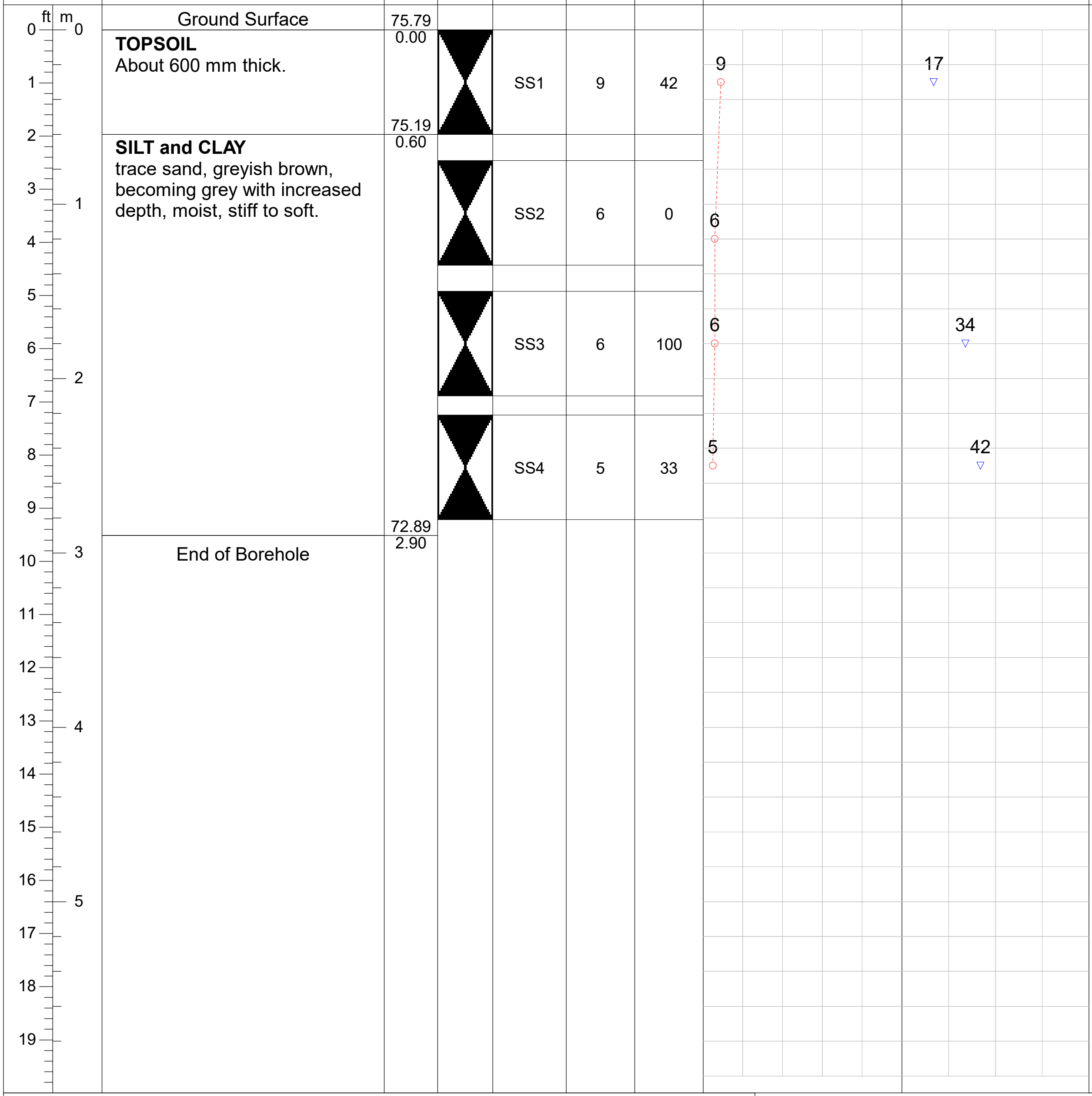
Driller: George Downing Estate Drillling Ltd.

Drilling Equipment: Track Mount CME 850

Drilling Method: Hollow Stew Auger

SUBSURFACE PROFILE / SAMPLE DATA

Soil Description	Elev./Depth (m)	Type	Sample Number	N or RQD	Recovery (%)
Ground Surface	75.79				
TOPSOIL About 600 mm thick.	0.00 75.19	⧗	SS1	9	42
SILT and CLAY trace sand, greyish brown, becoming grey with increased depth, moist, stiff to soft.	0.60	⧗	SS2	6	0
		⧗	SS3	6	100
	72.89	⧗	SS4	5	33
End of Borehole	2.90				



Monitoring Well Details

Easting: 471640 m

Northing: 5019371 m

Site Datum: Site Benchmark

Groundsurface Elevation: 75.79 m

Top of Riser Elev.: NA

Hole Diameter: 200 mm

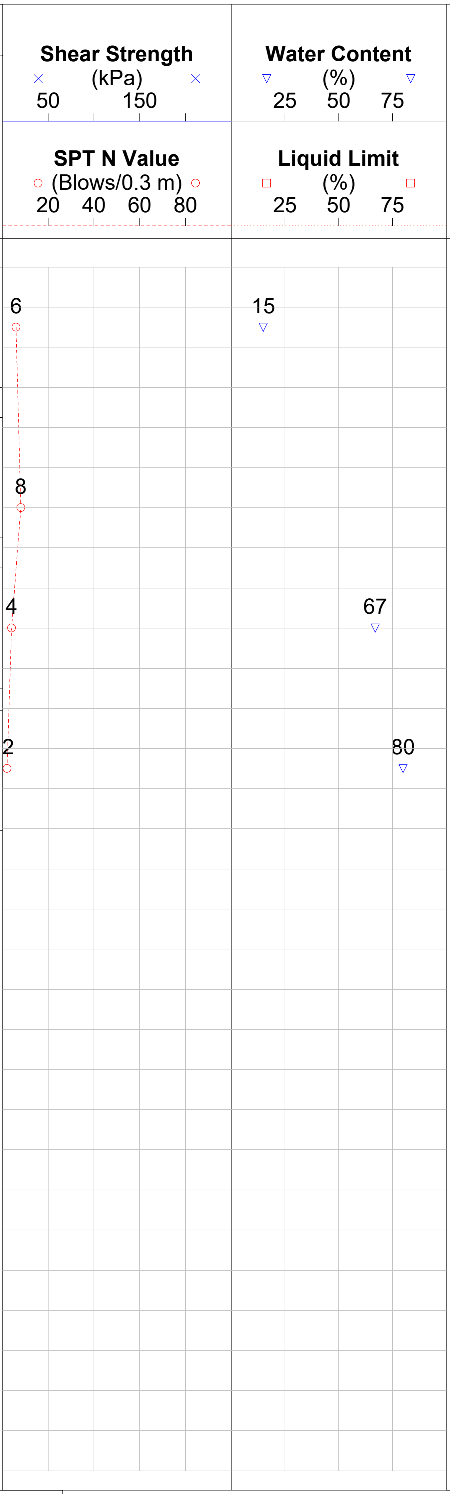
Monitoring Well Diameter: N/A

NOTES:

Borehole Log: BH4

Project No.: 230216
Project: Geotechnical Investigation - Road Extension
Client: Russell Township
Location: Vars Industrial Park
Date: July 24, 2023
Field Personnel: SV/KB
Driller: George Downing Estate Drillling Ltd.
Drilling Equipment: Track Mount CME 850
Drilling Method: Hollow Stew Auger

SUBSURFACE PROFILE	SAMPLE DATA					
Soil Description	Elev./Depth (m)	Type	Sample Number	N or RQD	Recovery (%)	Monitoring Well Details
Ground Surface	75.78					
TOPSOIL About 600 mm thick.	0.00 75.18	⧗	SS1	6	50	
SILTY CLAY trace sand, greyish brown, becoming grey with increased depth, moist, stiff to soft.	0.60	⧗	SS2	8	0	
		⧗	SS3	4	100	
	72.88	⧗	SS4	2	100	
End of Borehole	2.90					



Easting: 471623 m
Northing: 5019418 m
Site Datum: Site Benchmark
Groundsurface Elevation: 75.78 m
Top of Riser Elev.: NA
Hole Diameter: 200 mm
Monitoring Well Diameter: N/A

NOTES:

Borehole Log: BH5

Project No.: 230216

Project: Geotechnical Investigation - Road Extension

Client: Russell Township

Location: Vars Industrial Park

Date: July 24, 2023

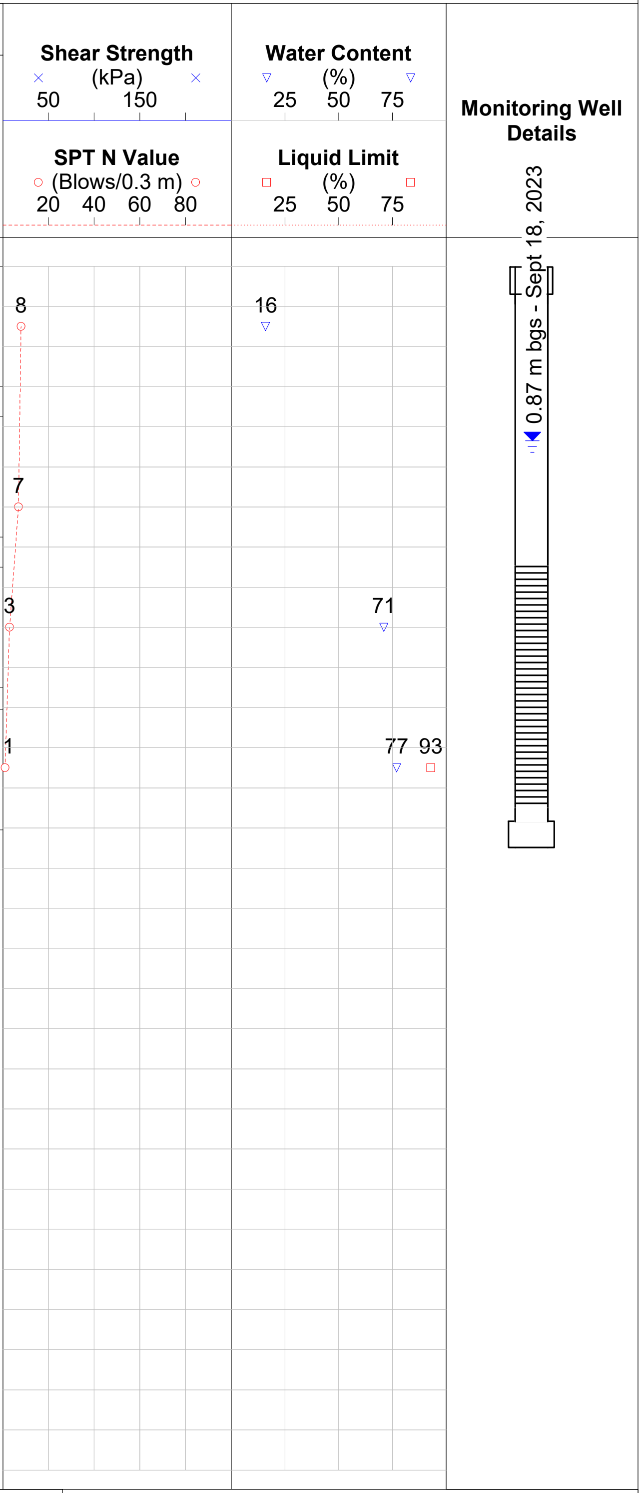
Field Personnel: SV/KB

Driller: George Downing Estate Drillling Ltd.

Drilling Equipment: Track Mount CME 850

Drilling Method: Hollow Stew Auger

SUBSURFACE PROFILE		SAMPLE DATA				
Depth (ft / m)	Soil Description	Elev./Depth (m)	Type	Sample Number	N or RQD	Recovery (%)
0	Ground Surface	75.83				
0	**TOPSOIL** About 600 mm thick.	0.00	⧗	SS1	8	42
		75.23 0.60				
	SILTY CLAY trace sand, greyish brown, becoming grey with increased depth, moist, firm to soft.		⧗	SS2	7	0
			⧗	SS3	3	100
			⧗	SS4	1	100
		72.93 2.90				
	End of Borehole					



Easting: 471612 m

Northing: 5019462 m

Site Datum: Site Benchmark

Groundsurface Elevation: 75.83 m

Top of Riser Elev.: NA

Hole Diameter: 200 mm

Monitoring Well Diameter: 19 mm

NOTES:

Borehole Log: BH6

Project No.: 230216

Project: Geotechnical Investigation - Road Extension

Client: Russell Township

Location: Vars Industrial Park

Date: July 24, 2023

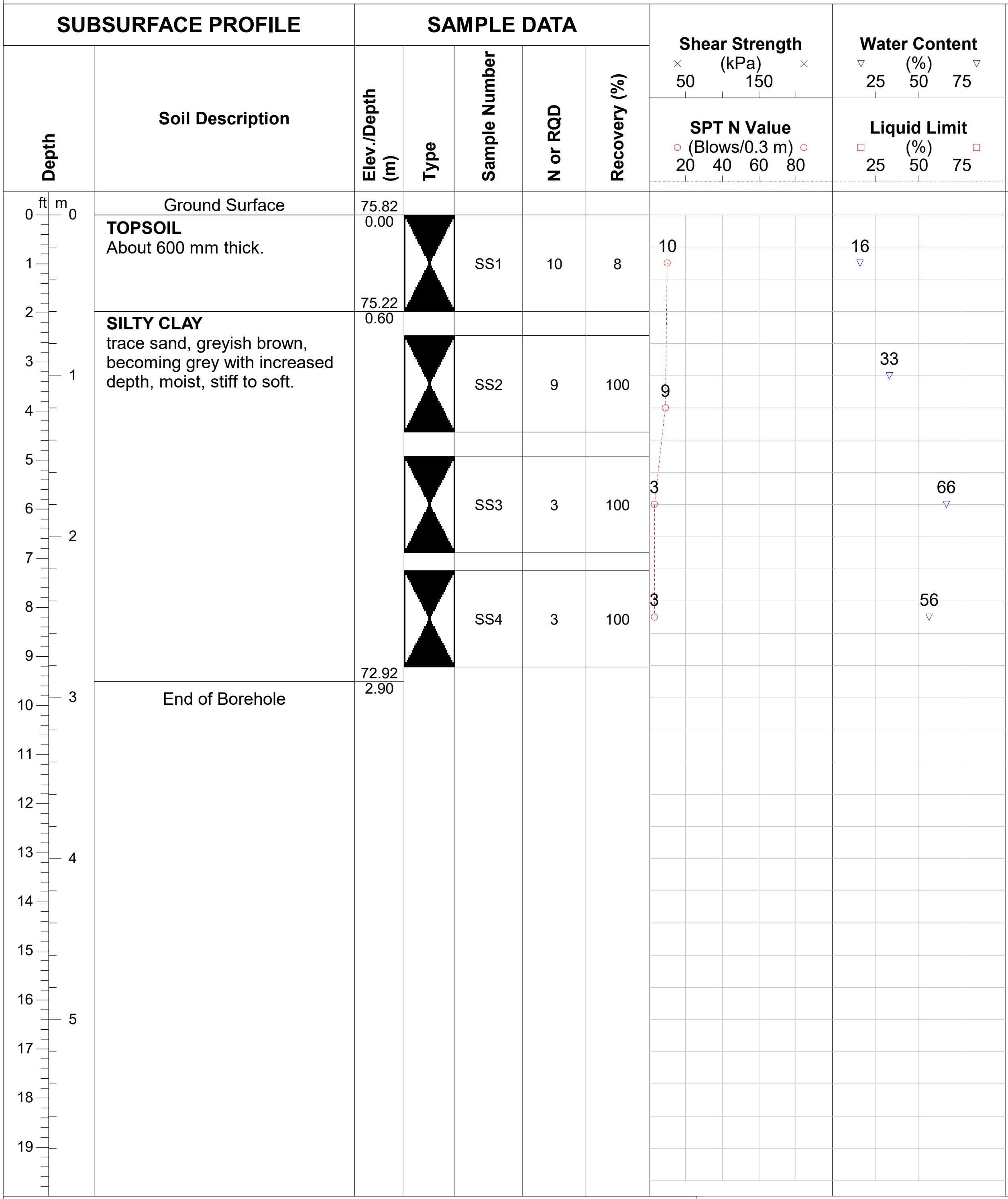
Field Personnel: SV/KB

Driller: George Downing Estate Drillling Ltd.

Drilling Equipment: Track Mount CME 850

Drilling Method: Hollow Stew Auger

SUBSURFACE PROFILE / SAMPLE DATA



Soil Description	Elev./Depth (m)	Type	Sample Number	N or RQD	Recovery (%)
Ground Surface	75.82				
TOPSOIL About 600 mm thick.	0.00		SS1	10	8
SILTY CLAY trace sand, greyish brown, becoming grey with increased depth, moist, stiff to soft.	75.22 0.60		SS2	9	100
			SS3	3	100
			SS4	3	100
End of Borehole	72.92 2.90				

Easting: 471595 m

Northing: 5019494 m

Site Datum: Site Benchmark

Groundsurface Elevation: 75.82 m

Top of Riser Elev.: NA

Hole Diameter: 200 mm

Monitoring Well Diameter: N/A

NOTES:

Borehole Log: BH7

Project No.: 230216

Client: Russell Township

Date: July 24, 2023

Project: Geotechnical Investigation - Road Extension

Location: Vars Industrial Park

Field Personnel: SV/KB

Driller: George Downing Estate Drillling Ltd.

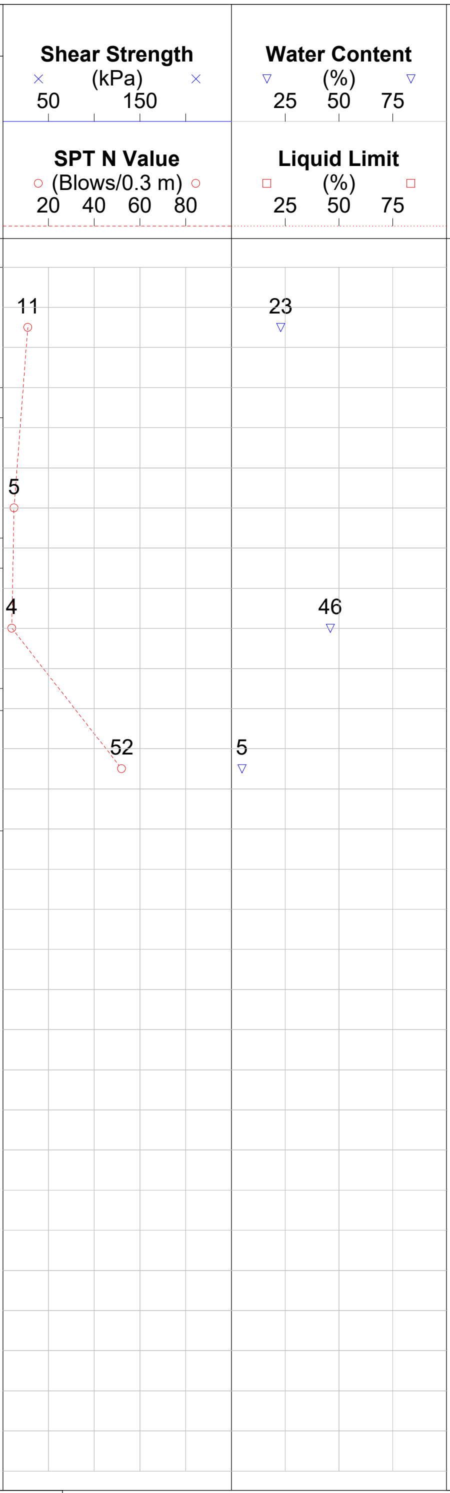
Drilling Equipment: Track Mount CME 850

Drilling Method: Hollow Stew Auger

SUBSURFACE PROFILE

SAMPLE DATA

Soil Description	Elev./Depth (m)	Type	Sample Number	N or RQD	Recovery (%)
Ground Surface	76.30				
TOPSOIL About 600 mm thick.	0.00 75.70	⧗	SS1	11	42
SILTY CLAY trace sand, greyish brown, becoming grey with increased depth, moist, firm to soft.	0.60	⧗	SS2	5	0
	74.32	⧗	SS3	4	50
GLACIAL TILL silt-clay, some sand, trace gravel, brownish grey, moist, very dense.	1.98 73.40	⧗	SS4	52	33
End of Borehole	2.90				



Monitoring Well Details

Easting: 471577 m

Northing: 5019534 m

Site Datum: Site Benchmark

Groundsurface Elevation: 76.30 m

Top of Riser Elev.: NA

Hole Diameter: 200 mm

Monitoring Well Diameter: N/A

NOTES:

Borehole Log: BH8

Project No.: 230216

Project: Geotechnical Investigation - Road Extension

Client: Russell Township

Location: Vars Industrial Park

Date: July 24, 2023

Field Personnel: SV/KB

Driller: George Downing Estate Drillling Ltd.

Drilling Equipment: Track Mount CME 850

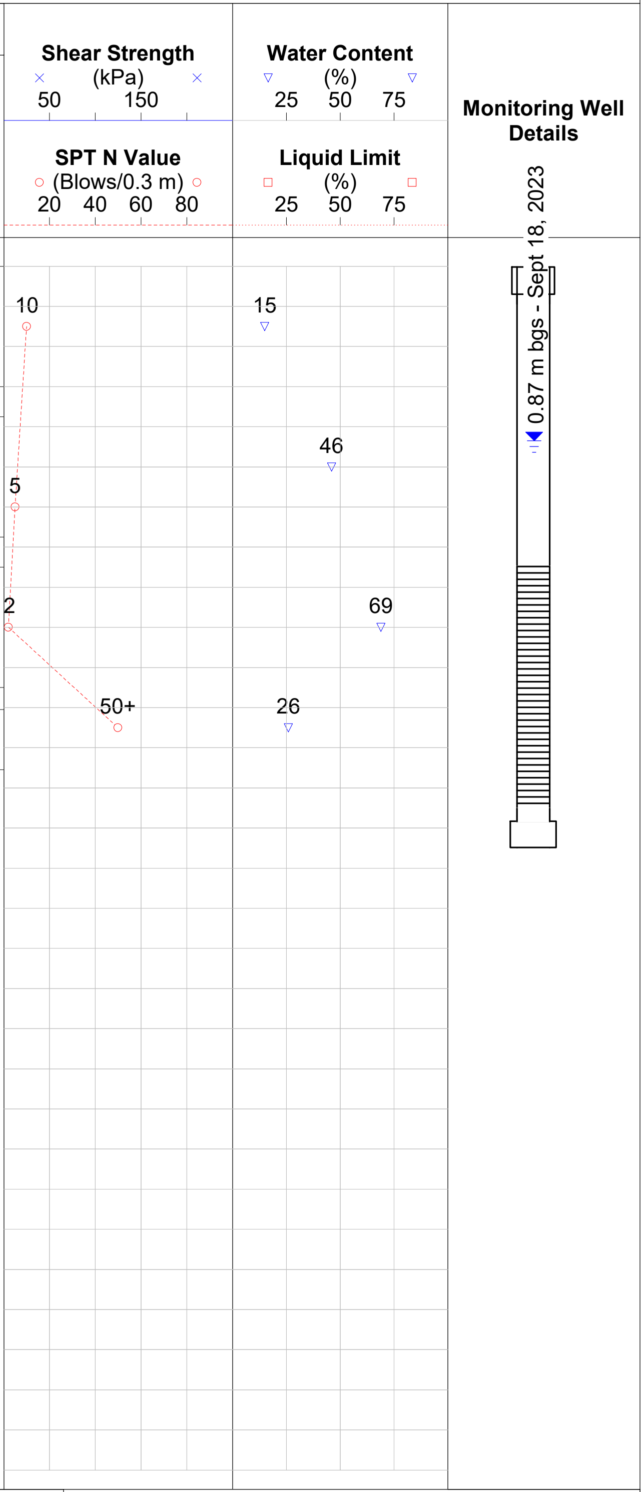
Drilling Method: Hollow Stew Auger

SUBSURFACE PROFILE

Depth (m)	Soil Description	Elev./Depth (m)
0	Ground Surface	76.45
0.00	**TOPSOIL** About 600 mm thick.	0.00 75.85
0.60	**SILTY CLAY** trace sand, greyish brown, becoming grey with increased depth, moist, firm to soft.	0.60 74.24
2.21	**GLACIAL TILL** silt-clay, some sand, trace gravel, brownish grey, moist, very dense.	2.21 73.55
2.90	End of Borehole	2.90

SAMPLE DATA

Type	Sample Number	N or RQD	Recovery (%)
⧗	SS1	10	17
⧗	SS2	5	75
⧗	SS3	2	100
⧗	SS4	50+	50



Easting: 471560 m

Northing: 5019572 m

Site Datum: Site Benchmark

Groundsurface Elevation: 76.45 m

Top of Riser Elev.: NA

Hole Diameter: 200 mm

Monitoring Well Diameter: N/A

NOTES:

Borehole Log: BH9

Project No.: 230216

Project: Geotechnical Investigation - Road Extension

Client: Russell Township

Location: Vars Industrial Park

Date: July 25, 2023

Field Personnel: SV/KB

Driller: George Downing Estate Drillling Ltd.

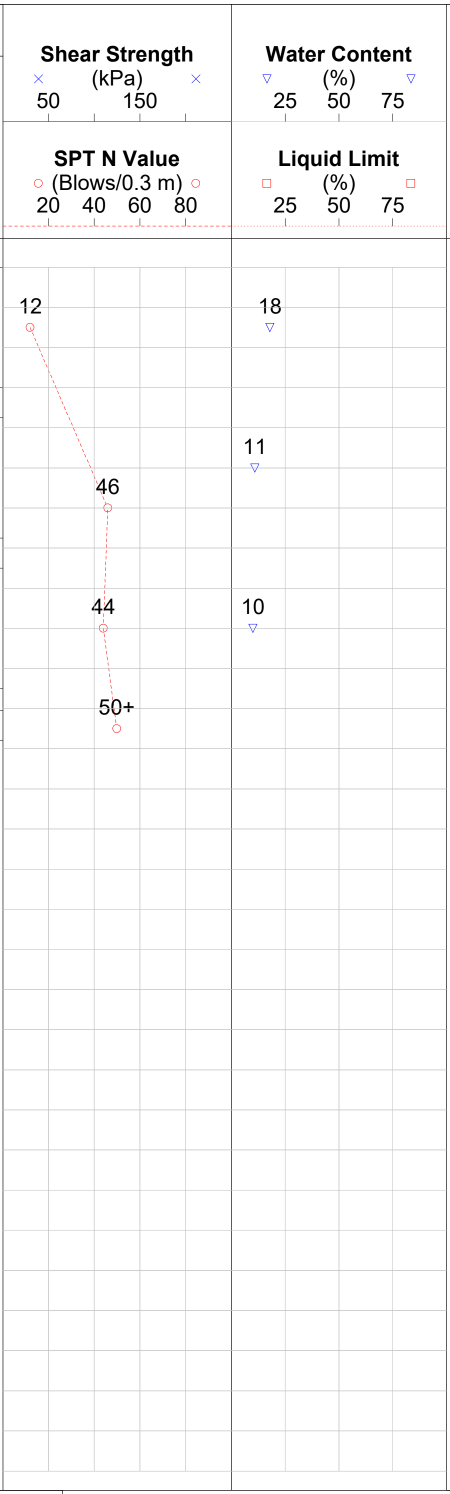
Drilling Equipment: Track Mount CME 850

Drilling Method: Hollow Stew Auger

SUBSURFACE PROFILE		SAMPLE DATA				
Depth	Soil Description	Elev./Depth (m)	Type	Sample Number	N or RQD	Recovery (%)
	Ground Surface	78.74				
	TOPSOIL About 600 mm thick.	0.00 78.14	⧗	SS1	12	33
	GLACIAL TILL silt-sand-gravel, trace clay, moist, brown, dense.	0.60	⧗	SS2	46	100
			⧗	SS3	44	21
		75.84	⧗	SS4	50+	0
	End of Borehole	2.90				

ft: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19

m: 0 1 2 3 4 5



Monitoring Well Details

Easting: 471393 m

Northing: 5019062 m

Site Datum: Site Benchmark

Groundsurface Elevation: 78.74 m

Top of Riser Elev.: NA

Hole Diameter: 200 mm

Monitoring Well Diameter: N/A

NOTES:

Borehole Log: BH10

Project No.: 230216

Project: Geotechnical Investigation - Road Extension

Client: Russell Township

Location: Vars Industrial Park

Date: July 25, 2023

Field Personnel: SV/KB

Driller: George Downing Estate Drillling Ltd.

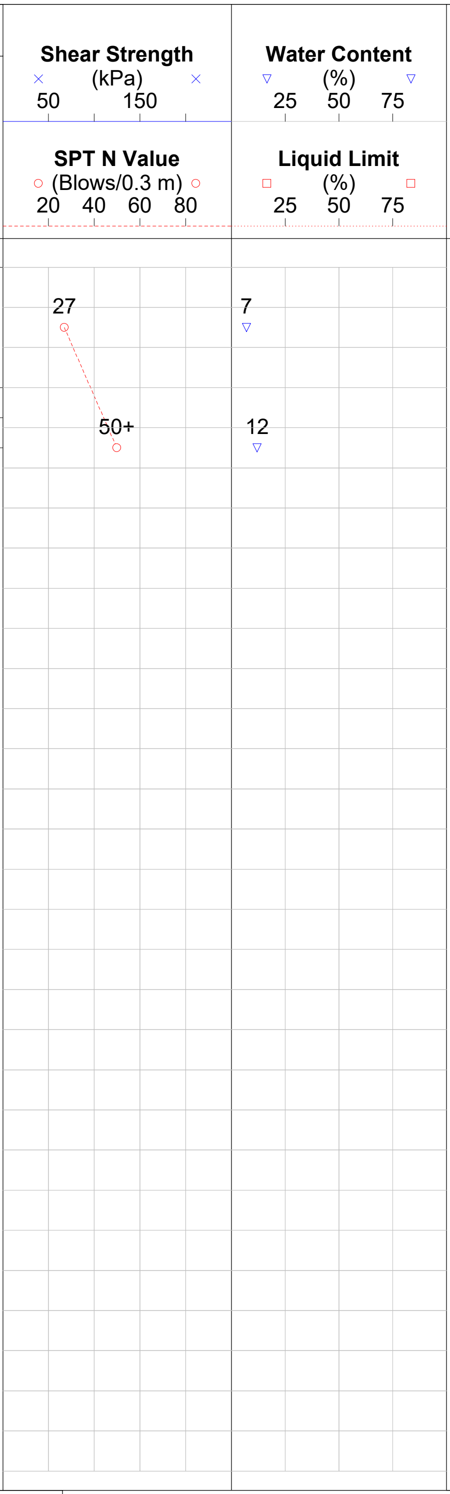
Drilling Equipment: Track Mount CME 850

Drilling Method: Hollow Stew Auger

SUBSURFACE PROFILE		SAMPLE DATA				
Depth	Soil Description	Elev./Depth (m)	Type	Sample Number	N or RQD	Recovery (%)
ft m	Ground Surface	78.73				
	TOPSOIL About 600 mm thick.	0.00 78.13	⧗	SS1	27	25
	GLACIAL TILL silt-sand-gravel, trace clay, moist, brown, very dense.	0.60 77.61	⧗	SS2	50+	0
	End of Borehole Borhole terminated after practical auger refusal	1.12				

ft: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19

m: 0 1 2 3 4 5



Monitoring Well Details

Easting: 471334 m

Northing: 5019022 m

Site Datum: Site Benchmark

Groundsurface Elevation: 78.73 m

Top of Riser Elev.: NA

Hole Diameter: 200 mm

Monitoring Well Diameter: N/A

NOTES:

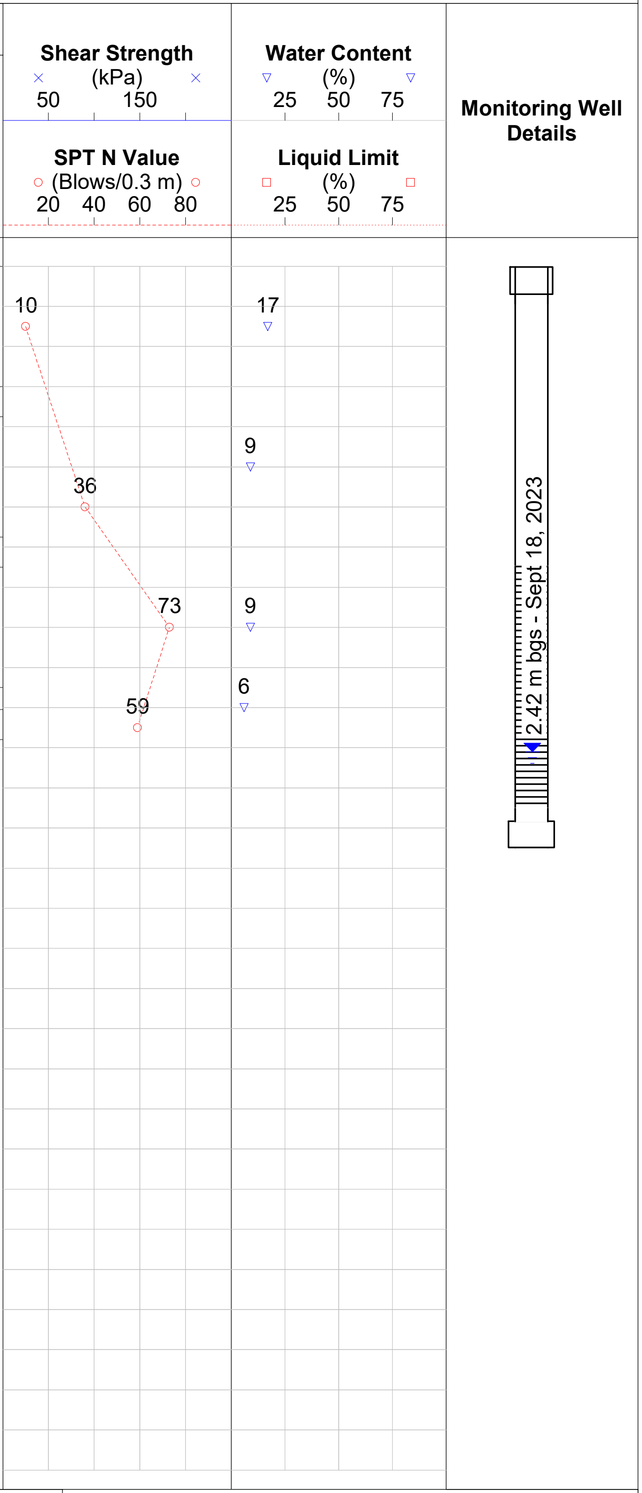
Borehole Log: BH11

Project No.: 230216
Client: Russell Township
Date: July 25, 2023

Project: Geotechnical Investigation - Road Extension
Location: Vars Industrial Park
Field Personnel: SV/KB

Driller: George Downing Estate Drillling Ltd. **Drilling Equipment:** Track Mount CME 850 **Drilling Method:** Hollow Stew Auger

SUBSURFACE PROFILE		SAMPLE DATA				
Depth	Soil Description	Elev./Depth (m)	Type	Sample Number	N or RQD	Recovery (%)
ft 0 / m 0	Ground Surface	78.77				
	TOPSOIL About 600 mm thick.	0.00	⧗	SS1	10	100
		78.17 0.60				
	GLACIAL TILL silt-sand-gravel, trace clay, moist, brown, dense.		⧗	SS2	36	67
			⧗	SS3	73	83
			⧗	SS4	59	67
		75.87 2.90				
	End of Borehole					



Easting: 471263 m **Northing:** 5018994 m

Site Datum: Site Benchmark

Groundsurface Elevation: 78.77 m **Top of Riser Elev.:** NA

Hole Diameter: 200 mm **Monitoring Well Diameter:** N/A

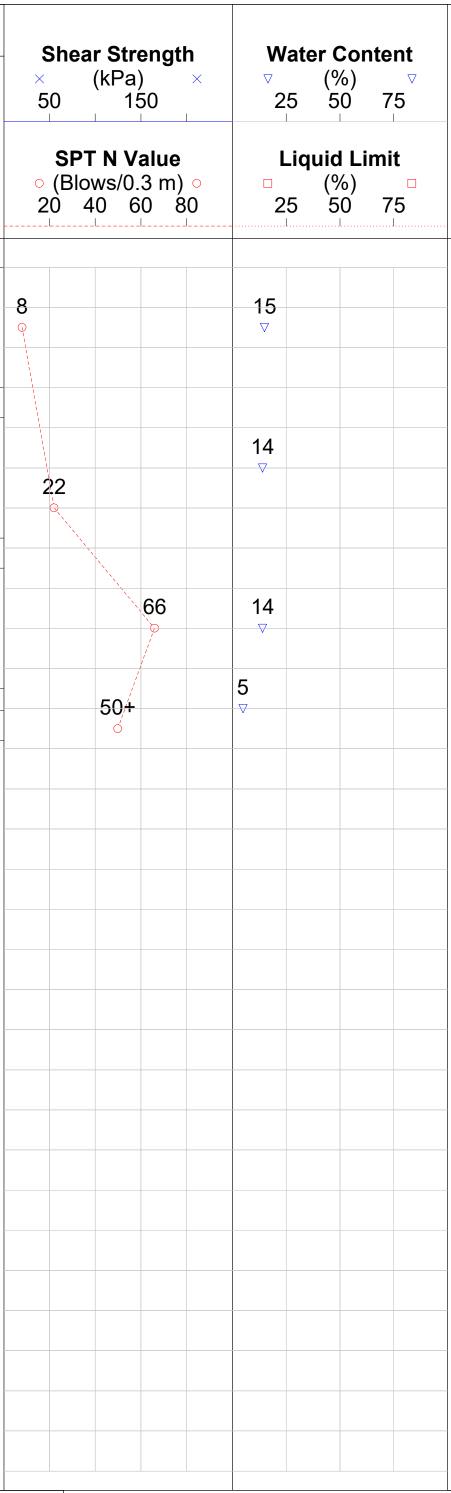
NOTES:

Borehole Log: BH12

Project No.: 230216
Client: Russell Township
Date: July 25, 2023
Project: Geotechnical Investigation - Road Extension
Location: Vars Industrial Park
Field Personnel: SV/KB
Driller: George Downing Estate Drillling Ltd.
Drilling Equipment: Track Mount CME 850
Drilling Method: Hollow Stew Auger

SUBSURFACE PROFILE / SAMPLE DATA

Depth (ft / m)	Soil Description	Elev./Depth (m)	Type	Sample Number	N or RQD	Recovery (%)
0 / 0	Ground Surface	82.38				
	TOPSOIL About 600 mm thick.	0.00	⧗	SS1	8	42
		81.78				
	GLACIAL TILL silt-sand-gravel, trace clay, moist, brown, compact to very dense.	0.60	⧗	SS2	22	75
			⧗	SS3	66	29
			⧗	SS4	50+	8
		79.48				
	End of Borehole	2.90				



Monitoring Well Details

Easting: 471206 m
Northing: 5018964 m
Site Datum: Site Benchmark
Groundsurface Elevation: 82.38 m
Top of Riser Elev.: NA
Hole Diameter: 200 mm
Monitoring Well Diameter: N/A

NOTES:

Borehole Log: BH13

Project No.: 230216

Project: Geotechnical Investigation - Road Extension

Client: Russell Township

Location: Vars Industrial Park

Date: July 25, 2023

Field Personnel: SV/KB

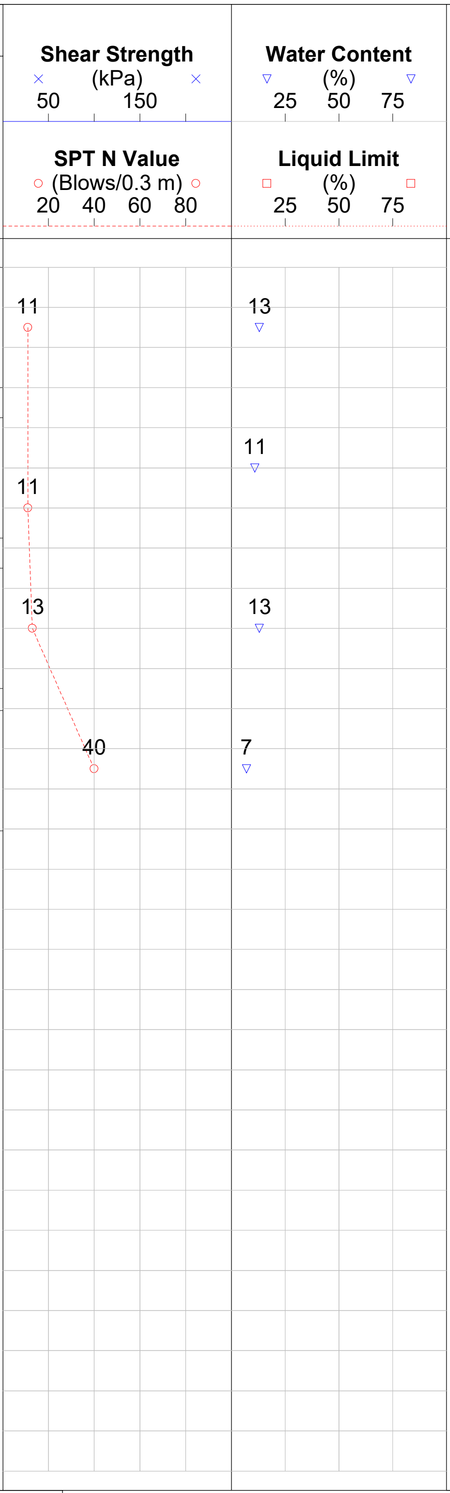
Driller: George Downing Estate Drillling Ltd.

Drilling Equipment: Track Mount CME 850

Drilling Method: Hollow Stew Auger

SUBSURFACE PROFILE / SAMPLE DATA

Soil Description	Elev./Depth (m)	Type	Sample Number	N or RQD	Recovery (%)
Ground Surface	83.78				
TOPSOIL About 600 mm thick.	0.00	⧗	SS1	11	33
	83.18 0.60				
GLACIAL TILL silt-sand-gravel, trace clay, moist, brown, compact to dense.		⧗	SS2	11	67
		⧗	SS3	13	33
		⧗	SS4	40	42
	80.88 2.90				
End of Borehole					



Monitoring Well Details

Easting: 471093 m

Northing: 5018911 m

Site Datum: Site Benchmark

Groundsurface Elevation: 83.78 m

Top of Riser Elev.: NA

Hole Diameter: 200 mm

Monitoring Well Diameter: N/A

NOTES:

Borehole Log: BH14

Project No.: 230216

Project: Geotechnical Investigation - Road Extension

Client: Russell Township

Location: Vars Industrial Park

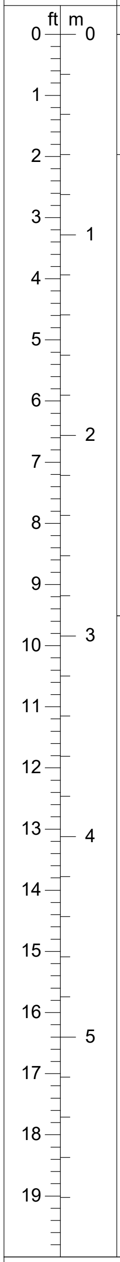
Date: July 25, 2023

Field Personnel: SV/KB

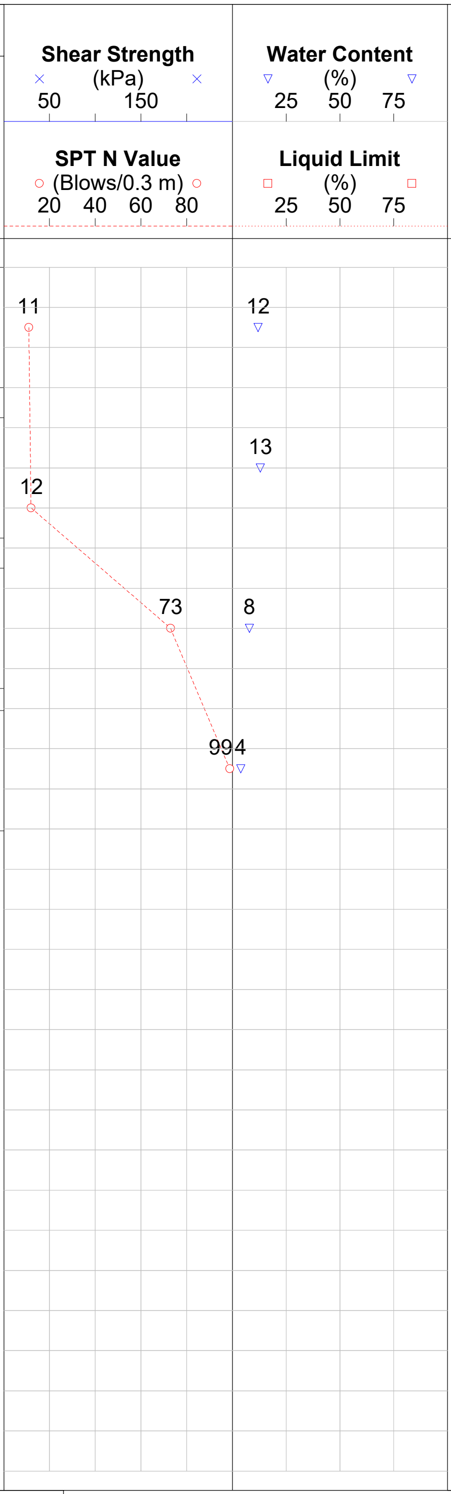
Driller: George Downing Estate Drillling Ltd. **Drilling Equipment:** Track Mount CME 850 **Drilling Method:** Hollow Stew Auger

SUBSURFACE PROFILE

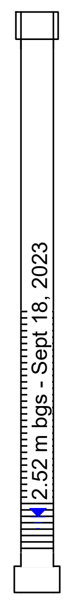
SAMPLE DATA



Soil Description	Elev./Depth (m)	Type	Sample Number	N or RQD	Recovery (%)
Ground Surface	84.50				
TOPSOIL About 600 mm thick.	0.00 83.90	⧗	SS1	11	8
GLACIAL TILL silt-sand-gravel, trace clay, moist, brown, compact to very dense.	0.60	⧗	SS2	12	75
		⧗	SS3	73	25
	81.60	⧗	SS4	99	25
End of Borehole	2.90				



Monitoring Well Details



Easting: 470985 m

Northing: 5018881 m

Site Datum: Site Benchmark

Groundsurface Elevation: 84.50 m

Top of Riser Elev.: NA

Hole Diameter: 200 mm

Monitoring Well Diameter: N/A

NOTES:

Borehole Log: BH15

Project No.: 230216

Project: Geotechnical Investigation - Road Extension

Client: Russell Township

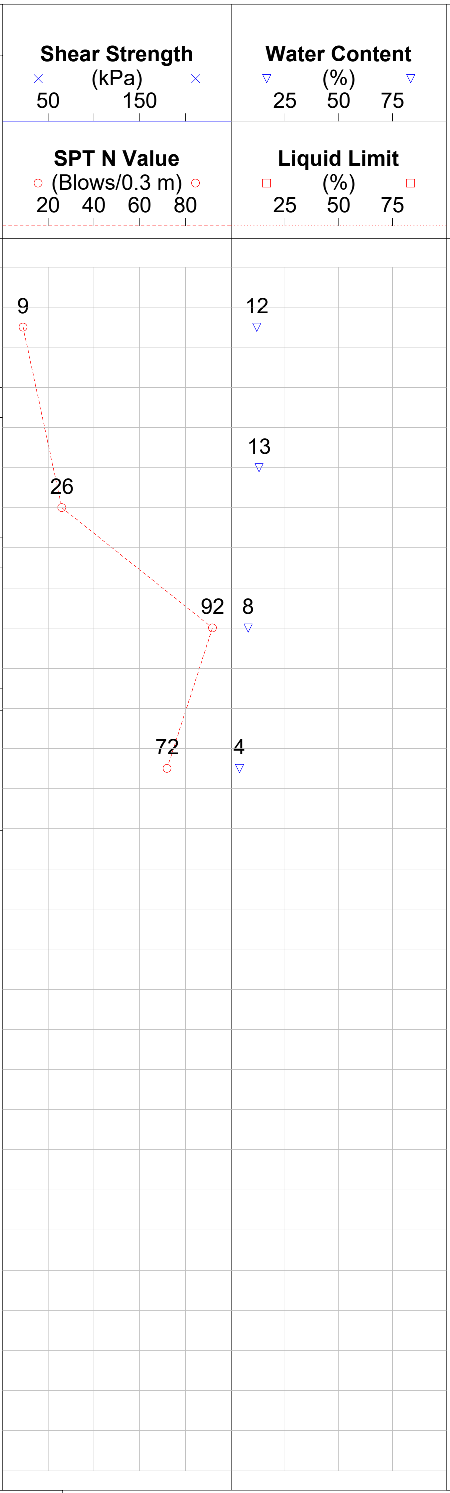
Location: Vars Industrial Park

Date: July 25, 2023

Field Personnel: SV/KB

Driller: George Downing Estate Drillling Ltd. **Drilling Equipment:** Track Mount CME 850 **Drilling Method:** Hollow Stew Auger

SUBSURFACE PROFILE		SAMPLE DATA				
Depth	Soil Description	Elev./Depth (m)	Type	Sample Number	N or RQD	Recovery (%)
ft 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 m 0 1 2 3 4 5	Ground Surface	85.93				
	TOPSOIL About 600 mm thick.	0.00 85.33	⧗	SS1	9	13
	GLACIAL TILL silt-sand-gravel, trace clay, moist, brown, compact to very dense.	0.60	⧗	SS2	26	67
			⧗	SS3	92	42
		83.03	⧗	SS4	72	42
	End of Borehole	2.90				



Monitoring Well Details

Easting: 470886 m

Northing: 5018835 m

Site Datum: Site Benchmark

Groundsurface Elevation: 85.93 m

Top of Riser Elev.: NA

Hole Diameter: 200 mm

Monitoring Well Diameter: N/A

NOTES:

Borehole Log: BH16

Project No.: 230216

Project: Geotechnical Investigation - Road Extension

Client: Russell Township

Location: Vars Industrial Park

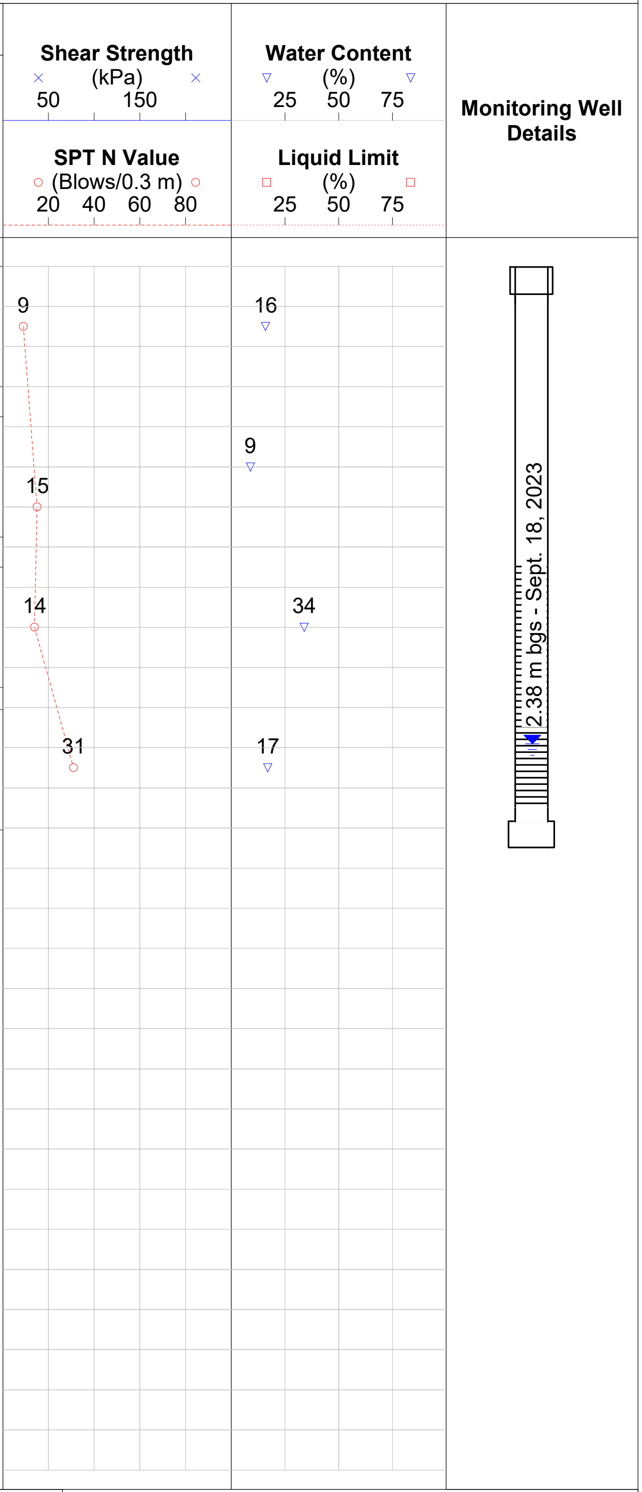
Date: July 25, 2023

Field Personnel: SV/KB

Driller: George Downing Estate Drillling Ltd. **Drilling Equipment:** Track Mount CME 850 **Drilling Method:** Hollow Stew Auger

SUBSURFACE PROFILE / SAMPLE DATA

Depth	Soil Description	Elev./Depth (m)	Type	Sample Number	N or RQD	Recovery (%)
ft 0 / m 0	Ground Surface	86.42				
	TOPSOIL About 600 mm thick.	0.00	⧗	SS1	9	21
		85.82 0.60				
	GLACIAL TILL silt-sand-gravel, trace clay, moist, brown, compact to dense.		⧗	SS2	15	63
			⧗	SS3	14	33
			⧗	SS4	31	100
		83.52 2.90				
	End of Borehole					



Easting: 470766 m **Northing:** 5018758 m

Site Datum: Site Benchmark

Groundsurface Elevation: 86.42 m **Top of Riser Elev.:** NA

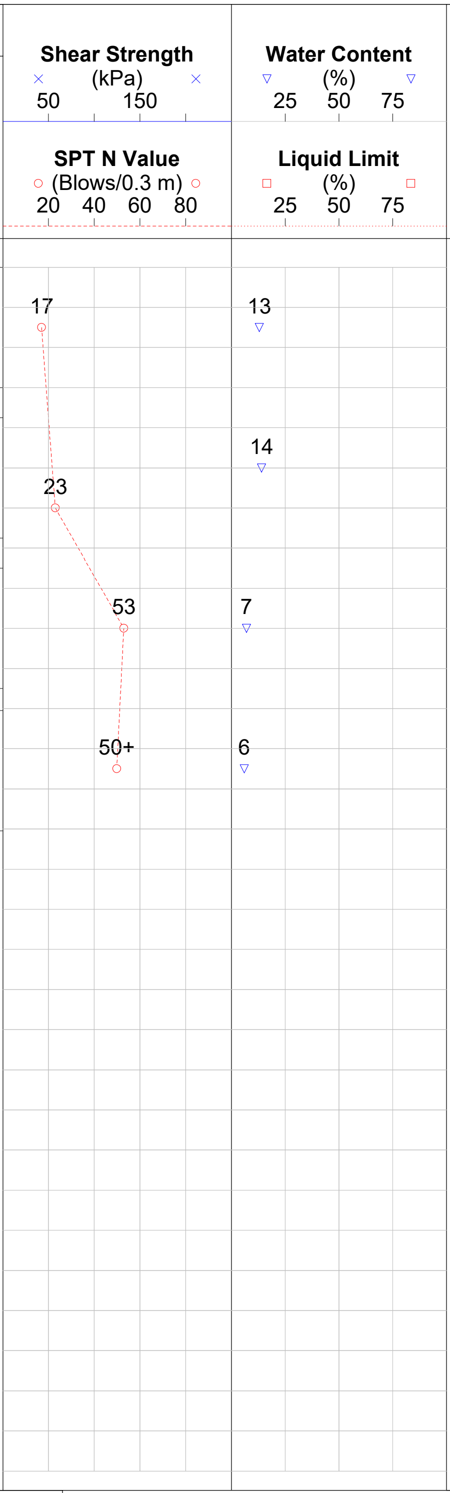
Hole Diameter: 200 mm **Monitoring Well Diameter:** N/A

NOTES:

Borehole Log: BH17

Project No.: 230216
Project: Geotechnical Investigation - Road Extension
Client: Russell Township
Location: Vars Industrial Park
Date: July 25, 2023
Field Personnel: SV/KB
Driller: George Downing Estate Drillling Ltd.
Drilling Equipment: Track Mount CME 850
Drilling Method: Hollow Stew Auger

SUBSURFACE PROFILE		SAMPLE DATA				
Depth (ft / m)	Soil Description	Elev./Depth (m)	Type	Sample Number	N or RQD	Recovery (%)
0	Ground Surface	86.40				
0–0.6 m	**TOPSOIL** About 600 mm thick.	0.00 85.80	⧗	SS1	17	42
0.6–2.9 m	**GLACIAL TILL** silt-sand-gravel, trace clay, moist, brown, compact to very dense.	0.60 83.50	⧗	SS2	23	33
			⧗	SS3	53	83
			⧗	SS4	50+	13
2.90 m	End of Borehole	2.90				



Monitoring Well Details

Easting: 470686 m
Northing: 5018715 m
Site Datum: Site Benchmark
Groundsurface Elevation: 86.40 m
Top of Riser Elev.: NA
Hole Diameter: 200 mm
Monitoring Well Diameter: N/A

NOTES:

Borehole Log: BH18

Project No.: 230216

Project: Geotechnical Investigation - Road Extension

Client: Russell Township

Location: Vars Industrial Park

Date: July 25, 2023

Field Personnel: SV/KB

Driller: George Downing Estate Drillling Ltd.

Drilling Equipment: Track Mount CME 850

Drilling Method: Hollow Stew Auger

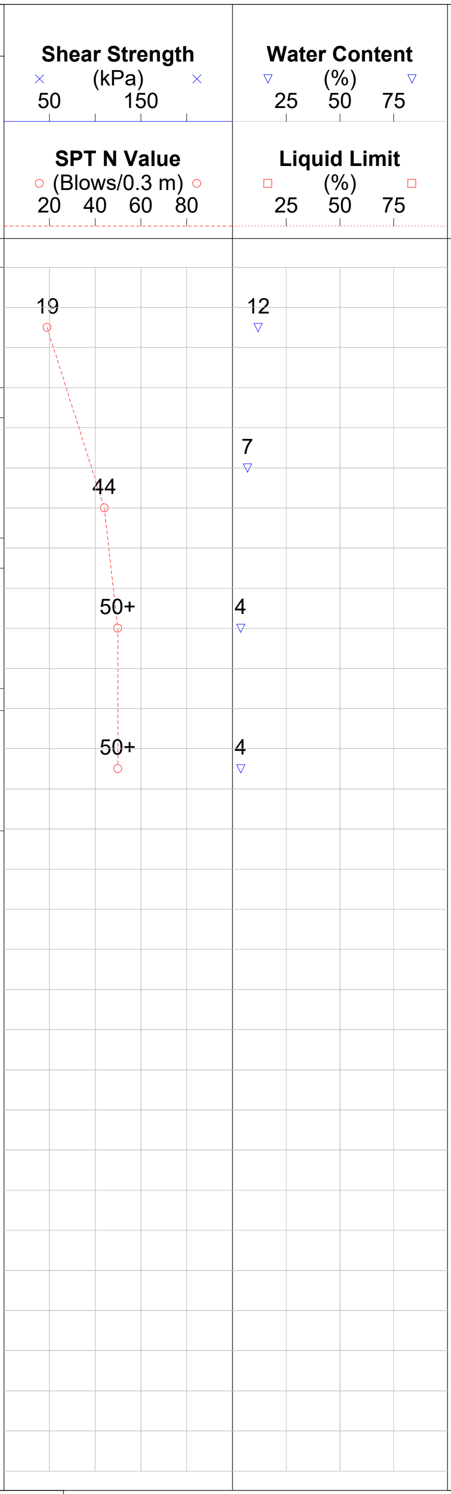
SUBSURFACE PROFILE

SAMPLE DATA

Depth	Soil Description	Elev./Depth (m)	Type	Sample Number	N or RQD	Recovery (%)	Monitoring Well Details
ft m 0 0	Ground Surface	87.30					
	TOPSOIL About 600 mm thick.	0.00	⧗	SS1	19	42	
		86.70					
	GLACIAL TILL silt-sand-gravel, trace clay, moist, brown, dense to very dense.	0.60	⧗	SS2	44	83	
			⧗	SS3	50+	8	
			⧗	SS4	50+	25	
		84.40					
	End of Borehole	2.90					

ft: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19

m: 0, 1, 2, 3, 4, 5



Easting: 470595 m

Northing: 5018685 m

Site Datum: Site Benchmark

Groundsurface Elevation: 87.30 m

Top of Riser Elev.: NA

Hole Diameter: 200 mm

Monitoring Well Diameter: N/A

NOTES:

Borehole Log: BH19

Project No.: 230216

Project: Geotechnical Investigation - Road Extension

Client: Russell Township

Location: Vars Industrial Park

Date: July 25, 2023

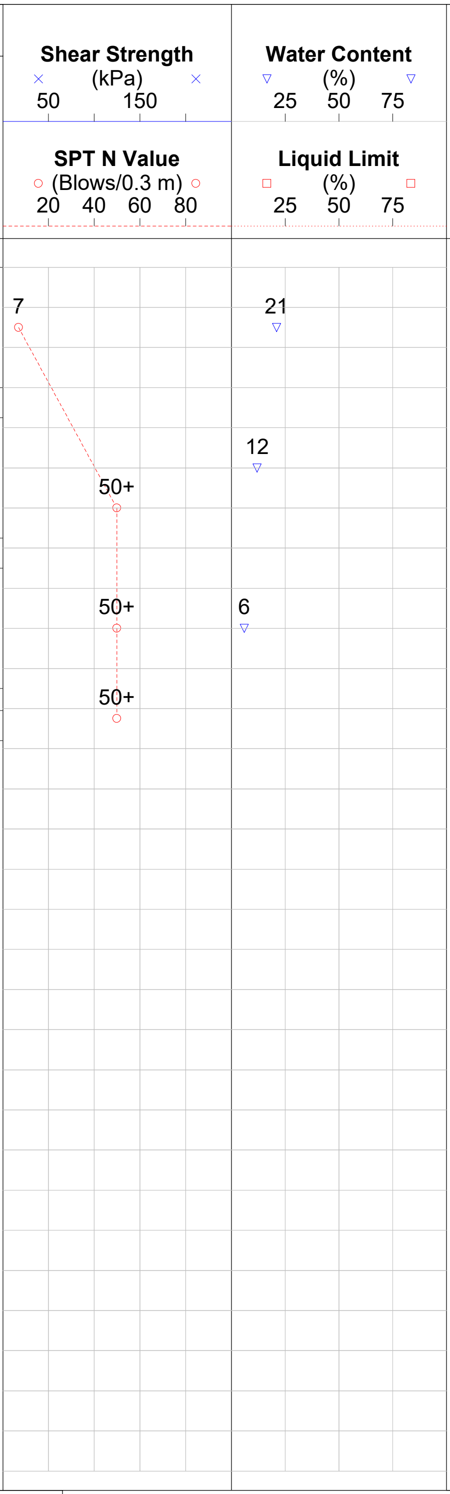
Field Personnel: SV/KB

Driller: George Downing Estate Drillling Ltd.

Drilling Equipment: Track Mount CME 850

Drilling Method: Hollow Stew Auger

SUBSURFACE PROFILE		SAMPLE DATA				
Depth (ft / m)	Soil Description	Elev./Depth (m)	Type	Sample Number	N or RQD	Recovery (%)
0	Ground Surface	87.12				
	TOPSOIL About 600 mm thick.	0.00	⧗	SS1	7	25
	GLACIAL TILL silt-sand-gravel, trace clay, moist, brown, very dense.	86.52 0.60	⧗	SS2	50+	67
			⧗	SS3	50+	13
			⧗	SS4	50+	0
	End of Borehole	84.22 2.90				



Monitoring Well Details

Easting: 470535 m

Northing: 5018644 m

Site Datum: Site Benchmark

Groundsurface Elevation: 87.12 m

Top of Riser Elev.: NA

Hole Diameter: 200 mm

Monitoring Well Diameter: N/A

NOTES:

APPENDIX C

Symbols and Terms used in Borehole Logs

Symbols and Terms Used on Borehole and Test Pit Logs

1. Soil Description

The soil descriptions presented in this report are based on commonly accepted methods of classification and identification employed in geotechnical practice. Classification and identification of soil involves some judgement and LRL Associates Ltd. does not guarantee descriptions as exact, but infers accuracy to the extent that is common in current geotechnical practice. Boundaries between zones on the logs are often not distinct but transitional and were interpreted.

a. Proportion

The proportion of each constituent part, as defined by the grain size distribution, is denoted by the following terms:

Term	Proportions
"trace"	1% to 10%
"some"	10% to 20%
prefix (i.e. "sandy" silt)	20% to 35%
"and" (i.e. sand "and" gravel)	35% to 50%

b. Compactness and Consistency

The state of compactness of granular soils is defined on the basis of the Standard Penetration Number (N) as per ASTM D-1586. It corresponds to the number of blows required to drive 300 mm of the split spoon sampler using a metal drop hammer that has a weight of 62.5 kg and free fall distance of 760 mm. For a 600 mm long split spoon, the blow counts are recorded for every 150 mm. The "N" value is obtained by adding the number of blows from the 2nd and 3rd count. Technical refusal indicates a number of blows greater than 50.

The consistency of clayey or cohesive soils is based on the shear strength of the soil, as determined by field vane tests and by a visual and tactile assessment of the soil strength.

The state of compactness of granular soils is defined by the following terms:

State of Compactness Granular Soils	Standard Penetration Number "N"	Relative Density (%)
Very loose	0 – 4	<15
Loose	4 – 10	15 – 35
Compact	10 - 30	35 – 65
Dense	30 - 50	65 - 85
Very dense	> 50	> 85

The consistency of cohesive soils is defined by the following terms:

Consistency Cohesive Soils	Undrained Shear Strength (C_u) (kPa)	Standard Penetration Number "N"
Very soft	<12.5	<2
Soft	12.5 - 25	2 - 4
Firm	25 - 50	4 - 8
Stiff	50 - 100	8 - 15
Very stiff	100 - 200	15 - 30
Hard	>200	>30

c. Field Moisture Condition

Description (ASTM D2488)	Criteria
Dry	Absence of moisture, dusty, dry to touch.
Moist	Dump, but not visible water.
Wet	Visible, free water, usually soil is below water table.

2. Sample Data

a. Elevation depth

This is a reference to the geodesic elevation of the soil or to a benchmark of an arbitrary elevation at the location of the borehole or test pit. The depth of geological boundaries is measured from ground surface.

b. Type

Symbol	Type	Letter Code
⌇	Auger	AU
⧗	Split Spoon	SS
‖	Shelby Tube	ST
∦	Rock Core	RC

c. Sample Number

Each sample taken from the borehole is numbered in the field as shown in this column.

LETTER CODE (as above) – Sample Number.

d. Recovery (%)

For soil samples this is the percentage of the recovered sample obtained versus the length sampled. In the case of rock, the percentage is the length of rock core recovered compared to the length of the drill run.

3. Rock Description

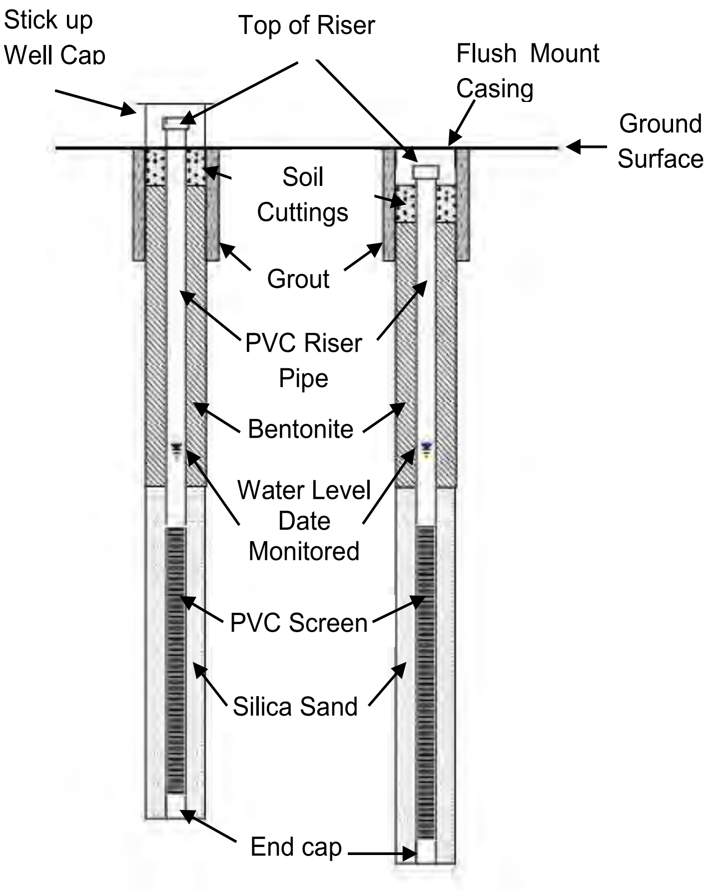
Rock Quality Designation (RQD) is a rough measure of the degree of jointing or fracture in a rock mas. The RQD is calculated as the cumulative length of rock pieces recovered having lengths of 100 mm or more divided by the length of coring. The qualitative description of the bedrock based on RQD is given below.

Rock Quality Designation (RQD) (%)	Description of Rock Quality
0 –25	Very poor
25 – 50	Poor
50 – 75	Fair
75 – 90	Good
90 – 100	Excellent

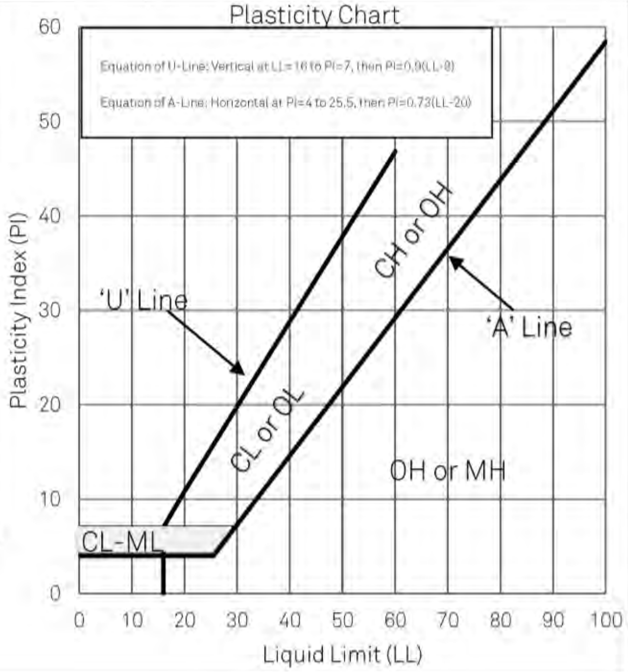
Strength classification of rock is presented below.

Strength Classification	Range of Unconfined Compressive Strength (MPa)
Extremely weak	< 1
Very weak	1 – 5
Weak	5 – 25
Medium strong	25 – 50
Strong	50 – 100
Very strong	100 – 250
Extremely strong	> 250

4. General Monitoring Well Data



5. Classification of Soils for Engineering Purposes (ASTM D2487) (United Soil Classification System)

Major divisions			Group Symbol	Typical Names	Classification Criteria			
Coarse-grained soils More than 50% retained on No. 200 sieve* (>0.075 mm)	Gravels More than 50% of coarse fraction retained on No. 4 sieve(4.75 mm)	Clean gravels <5% fines	GW	Well-graded gravel	If 15% sand add "with sand" to group name.	Classification on basis of percentage of fines: Less than 5% pass No. 200 sieve - GW, GP, SW, SP More than 12% pass No. 200 sieve - GM, GC, SM, SC 5 to 12% pass No. 200 sieve - Borderline classifications, use of dual symbols	$C_u = \frac{D_{60}}{D_{10}} \geq 4$; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
			GP	Poorly graded gravel			Not meeting either Cu or Cc criteria for GW	
		Gravels with >12% fines	GM	Silty gravel			Atterberg limits below "A" line or PI less than 4	Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols If fines are organic add "with orgnic fines" to group name
			GC	Clayey gravel			Atterberg limits on or above "A" line and PI > 7	
	Sands 50% or more of coarse fraction passes No. 4 sieve(<4.75 mm)	Clean sands <5% fines	SW	Well-graded sand	If 15% gravel add "with gravel to group name		$C_u = \frac{D_{60}}{D_{10}} \geq 6$; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
			SP	Poorly graded sand			Not meeting either Cu or C ccriteria for SW	
		Sands with >12% fines	SM	Silty sand			Atterberg limits below "A" line or PI less than 4	Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols If fines are organic add "with orgnic fines" to group name
			SC	Clayey sand			Atterberg limits on or above "A" line and PI > 7	
Fine-grained soils50% or more passes No. 200 sieve* (<0.075 mm)	Silts and Clays Liquid Limit <50%	Inorganic	ML	Silt	If 15 to 29% coarse-grained, add "with sand" or "with gravel" as appropriate. If >30% coarse-grained, add "sandy" or "gravelly" as appropriate. Class as organic when oven dried liquid limit is <75% of undried liquid limit.			
			CL	Lean Clay -low plasticity				
		Organic	OL	Organic clay or silt (Clay plots above 'A' Line)				
	Silts and Clays Liquid Limit >50%	Inorganic	MH	Elastic silt				
			CH	Fat Clay -high plasticity				
		Organic	OH	Organic clay or silt (Clay plots above 'A' Line)				
	Highly Organic Soils		PT	Peat, muck and other highly organic soils				

APPENDIX D

Laboratory Analysis

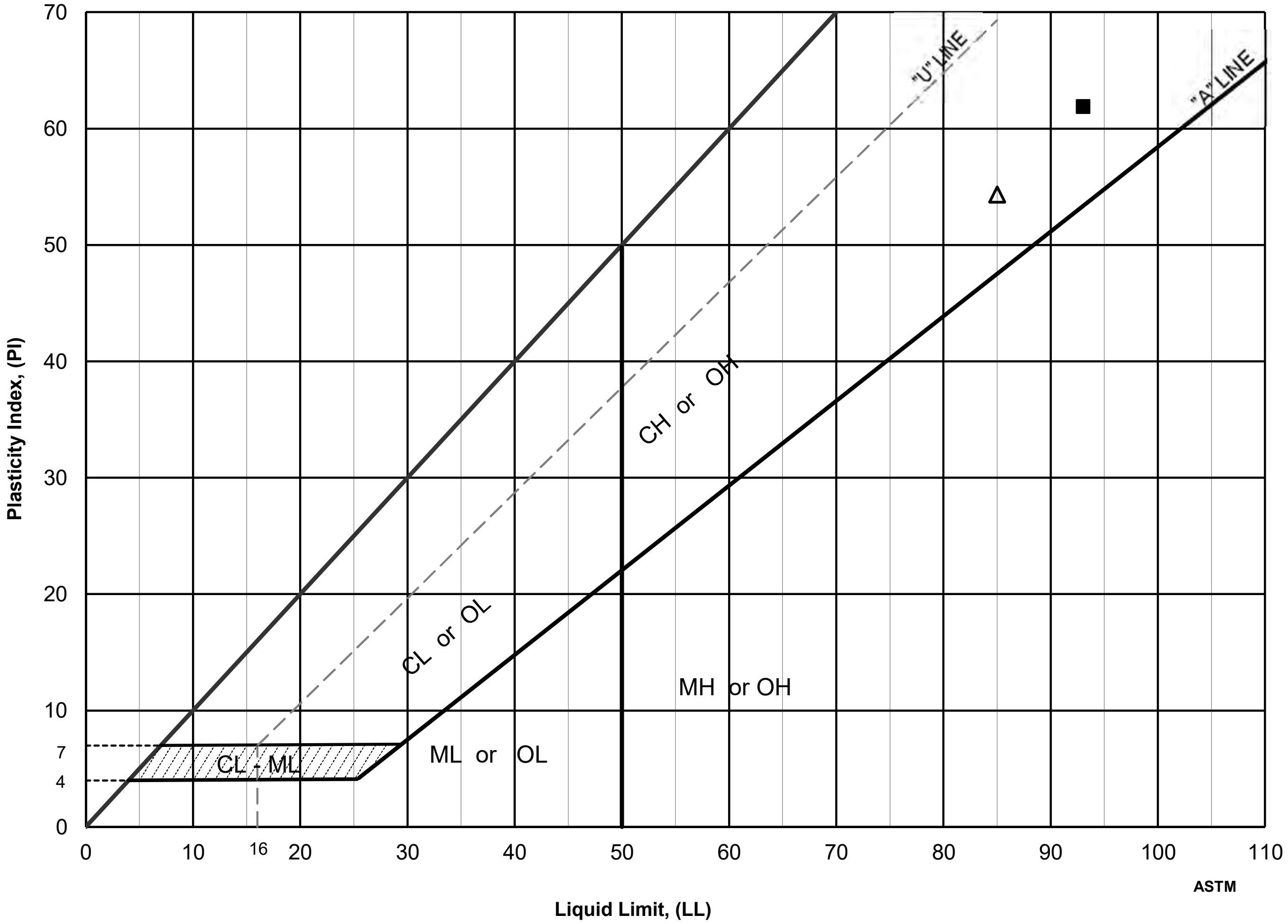
LRL Associates Ltd.

PLASTICITY INDEX

ASTM D 4318 / LS-703/704

Client:	Russell Township	**File No.:**	230216
Project:	Geotechnical Investigation	**Report No.:**	1
Location:	Warehouse Street, Vars. ON.	**Date:**	July 24, 2023

Plasticity Chart



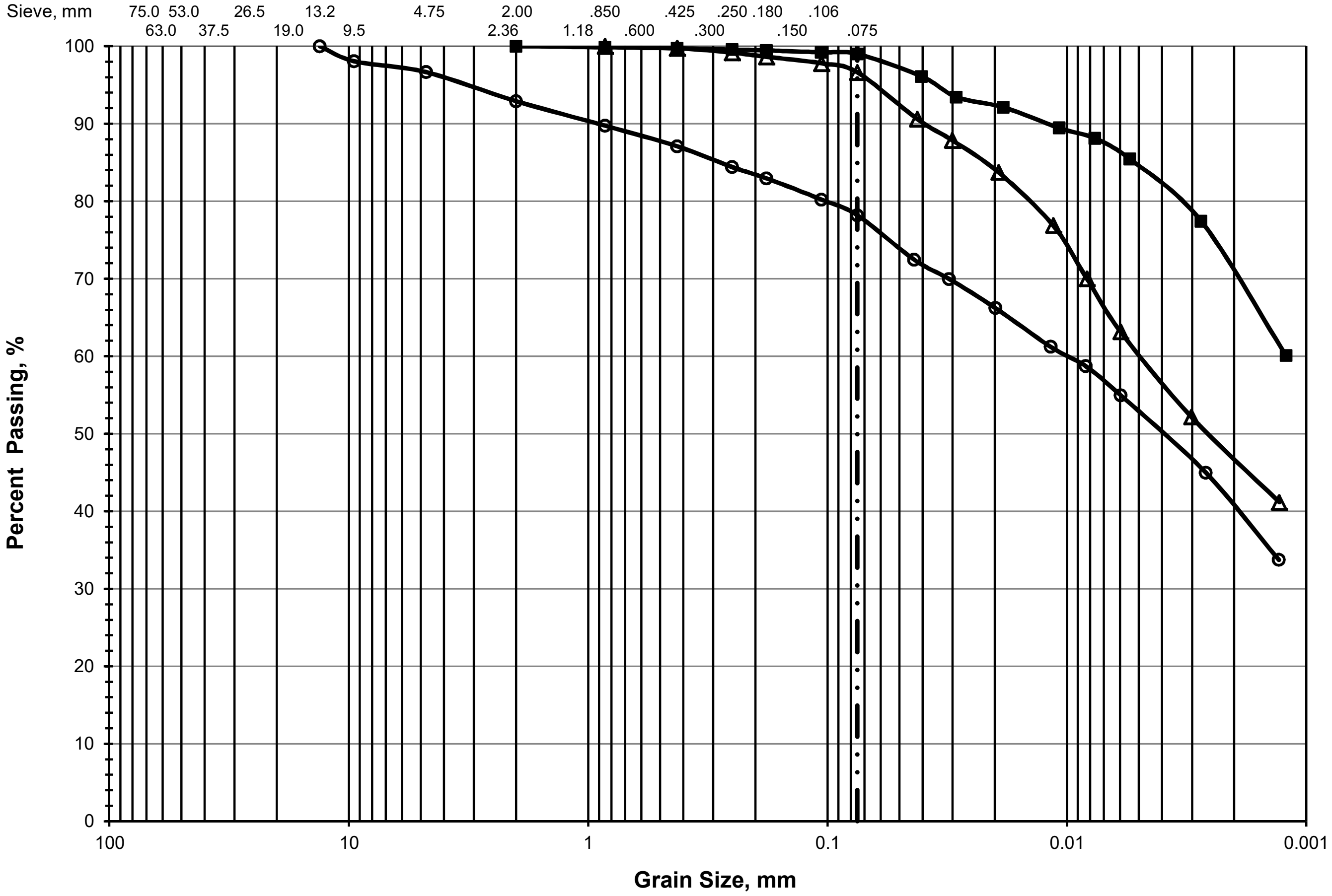
	Location	Sample	Depth, m	Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Activity Number	USCS
△	BH 2	SS-3	1.52 - 2.13	47	85	31	54	0.30	n/d	CH
■	BH 5	SS-4	2.29 - 2.90	77	93	31	62	0.74	n/d	CH

LRL Associates Ltd.

PARTICLE SIZE ANALYSIS

ASTM D 422 / LS-702

Client: Russell Township
Project: Geotechnical Investigation
Location: Warehouse Street, Vars, ON.
File No.: 230216
Report No.: 2
Date: July 24, 2023



Unified Soil Classification System

	> 75 mm	% GRAVEL		% SAND			% FINES	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
△	0.0	0.0	0.0	0.0	0.3	3.1	50.8	45.8
■	0.0	0.0	0.0	0.0	0.3	0.7	30.0	69.0
○	0.0	0.0	3.3	3.7	5.8	8.9	38.6	39.7

	Location	Sample	Depth, m	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
△	BH 1	SS-2	0.76 - 1.37	0.0051						
■	BH 4	SS-4	2.29 - 2.90	0.0012						
○	BH 7	SS-3	1.52 - 2.13	0.0101	0.0043					

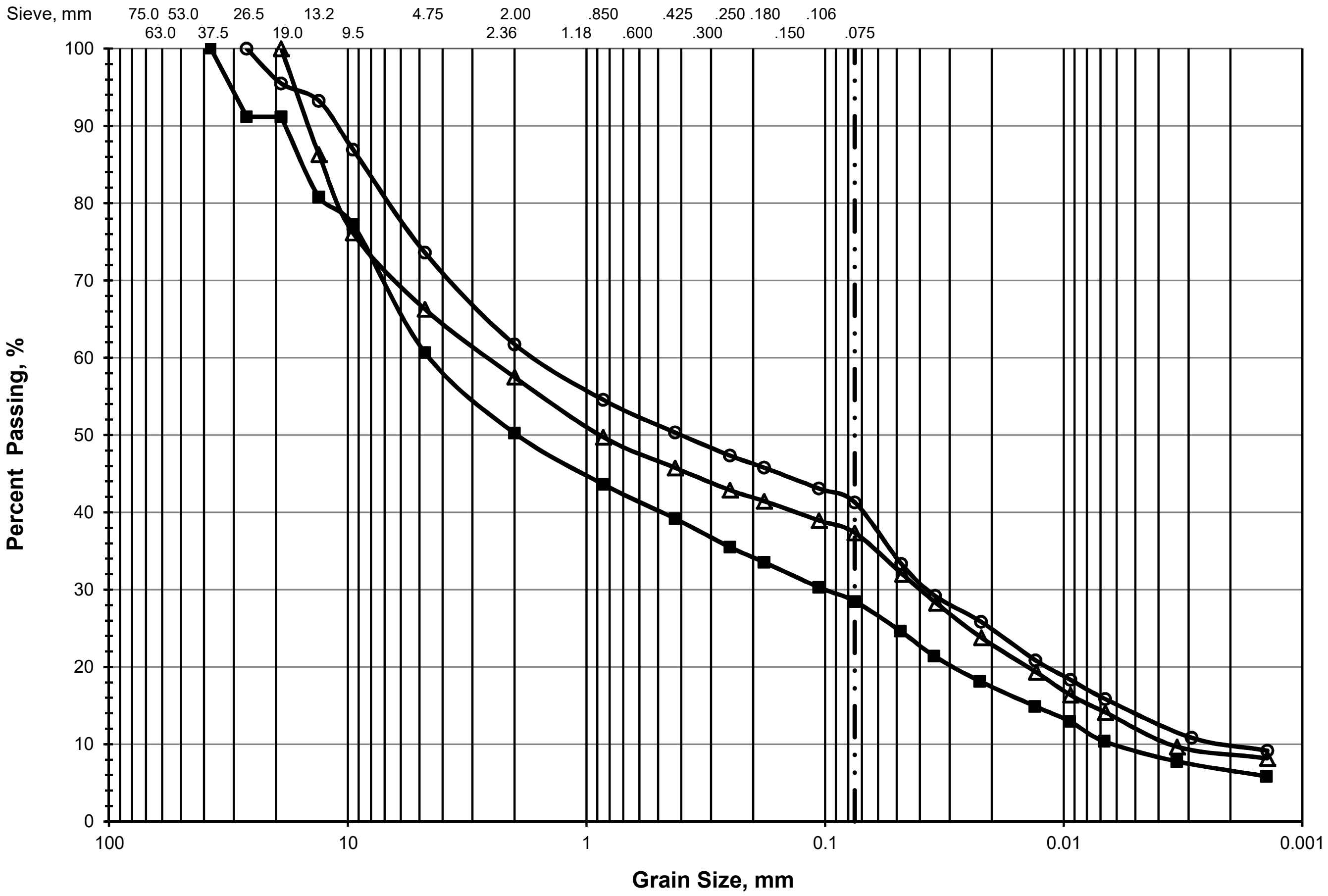
LRL Associates Ltd.

PARTICLE SIZE ANALYSIS

ASTM D 422 / LS-702

Client: Russell Township
Project: Geotechnical Investigation
Location: Emard Street, Vars, ON.

File No.: 230216
Report No.: 3
Date: July 24, 2023



Unified Soil Classification System

	> 75 mm	% GRAVEL		% SAND			% FINES	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
△	0.0	0.0	33.7	8.8	11.7	8.4	28.7	8.7
■	0.0	8.7	30.5	10.4	11.1	10.7	22.2	6.4
○	0.0	3.9	22.5	11.9	11.4	9.1	31.4	9.8

	Location	Sample	Depth, m	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
△	BH 11	SS-2	0.76 - 1.37	2.7850	0.8894	0.0404	0.0077	0.0036	0.2	773.6
■	BH 14	SS-3	1.52 - 2.13	4.5726	1.9574	0.1010	0.0134	0.0063	0.4	725.8
○	BH 18	SS-4	2.29 - 2.90	1.7213	0.4051	0.0372	0.0061	0.0022	0.4	782.4

APPENDIX D
Archeological Assessment Reports

STAGE 1 AND 2 ARCHAEOLOGICAL ASSESSMENTS
FOR A PROPOSED INDUSTRIAL PARK FUTURE DEVELOPMENT MUNICIPAL CLASS EA
PART LOTS 22 AND 23, CONCESSION 4
GEOGRAPHIC TOWNSHIP OF RUSSELL
UNITED COUNTIES OF PRESCOTT AND RUSSELL, ONTARIO

Past Recovery
Archaeological Services Inc.

STAGE 1 AND 2 ARCHAEOLOGICAL ASSESSMENTS FOR A PROPOSED INDUSTRIAL PARK FUTURE DEVELOPMENT MUNICIPAL CLASS EA, PART LOTS 22 AND 23, CONCESSION 4, GEOGRAPHIC TOWNSHIP OF RUSSELL, UNITED COUNTIES OF PRESCOTT AND RUSSELL, ONTARIO

Prepared for:	Kyle Herold Civil Engineering Designer, LRL Engineering 5430 Canotek Road Ottawa, ON K1J9G2 Phone: (613) 915-2988 Email: kherold@lrl.ca
Re:	*Municipal Class Environmental Assessment*
Prepared by:	Past Recovery Archaeological Services Inc. 99c Dufferin Street, Unit 1 Perth, ON K7H 3A5 Phone: (613) 267-7028 Email: pras@pastrecovery.com
Project No.:	PR24-007
Licensee:	Caitlyn Howard, M.A., P1074 Staff Archaeologist Past Recovery Archaeological Services Inc.
P.I.F. No.:	P1074-0148-2024
Date:	February 12th, 2025 Original Report

ACKNOWLEDGMENTS

Kyle Herold, Civil Engineering Designer, LRL Engineering, provided assistance with project mapping, background information and access logistics.

PROJECT PERSONNEL

Project Manager	Andy Snetsinger, M.A., R1089
Licence Holder	Caitlyn Howard, M.A., P1074
Field Director	Sara Lavigne, M.A., R1369 Liam Bowman, B.A., R1272
Assistant Field Director	Morgan Ward, B.A.
Field Crew	Becca Scott, B.A. Nicholas van Beek, M.A. Riley Jones, B.A. Cassidy Robertson, B.A. Emily Maidment, B.A.
Indigenous Monitor	Algonquins of Pikwakanagan First Nation: Derrick Amikons Algonquins of Ontario: Gabriel Pearce
Background Research	Adam Pollock, M.A., P336 Sara Lavigne
Report Writing	Sara Lavigne
Report GIS/Drafting	Sara Lavigne
Report Review	Jeff Earl, M.Soc.Sc.

EXECUTIVE SUMMARY

Past Recovery Archaeological Services Inc. was retained by LRL Engineering to undertake Stage 1 and 2 archaeological assessments in support of proposed future development of the Russell Township Highway 417 Industrial Park. The subject property was located on parts of Lot 22 and 23, Concession 4 in the geographic Township of Russell, United County of Prescott and Russell (see Maps 1 and 2). The study area covered by the proposed future development was approximately 75.78 hectares (187.25 acres) in size. Parts of this study area had been previously assessed through Stage 1 and/or Stage 2 assessments (WSP 2018; PIF: P365-0117-2017; Past Recovery 2021; PIF: P1201-0060-2020).

The purpose of the Stage 1 investigation was to evaluate the archaeological potential of the unassessed part of the study area and present recommendations for the mitigation of any significant known or potential archaeological resources. To this end, historical, environmental and archaeological research was conducted in order to make a determination of archaeological potential. The results of this study indicated that this part of the subject property retained potential for pre-Contact and post-Contact archaeological resources (see Map 7).

The purpose of the Stage 2 assessment was to determine whether or not the overall study area contained archaeological resources requiring further assessment, and if so to recommend an appropriate Stage 3 assessment strategy. A portion of the fieldwork was carried out on May 15th, 2024, conducted by means of shovel test pit survey at 5 m or judgmental 10 m intervals. Archaeological resources were not recovered during the survey. Following the first day of fieldwork the proponent informed Past Recovery that the assessment would not be moving forward; no further Stage 2 field survey was conducted. Thus, archaeological concerns remain for the unassessed portions of the study area, for which Stage 2 assessment is required prior to any future ground disturbance apart from on-going agricultural cultivation.

The results of the Stage 2 property survey documented in this report form the basis for the following recommendations:

1) The areas determined to retain archaeological potential either by the previous WSP Stage 1 assessment (WSP 2018; PIF: P365-0117-2017) or the current Past Recovery Stage 1 assessment (see the recommendations in Section 5.4) not field tested prior to the cancellation of the project have outstanding archaeological concerns and require Stage 2 archaeological assessment prior to any development-related impacts (see Map 8). This should be completed using a combination of shovel test pit survey at 5 m intervals or surface survey of ploughed fields at 5 m intervals, as appropriate.

2) All portions of the study area that have been tested during the current Stage 2 archaeological assessment and during previous Stage 2 assessment (Past Recovery 2021; PIF: P1201-0060-2020) require no further archaeological work (see Map 8).

3) In the event that future planning results in the identification of additional areas of impact beyond the limits of the present study area, further archaeological assessment may be required. It should be noted that impacts include all aspects of the proposed development causing soil disturbances or other alterations, including additional temporary property needs (i.e. access roads, staging/lay down areas, associated works etc.).

4) Any future Stage 2 archaeological assessment should be undertaken by a licensed consultant archaeologist, in compliance with *Standards and Guidelines for Consultant Archaeologists* (MCM 2011).

The reader is also referred to Section 6.0 below to ensure compliance with relevant provincial legislation and regulations as may relate to this project. In the event that any human remains or artifacts and features that are Indigenous in nature are encountered during the development of the subject property, Indigenous Communities with potential interests in this area will be contacted.

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1.0 INTRODUCTION

Past Recovery Archaeological Services Inc. (Past Recovery) was retained by LRL Engineering to undertake Stage 1 and 2 archaeological assessments in support of proposed future development of the Russell Township Highway 417 Industrial Park. The subject property was located on parts of Lot 22 and 23, Concession 4 in the geographic Township of Russell, United County of Prescott and Russell (Maps 1 and 2).

While the fieldwork for this project was underway, Past Recovery was informed that the assessment was to be discontinued and the project cancelled. The following report documents the Stage 1 and partial Stage 2 progress to that point, as well as all outstanding archaeological concerns.

The objectives of the Stage 1 archaeological assessment were as follows:

- To provide information concerning the geography, history, previous archaeological fieldwork and current land condition of the study area;
- To evaluate the potential for the subject property to contain significant archaeological resources; and,
- To recommend appropriate strategies for Stage 2 archaeological assessment in the event further assessment is warranted.

The objectives of the Stage 2 archaeological assessment were as follows:

- To document all archaeological resources on the property;
- To determine whether the property contains archaeological resources requiring further assessment; and,
- In the event that an archaeological site requiring further assessment is discovered, to recommend an appropriate Stage 3 assessment strategy.

2.0 PROJECT CONTEXT

This section of the report provides the context for the archaeological work undertaken, including a description of the study area, the related legislation or directives triggering the assessment, any additional development-related information, and the confirmation of permission to access the study area as required for the purposes of the assessment, and an acknowledgement of Indigenous territorial rights and interests.

2.1 Development Context

The Township of Russell, the project proponent, has completed a Schedule 'B' Class EA study addendum for a project to provide municipal water and sanitary servicing to the township's Highway 417 Industrial Park, located at the intersection of Highway 417 and County Road 28 (St. Guillaume Road). The study, part of the Township of Russell Water and Wastewater Master Plan Update, has been undertaken in accordance with the *Municipal Class Environmental Assessment* document (October 2000, as amended in 2007 and in 2011), and is currently in the Detail Design phase. As Class EA projects follow a streamlined EA process, the project is pre-approved (i.e. Minister approval is not required) and 'approval authority' rests with the project proponent.

A previous Stage 1 archaeological assessment was completed as part of Phase 1 of the Class EA (WSP 2018; PIF: P365-0117-2017), covering a study area of proposed development totalling approximately 374 hectares. The assessment addressed a study area that included the majority of the existing industrial park (including lands owned by the Township of Russell and adjacent lands to the north of Burton Road owned by the City of Ottawa), as well as an approximately eight-kilometre-long alignment for a proposed sanitary forcemain to connect with the Russell Sewage Lagoons. The Stage 1 archaeological assessment report identified the majority of the study area as exhibiting potential for the presence of significant archaeological resources. A Stage 2 archaeological assessment was also undertaken as part of the Phase 1 detail design for the proposed municipal industrial park water and wastewater servicing, though no archaeological resources were found (Past Recovery 2021; PIF: P1201-0060-2020).

Past Recovery was later retained by the TYLin Group, on behalf of the Township of Russell, to undertake an additional Stage 1 archaeological assessment as part of municipal water and wastewater servicing for future Russell Township Industrial Park lands. That study area overlapped with and extended the boundaries of the original Stage 1 study area (WSP 2018; PIF: P365-0117-2017) to the southwest, south, and southeast, including sections of land previously assessed during the Stage 2 study (Past Recovery 2021; PIF: P1201-0060-2020).

Past Recovery was then retained by LRL Engineering to undertake an additional Stage 1 and Stage 2 archaeological assessment as part of municipal water and wastewater servicing for future Russell Township Industrial Park lands. The new study area (approximately 75.78 hectares or 187.25 acres in size) overlapped with and extended the boundaries of the original Stage 1 study area (WSP 2018; PIF: P365-0117-2017) and included sections of land previously assessed during the Stage 2 study (Past Recovery 2021; PIF: P1201-0060-2020). A total of 60.57 hectares (149.67 acres) within the current study area had been previously assessed under the WSP Stage 1, leaving 15.27 hectares (37.73 acres) in the southwest corner where additional Stage 1 was required. A total of 1.99 hectares (4.91 acres) had been previously assessed under the Past Recovery Stage 2. The areas of overlap have been illustrated on Map 3. As stated above, while the fieldwork for this project was underway, Past Recovery was informed that the assessment was to be discontinued and the project cancelled. The following report documents the Stage 1 and partial Stage 2 progress to that point, as well as all outstanding archaeological concerns.

2.2 Property Description

The subject property is located on parts of Lots 22 and 23, Concession 4 in the geographic Township of Russell, and consists of approximately 75.78 hectares (187.25 acres) of actively cultivated agricultural fields. Small portions of the property have treed areas around ditches or creeks, a roadbed, or irrigation ditches through the fields (see Maps 1 and 2). The overall property is largely surrounded by agricultural fields, particularly to the west, south, and north. The east and southeast extent of the study area is, however, bordered by the expanding and newly constructed industrial park or by Highway 417. The study area contains portions of a network of deep drainage ditches that extend from creeks (South Indian Creek and Shaws Creek) which are natural tributaries of Castor River (to the south).

2.3 Access Permission

Permission to access the subject property and complete all aspects of the archaeological assessment, including photography, test excavation and the collection of artifacts, was granted by the proponent.

2.4 Territorial Acknowledgement

The study area falls within the traditional territory of the Anishinabe Algonquin, and forms part of the Algonquins of Ontario (AOO) Settlement Area set out by the current Agreement-in-Principle between the AOO and the federal and provincial governments, signed in 2016. It is also situated within lands initially described by the Crawford Purchase (1783) and subsequently ratified under the Williams Treaties Settlement Agreement (2018).

3.0 HISTORICAL CONTEXT

This section of the report is comprised of an overview of human settlement in the region using information derived from background historical research. The purpose of this research is to describe the known settlement history of the local area, with the intention of providing a context for the evaluation of known and potential archaeological sites, as well as a review of property-specific information presenting a record of settlement and land use history.

3.1 Regional Pre-Contact Cultural Overview

While our understanding of the pre-Contact sequence of human activity in the region is limited, it is possible to provide a general outline of pre-Contact relationships with the land based on archaeological, historical, and environmental research conducted across what is now eastern Ontario.[1] Archaeologists divide the long sequence of Indigenous history into both temporal periods and regional groups based primarily on the presence and/or style of various artifact types. While this provides a means of discussing the past, it is an archaeological construct and interpretation based only on a few surviving artifact types; it does not reflect the generally gradual nature of change over time, nor the complexities of interactions between different Indigenous groups. It also does not reflect Indigenous world views and histories as detailed in the oral traditions of Indigenous communities who have long-standing relationships with the land. The following summary uses the generally accepted archaeological chronology for the pre-Contact period while recognizing its limitations.

Across the region, glaciers began to retreat around 15,000 years ago (Munson 2013:21). Archaeological evidence indicates that humans have inhabited what is now called Ontario for at least 13,500 years, beginning with the arrival of small groups of hunter-gatherers referred to by archaeologists as Palaeo-Indigenous (Ellis 2013:35; Ellis and Deller 1990:39). These groups gradually moved northward as the glaciers and glacial lakes retreated. While very little is known about their lifestyle, it is likely that Palaeo-Indigenous groups travelled widely relying on the seasonal migration of caribou as well as small animals and wild plants for subsistence in a sub-arctic environment. They produced a variety of distinctive stone tools including fluted projectile points, scrapers, burins and gravers. Their sites are rare, and most are quite small (Ellis 2013:35-36). Palaeo-Indigenous peoples tended to camp along shorelines, and because of the changing environment, many of these areas are now inland. Indigenous settlement of much of eastern Ontario was late in comparison to other parts of Ontario as a result of the high-water levels associated with glacial Lake Algonquin, the early stages of glacial Lake Iroquois and the St. Lawrence Marine Embayment of the post-glacial Champlain Sea. In

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[1] Current common place names are used throughout this report while recognizing that the many Indigenous peoples who have lived in the region for thousands of years had, and often maintain, their own names for these places and natural features.

eastern Ontario, the old shoreline ridges of Lake Algonquin, Lake Iroquois, the Champlain Sea and of the emergent St. Lawrence and Ottawa river channels and their tributaries would be the most likely areas to find evidence of Palaeo-Indigenous presence in the landscape (Ellis 2013; Ellis and Deller 1990; Watson 1999).

During the succeeding Archaic period (c. 10,000 to c. 3,000 B.P.), the environment of the region approached modern conditions and more land became habitable as water levels in the glacial lakes dropped. Populations continued to follow a mobile hunter-gatherer subsistence strategy, although there appears to have been a greater reliance on fishing and gathered food (e.g. plants and nuts) and more diversity between regional groups. The tool kit also became increasingly diversified, reflecting an adaptation to environmental conditions more similar to those of today. This included the presence of adzes, gouges and other ground stone tools believed to have been used for heavy woodworking activities such as the construction of dug-out canoes, grinding stones for processing nuts and seeds, specialized fishing gear including net sinkers, and a general reduction in the size of projectile points. The middle and late portions of the Archaic period saw the development of trading networks spanning the Great Lakes, and by 6,000 years ago copper was being mined in the Upper Great Lakes and traded into southern Ontario. There was increasing evidence of ceremonialism and elaborate burial practices and a wide variety of non-utilitarian items such as gorgets, pipes and ‘birdstones’ were being manufactured. By the end of this period populations had increased substantially over the preceding Palaeo-Indigenous period (Ellis 2013; Ellis et al. 1990).

More extensive Indigenous settlement of the region began during this period, sometime between 7,500 and 6,500 B.P. Artifacts from Archaic sites suggest a close relationship between these communities and what archaeologists refer to as the Laurentian Archaic stage peoples who inhabited the Canadian biotic province transition zone between the deciduous forests to the south and the boreal forests to the north. This region included northern New York State, the upper St. Lawrence Valley across southern Ontario and Quebec, and the state of Vermont (Clermont et al. 2003). The ‘tradition’ associated with this period is characterized by a more or less systematic sharing of several technological features, including large, broad bladed, chipped stone and ground slate projectile points, and heavy ground stone tools. This stage is also known for the extensive use of cold-hammered copper tools including “*bevelled spear points, bracelets, pendants, axes, fishhooks and knives*” (Kennedy 1970:59). The sharing of this set of features is generally perceived as a marker of historical relatedness and inclusion in the same interaction network (Clermont et al. 2003). Cemeteries also appear for the first time during the Late Archaic. Evidence of Archaic inhabitation has been found across eastern Ontario (see Clermont 1999; Clermont et al. 2003; Ellis 2013; Kennedy 1962, 1970; Laliberté 2000; Watson 1990).

Archaeologists use the appearance of ceramics in the archaeological record to mark the beginning of the Woodland period (c. 3,000 B.P. to c. 350 B.P.). Ceramic styles and decorations suggest the continued differentiation between regional populations and are commonly used to distinguish between three periods: Early Woodland (2,900 to

2,300 B.P.), Middle Woodland (2,300 to 1,200 B.P.), and Late Woodland (1,200 to 400 B.P.). The introduction of ceramics to southern Ontario does not appear to have been associated with significant changes to lifeways, as hunting and gathering remained the primary subsistence strategy throughout the Early Woodland and well into the Middle Woodland. It does, however, appear that regional populations continued to grow in size, and communities continued to participate in extensive trade networks that, at their zenith c. 1,750 B.P., spanned much of the continent and included the movement of conch shell, fossilized shark teeth, mica, copper and silver; a large number of other items that rarely survive in the archaeological record would also have been exchanged, as well as knowledge.[2] Social structure appears to have become increasingly complex, with some status differentiation evident in burials. In southeastern Ontario, the first peoples to adopt ceramics are identified by archaeologists as belonging to the Meadowood Complex, characterized by distinctive biface preforms, side-notched points, and Vinette I ceramics which are typically crude, thick, cone-shaped vessels made with coils of clay shaped by cord-wrapped paddles. Meadowood material has been found on sites across southern Ontario extending into southern Quebec and New York State (Fox 1990; Spence et al. 1990).

In the Middle Woodland period increasingly distinctive trends or 'traditions' continued to evolve in different parts of Ontario (Spence et al. 1990). Although regional patterns are poorly understood and there may be distinctive traditions associated with different watersheds, the appearance of more refined ceramic vessels decorated with dentate or pseudo-scallop impressions have been used by archaeologists to distinguish the Point Peninsula Complex. These ceramics are identified as Vinette II and are typically found in association with evidence of distinct bone and stone tool industries. Sites exhibiting these traits are known from throughout south-central and eastern Ontario, northern New York, and northwestern Vermont, and are often found overlying earlier site components. Some groups appear to have practiced elaborate burial ceremonialism that involved the construction of large earthen mortuary mounds and the inclusion of numerous and often exotic materials in burials, construed as evidence of influences from northern Ontario and the Hopewell area to the south in the Ohio River valley. Archaeological evidence suggests that during this time period groups utilized a variety of resources within a home territory. Through the late fall and winter, small groups would coalesce at an inland 'family' hunting area. In the spring, these dispersed families would congregate at specific lakeshore sites to fish, hunt in the surrounding forest, and socialize. This gathering would last through to the late summer when large quantities of food would be stored up for the approaching winter (Spence et al. 1990).

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[2] For example, the recent discovery of a cache of charred quinoa seeds, dating to 3,000 B.P. at a site in Brantford, Ontario, indicates that crops were part of this extensive exchange network, which in this case travelled from the Kentucky-Tennessee region of the United States. Thus far, there is no indication that these seeds were locally grown (Crawford et al. 2019).

Towards the end of the Middle Woodland period (1200 B.P.), groups living in southern Ontario included horticulture in their subsistence strategy. Available archaeological evidence, which comes primarily from the vicinity of the Grand and Credit rivers, suggests that this development was not initially widespread. The adoption of maize horticulture instead appears to be linked to the emergence of the Princess Point Complex which is characterized by decorated ceramics combining cord roughening, impressed lines, and punctate designs; triangular projectile points; T-based drills; steatite and ceramic pipes; and ground stone chisels and adzes (Fox 1990).

Archaeologists have distinguished the Late Woodland period by the widespread adoption of maize horticulture by some Indigenous groups primarily across much of southern Ontario and portions of the southeast with favourable soils. Initially only a minor addition to the diet, the cultivation of corn, beans, squash, sunflowers, and tobacco radically altered subsistence strategies and gained economic importance in the region over time. This change is associated with increased sedentarism, and with larger and more dense settlements focused on areas of easily tillable farmland. In some areas, semi-permanent villages, with communal 'longhouse' dwellings, appeared for the first time. These villages were inhabited year-round for 12 to 20 years until local firewood and soil fertility had been exhausted. Many were surrounded by defensive palisades, evidence of growing hostilities between neighbouring groups. Associated with these sites is a burial pattern of individual graves occurring within the village. Upon abandonment, the people of one or more villages often exhumed the remains of their dead for reburial in a large communal burial pit or ossuary outside of the village(s) (Wright 1966; Williamson 2014). More temporary habitations such as small hamlets, agricultural cabin sites, and hunting and fishing camps were also used. Throughout the parts of what is now Ontario situated on the Canadian Shield, however, the terrain limited horticulture and Indigenous groups continued to move frequently across their territories hunting, fishing, and gathering (Pilon 1999).

Along the St. Lawrence River valley from the east end of Lake Ontario to the Quebec City region and beyond, archaeologists have identified a distinctive material culture associated with what they refer to as the St. Lawrence Iroquoians. The material culture and settlement patterns of the fourteenth and fifteenth century St. Lawrence Iroquoian sites are directly related to the Iroquoian-speaking groups that Jacques Cartier and his crew encountered in 1535 at Stadacona (Quebec City) and Hochelaga (Montreal Island) (Jamieson 1990:386). Like those peoples inhabiting what would become southern and southcentral Ontario, the St. Lawrence Iroquoians practised horticulture and supplemented their diet with fishing, hunting and gathering. They lived in large semi-permanent villages as well as smaller camps. Numerous discrete settlement clusters have been identified across this large territory; however, the political and social relationships between these populations is unclear (Tremblay 2006).

By the late sixteenth century all of the St. Lawrence Iroquoian settlements appear to have been abandoned. Long characterized by archaeologists as a 'mysterious disappearance,' recent scholarship instead highlights several lines of evidence that suggest a series of planned migrations by St. Lawrence Iroquoian groups to other Indigenous populations, including the Huron-Wendat, during a period of coalescence and social realignment (Micon et al. 2021; Lesage and Williamson 2020).[3] Horticultural villages have also been recorded along the north shore of Lake Ontario and up the Trent River dating to c. 550 B.P. (c. 1400 C.E.). By c. 450 B.P. (c. 1500 C.E), the easternmost of these settlements were located between Balsam Lake and Lake Simcoe in the region that would become historic Huronia. While this significant population movement is not fully understood, it undoubtedly involved complex interactions between different cultural groups including the Anishinabeg, the Huron-Wendat and, as noted above, may also have included St. Lawrence Iroquoians. As such, there are conflicting interpretations of the archaeological and historical records related to this period (see Gaudreau and Lesage 2016; Gitiga Migizi and Kapyrka 2015; Lainey 2006; Richard 2016; Pendergast 1972).

Those who became known as the Anishinabe Algonquin settled along the Ottawa River or Kichi-Sibi and its tributaries in eastern Ontario and western Quebec; the Ojibwa, Ottawa and Potawatomi inhabited the regions surrounding the Great Lakes; and the Nipissing were centred upon the lake now bearing their name. Living on and around the Canadian Shield, all Anishinabeg maintained a more nomadic lifestyle than their agricultural neighbours to the south, and accordingly their presence is less visible in the archaeological record (Morrison 2005; Sherman 2015:28). Finally, while the Iroquois or Haudenosaunee[4] homeland was initially south of Ontario in New York state, at times their hunting grounds extended along the north shore of Lake Ontario and the St. Lawrence River into southeastern Ontario and Quebec (Hill 2017). Archaeological data indicates some Haudenosaunee were living year-round in Ontario by the early seventeenth century (Konrad 1981).

The Indigenous population shifts and relationships of the late sixteenth and early seventeenth centuries through the period of initial contact with Europeans were complex and are not fully understood. They were certainly in part a result of the disruption of traditional trade and exchange patterns among all Indigenous peoples brought about by the arrival of the French, Dutch and British along the Atlantic seaboard the subsequent emergence of the lucrative St. Lawrence River trade route.

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[3] This period also saw the coalescence of horticultural communities associated with a northward territorial expansion and a concomitant abandonment of the north shore of Lake Ontario, changes that have been suggested to have been driven, in large part, by an increase in conflict with the Haudenosaunee over control of trade routes and access to European trade goods.

[4] Sometime between A.D. 1142 and A.D. 1451 the Mohawk, Oneida, Onondaga, Cayuga, and Seneca united to form the Haudenosaunee Confederacy, also known as the League of Five Nations, and called the Iroquois by the French. When the Tuscarora Nation joined the confederacy in 1722, it became the League of Six Nations.

3.2 Regional Post-Contact Cultural Overview

The first Europeans to travel into eastern Ontario arrived in the early seventeenth century; predominantly French, they included explorers, fur traders and missionaries. While exploring eastern Ontario and the Ottawa River watershed between c. 1610 and 1613,[5] Samuel de Champlain and others documented encounters with different Indigenous groups speaking Anishinabemowin, including the Matouweskarini along the Madawaska River, the Kichespirini at Morrison Island on the Ottawa River, the Otaguottouemin along the river northwest of Morrison Island, the Weskarini in the Petite Nation River basin,[6] and the Onontchataronon[7] living in the South Nation River basin as far west as the Gananoque River basin (Hanewich 2009; Hessel 1993; Sherman 2015:29). These extended family communities subsisted by hunting, fishing, and gathering, and undertook some horticulture (see also Pendergast 1999; Trigger 1987). The Anishinabeg living in the Upper Ottawa Valley and northeastward towards the headwaters of the Ottawa River included the Nipissing, Timiskaming, Abitibi (Wahgoshig), and others. As the French moved inland, however, they referred to all these groups who spoke different dialects of Anishinabemowin as 'Algonquin' (Morrison 2005:18).

At the time of Champlain's travels, the Anishinabe Algonquin were already acting as brokers in the fur trade and exacting tolls from those using the Ottawa River waterway which served as a significant trade route connecting the Upper Great Lakes via Lake Nipissing and Georgian Bay to the west and the St. Maurice and Saguenay via the Rivières des Outaouais (the portion of the Ottawa River extending eastward into Quebec from Lake Timiskaming). These northern routes avoided the St. Lawrence River and Lower Great Lakes route and, therefore, potential conflict with the Haudenosaunee (Joan Holmes & Associates Inc. 1993:2-3). Access to this southern route and the extent of settlement in the region fluctuated with the state of hostilities (Joan Holmes & Associates Inc. 1993:3). By the time Champlain arrived in the Quinte region while exploring the Trent watershed in 1615, for example, he encountered few Indigenous peoples (Gervais 2004:182). As the fur trade in New France was Montreal-based, Ottawa River navigation routes were of strategic importance in the movement of goods inland and furs down to Montreal and, in the wake of Champlain's travels, the Ottawa River became the principal route to the interior for the French. The recovery of European trade goods (e.g., iron axes, copper kettle pieces, glass beads, etc.) from sites throughout the Ottawa River drainage

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[5] From this section onwards all dates are presented as A.D.

[6] The Petite Nation River is in Quebec, with its mouth on the north side of the Ottawa River between Ottawa and Hawkesbury. It is sometimes confused with the South Nation River in eastern Ontario which empties into the south side Ottawa River opposite the Petite Nation River. Consequently, the Weskarini territory is sometimes associated with the South Nation River, but this appears to be an error (*cf.* Hessel 1993).

[7] This is a Haudenosaunee term and is, therefore, thought to be an Anishinabe Algonquin community that adopted Iroquoians who had been displaced from their territory along the St. Lawrence River near Montreal (Fox and Pilon 2016).

basin provides some evidence of the extent of interaction between Indigenous groups and the French during this period (Kennedy 1970).

With Contact, major population disruptions were brought about by the introduction of European diseases against which Indigenous populations had little resistance; severe smallpox epidemics in 1623-24 and again between 1634 and 1640 resulted in drastic population decline among all Indigenous peoples living in the Great Lakes region (Konrad 1981). The expansion of hunting for trade with Europeans also accelerated decline in the beaver population, such that by the middle of the seventeenth century the centre of the fur trade had shifted northward from what became the northeastern states into southern Ontario.

Seeking to expand their territory and disrupt the French[8] fur trade, the Haudenosaunee launched raids into the region and established a series of winter hunting bases and trading settlements near the mouths of the major rivers flowing into what is now the north shore of Lake Ontario and the St. Lawrence River.[9] The first recorded Haudenosaunee settlements were two Cayuga villages established at the northeastern end of Lake Ontario (Konrad 1981). Between 1640 and 1650 conflict with the Haudenosaunee Confederacy culminated in the near complete abandonment of what is now southern Ontario by Anishinabeg and Huron-Wendat groups. In the face of continued harassment, resident Indigenous communities appear to have dispersed further afield or joined other communities, settling to the north and west of the Ottawa Valley,[10] and at the French posts of Montreal, Quebec City, Sillery, and Trois Rivières (Joan Holmes & Associates Inc. 1993:3; Trigger 1987:610, 637-638).[11] It should be noted, however, that available evidence suggests that segments of these populations either remained in the region or returned seasonally to hunt, fish and trap.

In spite of traditional enmity since the arrival of Champlain, following French raids into Mohawk territory in 1666-1667, the Cayuga occupying the settlement at Kente (now Carrying Place near the narrows separating the western end of what is now Prince Edward County from the Hastings County mainland) approached the French to ask for missionaries, and a Sulpician mission was established in 1668. The mission was short-lived, being abandoned by 1680, but it had both extended French influence into the area

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[8] The French appear to have been allied with the Huron-Wendat, the Petun, and the Anishinabeg as trading partners at this time.

[9] These settlements included: Quinaouatoua near present day Hamilton, Teiaiagon on the Humber River, Ganatswekwyagon on the Rouge River, Ganaraske on the Ganaraska River, Kentsio on Rice Lake, Kente on the Bay of Quinte, and Ganneious, near Napanee (Adams 1986).

[10] Some Nipissing, for example, re-located to the Lake Nipigon region (Joan Holmes & Associates Inc. 1993:3).

[11] In the case of the 1649-1650 move of a group of Huron-Wendat from Gahoendoe (Christian) Island to the area of Quebec City, the relocation was the result of careful consideration and was planned well in advance, with a diplomatic mission having been sent in advance to discuss the move with their French allies (see Lesage and Williamson 2020).

and become the first settlement on the north shore of Lake Ontario to have both Indigenous and European members (Edwards 1984:17).

Fort Frontenac was established by the French at the present site of Kingston in 1673, and another fort was constructed at La Presentation (Ogdensburg, New York) in 1700, resulting in a sporadic European presence at the eastern end of what is now Lake Ontario during the late seventeenth century and throughout the eighteenth century. These forts served to solidify control of the fur trade, storing supplies intended for the interior military and trading posts on the Niagara, Detroit, Illinois, and (American) Mississippi rivers. Though the French military garrison readily abandoned Fort Frontenac whenever disputes with the Haudenosaunee seemed to escalate, the secondary function of this and other posts were to enhance ties with local Indigenous populations. To this end, the French encouraged the establishment of Indigenous villages near their settlements; extensive European settlement was not undertaken (Adams 1986).

The full extent of Indigenous settlement in eastern Ontario through to the end of the seventeenth century, however, is uncertain, with not enough archaeological evidence having yet been procured. Apart from the population movements described below, the Odawa appear to have been using the Ottawa River for trade from c. 1654 onward and some Anishinabe Algonquin remained within the area under French influence, possibly having withdrawn to the headwaters of various tributaries in the watershed. In 1677 the Sulpician Mission of the Mountain was established near Montreal where the Ottawa River empties into the St. Lawrence River. While it was mostly a Mohawk community that became known as Kahnawake, some Anishinabe Algonquin who had converted to Christianity settled at the mission for part of the year and were known as the Oka Algonquin (Joan Holmes & Associates Inc. 1993).

As a result of increased tensions between the Haudenosaunee and the French, and declining population from disease and warfare, the Cayuga villages were abandoned in 1680 (Edwards 1984:17). Around this time, the Anishinabeg began to mount an organized counter-offensive against the Haudenosaunee who were pushed further south, leading once again to an increased Michi Saagiig presence in southern and central Ontario. This change saw Anishinabeg gain wider access to European trade goods and allowed them to use their experience and strategic position to act as intermediaries in trade between the British and Indigenous communities to the north (Edwards 1984:10,17; Ripmeester 1995).

Following almost a century of warfare, the Great Peace was signed in Montreal in 1701 between New France and 39 Indigenous Nations, including the Anishinabeg, Huron-Wendat and Haudenosaunee. This led to a period of relative peace and stability. During the first half of the eighteenth century, the Haudenosaunee appear to have been largely centred south of the St. Lawrence River, while Michi Saagiig and Ojibwa were living in southern and central Ontario, generally beyond the Ottawa River watershed (Joan Holmes & Associates Inc. 1993:3). Anishinabe Algonquin were residing along the Ottawa River and its tributaries, as well as outside the Ottawa River watershed at Trois-Rivières;

Nipissing were located around Lake Nipissing and at Lake Nipigon. Reports from c. 1752 suggest that some non-resident Anishinabe Algonquin and Nipissing were trading at the mission at Lake of Two Mountains during the summer but returning to their hunting grounds "*far up the Ottawa River*" for the winter, and there is some indication that they may have permitted Haudenosaunee residents of the mission to hunt in their territory (Joan Holmes & Associates Inc. 1993:3-4; Heidenreich and Noël 1987:Plate 40).

In 1754, hostilities over trade and the territorial ambitions of the French and British led to the Seven Years' War, in which many Anishinabeg fought on behalf of the French. With the French surrender in 1760, Britain gained control over New France, though in recognition of Indigenous title to the land the British government issued the Royal Proclamation of 1763. This created a boundary line between the British colonies on the Atlantic coast and the 'Indian Reserve' west of the Appalachian Mountains. This line then extended from where the 45th parallel of latitude crossed the St. Lawrence River near present day Cornwall northwestward to the southeast shore of Lake Nipissing and then northeastward to Lac St. Jean. The proclamation specified that "*Indians should not be molested on their hunting grounds*" (Joan Holmes & Associates Inc. 1993:4) and outlawed the private purchase of Indigenous land, instead requiring all future land purchases to be made by Crown officials "*at some public Meeting or Assembly of the said Indians*" living upon the land in question (cited in Surtees 1982: 9). In 1764, the post at Carillon on the Ottawa River was identified as the point beyond which traders could only pass with a specific licence to trade in "*Indian Territory.*" Nevertheless, settlers continued to trespass into this territory, cutting trees and driving away game vital to Indigenous lifeways (Joan Holmes & Associates Inc. 1993:5). Akwesasne, within the Haudenosaunee hunting territory near what is now Cornwall, became a permanent settlement towards the middle of the eighteenth century.[12]

At first, the end of the French Regime brought little change to eastern Ontario. Between 1763 and 1776 some British traders traveled to the Kingston area, but the British presence remained sporadic until 1783 when Fort Frontenac was officially re-occupied. With the conclusion of the American Revolutionary War (1775 to 1783), however, the British sought additional lands on which to settle United Empire Loyalists fleeing the United States, disbanded soldiers, and the Mohawk who had fought with the British under Thayendanegea (Joseph Brant) and Chief Deserontyon and were, therefore, displaced from their lands in New York State. To this end, the British government undertook hasty negotiations with Indigenous groups to acquire rights to lands; however, these negotiations did not include Anishinabe Algonquin and Nipissing who were continuously ignored, despite much of the area being their traditional territory (Lanark County Neighbours for Truth and Reconciliation 2019). Initially the focus for settlement was the north shore of Lake Ontario and the St. Lawrence River, resulting in a series of 'purchases' and treaties beginning with the Crawford Purchase of 1783. As noted, these treaties did not include all of the Indigenous groups who lived and hunted in the region

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[12] www.firstbatuibs.info/akwesasne.html

and the recording of the purchases – including the boundaries – and their execution were problematic; they also did not extinguish Indigenous rights and title to the land (Joan Holmes & Associates Inc. 1993:5; Royal Commission on Aboriginal Peoples 1996). The *Crown Grant to the Mohawks of the Bay of Quinte* was issued in 1784 in recognition of the Six Nations' support during the American Revolutionary War. It included lands on the Bay of Quinte, originally part of the Crawford Purchase, on which Chief Deserontyon and other Haudenosaunee settled.[13]

Major Samuel Holland, Surveyor General for Canada, began laying out the land within the Crawford Purchase in 1784 with such haste that the newly established townships were assigned numbers instead of names. Euro-Canadian settlement along the north shore of the St. Lawrence River and the eastern end of Lake Ontario began in earnest about this time. By the late 1780s the waterfront townships were full and more land was required to meet both an increase in the size of grants to all Loyalists and grant obligations to the children of Loyalists who were now entitled to 200 acres in their own right upon reaching the age of 21 (H. Belden & Co. 1880:16). In 1792 John Graves Simcoe, Lieutenant Governor of the Province of Upper Canada, offered free land grants to anyone who would swear loyalty to the King, a policy aimed at attracting more American settlers. As government policy also dictated the setting aside of one seventh of all land for the Protestant Clergy and another seventh as Crown reserves, pressure mounted to open up more of the interior. As a result, between 1790 and 1800 most of the remainder of the Crawford Purchase was divided into townships (H. Belden & Co. 1880:16).

A number of other purchases during the late eighteenth century between representatives of the Crown and certain Anishinabe covered lands immediately west of the Crawford Purchase, from the north shore of Lake Ontario northward to Lake Simcoe and Georgian Bay/Lake Huron. These included the John Collins Purchase of 1785, the Johnson-Butler Purchase[14] of 1787-88, and the 1798 Penetanguishene Purchase (Treaty 5) aimed at acquiring a harbour on Lake Huron for British vessels.[15] The lands purportedly covered by these purchases were often poorly defined and were thus included in the later Williams Treaties of 1923 (see below).

The *Constitution Act* of 1791, which created the provinces of Upper and Lower Canada (later Ontario and Quebec) used the Ottawa River as the boundary between the two. This effectively divided the Anishinabe Algonquin and Nipissing territories, both of which straddled the river. European settlement continued to expand up the river, with continued disruption to local Indigenous community lifeways. In the early 1800s, a few Anishinabe Algonquin and Nipissing settled on the shores of Golden Lake, known to

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[13] https://www.ontario.ca/page/map-ontario-treaties-and-reserves

[14] Sometimes referred to as the 'Gunshot Treaty' as it reportedly covered the land as far back from the lake shore as a person could hear a gunshot (https://www.ontario.ca/page/map-ontario-treaties-and-reserves).

[15] https://www.ontario.ca/page/map-ontario-treaties-and-reserves

them as 'Peguakonagang;' they called themselves 'Ininwezi,' which they translated as 'we people here alone' (Johnson 1928; MacKay 2016).[16] The Golden Lake band, as they initially came to be known, resided in this area for at least part of the year, with various band members maintaining traplines, hunting territories, and sugar bushes.[17]

The War of 1812 between the United States and Great Britain (along with its colonies in North America and its Indigenous allies) brought another period of conflict to the region. In 1815, at the conclusion of the war, the British government issued a proclamation in Edinburgh to further encourage settlement in British North America. The offer included free passage and 100 acres of land for each head of family, with each male child to receive his own 100 acre parcel upon reaching the age of 21 (H. Belden & Co. 1880:16). At the same time, the government was seeking additional land on which to resettle disbanded soldiers from the War of 1812. Demobilized forces could thereby act as a 'force-in-being' to oppose any possible future incursions from the United States. Veterans were encouraged to take up residence within a series of newly created 'military settlements' including those at Perth (1816) and Richmond (1818). The pressure to find more land was exacerbated by the sheer number of settlers moving into the region as a result of these initiatives, which began to push settlement beyond the acquired territory into what had formally been protected as 'Indian Land.'[18]

Additional 'purchases' were signed in the early nineteenth century between the Crown and certain Anishinabe communities including the Lake Simcoe Purchase (Treaty 16) signed in 1815 and covering lands between Lake Simcoe and Georgian Bay, the Nottawasaga Purchase (Treaty 18) of 1818 to the south and west of the Lake Simcoe Purchase, and the Rice Lake Purchase or Treaty 20 of 1818 which covered a large area around Rice Lake.[19]

Further east, with the settlement of the region underway, Lieutenant Governor Gore ordered Captain Ferguson, the Resident Agent of Indian Affairs at Kingston, to arrange the purchase of additional lands extending from the rear of the earlier Crawford Purchase to the Ottawa River. The resulting Rideau Purchase (Treaty 27 and 27¼), signed by the Michi Saagiig in 1819 and confirmed in 1822, was just as problematic in its terms and exclusions as the earlier Crawford Purchase had been (Canada 1891:62).

As Euro-Canadian settlement spread, Indigenous groups were increasingly pushed out of southern and eastern Ontario, generally moving further to the north and west, although some families remained in their traditional lands, at least seasonally. Records

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[16] The Algonquin of River Desert identified The Golden Lake Band using the name "Nozebi'wininiwag," translated as "Pike-Water People" (Speck in Johnson 1928:174).

[17] The 'Golden Lake Reserve' or Pikwàkanagàn was created by the federal government in 1873 (Joan Holmes & Associates Inc. 1993:9).

[18] Between 1815 and 1850 over an estimated 800,000 Euro-Canadian settlers moved into the region (https://www. lanarkcountyneighbours.ca/the-petitions-of-chief-shawinipinessi.html).

[19] https://www.ontario.ca/page/map-ontario-treaties-and-reserves

relating to the Hudson's Bay Company, the diaries of provincial land surveyors, the reports of geologists sent in by the Geological Survey of Canada, census returns,[20] store account books and settler's diaries all provide indications of the continued Indigenous settlement in the region, as does Indigenous oral history. In addition to their interactions with Indigenous families who remained in the area, nineteenth century settlers found evidence of the former extent of Indigenous inhabitation, particularly as they began to clear the land. In 1819, Andrew Bell wrote from Perth:

> *All the country hereabouts has evidently been once inhabited by the Indians, and for a vast number of years too. The remains of fires, with the bones and horns of deers (sic) round them, have often been found under the black mound... A large pot made of burnt clay and highly ornamented was lately found near the banks of the Mississippi, under a large maple tree, probably two or three hundred years old. Stone axes have been found in different parts of the settlement.*
>
> (cited in Brown 1984:8)

Other treaties signed in the mid-nineteenth century included the St. Regis Purchase (Treaty 57) signed in 1847 between the Crown and the Mohawk and covering a narrow parcel of land, known as the 'Nutfield Tract' extending north of the St. Lawrence River at Cornwall towards the Ottawa River, and the Robinson-Huron Treaty (Treaty 61) of 1850 between the Crown and certain Anishinabeg for lands east of Georgian Bay and the northern shore of Lake Huron eastward to the Ottawa River.[21]

The Williams Treaties of 1923 were signed between the Crown and seven Anishinabe First Nations[22] to address lands that had not been surrendered via a formal treaty process (see above).[23] These lands covered a large area from the north shore of Lake Ontario to Lake Nipissing and overlapped with a number of other treaties and 'purchases.' To address further issues with a number of the pre-confederation purchases and treaties, the Williams Treaties First Nations ratified the Williams Treaties Settlement Agreement with Canada and Ontario in June, 2018. This agreement recognized harvesting rights in Treaties 5, 16, 18, 20, 27 and 27¼, the Crawford Purchase, the Johnson-Butler Purchase and Lake Simcoe Purchase.[24]

As noted above, lands considered traditional Anishinabe Algonquin territory were included in various nineteenth century purchases from which they were excluded.

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[20] While Indigenous peoples were clearly still residing in the area and making use of the land, they often do not appear in the 1851 to 1871 census records. Huitema (2001:129) notes that 'Algonquin' were sometimes listed in these records as 'Frenchmen' or 'halfbreeds' because they had utilized the mission at Lake of Two Mountains as their summer gathering place and, therefore, were thought of as being French.

[21] https://www.ontario.ca/page/map-ontario-treaties-and-reserves

[22] These First Nations include the Chippewas of Beausoleil, Georgina Island and Rama, and the Mississaugas of Alderville, Curve Lake, Hiawatha and Scugog Island.

[23] https://www.ontario.ca/page/map-ontario-treaties-and-reserves

[24] www.williamstreatiesfirstnations.ca

Anishinabe Algonquin claims to these lands include a series of petitions to the Crown going back to 1772 that asserted rights to land and resources. An official land claim was made in the 1980s and, in 2016, an Agreement-in-Principle was signed by Ontario, Canada and the Algonquins of Ontario, a step towards a treaty recognizing Anishinabe Algonquin rights across much of eastern Ontario.[25]

3.3 Indigenous Historical Contexts

The following historical supplements have been provided by the Indigenous communities indicated below.

3.3.1 Curve Lake First Nation

> *The traditional homelands of the Michi Saagiig (Mississauga Anishinaabeg) encompass a vast area of what is now known as southern Ontario. The Michi Saagiig are known as "the people of the big river mouths" and were also known as the "Salmon People" who occupied and fished the north shore of Lake Ontario where the various tributaries emptied into the lake. Their territories extended north into and beyond the Kawarthas as winter hunting grounds on which they would break off into smaller social groups for the season, hunting and trapping on these lands, then returning to the lakeshore in spring for the summer months.*
>
> *The Michi Saagiig were a highly mobile people, travelling vast distances to procure subsistence for their people. They were also known as the "Peacekeepers" among Indigenous nations. The Michi Saagiig homelands were located directly between two very powerful Confederacies: The Three Fires Confederacy to the north and the Haudenosaunee Confederacy to the south. The Michi Saagiig were the negotiators, the messengers, the diplomats, and they successfully mediated peace throughout this area of Ontario for countless generations.*
>
> *Michi Saagiig oral histories speak to their people being in this area of Ontario for thousands of years. These stories recount the "Old Ones" who spoke an ancient Algonquian dialect. The histories explain that the current Ojibwa phonology is the 5th transformation of this language, demonstrating a linguistic connection that spans back into deep time. The Michi Saagiig of today are the descendants of the ancient peoples who lived in Ontario during the Archaic and Paleo-Indian periods. They are the original inhabitants of southern Ontario, and they are still here today.*
>
> *The traditional territories of the Michi Saagiig span from Gananoque in the east, all along the north shore of Lake Ontario, west to the north shore of Lake Erie at Long Point. The territory spreads as far north as the tributaries that flow into these lakes, from Bancroft and north of the Haliburton highlands. This also includes all the tributaries that flow from the height of land north of Toronto like the Oak Ridges Moraine, and all of the rivers that flow into Lake Ontario (the Rideau, the Salmon, the Ganaraska, the Moira, the Trent, the Don, the Rouge, the Etobicoke, the Humber, and the Credit, as well as Wilmot and 16 Mile Creeks) through*

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[25] https://www.ontario.ca/page/map-ontario-treaties-and-reserves

Burlington Bay and the Niagara region including the Welland and Niagara Rivers, and beyond. The western side of the Michi Saagiig Nation was located around the Grand River which was used as a portage route as the Niagara portage was too dangerous. The Michi Saagiig would portage from present-day Burlington to the Grand River and travel south to the open water on Lake Erie.

Michi Saagiig oral histories also speak to the occurrence of people coming into their territories sometime between 500-1000 A.D. seeking to establish villages and a corn growing economy – these newcomers included peoples that would later be known as the Huron-Wendat, Neutral, Petun/Tobacco Nations. The Michi Saagiig made Treaties with these newcomers and granted them permission to stay with the understanding that they were visitors in these lands. Wampum was made to record these contracts, ceremonies would have bound each nation to their respective responsibilities within the political relationship, and these contracts would have been renewed annually (see Gitiga Migizi and Kapyrka 2015). These visitors were extremely successful as their corn economy grew as well as their populations. However, it was understood by all nations involved that this area of Ontario were the homeland territories of the Michi Saagiig.

The Odawa Nation worked with the Michi Saagiig to meet with the Huron-Wendat, the Petun, and Neutral Nations to continue the amicable political and economic relationship that existed – a symbiotic relationship that was mainly policed and enforced by the Odawa people. Problems arose for the Michi Saagiig in the 1600s when the European way of life was introduced into southern Ontario. Also, around the same time, the Haudenosaunee were given firearms by the colonial governments in New York and Albany which ultimately made an expansion possible for them into Michi Saagiig territories. There began skirmishes with the various nations living in Ontario at the time. The Haudenosaunee engaged in fighting with the Huron-Wendat and between that and the onslaught of European diseases, the Iroquoian speaking peoples in Ontario were decimated.

The onset of colonial settlement and missionary involvement severely disrupted the original relationships between these Indigenous nations. Disease and warfare had a devastating impact upon the Indigenous peoples of Ontario, especially the large sedentary villages, which mostly included Iroquoian speaking peoples. The Michi Saagiig were largely able to avoid the devastation caused by these processes by retreating to their wintering grounds to the north, essentially waiting for the smoke to clear.

Michi Saagiig Elder Gitiga Migizi (2017) recounts:

"We weren't affected as much as the larger villages because we learned to paddle away for several years until everything settled down. And we came back and tried to bury the bones of the Huron but it was overwhelming, it was all over, there were bones all over – that is our story.

There is a misnomer here, that this area of Ontario is not our traditional territory and that we came in here after the Huron-Wendat left or were defeated, but that is not true. That is a big *misconception of our history that needs to be corrected. We are the traditional people, we are the ones that signed treaties with the Crown. We are recognized as the ones who signed these treaties and we are the ones to be dealt with officially in any matters concerning territory in southern Ontario.*

We had peacemakers go to the Haudenosaunee and live amongst them in order to change their ways. We had also diplomatically dealt with some of the strong chiefs to the north and tried to make peace as much as possible. So we are very important in terms of keeping the balance of relationships in harmony.

Some of the old leaders recognized that it became increasingly difficult to keep the peace after the Europeans introduced guns. But we still continued to meet, and we still continued to have some wampum, which doesn't mean we negated our territory or gave up our territory – we did not do that. We still consider ourselves a sovereign nation despite legal challenges against that. We still view ourselves as a nation and the government must negotiate from that basis."

Often times, southern Ontario is described as being "vacant" after the dispersal of the Huron-Wendat peoples in 1649 (who fled east to Quebec and south to the United States). This is misleading as these territories remained the homelands of the Michi Saagiig Nation.

The Michi Saagiig participated in eighteen treaties from 1781 to 1923 to allow the growing number of European settlers to establish in Ontario. Pressures from increased settlement forced the Michi Saagiig to slowly move into small family groups around the present day communities: Curve Lake First Nation, Hiawatha First Nation, Alderville First Nation, Scugog Island First Nation, New Credit First Nation, and Mississauga First Nation.

The Michi Saagiig have been in Ontario for thousands of years, and they remain here to this day.

This historical context was prepared by Gitiga Migizi, a respected Elder and Knowledge Keeper of the Michi Saagiig Nation.

3.3.2 Chippewas of Rama First Nation

The Chippewas of Rama First Nation are an Anishinaabe (Ojibway) community located at Rama First Nation, ON. Our history began with a great migration from the East Coast of Canada into the Great Lakes region. Throughout a period of several hundred years, our direct ancestors again migrated to the north and eastern shores of Lake Huron and Georgian Bay. Our Elders say that we made room in our territory for our allies, the Huron-Wendat Nation, during their times of war with the Haudenosaunee. Following the dispersal of the Huron-Wendat Nation from the region in the mid-1600s, our stories say that we again migrated to our territories in what today is known as Muskoka and Simcoe County. Several major battles with the Haundenosaunee culminated in peace being agreed between the Anishinaabe and the Haudenosaunee, after which the Haudenosaunee agreed to leave the region and remain in southern Ontario. Thus, since the early 18th century, much of central Ontario into the lower parts of northern Ontario has been Anishinaabe territory.

The more recent history of Rama First Nation begins with the creation of the "Coldwater Narrows" reserve, one of the first reserves in Canada. The Crown intended to relocate our ancestors to the Coldwater reserve and ultimately assimilate our ancestors into Euro-Canadian culture. Underlying the attempts to assimilate our ancestors were the plans to take possession of our vast hunting and harvesting territories. Feeling the impacts of increasingly widespread settlement, many of our ancestors moved to the Coldwater reserve in the early 1830s. Our ancestors built homes, mills, and farmsteads along the old portage route which ran through the reserve, connecting Lake Simcoe to Georgian Bay (this route is now called "Highway 12"). After a short period of approximately six years, the Crown had a change of plans. Frustrated at our ancestors continued exploiting of hunting territories (spanning roughly from Newmarket to the south, Kawartha Lakes to the east, Meaford to the west, and Lake Nipissing to the north), as well as unsuccessful assimilation attempts, the Crown reneged on the promise of reserve land. Three of our Chiefs, including Chief Yellowhead, went to York under the impression they were signing documents affirming their ownership of land and buildings. The Chiefs were misled, and inadvertently allegedly surrendered the Coldwater reserve back to the Crown.

Our ancestors, then known as the Chippewas of Lakes Simcoe and Huron, were left landless. Earlier treaties, such as Treaty 16 and Treaty 18, had already resulted in nearly 2,000,000 acres being allegedly surrendered to the Crown. The Chippewas made the decision to split into three groups. The first followed Chief Snake to Snake Island and Georgina Island (today known as the Chippewas of Georgina Island). The second group followed Chief Aissance to Beausoleil Island, and later to Christian Island (Beausoleil First Nation). The third group, led by Chief Yellowhead, moved to the Narrows between Lakes Simcoe and Couchiching and eventually, Rama (Chippewas of Rama First Nation).

A series of purchases, using Rama's own funds, resulted in Yellowhead purchasing approximately 1,600 acres of abandoned farmland in Rama Township. This land makes up the core of the Rama Reserve today, and we have called it home since the early 1840's. Our ancestors began developing our community, clearing fields for farming and building homes. They continued to hunt and harvest in their traditional territories, especially within the Muskoka region, up until the early 1920's. In 1923, the Williams Treaties were signed, surrendering 12,000,000 acres of previously unceded land to the Crown. Once again, our ancestors were misled, and they were informed that in surrendering the land, they gave up their right to access their seasonal traditional hunting and harvesting territories.

With accessing territories difficult, our ancestors turned to other ways to survive. Many men guided tourists around their former family hunting territories in Muskoka, showing them places to fish and hunt. Others worked in lumber camps and mills. Our grandmothers made crafts such as porcupine quill baskets and black ash baskets, and sold them to tourists visiting Simcoe and Muskoka. The children were forced into Indian Day School, and some were taken away to Residential Schools. Church on the reserve began to indoctrinate our ancestors. Our community, along with every other First Nation in Canada, entered a dark period of attempted genocide at the hands of Canada and the Crown. Somehow, our ancestors persevered, and they kept our culture, language, and community alive.

> *Today, our community has grown into a bustling place, and is home to approximately 1,100 people. We are a proud and progressive First Nations community.*

3.4 Property History

The following detailed review of archival research was conducted in order to develop a picture of the land-use history of the study area through the nineteenth and twentieth centuries, particularly as it relates to the archaeological potential of the property. Information was compiled from a variety of sources, including the 1862 Walling map of Russell County, the 1881 Belden map of Russell Township, twentieth-century topographic maps and aerial photographs, directories, census returns and survey plans.[26] Records at the Russell County Land Registry Office (or RCLRO) were also consulted.

The study area falls within the geographic Township of Russell, which was first surveyed in 1821 by William MacDonald. MacDonald's plan was shaded to indicate the extent of low-lying land with poor drainage characteristics, with notations on tree species encountered during the survey of these areas including cedar, spruce, ash, and larch.[27] Euro-Canadian settlement was slow over the following decades, with initial settlers including many United Empire Loyalists, as well as migrants from Ireland and the British Isles. These newly arrived families took up lands in well-drained areas along the Castor River, first in Luxemburg (named after Elisha Loux/Loucks, this village no longer exists) and Duncanville (named after William Duncan; now the village of Russell; MTBA Associates 2019). The 1840s saw an influx of French Canadian settlement into the lowlands in the eastern portion of the township, predominately in the Village of Embrun. By 1842 the population had reached 196 people (Smith 1851:376). Three years later approximately 4,936 acres of land had been taken up (though with only 504 under cultivation; Smith 1851:376). A contemporary observer noted that "*…[t]he want of roads…was the main cause of …[the] tardy settlement, and the inhabitants are too poor to make them*" (Smith 1851:377).

A review of the land registry records indicate that the deed for Lot 22, Concession 4 was obtained by John Adams in 1841 from the Crown. Adams divided the lot into north and

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[26] Historical maps and aerial photographs have been geo-referenced using Geographic Information Systems (GIS) software to generate the mapping contained in this report. Geo-referencing is the name given to the process of transforming a map or image by assigning X and Y coordinates to features, allowing the software to rotate, stretch, and in some cases warp the original image to best match the supplied coordinates. Owing to considerable variation in the scale, accuracy, and resolution of historical maps and aerial photographs, there is often an unknown degree of error introduced in the process of geo-referencing and, as for this reason, the location and extent of the study area overlain on these maps should be considered approximate.

[27] Land surveyors drew part of their payment for completing the survey of a township through grants of lands. Although lots were to be randomly selected, some surveyors sought to circumvent the legislation. For instance, William MacDonald proposed to the Land Commission that, as Russell Township was "*for the most part unfit for cultivation,*" he be given an increased commission. The request was refused (Moorman 1997:252)

south halves and sold them to Andrew and John Simpson, respectively (RCLRO Instruments 6428 and 6429). Lot 23, Concession 4 was divided into east and west halves at the time the deeds were obtained from the Crown. Elizabeth Rupert acquired the west half in 1838 and Peter McVeigh the east half in 1852. Neither of these divisions within the lots are indicated on historical mapping (Map 4).

An 1862 map of the area, produced by H. F. Walling, provides an indication of the extent of settlement in the township at the time (LAC NMC 21998). The map shows the communities of Duncanville (now Russell) and Embrun and a concentration of settlement along the Castor River and the existing road network. Several names are shown in association with the lots containing the existing industrial park. Farms or residences belonging to a person by the name of Sparks as well as L. E. Wood were located to the west at the periphery of the study area limits. Only one structure was mapped within the current study area, located along the northern edge adjacent to the township boundary, though no name is associated with the lot the structure sits within (see Map 4). Also of note on the Walling map, the road allowance between Concessions 4 and 5 was illustrated with dotted lines, indicating that this was an unopened (not cleared and travelled) right-of-way.

The land records indicate that George Sparks acquired the north half of Lot 22 in 1861 while the deed to the south half of the lot was purchased by Mary Jane Wood in 1882, likely a family member of the L. E. Wood depicted on the Walling map (RCLRO Instruments 4469 and 2889). The deeds to the west and east halves of Lot 23 changed hands frequently during the nineteenth century. Eventually, George Sparks purchased the east half of Lot 23 in 1886 (RCLRO Instrument 3451). The west half was exchanged between or willed to members of the Armstrong family. In 1907 George M. Armstrong purchased the deed from Barbara M. Armstrong (RCLRO Instrument 9611).

A map of Russell Township appearing in the 1881 *Prescott and Russell Supplement* in the *Illustrated Atlas of the Dominion of Canada* published by H. Belden and Co. also shows the names of owners/occupants, as well as the locations of residences and farmsteads.[28] It is important to note, however, that atlases of this type were sold by subscription, and subscribers tended to be documented in greater detail. Accordingly, neither the absence of a named individual(s) nor a residence/farmstead on the map should be construed as evidence that specific lots had not been settled. Still, the map can be used to provide an overview of settlement in the township, revealing that Duncanville (now Russell) and Embrun remained the largest settlements. Lots 22 and 23, Concession 4 on the 1881 Belden map are depicted without the structures shown on the previous Walling map (see Map 4). Additionally, while the Concessions 4 and 5 road allowance is illustrated on the 1881 Belden map in the same way as other established roads in the township, it seems

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[28] Deviations in lot boundaries appearing on this map suggest that errors in the original survey had led to a re-survey and subsequent re-adjustment of the lot and concession fabric within Russell Township.

clear that this was a mapping convention and not a reflection that all concession roads in Russell had been fully cleared.

A review of the directories for the City of Ottawa and/or the Counties of Carleton and Russell from the years 1866, 1870, and 1884 indicates that Robert Armstrong was listed as living in the Township of Russell on Lot 23, Concession 4 in the 1860s and 1870s, and then on Lot 23, Concession 3 by 1884. George Sparks was listed as living on Lot 23, Concession 4 in the 1860s and 1870s but on Lot 24 by 1884. As Lot 24, Concession 4 does not exist and there is no entry for Lot 23 in the directory, it is likely that this was a clerical error, and that Sparks remained on Lot 23 during the 1880s as well. The directory also appears to be in conflict with the land records and maps which place Sparks on the north half of Lot 22. Edmond Woods was listed as living on Lot 22, Concession 4 during the 1860s and 1870s. In the 1884 directory the occupant of Lot 22, Concession 4 was Leonard O. Wood with an annotation that Leonard was a farmer's son, suggesting Edmond Woods was still living on the land. All occupants of the lots in the directories are understood to have been farmers (Fuller 1884; Irwin 1870; Sutherland 1866).

The first edition of what was to become the one-inch-to-one-mile (1:63,360) National Topographic System map of the area, produced in 1908 (though based on a 1906 survey) reveals a more representative view of the extent of settlement in the area (see Map 4). The map illustrates the locations of farmsteads and residences, providing an indication of the construction material (red for stone or brick, black for wood). Also illustrated was the extent of local forest clearance, which reveals that significant portions of the current study area had been cleared at that time. Features of note include the farms or residences along the western edge of the study area on Eadie Road, one of which is depicted as a stone structure. Additionally, the road allowance between Concessions 4 and 5 adjacent to the east limits of the study area had not been opened.

A 1936 topographic map shows Route 100 had been fully extended between Concessions 4 and 5 by that date, though the distribution of farms shown adjacent to the study area appears otherwise unchanged (see Map 4). Aerial photography of the area, dating from 1954, provides a more detailed view of the distribution of roads and farmsteads (Map 5). The study area appears to be comprised of open agricultural lands with field margins established by hedge rows or ditches, a small forested area, two extant structures on Lot 22, Concession 4 (likely barns), and one extant structure on Lot 23, Concession 4 in the approximate location of the residence indicated on the Walling map. The barns on Lot 22 in the 1954 photograph look to have been razed since that time and no longer appear on current aerial imagery. Later editions of National Topographic System maps produced for the area provide an indication of the continued development through the twentieth century. Of specific interest, the local network of municipal drains are shown to have been extended through the study area in the second half of the twentieth century, indicating that poor drainage characteristics noted for local soils were addressed through the excavation of a network of deep drainage ditches.

4.0 ARCHAEOLOGICAL CONTEXT

This section describes the archaeological context of the study area, including known archaeological research, known cultural heritage resources (including archaeological sites), and environmental conditions. In combination with the historical context outlined above, this provides the necessary background information to evaluate the archaeological potential of the property.

4.1 Previous Archaeological Research

In order to determine whether any previous archaeological fieldwork has been conducted within or in the immediate vicinity of the present study area, a search of the titles of reports in the *Public Register of Archaeological Reports* maintained by the Ministry of Citizenship and Multiculturalism (MCM) was undertaken. To augment these results, a search of the Past Recovery corporate library was also conducted.[29]

To the knowledge of Past Recovery staff, eight previous archaeological assessments have occurred within or in proximity to the study area. Known cultural resource management assessments in the immediate vicinity include the following:

- A Stage 1 archaeological assessment was undertaken for the Russell Township Industrial Park municipal water and wastewater servicing additional Class EA in 2024 (Past Recovery 2024; PIF: P1074-0094-2023). This assessment covered an area of 156.77 hectares. The assessment was comprised of a desktop survey without an optional property inspection and determined that potions of the subject property retained potential for both pre-Contact and post-Contact archaeological resources. It was recommended that those portions of the study area be subject to Stage 2 archaeological assessment prior to soil disturbance or other alterations to the property.
- A Stage 2 archaeological assessment was undertaken for the Russell Township Industrial Park municipal water and wastewater servicing Class EA in 2020 (Past Recovery 2021; PIF: P1201-0060-2020). This assessment covered an area of 17.473 hectares, which encompassed part of the current study area. The assessment was conducted by means of pedestrian survey of ploughed fields and shovel test pit survey, both at 5 m intervals. No significant archaeological resources were

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[29] In compiling the results, it should be noted that archaeological fieldwork conducted for research purposes should be distinguished from systematic property surveys conducted during archaeological assessments associated with land use development planning (generally after the introduction of the *Ontario Heritage Act* in 1974 and the *Environmental Assessment Act* in 1975), in that only those studies undertaken to current standards can be considered to have adequately assessed properties for the presence of archaeological sites with cultural heritage value or interest. In addition, it should be noted that the majority of the research work undertaken in the area has been focused on the identification of pre-Contact Indigenous sites, while current MCM requirements minimally require the evaluation of the material remains of occupations and or land uses pre-dating 1900.

discovered. Additional Stage 2 archaeological assessment was recommended for a portion of the study area which was not assessed given property conditions at the time. No further archaeological assessment was recommended for the remaining portions of the study area.

- A Stage 1 archaeological assessment was undertaken by Archaeological Services Inc. in advance of a proposed boundary road pipeline project (ASI 2020; PIF: P380-0061-2019). The assessment was comprised of two proposed routes for the pipeline, one along Boundary Road and alternate route along Burton Road. Both routes were given a 50 metre buffer from the centreline of the road. The assessment determined that parts of the study areas exhibited archaeological potential. Stage 2 archaeological assessment was recommended for the areas determined to exhibit archaeological potential.
- A Stage 1 archaeological assessment was undertaken for the Russell Township Industrial Park in 2018 (WSP 2018; PIF: P365-0117-2017) in support of Phase 1 of the municipal water and sewer servicing Class EA. This assessment covered an area of proposed development of approximately 374 hectares, encompassing part of the current study area. The assessment identified portions of the current study area as exhibiting potential for archaeological resources and recommended that a Stage 2 archaeological assessment of these areas was required.
- A Stage 1 archaeological assessment was undertaken for the North Russell Road Site for the proposed Capital Region Resource Recovery Centre by Golder Associates in 2014 (Golder 2014; PIF: P366-0025-2013). The assessment covered a total of 193 hectares within parts of Lots 18 and 19 in Concession 3, and Lot 18 in Concession 4. The assessment identified significant portions of the property as exhibiting potential for archaeological resources and recommended that a Stage 2 archaeological assessment of these areas was required.
- A Stage 1 archaeological assessment was undertaken in 2014 prior to planned Highway 417 rehabilitation and improvements as part of a Class EA study (URS 2014; PIF: P123-0211-2013). The assessment covered a 20.4 km long study area, stretching from Eighth Line/Pipersville Road to Limoges Road, with a total area of approximately 420 hectares. The assessed area approached within 376 metres of the current study area.
- An archaeological resource inventory and assessment of potential was undertaken for Russell Township by Heritage Quest in 2004 (Heritage Quest 2004; PIF: P051-033-2004) as a component of the *Township of Russell Master Plan Study*. The assessment was not intended to be an archaeological master plan or, given the scale and scope of the work, the equivalent of a Stage 1 archaeological assessment. The study followed criteria under consideration by the then Ontario Ministry of Culture (now MCM) to identify areas of archaeological potential, including all lands lying within 375 metres of a 'double line river' (wider than 20 metres following a convention used in the preparation of OBM 1:10,000 scale mapping for southern Ontario) and 200 metres from a 'single line' watercourse, as well as 125 metres from historic transportation corridors. The potential mapping included in

the report identifies portions of the current study area as exhibiting potential for significant archaeological resources. The report included a recommendation that if land use development planning identified a property, or part thereof, as having potential, a Stage 1 archaeological assessment should be completed.

- A pre-Contact archaeological potential study was completed for the Ontario Hydro Eastern Ontario Route Stage study area by James Pendergast in 1981, which covered a broad swath of land in eastern Ontario (Pendergast 1981). The study identified several locations within and in close proximity to the current study area as exhibiting potential for significant archaeological resources, including areas around flights of abandoned Champlain Sea beaches with elevated potential for Palaeo-Indigenous period sites. Nearby drumlin-shaped coarse-textured littoral deposits were also identified as potential islands within the Champlain Sea, although none were identified within the current study area.

4.2 Previously Recorded Archaeological Sites

The primary source for information regarding known archaeological sites in Ontario is the *Archaeological Sites Database* maintained by the Ontario Ministry of Citizenship and Multiculturalism (MCM). The database largely consists of archaeological sites discovered by professional archaeologists conducting archaeological assessments required by legislated processes under land use development planning (mostly since the late 1980s). A search of the database for registered sites revealed that there are no registered archaeological sites within a one-kilometre radius of the study area.

4.3 Cultural Heritage Resources

The recognition or designation of cultural heritage resources (here referring only to built heritage features and cultural heritage landscapes) may provide valuable insight into aspects of local heritage, whether identified at the local, provincial, national, or international level. As some of these cultural heritage resources may be associated with significant archaeological features or deposits, the background research conducted for this assessment included the compilation of a list of cultural heritage resources that have previously been identified within or immediately adjacent to the current study area. The following sources were consulted:

- Federal Heritage Buildings Review Office online Directory of Heritage Designations[30];
- Canada's Historic Places website[31];
- Ontario Heritage Properties Database[32];
- An archived listing of Ministry of Citizenship and Multiculturalism's Heritage

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[30] https://www.pc.gc.ca/apps/DFHD/default_eng.aspx

[31] https://www.historicplaces.ca/en/rep-reg/search-recherche.aspx

[32] https://www.heritagetrust.on.ca/en/oha/advanced-search

Conservation Districts[33]; and,
- Ontario Heritage Trust website[34]

No designated cultural heritage sites were found within a 300 m radius from the study area.

4.4 Heritage Plaques and Monuments

The recognition of a place, person, or event through the erection of a plaque or monument may also provide valuable insight into aspects of local history, given that these markers typically indicate some level of heritage recognition. As with cultural heritage resources (built heritage features and/or cultural heritage landscapes), some of these places, persons, or events may be associated with significant archaeological features or deposits. Accordingly, this study included the compilation of a list of heritage plaques and/or markers in the vicinity of the study area. The following sources were consulted:

- The Ontario Heritage Trust Online Plaque Guide[35];
- A listing of plaques transcribed at www.readtheplaque.com;
- Parks Canada Directory of Federal Heritage Designations[36]; and,
- A listing of historical plaques of Ontario maintained by Sarah J. McCabe[37]

No heritage plaques or monuments were found within a 300 m radius from the study area.

4.5 Cemeteries

The presence of historical cemeteries in proximity to a parcel undergoing archaeological assessment can pose archaeological concerns in two respects. First, cemeteries may be associated with related structures or activities that may have become part of the archaeological record, and thus may be considered features indicating archaeological potential. Second, the boundaries of historical cemeteries may have been altered over time, as all or portions may have fallen out of use and been forgotten, leaving potential for the presence of unmarked graves. For these reasons, the background research conducted for this assessment included a search of available sources of information regarding historical cemeteries. For this study, the following sources were consulted:

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[33] https://web.archive.org/web/20220325223537/http://www.mtc.gov.on.ca/en/heritage/heritage_conserving_list.shtml

[34] https://www.heritagetrust.on.ca/en/index.php/pages/tools/plaque-database

[35] https://www.heritagetrust.on.ca/en/index.php/pages/tools/plaque-database

[36] https://www.pc.gc.ca/apps/dfhd/default_eng.aspx

[37] https://ontarioplaques.omeka.net/

- An archived listing of all registered cemeteries in the province of Ontario maintained by the Consumer Protection Branch of the Ministry of Public and Business Service Delivery (last updated 06/07/2011);
- Field of Stones website[38];
- Ontario Cemetery Locator website maintained by the Ontario Genealogical Society[39];
- Ontario Headstones Photo Project website[40]; and,
- Available historical mapping and aerial photography

No known cemeteries were located within or adjacent to the study area.[41] The closest registered cemetery is North Russell Cemetery (also known as North Russell Union Cemetery) on Lot 18, Concession 2, Township of Russell, approximately 2 km southwest of the study area.

4.6 Mineral Resources

The presence of scarce mineral resources on or near to a property may indicate potential for archaeological resources associated with both pre-Contact and post-Contact exploration and exploitation. For this reason, the background research conducted for the assessment includes a search of available sources of information on the locations of outcrops of rare and highly valued minerals, such as quartz, chert, ochre, copper, and soapstone, as well as minerals sought out by post-Contact prospectors and miners for more industrial-scale exploitation (i.e. gold, copper, iron, mica, etc.). Useful tools in this search are provided by databases maintained by the Ontario Geological Survey and the Ministry of Northern Development and Mines, including:

- *Abandoned Mines Information System* which contains a list of all known abandoned and inactive mine sites and associated features in the Province;
- *Mining Claims* which contains a list of all active claims, alienations, and dispositions;
- *Mineral Deposits Inventory* which contains a list of known mineral occurrences of economic value in the Province; and,
- *Bedrock Geology Data Set*, which shows the distribution of bedrock units and illustrates geologic rock types, major faults, iron formations, kimberlite intrusions, and dike swarms.

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[38] https://freepages.rootsweb.com/~clifford/history/

[39] https://vitacollections.ca/ogscollections/2818487/data?g=d

[40] https://canadianheadstones.ca/ wp/cemetery-lookup/

[41] It should be noted that the research undertaken as part of this Stage 1 archaeological assessment is unlikely to identify the potential for the presence of unrecorded burial plots, such as those of individual families on rural properties. See Section 6.0 of this report for information regarding compliance with provincial legislation in the event that human remains are identified during future development.

A review of the above-mentioned databases did not reveal cases of mineral deposits within a 300 m radius of the study area.

4.7 Local Environment

The assessment of present and past environmental conditions in the region containing the study areas is a necessary component in determining the potential for past occupation as well as providing a context for the analysis of archaeological resources discovered during an assessment. Factors such as local water sources, soil types, vegetation associations and topography all contribute to the suitability of the land for human exploitation and/or settlement. For the purposes of this assessment, information from local physiographic, geological and soils research has been compiled to create a picture of the environmental context for both past and present land uses.

The physiography and distribution of surficial material in this area are largely the result of glacial activity that took place in the Late Wisconsinan. This period, which lasted from approximately 23,000 to 10,000 years before present, was marked by the repeated advance and retreat of the massive Laurentide Ice Sheet (Barnett 1992 in Rowell 1997:12). As the ice advanced, debris from the underlying sediments and bedrock accumulated within and beneath the ice. The debris, a mixture of stones, sand, silt, and clay, was deposited over large areas as till plains, drumlins, and moraines. During deglaciation, as the Late Wisconsinan ice margin receded to the north, waters from the Atlantic Ocean flooded the isostatically-depressed upper St. Lawrence and Ottawa valleys and formed the Champlain Sea. Landforms and deposits north of the Ottawa River suggest that the maximum elevation reached by the Champlain Sea was between approximately 180-190 metres above the present sea level, which would have covered the region containing the current study area (Rowell 1997:12). Extensive deposits of fine-grained sediments, representative of deep water environments, were laid down during this time. Continued isostatic rebound lead to the retreat of the glaciomarine waters, leaving behind boulder gravel spits, bars, and beaches at elevations between 120 and 60 metres (Rowell 1997:12). During the regression of the Champlain Sea, the ancestral Ottawa River and its north bank tributaries created extensive deposits of deltaic sands and formed numerous sand bars. Owing to poor drainage characteristics associated with the underlying clays, extensive bogs subsequently developed, in low-lying areas, accumulating peat and other organic deposits.

Chapman and Putman (1984) have defined the physiographic region in the area covered by the present study area as part of the Russell and Prescott Sand Plains. The Russell and Prescott Sand Plains, a product of the ancestral Ottawa River, are characterized by a large sand plain dispersed over the clays of the lower Ottawa Valley (Chapman and Putnam 1984). The sand plains have a relatively level surface, rising to almost 50 feet above the surface of the surrounding clay plains. The depths of the sand varies greatly, however, with the highest elevations found in the north and west, thinning out along the clay plain to the south. The texture of the sand also varies, being coarse towards the north and grading into fine sand and silt south of the Castor River.

Surficial geological mapping shows the study area lies within the main part of the deltaic sands associated with the ancestral Ottawa River (Map 6). A band of discontinuous coarse-textured glaciomarine sands and flights of beach ridges, littoral deposits representing a former Champlain Sea shoreline, bisects the subject property. The remainder of the study area is underlain by surficial deposits identified as organic, consisting of peat, muck, or marl.

Soil survey mapping shows variability across the study area, consistent with the distribution of parent materials described above (Wicklund and Richards 1962; see Map 6). Identified soil series include Vars, Castor, and Bainsville/Osgoode. Brief descriptions of each soil type are provided below.

Vars series soils have been mapped in the northwestern portion of the study area, in the area of the scattered, coarse textured glaciomarine littoral deposits associated with the Champlain Sea. Soil parent materials are reportedly derived from a local rock formation that has been modified by glacial action. This material is composed primarily of glacial till, but includes gravel of varying sizes. This till is described as having a distinct red colour, which also dominates the weathered soil profile. Vars series soils are described as gravelly sands or loams, are reportedly well drained and, although free from surface stones, have a high gravel content, ranging from 20 to 80 percent. These soils are classified as Grey Brown Podzolic, though owing to the gravelly nature of the soil material and the dominant red colour carried by the shale, are recorded as having a week horizon expression (Wicklund and Richards 1962; Hoffman et al. 1967).

Castor series soils have been identified in areas underlain by extensive deposits of deltaic sands associated with the ancestral Ottawa River as they fan out over the surrounding glaciomarine clay plains. Depths of these soils, formed from fine sand and silt, are irregular, ranging from 12 to 36 inches (30 to 90 cm). Drainage characteristics are variable, ranging from good to moderately poor. Cultivated Castor soil profiles show a dark coloured fine sandy loam to silt loam. Subsoil horizons consist of one thin leached horizon, followed by a strongly mottled yellowish brown horizon of fine sandy loam to silt loam (Wicklund and Richards 1962; Hoffman et al. 1967).

Bainsville series soils have also been identified in areas underlain by extensive deposits of deltaic sands associated with the ancestral Ottawa River. These soils are described as being similar to Castor series soils, though having poorer natural drainage and a more silty texture, occurring in transition zones between large sand plains and the surrounding clay flats. As a result of poor drainage characteristics, Bainsville soils are described as having surface and subsoil horizons with darker colours than in surrounding, better drained soils, where cultivated soil profiles show approximately 20cm of black fine silty loam over a subsoil of grey silt loam that usually caries some mottling. Recently, these soils have been re-classified as very fine sandy loams belonging to the Osgoode series defined for, what was at the time, the Regional Municipality of Ottawa-Carleton (Wicklund and Richards 1962; Hoffman et al. 1967).

Provincial topographical base mapping shows the area as generally flat, with a gentle slope to the south and east. Within the study area, elevation contours range from a high of 88 metres above sea level (masl) to a low of 76 masl, providing up to 12 m of local topographic relief. A topographic map showing a Digital Elevation Model (DEM) of the vicinity provides a representation of the local area elevation (see Map 6). The majority of the study area is located within the Castor River subwatershed, extending slightly into the Bear Brook subwatershed in the extreme northwest.

The study area is located within the Upper St. Lawrence division of the Great Lakes - St. Lawrence Forest Region (Rowe 1972:94). This region is characterized by a mixture of coniferous and deciduous tree species, dominated by sugar maple and beech, with red maple, yellow birch, basswood, white ash, largetooth aspen, and road and bur oaks. Local occurrences of white oak, red ash, grey birch, rock elm, blue-beech, and bitternut hickory are also known. Butternut, eastern cottonwood, and slippery elm have a sporadic distribution in river valleys, and some small pure stands of black and silver maple have been reported on fertile, fine-textured lowland soils. Poorly-drained depressions frequently carry a hardwood swamp type in which black ash is prominent.

5.0 STAGE 1 ARCHAEOLOGICAL ASSESSMENT

This section of the report includes an evaluation of the archaeological potential within the study area, in which the results of the background research described above are synthesized to determine the likelihood of the property to contain significant archaeological resources.

5.1 Optional Property Inspection

An optional property inspection was not undertaken as part of the Stage 1 assessment.

5.2 Evaluation of Archaeological Potential

The evaluation of the potential of a particular parcel of land to contain significant archaeological resources is based on the identification of local features that have demonstrated associations with known archaeological sites. For instance, archaeological sites associated with pre-Contact settlements and land uses are typically found in close physical association with environmental features such as sources of potable water, transportation routes (navigable waterways and trails), accessible shorelines, areas of elevated topography (i.e. knolls, ridges, eskers, escarpments, and drumlins), areas of sandy and well-drained soils, distinctive land formations (i.e. waterfalls, rock outcrops, caverns, mounds, and promontories and their bases), as well as resource-rich areas (e.g. migratory routes, spawning areas, scarce raw materials, etc.). Similarly, post-Contact archaeological sites are often found in association with many of these same environmental features, though they are also commonly connected with known areas of early Euro-Canadian settlement, early historical transportation routes (e.g. roads, trails, railways, etc.), and areas of early Euro-Canadian industry (i.e. the fur trade, logging and mining). For this reason, assessments of the potential of a particular parcel of land to contain post-Contact archaeological sites rely heavily on historical and archival research, including reviews of available land registry records, census returns and assessment rolls, historical maps, and aerial photographs. The locations of previously discovered archaeological sites can also be used to shed light on the chances that a particular location contains an archaeological record of past human activities.

Archaeological assessment standards established in the *Standards and Guidelines for Consultant Archaeologists* (MCM 2011) specify which factors, at a minimum, must be considered when evaluating archaeological potential. Licensed consultant archaeologists are required to incorporate these factors into potential determinations and account for all features on the property that can indicate the potential for significant archaeological sites. If this evaluation indicates that any part of a subject property exhibits potential for archaeological resources, the completion of a Stage 2 archaeological assessment is commonly required prior to the issuance of approvals for activities that would involve soil disturbances or other alterations.

The *Standards and Guidelines for Consultant Archaeologists* (MCM 2011) also establish minimum distances from features of archaeological potential that must be identified as exhibiting potential for sites. For instance, this includes all lands within 300 m of primary and secondary water sources, past water sources (i.e. glacial lake shorelines), registered archaeological sites, areas of early Euro-Canadian settlement, or locations identified as potentially containing significant archaeological resources by local histories or informants. It also includes all lands within 100 m of early historic transportation routes (e.g. roads, trails, and portage routes). Further, any portion of a property containing elevated topography, pockets of well-drained sandy soils, distinctive land formations, resource-rich/harvesting areas, and/or previously identified cultural heritage resources (i.e. built heritage properties and/or cultural heritage landscapes that may be associated with significant archaeological resources) must also be identified as exhibiting archaeological potential.

5.3 Analysis and Conclusions

The background research undertaken for this assessment indicates that all of the subject property requiring Stage 1 assessment exhibits potential for the presence of significant archaeological resources associated with pre-Contact settlement and/or land uses. Specifically:

- All of the study area lies within or within 300 m of a Champlain Sea shoreline, which indicates potential for Paleo-Indigenous and Early Archaic Indigenous occupation in the region; and,
- Some soils in the study area are well-drained, of a type preferred for pre-Contact campsites.

The study area also exhibits characteristics that indicate potential for the presence of archaeological resources associated with post-Contact settlement and/or land uses. Specifically:

- The review of historical plans, maps, and written sources has indicated that there was early Euro-Canadian occupation within or within 300 m of the study area; and,
- The review of historical plans, maps, and written sources has indicated that there were early historical transportation routes within 100 m of the study area.

The evaluation of archaeological potential also included a review of available sources of information (i.e. high resolution aerial photographs and satellite imagery) to determine if part or all of the study area had been subject to deep and intensive soil disturbance (i.e. quarrying, road construction, major landscaping involving grading below topsoil, former building footprints, utility line and infrastructure development, etc.) in the recent past, as these activities would have severely damaged the integrity of or removed any archaeological resources that might have been present. Further, the review included an assessment of the property for additional factors that might limit archaeological potential such as land with permanent water saturation, exposed bedrock or steep slope of greater than 20 degrees in elevation. As has been noted above, most of the property consisted of actively cultivated agricultural fields, though there were some deep drainage ditches that had caused extensive local disturbance.

Based on the historical sources and imagery reviewed, it has been determined that the portion of the study area requiring Stage 1 assessment retains archaeological potential for both pre-Contact and post-Contact archaeological resources (Map 7). In addition, there are outstanding archaeological concerns for the remaining overall study area stemming from the previous WSP Stage 1 assessment (WSP 2018), apart from those sections prevoiusly tested by Past Recovery (Past Recovery 2021). All areas deemed to retain archaeological potential should be subject to Stage 2 assessment prior to any future ground disturbance apart from on-going agricultural cultivation.

5.4 Stage 1 Recommendations

The results of the background research discussed above have indicated that the portion of the study area requiring Stage 1 assessment exhibits potential for the presence of significant archaeological resources. Accordingly, it is recommended that:

1) The portion of the study area requiring Stage 1 archaeological assessment that has been determined to exhibit archaeological potential should be subject to Stage 2 archaeological assessment prior to any development-related impacts (see Map 7).

2) The areas determined to retain archaeological potential by the WSP Stage 1 assessment (WSP 2018; PIF: P365-0117-2017) that have not been previously assessed should be subject to Stage 2 archaeological assessment prior to any development-related impacts.

3) All portions of the study area that have been previously tested during the Past Recovery Stage 2 archaeological assessment (Past Recovery 2021; PIF: P1201-0060-2020) require no further archaeological work (see Map 7).

4) Any future Stage 2 archaeological assessment should be undertaken by a licensed consultant archaeologist, in compliance with *Standards and Guidelines for Consultant Archaeologists* (MCM 2011). All potions of the study area which are non-agricultural land and identified as exhibiting archaeological potential should be assessed by means of a shovel test pit survey conducted at 5 m intervals. All portions of the study area which are actively cultivated agricultural fields and identified as exhibiting archaeological potential should be assessed by means of a pedestrian survey conducted at 5 m intervals.

5) In the event that future planning results in the identification of additional areas of impact beyond the limits of the present study area, further archaeological assessment may be required. It should be noted that screening for impacts should include all aspects of the proposed development that may cause soil disturbances or other alterations (i.e. access roads, staging/lay down areas, associated works etc.), and that even temporary property needs should be considered.

6.0 STAGE 2 ARCHAEOLOGICAL ASSESSMENT

This section of the report describes the methodology used and results of the Stage 2 property survey conducted to determine whether the subject property contains significant archaeological resources.

6.1 Field Methods

The Stage 2 archaeological fieldwork completed prior to the cancellation of the project was undertaken on May 15th, 2024, by a crew of eight people consisting of two licensed field directors and six field technicians. Fieldwork was conducted according to archaeological fieldwork standards outlined in *Standards and Guidelines for Consultant Archaeologists* (MCM 2011). Weather conditions were overcast with a high of 20 degrees C. These conditions permitted adequate to excellent visibility for the identification, documentation, and, where appropriate, recovery of archaeological resources.

The Past Recovery field crew used ‘Mapit Pro’ GIS software on a tablet loaded with detailed satellite imagery overlain with the study area to ensure the Stage 2 survey was carried out within the study area limits. This digital mapping interface, along with a high accuracy, GIS-mapping-grade Global Navigation Satellite System (GNSS) receiver, allowed the field crew to accurately delimit the study area in relation to their ‘real time’ position and record features of interest. The GNSS unit employed for this purpose was a Trimble Catalyst DA1 antennae connected to a Samsung tablet running Trimble Mobile Manager software and receiving Trimble RTX corrections. While in use, the receiver reported accuracies within the range of plus or minus 2 m.

The study area was comprised of actively cultivated agricultural fields with small portions of the property consisting of treed areas around ditches or creeks, roadbed, or irrigation ditches through the fields. As such the Stage 2 archaeological assessment was planned to consist of a combination of, primarily, pedestrian survey with small areas of shovel test pit survey, both at 5 m intervals. Upon arrival, the agricultural fields had not been ploughed sufficiently to allow for 80% visibility of the ploughed ground surface, as required by Standard 2.1.1.5 in *Standards and Guidelines for Consultant Archaeologists* (MCM 2011). Thus the work was limited to shovel test pit survey, with a portion of the areas requiring survey using this method completed. The survey consisted of test pits at 5 m intervals where dry soils were encountered, expanding to 10 m judgmental intervals where saturated soils were encountered (Map 8). Following the first day of fieldwork the proponent informed Past Recovery that the assessment would not be moving forward; no further Stage 2 field survey was conducted. Survey methods and field conditions were recorded on project mapping and estimates of survey coverage are provided in Table 1.

Table 1. Estimates of Survey Coverage during the Stage 2 Assessment.

Survey Type	Area Covered	Percentage of Study Area
Previously assessed at Stage 2 and not recommended for further assessment	1.99 hectares	2.6%
Shovel test pit survey at 5 m intervals	0.99 hectares	1.3%
Shovel test pit survey judgmental	0.4 hectares	0.5%
Unassessed during the current Stage 2 field survey; archaeological concerns remain, Stage 2 testing required	72.64 hectares	95.8%

Table 2. Inventory of the Stage 2 Documentary Record.

Type of Document	Description	Number of Records	Location
Photographs	Digital photographs documenting the Stage 2 fieldwork	36 photographs	On Past Recovery computer network – file PR24-007
Mapping data	Shapefiles (*.shp)	6 files	On Past Recovery computer network – file PR24-007
Field Notes	Scanned and digital notes on the Stage 2 fieldwork; test pit forms	17 pages (2 *.pdf files)	On Past Recovery computer network – file PR24-007

All test pit survey was completed using shovels and trowels, with back-dirt screened through 6 mm hardware mesh (Images 1 and 2). Shovel test pits were at least 30 cm in diameter and excavation continued for 5 cm into sterile subsoil. All pits were examined for soil stratigraphy, cultural features, and/or evidence of deep and intensive disturbance. Sample test pits were documented with digital photographs and field notes. Once all required recording had been completed, all test pits were backfilled. Soil layers within test pits were assigned lot numbers in the order of appearance. Low-lying areas with standing water or permanently saturated soils were typically encountered at the west end of the area tested (Image 3). The central portion of the area tested was typically dry, but the east end consisted of a mixture of wet and dry soils, and push-piles of bull-dozed disturbed soil were also more frequent in this area (Images 4 and 5). As no archaeological resources were found, no test pit intensification was undertaken.

Field activities were recorded through field notes, digital photographs, and digital mapping. A catalogue of the material generated during the Stage 2 property survey is included above in Table 2. The complete photographic catalogue is included as Appendix 1, and the locations and orientations of all photographs referenced in this section of the report are shown on Map 8. As per *Terms and Conditions for Archaeological Licences in Ontario*, curation of all photographs and field notes generated during the

Stage 2 archaeological assessment is being provided by Past Recovery pending the identification of a suitable repository.

6.2 Fieldwork Results

The soil stratigraphy was generally comprised of 23 cm to 40 cm of brown to dark brown silty clay topsoil. In the western end of the tested area the topsoil was typically underlain by pale brown or orange-brown clay subsoil, which then filled quickly with water (Image **6**). In the central section the topsoil was typically underlain by black or very dark brown clay loam buried wetland matrix which was 12 cm to 15 cm thick (Image 7). This was in turn underlain by pale beige silt C-horizon subsoil. Typically, these test pits remained dry. Toward the eastern end the topsoil was either underlain by the buried wetland matrix which then gave way to light brown silty sand or pale beige silt subsoil, or underlain directly by subsoil (Image 8). Some of these test pits were water saturated. The soil stratigraphy encountered suggests that the lower topography to the east of the area shovel tested was previously a wetland or marsh and that the topsoil in the surrounding area had been used as fill to level out the agricultural field.

6.3 Record of Finds

No archaeological resources of cultural heritage value or interest were found during the Stage 2 survey.

6.4 Analysis and Conclusions

The Stage 2 archaeological assessment consisted of a shovel test pit survey including a combination of 5 m and judgmental intervals across the portion of the study area surveyed prior to the cancellation of the project (see Map 8). As mentioned above, no archaeological resources were found over the course of this work. The remainder of the study area retains outstanding archaeological concerns and requires Stage 2 assessment prior to any future ground disturbance apart from on-going agricultural cultivation.

6.5 Stage 2 Recommendations

On the basis of the results of the Stage 2 property survey discussed above, it is recommended that:

5) The areas determined to retain archaeological potential either by the previous WSP Stage 1 assessment (WSP 2018; PIF: P365-0117-2017) or the current Past Recovery Stage 1 assessment (see the recommendations in Section 5.4) not field tested prior to the cancellation of the project have outstanding archaeological concerns and require Stage 2 archaeological assessment prior to any development-related impacts (see Map 8). This should be completed using a combination of shovel test pit survey at 5 m intervals or surface survey of ploughed fields at 5 m intervals, as appropriate.

6) All portions of the study area that have been tested during the current Stage 2 archaeological assessment and during previous Stage 2 assessment (Past Recovery 2021; PIF: P1201-0060-2020) require no further archaeological work (see Map 8).

7) In the event that future planning results in the identification of additional areas of impact beyond the limits of the present study area, further archaeological assessment may be required. It should be noted that impacts include all aspects of the proposed development causing soil disturbances or other alterations, including additional temporary property needs (i.e. access roads, staging/lay down areas, associated works etc.).

8) Any future Stage 2 archaeological assessment should be undertaken by a licensed consultant archaeologist, in compliance with *Standards and Guidelines for Consultant Archaeologists* (MCM 2011).

The reader is also referred to Section 7.0 below to ensure compliance with relevant provincial legislation and regulations as may relate to this project. In the event that any human remains or artifacts and features that are Indigenous in nature are encountered during the development of the subject property, Indigenous Communities with potential interests in this area will be contacted.

7.0 ADVICE ON COMPLIANCE WITH LEGISLATION

In order to ensure compliance with relevant Provincial legislation as it may relate to this project, the reader is advised of the following:

1) This report is submitted to the Minister of Citizenship and Multiculturalism 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 Citizenship and Multiculturalism, 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.

2) 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*.

3) Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48 (1) of the *Ontario Heritage Act*.

4) The *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 requires that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Public and Business Service Delivery.

5) Archaeological sites recommended for further archaeological fieldwork or protection remain subject to Section 48 (1) of the *Ontario Heritage Act* and may not be altered, or have artifacts removed from them, except by a person holding an archaeological licence.

8.0 LIMITATIONS AND CLOSURE

Past Recovery Archaeological Services Inc. has prepared this report in a manner consistent with that level of care and skill ordinarily exercised by members of the archaeological profession currently practicing under similar conditions in the jurisdiction in which the services are provided, subject to the time limits and physical constraints applicable to this report. No other warranty, expressed or implied, is made.

This report has been prepared for the specific site, design objective, developments and purpose prescribed in the client proposal and subsequent agreed upon changes to the contract. The factual data, interpretations and recommendations pertain to a specific project as described in this report and are not applicable to any other project or site location.

Unless otherwise stated, the suggestions, recommendations and opinions given in this report are intended only for the guidance of the client in the design of the specific project.

Special risks occur whenever archaeological investigations are applied to identify subsurface conditions and even a comprehensive investigation, sample and testing program may fail to detect all or certain archaeological resources. The sampling strategies in this study comply with those identified in the Ministry of Citizenship and Multiculturalism's *Standards and Guidelines for Consultant Archaeologists* (2011).

The documentation related to this archaeological assessment will be curated by Past Recovery Archaeological Services Inc. until such a time that arrangements for their ultimate transfer to an approved and suitable repository can be made to the satisfaction of the project owner(s), the Ontario Ministry of Citizenship and Multiculturalism and any other legitimate interest group.

We trust that this report meets your current needs. If you have any questions or if we may be of further assistance, please do not hesitate to contact the undersigned.

Jeff Earl

Jeff Earl, M.Soc.Sc.
Principal
Past Recovery Archaeological Services Inc.

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31G06	Russell Sheet	1908	1:63,360
31G06	Russell Sheet	1936	1:63,360

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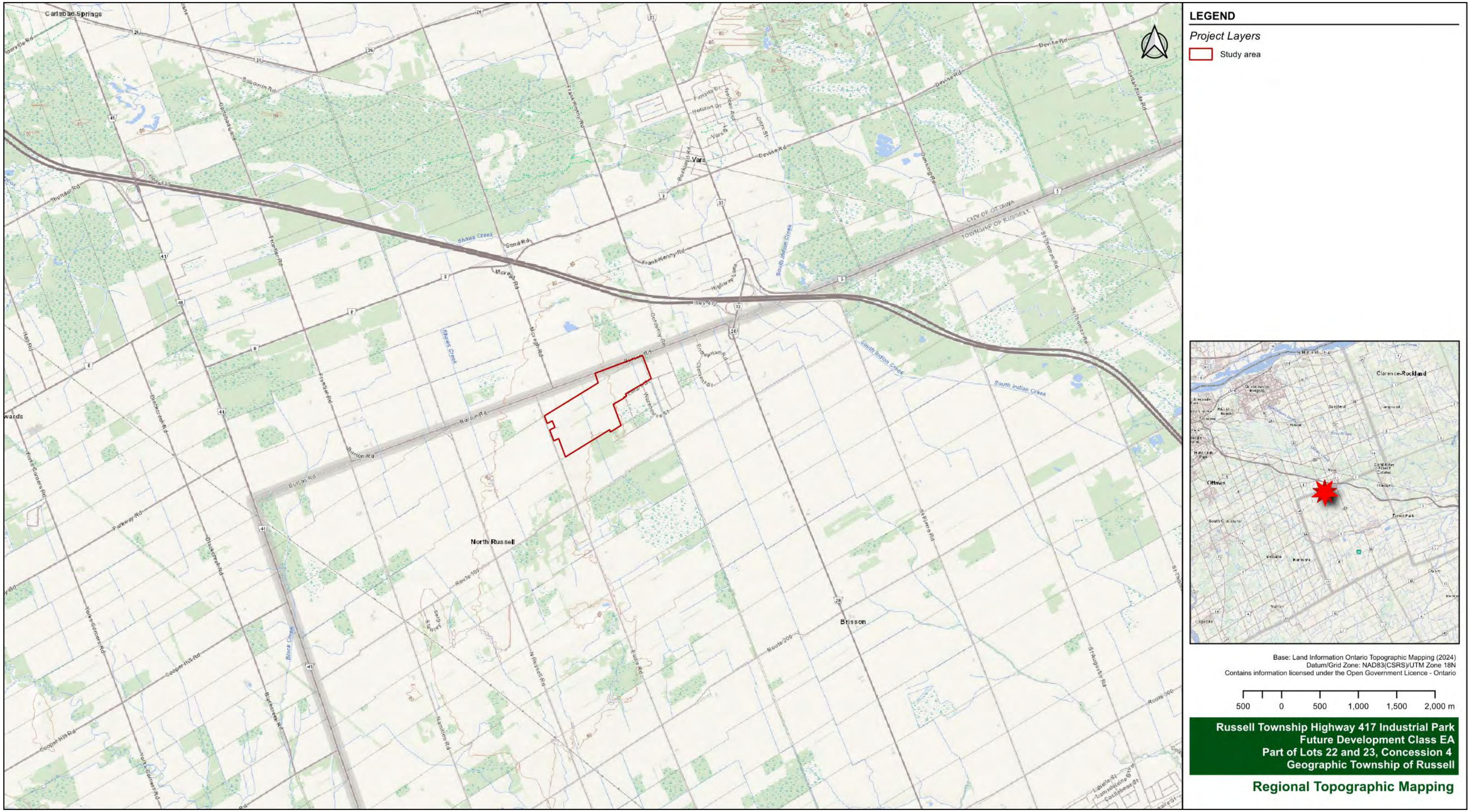
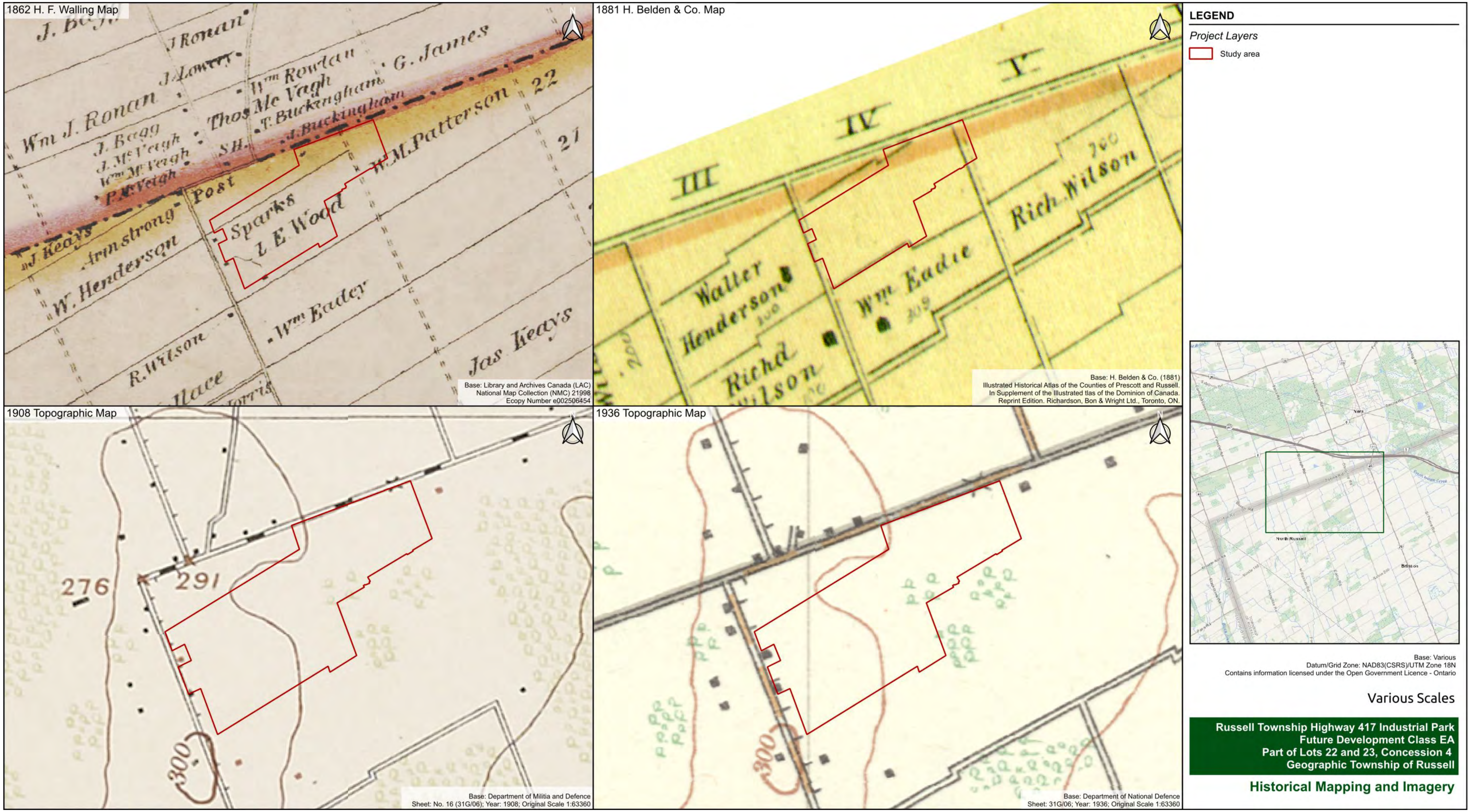
10.0 MAPS



Map 1. Location of the study area.

Map 2. Recent (2022) orthographic imagery showing the study area.

Map 3. Recent (2022) orthographic imagery showing the study area and previous archaeological assessments.



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National Map Collection (NMC) 21998
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Base: H. Belden & Co. (1881)
Illustrated Historical Atlas of the Counties of Prescott and Russell.
In Supplement of the Illustrated tlas of the Dominion of Canada.
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Base: Department of Militia and Defence
Sheet: No. 16 (31G/06); Year: 1908; Original Scale 1:63360

Base: Department of National Defence
Sheet: 31G/06; Year: 1936; Original Scale 1:63360

Base: Various
Datum/Grid Zone: NAD83(CSRS)/UTM Zone 18N
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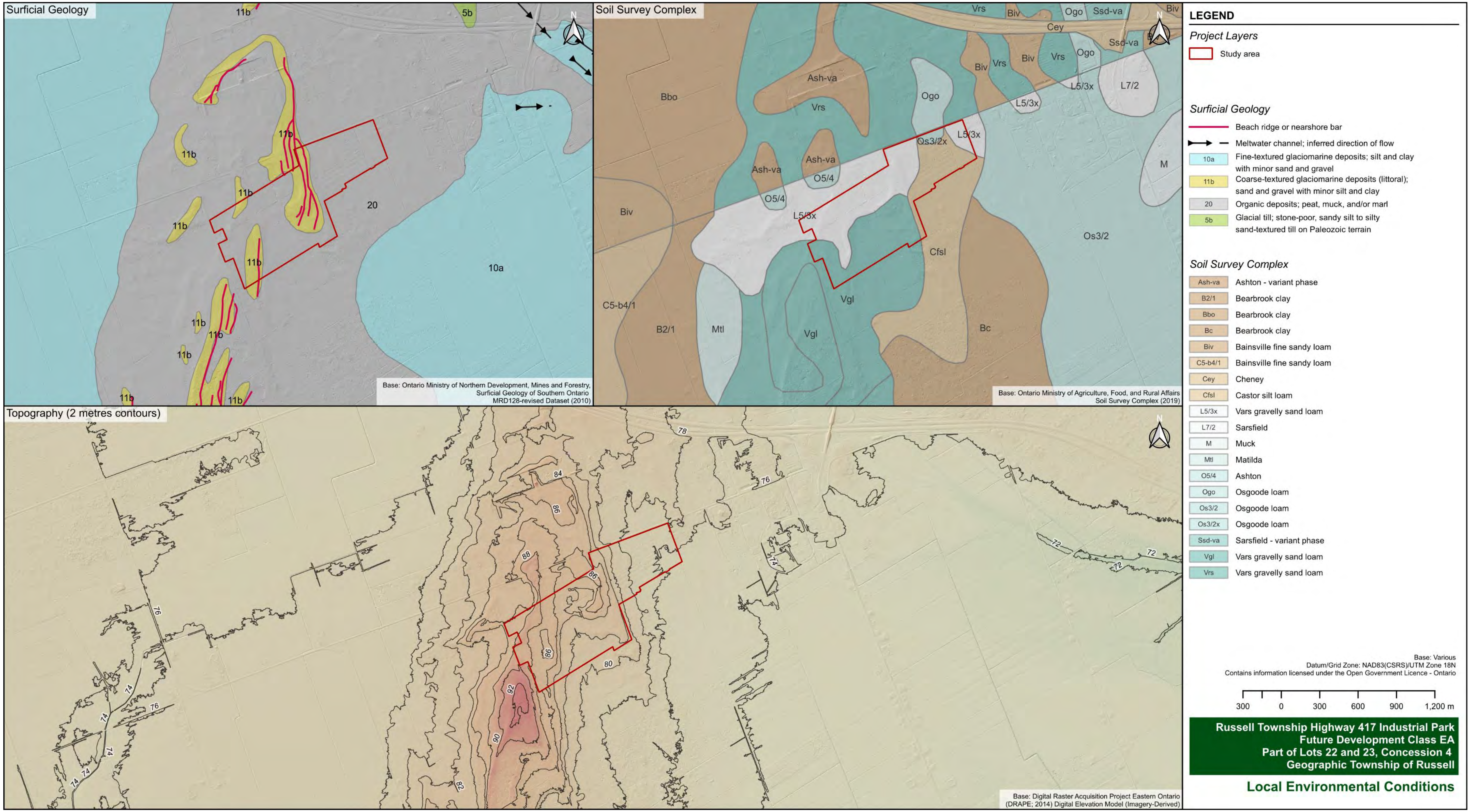
Map 4. Historical mapping showing the approximate location of the study area.

Map 5. Historical 1954 aerial photography showing the study area.



Map 6. Environmental mapping showing the study area.

Map 7. Recent (2022) orthographic imagery showing areas of archaeological potential within the portion of the study area requiring Stage 1 assessment.

Map 8. Recent (2022) orthographic imagery showing Stage 2 field methods and results, as well as field photograph locations, orientation and image numbers.

11.0 IMAGES

Image 1. View of field crew excavating at 5 m intervals, facing north. (PR24-007D002)

Image 2. View of field crew excavating at 5 m intervals, facing north. (PR24-007-025)

Image 3. View of standing water in the treed area at the west end of the shovel test pit area, facing northeast. (PR24-007D003)

Image 4. View of standing water at the east end of the shovel test pit area, facing northeast. (PR24-007D033)

Image 5. View of a push-pile of disturbed soils at the east end of the shovel test pit area, facing northeast. (PR24-007D031)

Image 6. Sample test showing an undisturbed soil profile but with water saturation, facing east. (PR24-007D006)

Image 7. Sample test pit showing an undisturbed soil profile, facing east. (PR24-007D018)

Image 8. Sample test pit showing an undisturbed soil profile, facing west. (PR24-007D035)

APPENDIX 1: Photographic Catalogue

Camera: Samsung SM-X308U or SM-T395

Catalogue No.	Description	Dir.
PR24-007D001	View of scrub and wetland with saturated soils at the west end of the shovel test pit area	NE
PR24-007D002	View of field crew excavating at 5 m intervals	N
PR24-007D003	View of standing water in treed area at west end of shovel test pit area	NE
PR24-007D004	View of irrigation ditch at west end of shovel test pit area	NE
PR24-007D005	Sample test pit 01	E
PR24-007D006	Sample test pit 01	E
PR24-007D007	Sample test pit 01	E
PR24-007D008	Sample test pit 02	E
PR24-007D009	Sample test pit 02	E
PR24-007D010	Sample test pit 03	N
PR24-007D011	Sample test pit 03	N
PR24-007D012	Sample test pit 03	N
PR24-007D013	View of small creek running north south in the western half of the shovel test pit area, facing NE	NE
PR24-007D014	Sample test pit 04	E
PR24-007D015	Sample test pit 04	E
PR24-007D016	Sample test pit 04	E
PR24-007D017	View of undulating terrain caused by pushing of fill as well as low lying wetlands	NE
PR24-007D018	Sample test pit 05	E
PR24-007D019	Sample test pit 05	E
PR24-007D020	Sample test pit 06	E
PR24-007D021	Sample test pit 06	E
PR24-007D022	View of field crew excavating at 5 m intervals	S
PR24-007D023	View of field crew excavating at 5 m intervals	S
PR24-007D024	View of field crew excavating at 5 m intervals	N
PR24-007D025	View of field crew excavating at 5 m intervals	N
PR24-007D026	View of irrigation ditch running east west along northern edge of the shovel test pit area, facing E	E
PR24-007D027	View of push piles along irrigation ditch running east west along north edge of shovel test pit area, facing E	E
PR24-007D028	View of field crew testing at 5m intervals near center of shovel test pit area, facing SE	SE
PR24-007D029	Sample test pit 07	N
PR24-007D030	Sample test pit 07	N
PR24-007D031	View of push pile of disturbed soils at east end of shovel test pit area	NE
PR24-007D032	View of seasonal wetland with saturated soils at east end of shovel test pit area	NE

Catalogue No.	Description	Dir.
PR24-007D033	View of standing water at east end of shovel test pit area	NE
PR24-007D034	Sample test pit 08	W
PR24-007D035	Sample test pit 08	W
PR24-007D036	View of push pile of disturbed soils at east end of shovel test pit area	NE

APPENDIX 2: Glossary of Archaeological Terms

Archaeology:
The study of human past, both prehistoric and historic, by excavation of cultural material.

Archaeological Sites:
The physical remains of any building, structure, cultural feature, object, human event or activity which, because of the passage of time, are on or below the surface of the land or water.

Archaic:
A term used by archaeologists to designate a distinctive cultural period dating between 8000 and 1000 B.C. in eastern North America. The period is divided into Early (8000 to 6000 B.C.), Middle (6000 to 2500 B.C.) and Late (2500 to 1000 B.C.). It is characterized by hunting, gathering and fishing.

Artifact:
An object manufactured, modified or used by humans.

B.P.:
Before Present. Often used for archaeological dates instead of B.C. or A.D. Present is taken to be 1951, the date from which radiocarbon assays are calculated.

Backdirt:
The soil excavated from an archaeological site. It is usually removed by shovel or trowel and then screened to ensure maximum recovery of artifacts.

Chert:
A type of silica rich stone often used for making chipped stone tools. A number of chert sources are known from southern Ontario. These sources include outcrops and nodules.

Contact Period:
The period of initial contact between Indigenous and European populations. In Ontario, this generally corresponds to the seventeenth and eighteen centuries depending on the specific area.

Cultural Resource / Heritage Resource:
Any resource (archaeological, historical, architectural, artifactual, archival) that pertains to the development of our cultural past.

Cultural Heritage Landscapes:
Cultural heritage landscapes are groups of features made by people. The arrangement of features illustrate noteworthy relationships between people and their surrounding environment. They can provide information necessary to preserve, interpret or reinforce the understanding of important historical settings and changes to past patterns of land use. Cultural landscapes include neighbourhoods, townscapes and farmscapes.

Diagnostic:
An artifact, decorative technique or feature that is distinctive of a particular culture or time period.

Disturbed:
In an archaeological context, this term is used when the cultural deposit of a certain time period has been intruded upon by a later occupation.

Excavation:
The uncovering or extraction of cultural remains by digging.

Feature:
This term is used to designate modifications to the physical environment by human activity. Archaeological features include the remains of buildings or walls, storage pits, hearths, post moulds and artifact concentrations.

Flake:
A thin piece of stone (usually chert, chalcedony, etc.) detached during the manufacture of a chipped stone tool. A flake can also be modified into another artifact form such as a scraper.

Fluted:
A lanceolate shaped projectile point with a central channel extending from the base approximately one third of the way up the blade. One of the most diagnostic Palaeo-Indigenous artifacts.

Historic:
Period of written history. In Ontario, the historic period begins with European settlement.

Lithic:
Stone. Lithic artifacts would include projectile points, scrapers, ground stone adzes, gun flints, etc.

Lot:
The smallest provenience designation used to locate an artifact or feature.

Midden:
An archaeological term for a garbage dump.

Mitigation:
To reduce the severity of development impact on an archaeological or other heritage resource through preservation or excavation. The process for minimizing the adverse impacts of an undertaking on identified cultural heritage resources within an affected area of a development project.

Multicomponent:
An archaeological site which has seen repeated occupation over a period of time. Ideally, each occupation layer is separated by a sterile soil deposit that accumulated during a period when the site was not occupied. In other cases, later occupations will be directly on top of earlier ones or will even intrude upon them.

Operation:
The primary division of an archaeological site serving as part of the provenience system. The operation usually represents a culturally or geographically significant unit within the site area.

Palaeo-Indigenous:
The earliest human inhabitation of Ontario designated by archaeologists. The period dates between 9000 and 8000 B.C. and is characterized by small mobile groups of hunter-gatherers.

Pre-Contact:
Before written history. In Ontario, this term is used for the period of Indigenous inhabitation up until the first contact with European groups.

Profile:
The profile is the soil stratigraphy that shows up in the cross-section of an archaeological excavation. Profiles are important in understanding the relationship between different occupations of a site.

Projectile Point:
A point used to tip a projectile such as an arrow, spear or harpoon. Projectile points may be made of stone (either chipped or ground), bone, ivory, antler or metal.

Provenience:
Place of origin. In archaeology this refers to the location where an artifact or feature was found. This may be a general location or a very specific horizontal and vertical point.

Salvage:
To rescue an archaeological site or heritage resource from development impact through excavation or recording.

Stratigraphy:
The sequence of layers in an archaeological site. The stratigraphy usually includes natural soil deposits and cultural deposits.

Sub-operation:
A division of an operation unit in the provenience system.

Survey:
To examine the extent and nature of a potential site area. Survey may include surface examination of ploughed or eroded areas and sub-surface testing.

Test Pit:
A small pit, usually excavated by hand, used to determine the stratigraphy and presence of cultural material. Test pits are often used to survey a property and are usually spaced on a grid system.

Woodland:
The most recent major division in the prehistoric sequence of Ontario. The Woodland period dates from 1000 B.C. to A.D. 1550. The period is characterized by the introduction of ceramics and the beginning of agriculture in southern Ontario. The period is further divided into Early (1000 B.C. to A.D. 0), Middle (A.D. 0 to A.D. 900) and Late (A.D. 900 to A.D.1550).

ORIGINAL REPORT

Stage 1 and 2 Archaeological Assessment:
Vars Industrial Park
Part Lots 22 and 23, Concession 4,
Geographic Township of Russell,
Township of Russell,
United Counties of Prescott and Russell,
Vars, Ontario

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Report: MH1326-REP.01

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1.0 Executive Summary

Matrix Heritage, on behalf of the Township of Russell, undertook a combined Stage 1 and 2 archaeological assessment of the study area located along the extensions of Robot and Émard Streets, Vars, located on Part Lots 22 and 23, Concession 4, in the Geographic Township of Russell, in the Township of Russell, in the United Counties of Prescott and Russell (Map 1). The archaeological assessment was requested by the Township of Russell in support of the Robot Street and Émard Street extensions (Map 2) to fulfill the requirements for a Schedule B Municipal Class Environmental Assessment (MCEA) for future industrial park development. This assessment is in accordance with the Ministry of Citizenship and Multiculturalism *Standards and Guidelines for Consultant Archaeologists* (2011).

The Stage 1 assessment included a review of the updated MCM archaeological site databases, a review of relevant environmental, historical, and archaeological literature, as well as primary historical research including: historical maps, land registry, and census records. The majority of the current study area was previously assessed through a Stage 1 assessment (P365-0117-2017), which determined parts of the Vars Industrial Park study area had archaeological potential (Map 3), including the current study area, and recommended Stage 2 assessment (WSP 2018). The current Stage 1 background assessment concluded that, based on criteria outlined in the MCM's *Standards and Guidelines for Consultant Archaeologists* (Section 1.3, (2011)), the study area has both pre-contact Indigenous as well as historical Euro-Canadian archaeological potential.

The Stage 2 archaeological assessment involved pedestrian survey and subsurface testing consisting of hand excavated test pits at 5 m intervals in areas of archaeological potential. Fieldwork was undertaken on October 3, 15, and November 25, 2024. Permission to access the property was provided by the owner. Nothing of archaeological significance was encountered during the field assessment.

Based on the results of this investigation it is recommended:

1. No further archaeological study is required for the subject property as delineated in Map 1.

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3.0 Project Personnel

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Report Review	Nadine Kopp, MA (P378)

4.0 Project Context

4.1 Development Context

Matrix Heritage, on behalf of the Township of Russell, undertook a combined Stage 1 and 2 archaeological assessment of the study area located along the extensions of Robot and Émard Streets, Vars, located on Part Lots 22 and 23, Concession 4, in the Geographic Township of Russell, in the Township of Russell, in the United Counties of Prescott and Russell (Map 1). The archaeological assessment was requested by the Township of Russell in support of the Robot Street and Émard Street extensions (Map 2) to fulfill the requirements for a Schedule B Municipal Class Environmental Assessment (MCEA) for future industrial park development. This assessment is in accordance with the Ministry of Citizenship and Multiculturalism *Standards and Guidelines for Consultant Archaeologists* (2011).

At the time of the archaeological assessment, the study area was owned by the Township of Russell. Permission to access the study property was granted by the owner prior to the commencement of any field work; no limits were placed on this access.

4.2 Historical Context

4.2.1 Historic Documentation

Notable histories of the Algonquins include: *Algonquin Traditional Culture* (Whiteduck 1995) and *Executive Summary: Algonquins of Golden Lake Claim* (Holmes and Associates 1993a).

The subject property is in the Geographic Township of Russell within the United Counties of Prescott-Russell. There are a limited number of published resources on the history and development of Prescott-Russell counties, one example is *Histoire des Comtes Unis de Prescott et de Russell* (Brault 1965). Useful resources are the Prescott-Russell and Stormont, Dundas, and Glengarry Supplements in the *Illustrated Atlas of the Dominion of Canada* (Belden & Co. 1881).

4.2.2 Territory of the Algonquins

Archaeological information suggests that ancestral Anishinabe Algonquin people lived in the Ottawa Valley for at least 8,000 years before the Europeans arrived in North America. This traditional territory is generally considered to encompass the Ottawa Valley on both sides of the river, in Ontario and Quebec, from the Rideau Lakes to the headwaters of the Ottawa River. The Ottawa Valley is dominated by the Canadian Shield which is characterized by low rolling land of Boreal Forest, rock outcrops and muskeg with innumerable lakes, ponds, and rivers. This environment dictated much of the traditional culture and lifestyle of the Anishinabe Algonquin peoples. At the time of European contact, the Anishinabe Algonquin territory was bounded on the east by the Innu people, to the west by the Nipissing and Ojibwa, to the north by the Cree, and to the south by the lands of the Iroquois.

Naming

The Anishinabe Algonquins' name for themselves is Anishinabeg, which means "human being." The word Algonquin supposedly came from the Malecite word meaning "they are our relatives", which French explorer Samuel de Champlain recorded as “Algoumequin” in 1603. The name stuck and the term “Algonquin” refers to those groups that have their traditional lands around the Ottawa Valley. Some confusion can arise regarding the term “Algonquian” which refers to the broader language family, of which the dialect of the Algonquin is one. The Algonquian linguistic group stretches across a significant part of North America and comprises scores of Nations related by language and customs (Algonquins of Ontario ND).

Early Human Occupation

The earliest human occupation of the Americas has been documented to predate 14,000 years ago, however at this time much of eastern Canada was covered by thick and expansive glaciers. The Laurentide Ice Sheet of the Wisconsinian glacier blanketed the Ottawa area until about 11,000 B.P. when then the glacial terminus receded north of the Ottawa Valley, and water from the Atlantic Ocean flooded the region to create the Champlain Sea. This sea encompassed the lowlands of Quebec on the north shore of the Ottawa River and most of Ontario east of Petawawa, including the Ottawa Valley and Rideau Lakes. By 10,000 B.P. the Champlain Sea was receding and within 1,000 years has drained from Eastern Ontario (Watson 1990:9).

The northern regions of eastern Canada were still under sheets of glacial ice as small groups of hunters first moved into the southern areas following the receding ice and water. By circa 11,000 B.P., when the Ottawa area was emerging from glaciations and being flooded by the Champlain Sea, northeastern North America was home to what are commonly referred to as the Paleo people. For Ontario the Paleo period is divided into the Early Paleo period (11,000 - 10,400 B.P.) and the Late Paleo period (10,500-9,400 B.P.), based on changes in tool technology (Ellis and Deller 1990). The Paleo people, who had moved into hospitable areas of southwest Ontario, likely consisted of small groups of exogamous hunter-gatherers relying on a variety of plants and animals who ranged over large territories (Jamieson 1999). The few possible Paleo period artifacts found, as surface finds or poorly documented finds, in the broader Eastern Ontario region are from the Rideau Lakes area (Watson 1990) and Thompson's Island near Cornwall (Ritchie 1969). In comparison, little evidence exists for Paleo occupations in the immediate Ottawa Valley, as can be expected given the environmental changes the region underwent, and the recent exposure of the area from glaciations and sea. As Watson suggests (Watson 1999:38), it is possible Paleo period people followed the changing shoreline of the Champlain Sea, moving into the Ottawa Valley in the late Paleo Period, although archaeological evidence is absent.

Archaic Period

As the climate continued to warm, the glacial ice sheet receded further northwards allowing areas of the Ottawa Valley to be travelled and occupied in what is known as the Archaic Period (9,500 – 2,900 B.P.). In the Boreal forests of the Canadian Shield this cultural period is referred to as the “Shield Archaic”. The Archaic period is generally characterized by increasing populations, developments in lithic technology (e.g., ground stone tools), and emerging trade networks.

Archaic populations remained hunter-gatherers with an increasing emphasis on fishing. People began to organise themselves into small family groups operating in a seasonal migration, congregating annually at resource-rich locations for social, religious, political, and economic activities. Sites from this period in the Ottawa Valley region include Morrison's Island-2 (BkGg-10), Morrison's Island-6 (BkGg-12) and Allumette Island-1 (BkGg-11) near Pembroke, the Lamoureaux site (BiFs-2) in the floodplain of the South Nation River (Clermont 1999), and the BiFw-20 and BiFw-91 sites on the Ottawa River near the mouth of the Gatineau River (Laliberté 2000; Pilon 2006; 2008). Often sites from this time are located on islands, waterways, and at narrows on lakes and rives where caribou and deer would cross, suggesting a common widespread use of the birchbark canoe that was so prominent in later history (McMillan 1995). It is suggested that the Algonquin peoples in the Ottawa Valley area developed out of this Shield Archaic culture.

It was during this period that a significant cultural landscape emerged between the Chaudière Falls and the mouth of the Gatineau River. Located on the floodplain of the Gatineau River delta, at the confluence of the Rideau, Gatineau, and Ottawa Rivers, Leamy Lake Park appears to have been sporadically occupied by groups during the Archaic period before becoming a significant summer meeting place during the Middle Woodland (100 BCE to 500 CE). This is reflected in the Algonquin name for Leamy Lake Park, "Kabeshinàn" or "summer camp" (Pilon and Boswell 2015). The Leamy Lake archaeological complex is the largest collection of archaeological sites known in the Ottawa River drainage basin and encompasses a cultural landscape that was used continuously for more than 6,000 years by Indigenous groups.

Woodland / Pre-European Contact Period

Generally, the introduction of the use of ceramics marks the transition from the Archaic Period into the Woodland period. Populations continued to participate in extensive trade networks that extended across much of North America. Social structure appears to have become increasingly complex with some status differentiation recognized in burials. Towards the end of this period domesticated plants were gradually introduced to the Ottawa Valley region. This coincided with other changes including the development of semi-permanent villages. The Woodland period is commonly divided into the Early Woodland (1000 – 300 B.C.), Middle Woodland (400 B.C. to A.D. 1000), and the Late Woodland (A.D. 900 – European Contact) periods.

The Early Woodland is typically noted via lithic point styles (i.e., Meadowood bifaces) and pottery types (i.e., Vinette I). Early Woodland sites in the Ottawa Valley region include Deep River (CaGi-1) (Mitchell 1963), Constance Bay I (BiGa-2) (Watson 1972), and Wyght (BfGa-11) (Watson 1980). The Middle Woodland period is identified primarily via changes in pottery style (e.g., the addition of decoration). Some of the best documented Middle Woodland Period sites from the region are from Leamy Lake Park (BiFw-6, BiFw-16) (Laliberté 1999).

The identification of pottery traditions or complexes (Laurel, Point Peninsula, Saugeen) within the Northeast Middle Woodland, the identifiers for the temporal and social organizational changes signifying the Late Woodland Period, subsequent phases within in the Late Woodland, and the overall 'simple' culture history model assumed for Ontario at this time (e.g. Ritchie 1969; Wright 1966; Wright 2004) are much debated. Newer evidence derived from various sources including anthropological and scientific analysis of ceramic manufacturing, cooking residue analysis, and mtDNA studies has highlighted flaws in the assumptions underpinning the cultural historical model. These analyses examine the origin and progression of traits (e.g., the convergence of corn-bean-squash agriculture) that have been used as qualifiers for boxed complexes within the cultural history model. When examining the details, the patterns used to define the cultural history-based complexes are found to be intrinsically flawed. For example, the confluence of defining “Iroquoian” traits such as palisaded villages, three sisters’ agriculture, etc., are shown to only converge into the identifiable “Iroquoian suite” of traits possibly as late as A.D. 1300 (Engelbrecht 1999; Hart and Brumbach 2003; Hart and Brumbach 2009; Hart and Engelbrecht 2011; Martin 2004; Martin 2008).

Cultural and ethnic groups and the potential material culture identifiers thereof, are constantly changing and evolving in both temporally and geographically. Newer models, for example those employing an ethnogenesis perspective allow, for the finding and discussions of ethnically diverse groups bearing “multilingualism [and] intermarriage across supposedly profound ethnic boundaries, and enormous cultural variation” (Moore 1994:936), rather than requiring monolithic homogenous groups. An ethnogenesis perspective allows for the different emergent lines of evidence that now demonstrate the flaws of the culture history model (Hart and Brumbach 2009).

Thus, the divides within the Middle Woodland and the shift into the period held as the Late Woodland are not well defined. There are general trends for increasingly sedentary populations, the gradual introduction of agriculture, and changing pottery and lithic styles. However, nearing the time of contact, Ontario was populated with somewhat distinct regional populations that broadly shared many traits. In the southwest, in good cropland areas, groups were practicing corn-bean-squash agriculture in semi-permanent, often palisaded villages which are commonly assigned to Iroquoian peoples (Wright 2004:1297–1304). Algonquian-speaking Anishinaabeg peoples inhabited the same or neighbouring areas, but their presence in the archaeological record is less visible due to their generally more mobile settlement-subsistence pattern (Kapyrka and Migizi 2016:4–5).

The Woodland Period Algonquin peoples of the Ottawa Valley area had a social and economic rhythm of life following an annual cyclical pattern of seasonal movements. Subsistence was based on small independent extended family bands operating an annual round of hunting, fishing, and plant collecting. Families returned from their winter hunting camps to rejoin with other groups at major fishing sites for the summer. The movements of the people were connected with the rhythm of the natural world around them allowing for efficient and generally sustainable subsistence. Their annual congregations facilitated essential social, political, and cultural exchange.

The Woodland Period Algonquin peoples in the Ottawa Valley also established significant trade networks and a dominance of the Ottawa River (in Algonquian the “Kitchissippi”) and its tributaries. The trade networks following the Ottawa River connected the Algonquins to an interior eastern waterway via Lake Timiskaming and the Rivière des Outaouais to the St. Maurice and Saguenay as well as the upper Great Lakes and interior via Lake Nipissing and Georgian Bay. From there their Huron allies would distribute goods to the south and west. The Iroquois and their allies along the St. Lawrence River and the lower Great Lakes dominated the trade routes on those waterways to the south thus leading to a rivalry that would escalate with European influence (Moreau et al. 2016).

This brief synthesis does not do full justice to the incredibly complex landscape in pre-contact Ontario. Intensive study of archaeological, ethnohistoric, and oral historical evidence has produced a detailed picture of the dynamic history of the region and the shifting relationships between disparate linguistic and cultural groups leading up to contact (Ellis and Ferris 1990; Sioui 1999; Trigger 1976; Warrick 2008; Wright 2004).

European Contact

The addition of European trade goods to artifacts of native manufacture in archaeological material culture assemblages’ ushers in a new period of history. Archaeological data shows that European goods penetrated the Canadian Shield as early as 1590 and the trade was well entrenched by 1600 through the trade routes established by the Algonquin peoples along the Ottawa River (Moreau et al. 2016) and their neighbouring allies the Michi Saagiig and the Chippewa nations.

The first recorded meeting between Europeans and Algonquins occurred at the first permanent French settlement on the St. Lawrence at Tadoussac in the summer of 1603. Samuel de Champlain came upon a party of Algonquins, the Kitchissippirini under Chief Tessouat, who were celebrating a recent victory over the Iroquois with their allies the Montagnais and Malecite (Hessel 1993). Champlain made note of the “Algoumequins” and his encounter with them, yet the initial contact between Champlain and the Algonquin people within their own territory in the Ottawa Valley was during his travels of exploration in 1613.

By the time of Champlain’s 1613 journey, the Algonquin people along the Ottawa River Valley were important middlemen in the rapidly expanding fur-trade industry. Champlain knew this and wanted to form and strengthen alliances with the Algonquins to further grow the fur-trade, and to secure guidance and protection for future explorations inland and north towards a potential northwest passage. Further, involving the Algonquins deeper in the fur trade promised more furs filling French ships and more Indigenous dependence on European goods. For their part, the French offered the promise of safety and support against the Iroquois to the south.

Early historical accounts note many different Algonquian speaking groups in the region at the time. Of note for the lower Ottawa Valley area were the Kichesipirini (focused around Morrison Island); Matouweskarini (upstream from Ottawa, along the Madawaska River); Weskarini (around the Petite Nation, Lièvre, and Rouge rivers west of Montreal), Kinounchepirini (in the Bonnechere River drainage); and the Onontchataronon, (along the South Nation River) (Holmes and Associates 1993a; Morrison 2005; Pilon 2005). However, little archaeological work has been undertaken regarding Algonquins at the time of contact with Europeans (Pilon 2005).

Fur Trade, Early Contact with the French

Champlain understood that the Algonquins would be vital to his eventual success in making his way inland, exploring, and expanding the fur trade. This was partially due to their language being the key to communication with many other groups, as well as their dominance over trade routes surrounding the Ottawa River and the connection with the Huron in the west.

When the French arrived, there was already a vast trade network in place linking the Huron and the Algonquins, the Michi Saagiig and Chippewa, extending from the Saguenay to Huronia. This route existed at least from the very early beginnings of agricultural societies in Ontario around A.D. 1000 (Moreau et al. 2016). This trade increased rapidly after the arrival of the Europeans with the introduction of European goods and the demand for furs. The Huron held a highly strategic commercial location controlling the trade to the south and the west, and the Algonquin, Michi Saagiig, and Chippewa were their critical connection to goods from the east, including European products.

By the mid-17th century, the demands of the fur trade had caused major impacts to the traditional way of life including a change in tools, weapons, and a shift in diet to more European as hunting was more for furs and not for food. This dependence on European food, ammunition, and protection tied people to European settlements (McMillan 1995). The summer gathering sites shifted from prominent fishing areas to trading posts. This further spurred social changes in community structure and traditional land distribution and use.

The well-situated Algonquin, particularly the Kitchesipirini who controlled passage around Allumette Island, were originally reluctant to cede any of their dominance in fear of being cut out of their lucrative middleman role in the trade economy. However, an alliance with the French meant protection and assistance against the Iroquois. The French, as well as other Europeans like the Dutch and English, were able to align their own political and economic rivalries with those of the native populations. The competitive greed and obsession with expanding the fur trade entrenched the rivalries that were already in place, and these were intensified by European weapons and economic ambition.

Haudenosaunee (Iroquois) Wars

Little information exists about inter-tribal warfare prior to European contact, however, there was existing animosity between the Haudenosaunee and the Algonquins when Champlain first arrived in the Ottawa Valley. Like his fellow Europeans, Champlain was able to use this existing rivalry to make a case for an alliance, thus gaining crucial access to the established trade networks and economic power of the Algonquin. Prior to European contact, the hostilities had been mainly skirmishes and raids, but everything changed as European reinforcement provided deadlier weapons and higher economic stakes with the introduction of the fur trade.

Along with the French, the Algonquin were allied against the Haudenosaunee with the Huron, Nippissing, Michi Saagiig, and Chippewa. French records suggest that at the end of the sixteenth century the Algonquins were the dominant force and were proud to have weakened and diminished the Iroquois. The first Algonquin campaign the French took part in was a 1609 attack against the Mohawk. The use of firearms in this fight marked the beginning of the escalation of brutality between these old enemies. The Haudenosaunee corn stalk shields could stop arrows but not bullets or French swords (Hessel 1993).

Eventually the tide changed and as the Haudenosaunee exhausted the beaver population in their own territory they became the aggressors, pushing into the lands of the Algonquin, Michi Saagiig, Chippewa, and Huron, with the added strength of Dutch weaponry. Through the 1630s and 40s constant and increased raiding into Algonquin, Michi Saagiig, and Chippewa territory by the Haudenosaunee nations had forced many multi-generational residents to leave their lands in seek protection from their French allies in places like Trois Rivieres and Sillery while others fled to the north. By 1650 Huronia, the home of the long-time allies of the Algonquin and traditional and treaty territory of the Chippewa, had been destroyed by the Haudenosaunee. The Algonquins of the Ottawa Valley had largely been scattered or displaced, reduced through war and disease to small family groups under the protection of the French missions only fifty years after the first Europeans had travelled the Ottawa River (Morrison 2005:26).

There is some evidence that Algonquins did not completely abandon the Ottawa Valley but withdrew from the Ottawa River to the headwaters of its tributaries and remained in those interior locations until the end of the century. Taking advantage of the Algonquin absence, the Ottawa people, originally from the area of Manitoulin Island, used the river for trade during this time and their name became historically applied to the river.

Aftermath of War

As the Haudenosaunee push continued and the Algonquin sought refuge amongst their French allies, other factors came into play that significantly contributed to their displacement and near destruction. The introduction of European diseases, the devastating influence of alcohol, and the increasing pressure to convert to Christianity massively contributed to the weakening of the Algonquin people and their traditional culture.

The Algonquins thought of themselves as part of the natural world with which they must live in harmony. The traditional stories of Algonquin folklore contained lessons and guides to behaviour. The French missionaries regarded them as “heathens” and dismissed their religion as superstition (Day 2005). The missionaries believed it was their duty to convert these people to Christianity to save them from evil. Algonquin chief Tessouat had seen his Huron neighbours become ill and die after interactions with the European missionaries and had thus originally warned his people about abandoning their old beliefs and the dangers of conversion (Hessel 1993). Eventually the French imposed laws allowing only those converted to Christianity to remain within the missions and under French protection. This created divisions amongst the Algonquin themselves which weakened the social structure as some settled into a new religion and new territory.

Starting in the 1630s and continuing into the 1700s, European disease spread among the Algonquin groups along the Ottawa River, bringing widespread death (Trigger 1986:230). As disease spread through the French mission settlements the priests remained certain that the suffering was punishment for resisting Christianity. An additional threat lurking amongst the French settlements was alcohol which precipitated many issues.

The Long Way Back

After the Haudenosaunee (Iroquois) Wars, the remaining Algonquin people were generally settled around various French trading posts and missions from the north end of the Ottawa Valley to Montreal. A large settlement at Oka was the first mission established on Algonquin lands in 1720. This settlement included peoples from many groups who had been collected and moved around from various locations. It became a type of base camp; occupied during the summer while the winters were spent at their traditional hunting territories in the upper Ottawa Valley. This arrangement served the French well, since the Algonquin converts at Oka maintained close ties with the northern bands and could call upon the inland warriors to join them in case of war with the British or Iroquois League.

As the British gained control of Canada from the French in 1758-1760 they included in the Articles of Capitulation a guarantee that the Indian allies of the French would be maintained in the lands they inhabited. Many of the Algonquin and other native groups that had been living on French mission settlements were shuffled around to new reserves while others began to migrate back to their traditional territories. Those who had remained on the land and continued to be active in the fur trade, now did so with the English through companies in Montreal like the North West Company, and in the north with the Hudson Bay Company.

Some Algonquin people began to return to their traditional territory to join those groups who had remained in the lower Ottawa Valley and continued their traditional lifeway through to the influx of European settlement in the late 1700s and early 1800s. This included bands noted to be living along the Gatineau River and other rivers flowing into the Ottawa. These traditional bands maintained a seasonal round focused on harvesting activities into the 1800s when development pressures and assimilation policies implemented by the colonial government saw Indigenous lands taken up, albeit under increasing protest and without consideration for Indigenous claims, for settlement and industry. Algonquin lands began to be encroached upon by white settlers involved in the booming lucrative logging industry or having been granted the land as Loyalist soldiers or through other settler groups.

As some Algonquins had been redistributed to lands in Quebec, their traditional territory within the Ottawa Valley was included in multiple land transfer deals, agreements, and sales with the British Crown beginning in the 1780s and continuing till the 1840s. The Algonquin were not included in these transactions and numerous petitions and inquiries on behalf of their interests were often overruled or ignored (Holmes and Associates 1993a; Holmes and Associates 1993b; Sarazin). The Constitution Act of 1791 divided Quebec into the Provinces of Upper and Lower Canada with Ottawa River as the division line, thus the lands claimed by the Algonquins fell under two separate administrations creating more confusion, exclusion, and oversight.

Two “protectorate” communities were eventually established in the nineteenth century for the Algonquin people at Golden Lake in Ontario and River Desert (Maniwaki) in Quebec. One of the last accounts of the Algonquins living traditionally was from 1865. The White Duck family was living just west of Arnprior when they were forced to leave their wigwams as surveyors arrived to tell them the railway was being expanded through their land (Hessel 1993).

Algonquin people continue to live in the Ottawa Valley and there are still many speakers of several Algonquian dialects. Outside of the officially recognized bands there are an unspecified number of people of Algonquin descent throughout the Ottawa Valley unaffiliated with any reserve. Today there are ten Algonquin communities that comprise the Algonquins of Ontario: The Algonquins of Pikwàkanagàn First Nation, Antoine, Kijicho Manito Madagouskarini, Bonnechere, Greater Golden Lake, Mattawa/North Bay, Ottawa, Shabot Obaadjiwan, Snimikobi, and Whitney and area.

Struggles to officially secure title to their traditional land, as well as fight for hunting and fishing rights have continued into modern times. The Algonquins of Ontario (AOO) and the Governments of both Canada and Ontario are working together to resolve this land claim through a negotiated settlement. The claim includes an area of 9 million acres of unceded territory within the watersheds of the Ottawa and Mattawa Rivers in Ontario including the city of Ottawa and most of Algonquin Park. The signing of the Agreement-in-Principle in 2016 by the AOO and the provincial and federal governments, signifying a mutual intention for a lasting partnership, was a key step towards a final agreement to clarify the rights and nurture new economic and development opportunities in the area.

4.2.1 Euro Canadian Colonial History

The area became part of European expansion after the signing of the Rideau Purchase in 1819, which ceded large tracts of Algonquin land to the Crown (Surtees 1986). The township was formally surveyed and incorporated in 1850, reflecting its growing population and economic activity. Early settlers focused on agriculture, particularly wheat farming, as well as logging, which capitalized on the rich forest resources of the area. These industries were supported by the development of transportation infrastructure, including local roads and, later, railways, which connected Russell to larger markets in Ottawa and beyond (Smith 1879).

The Township of Russell originally got its name from Peter Russell, a high-ranking administrator in the government of Upper Canada. Born in Ireland, Russell moved to York, now Toronto, in the late 18th century. A known slave owner, Russell actively opposed legislation to abolish slavery in the region. In light of this, the Township of Russell rededicated the name in 2022 to anyone with the first, middle or last name Russell who has had a positive impact locally (Frizell 2022).

4.2.2 Study Area Specific History

The 1861 Walling map (Map 4) shows three structures within Lot 22, Concession 4. Two of the structures are along the western border along the historic road now known as Eadie Road and one along the southern edge in the western half, all outside the current study area. The name

Sparks appears in the northern portion of the lot and the name L. E. Wood in the southern portion, presumably George Sparks and Edmund Wood. Lot 23, Concession 4 shows no structures or names, however there is a structure labelled "Post" adjacent to the northwest corner of the lot, outside the current study area. Immediately to the north, in Cumberland Township, there are a number of houses with multiple individuals with the last name McVeigh (alternatively spelled McVagh and McVey) (Walling 1862).

The 1881 Belden map (Map 4) shows no names or structures on either Lots 22 or 23, Concession 4. Immediately to the north in Cumberland Township, there is a store and a post office shown (Belden 1881:188).

Lot 22, Concession 4

In 1841, John Adams received the patent to Lot 22, Concession 4 from the Crown. In 1854, Adams and his wife split the property into two halves and the north half of the lot was acquired by Andrew Simpson and the south half by John A. Simpson (OLR, (50)).

In 1861, Andrew Simpson and his wife sold the north half to George Sparks. George Sparks, born in 1832 in Vars, Ontario, is listed as living on Lot 23, Concession 4 in the 1866-7 Ottawa City and Counties of Carleton and Russell Directory (Sutherland 1866; Ancestry.com 2012). He was married to Lydia Matilda (1833-1915) (Ancestry.com). In the 1891 census, the couple were living with 8 children ranging in age from 6 to 28 including 24 year old William, 17 year old Albert, and 15 year old Russell (Statistics Canada 1891). In 1905, their son Russell married Maria Lydia Armstrong and the young couple had their first child together, George, in 1906 (Ancestry.com 2010). In 1912, the east half of the north half of Lot 22 was sold to Russell by his father George who then sold Russell the west half of the north half in 1915 (OLR, (50)). In the 1921 census, Russell and Maria are living with their four children, a nephew, and 87 year old George Sparks who died a year later in 1922 (Ancestry.com 1921; Ancestry.com). In 1925, Russell lost the north half of the lot in a foreclosure. In 1926, William H. H. Sparks bought the property back and sold it to Linda Sparks, wife of Albert E. Sparks in 1932. Widowed Linda was the last Sparks owner of the property. She sold the property two years later in 1934 to Harold Fitzsimmons.

The south half of Lot 22 was acquired by Mary Jane Wood in 1882 from Emaline Earmentrout (likely formerly Emaline Simpson) et al. Mary Jane's maiden name was McVeigh which could indicate a connection with the other McVeigh's recorded on the 1862 Walling map in Cumberland Township just north of the study area (Walling 1862). In the 1866-7 Directory, Edmund Wood, husband of Mary Jane, was listed as living on Lot 22, Concession 4 which indicated the family already had a connection to the land before Mary Jane purchased it (Sutherland 1866). Upon Mary Jane's death in 1894, the land transferred to Leonard Wood et al. (Ancestry.com). In 1903, Peter William Wood bought out the other claimants to own the land. His widow sold the land in 1937 to Leonard Earmentrout Wood. Leonard's middle name suggests a connection to Emaline Earmentrout who sold the property to Mary Jane in 1882. The property remained in the Wood family until the end of the 20th century (OLR, (50)).

Lot 23, Concession 4

According to the County of Russell letters patent book, the west 100 acres of Lot 23, Concession 4, was acquired by Elizabeth Rupert on June 22, 1838. Elizabeth Rupert is named as one of the first settlers in Russell Township (Russell Township). The east 25 acres was patented to Peter McVeigh in 1852. Interestingly, McVeigh was the maiden name of Mary Jane Wood (owner of Lot 22, Concession 4 from 1882 to 1894) which could suggest a connection between ownership of part Lots 22 and 23 (Ancestry.com). Lot 23 is a partial lot that is cut off by the neighbouring Township of Cumberland and is only approximately 51 acres which does not account for the 125 acres that were recorded to be patented in the Russell County patent letters (OLR (50)).

Available land registry for Lot 23 starts in 1919. The Sparks family is in possession of part of the lot from at least 1919 to 1934 when it was sold to Harold Fitzsimmons who also bought the north half of Lot 22 that same year (OLR, (50)).

4.3 Archaeological Context

4.3.1 Current Conditions

The study area (2.05 ha) divided into two parcels which consist of agricultural fields (Figure 1-Figure 4) and a small section of forest in the middle of the eastern parcel (Figure 5). The property is mainly surrounded by agricultural fields with the industrial complex sitting to the southeast of the study area (Map 5).

4.3.2 Physiography

The study area lies within undrumlinized till plains and the Russell and Prescott Sand Plains (Map 6). The undrumlinized till plains in the Township of Russell are characterized by flat to gently rolling terrain composed of dense, glacially-deposited till. The sand plains consist of a large continuous belt, 65 miles in length, that stretches from Ottawa to Hawkesbury. Except for the higher sands south of Ottawa, the entire area was originally a continuous delta built up by the Ottawa River and the tributaries into the Champlain Sea. The sand plains have a level surface, and depth that varies from 20 to 30 feet. The texture of the sand is also variable, coarser towards the north and fine sand and silt south of the Castor River. The sands are underlain with stratified red and grey clay. Most of the area lies within the drainage of the South Nation River. Drainage is good near the escarpments, but increasingly worse towards the core of the region. As most of the ground water drains into the sand, there are few streams. The South Nation River cuts a canyon 20-25 m deep across the plain from Casselman to Lemieux (Chapman and Putnam 2007).

The majority of the soils of the study area consist of Vars soils, which are found primarily in Russell County. They are derived from a distinctive red-coloured glacial till influenced by local shale rock formations. These well-drained soils occur on ridges and low-rounded hills, often displaying a gravelly loam texture with varying gravel content. Slightly acidic throughout the profile, Vars soils are well-suited for general farming, particularly hay and spring grains, but are less ideal for shallow-rooted crops due to limited moisture retention (Wicklund and Richards 1962:14–15).

The remainder of the soils of the study area consist of Castor fine sandy loam except for along the northeastern border where an eroded channel of the South Nation River is found (Map 6). The sediments that the Castor soils have developed include alternating bands of silt and fine sand. All alluvial sediments overlie clay, with the depth of the overlying silt and sand irregular, ranging between 30 and 70 cm. Drainage varies dependant on the bands of silt and sand (Wicklund and Richards 1962:24–25).

The surficial geology of the study area is organic deposits of peat, much and marl (Map 6).

The study area is located about 7km north of the Castor River and 2km south of Shaw's Creek.

4.3.3 Previous Archaeological Assessments

Archaeological work in the region has primarily consisted of cultural resource management studies related to specific properties or development projects. A Stage 1 Archaeological Assessment was undertaken for the Vars Industrial Park by WSP in 2017 (P365-0117-2017), which covered the majority of the current study area (Map 3). This assessment determined that the current study area within the larger Vars Industrial Park area retained archaeological potential and Stage 2 assessment was recommended (WSP 2018).

4.3.4 Registered Archaeological Sites and Commemorative Plaques

A search of the Ontario Archaeological Sites Database indicated that there are no registered archaeological sites located within a 5 km radius of the study area.

No commemorative plaques or monuments are located near the subject property.

4.4 Archaeological Potential

Potential for pre-contact Indigenous sites is based on physiographic variables that include distance from the nearest source of water, the nature of the nearest source/body of water, distinguishing features in the landscape (e. g. ridges, knolls, eskers, wetlands), the types of soils found within the area of assessment and resource availability. The study area has potential for pre-contact Indigenous archaeological sites due to the presence of well drained soils.

Potential for historical Euro-Canadian sites is based on proximity to historical transportation routes, community buildings such as schools, churches, and businesses, and any known archaeological or culturally significant sites. The study area has potential for historical period Euro-Canadian archaeological sites due to the early patent date, the close proximity to a store and Post Office as seen on the 1881 Belden map (Map 4), and the proximity to historic roads (Belden 1881).

5.0 Field Methods

The study area (2.05 ha) is considered to have archaeological potential according to the 2011 standards set out for consultant archaeologists by the MCM.

Most of the study area (1.27 ha) consists of current and former agricultural fields of sandy soils and was therefore suitable for ploughing and pedestrian survey as per Section 2.1.1 (MCM 2011) (Map 5). All surveyed fields had been ploughed and adequately weathered with excellent surface visibility prior to commencing fieldwork. Pedestrian survey was conducted at 5 metre intervals (Figure 6and Figure 7). Nothing of archaeological significance was identified during the pedestrian survey of the study area.

A small portion of the eastern parcel was forested. This section, about 50x20m in diameter, was shovel tested at 5m intervals (Figure 8). All test pits were a minimum of 30cm in diameter and were excavated 5cm into subsoil and extended to within 1m of structures (Section 2.1.2). All soil was screened using 6mm mesh screens. All test pits were examined for cultural features and stratigraphy, then backfilled upon completion. Nothing of archaeological significance was identified within the test pit portion of the study area.

All field activity and testing areas were mapped using a BadElf Survey GPS with WAAS and DGPS enabled, paired to an iPad with ArcGIS Field Maps. Average accuracy at the time of survey was approximately 2 m horizontal. Study area boundaries were determined in the field using boundaries digitized from the sketch plan provided by the client, parcel mapping, and Google Earth (Map 2) overlaid in ArcGIS Field Maps. All survey data is compiled into ArcGIS and every survey point has a UTM Zone 18T NAD 83 coordinate.

Photographs were taken during fieldwork to document the current land conditions (see Map 5 for photo locations mapped by figure number) as per Standard 1.a., Section 7.8.6 (MCM 2011). Site photograph, map, and document catalogues appear in Appendices A, B, and C.

Fieldwork was undertaken on October 3, 15, and November 25, 2024. Weather conditions ranged from partly cloudy to sunny with temperatures ranging between 3°C and 20°C. Lighting, visibility, and overall conditions were good (Section 2.1, Standard 3 MCM 2011). Permission to access the property was provided by the owner prior to the commencement of any field work; no limits were placed on this access.

6.0 Records of Finds

Despite having archaeological potential, no archaeological remains, artifacts, or cultural soil profiles were encountered during the Stage 2 investigations of the study area. Soils in the ploughed fields were a heavy clay with some rock inclusions. Soils in the forested section were also a heavy clay with topsoil being a medium to dark greyish brown with many rock inclusions. Subsoil was also rocky and lighter brown to light grey clay. Depths ranged from 25-35cm (Figure 9).

The Stage 2 archaeological assessment resulted in no indication of archaeological remains with CHVI within the proposed development area.

7.0 Analysis and Conclusions

The Stage 1 assessment indicated that there was archaeological potential for the study area based on the well-drained soils, the early land patent date, the close proximity to a store and Post Office as seen on the 1881 Belden map and the proximity to historic roads (Map 4) (Belden 1881). No archaeological remains, artifacts, or cultural soil profiles were encountered during the Stage 2 test pit survey or pedestrian survey of the study area.

The Stage 2 archaeological assessment involved pedestrian survey at 5m intervals and subsurface testing which consisted of hand excavated test pits at 5 metre intervals in areas of archaeological potential as per Standard 1.a., Section 2.1.2 (MCM 2011). There were no archaeological resources with CHVI identified within the proposed development area.

8.0 Recommendations

The Stage 2 Archaeological Assessment resulted in no indication of archaeological remains with cultural heritage value or interest within the study area.

Based on the results of this investigation the property has low to no archaeological potential and it is recommended that:

2. No further archaeological study is required for the subject property as delineated in Map 1.

9.0 Advice on Compliance with Legislation

a. This report is submitted to the *Minister of Citizenship and Multiculturalism* as a condition of licencing 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 Citizenship and Multiculturalism, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

b. It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licenced 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 Archaeology Reports referred to in Section 65.1 of the *Ontario Heritage Act*.

c. Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licenced consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48 (1) of the *Ontario Heritage Act*.

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

10.0 Closure

Matrix Heritage has prepared this report in a manner consistent with the time limits and physical constraints applicable to this report. No other warranty, expressed or implied is made. The sampling strategies incorporated in this study comply with those identified in the Ministry of Citizenship and Multiculturalism's *Standards and Guidelines for Consultant Archaeologists* (2011) however; archaeological assessments may fail to identify all archaeological resources.

The present report applies only to the project described in the document. Use of this report for purposes other than those described herein or by person(s) other than the Township of Russell or their agent(s) is not authorized without review by this firm for the applicability of our recommendations to the altered use of the report.

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This report is pending Ministry approval.

We trust that this report meets your current needs. If you have any questions or we may be of further assistance, please contact the undersigned.

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Senior Archaeologist

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WSP

2018 *Stage 1 Archaeological Assessment: Vars Industrial Park, LOTS 21-23, CONCESSION 4, AND LOTS 10-22, CONCESSION 5, AND LOTS 21 & 22, CONSESSION 6, TOWNSHIP OF RUSSELL, AND LOTS 27 & 28, CONCESSION 6 & 7, TOWNSHIP OF CUMBERLAND UNITED COUNTIES OF PRESCOTT-RUSSELL, HISTORIC COUNTIES OF RUSSELL AND CUMBERLAND, PROVINCE OF ONTARIO.*

12.0 Images

Figure 1: Overview of eastern section of Émard Street extension (MH1326-D011).

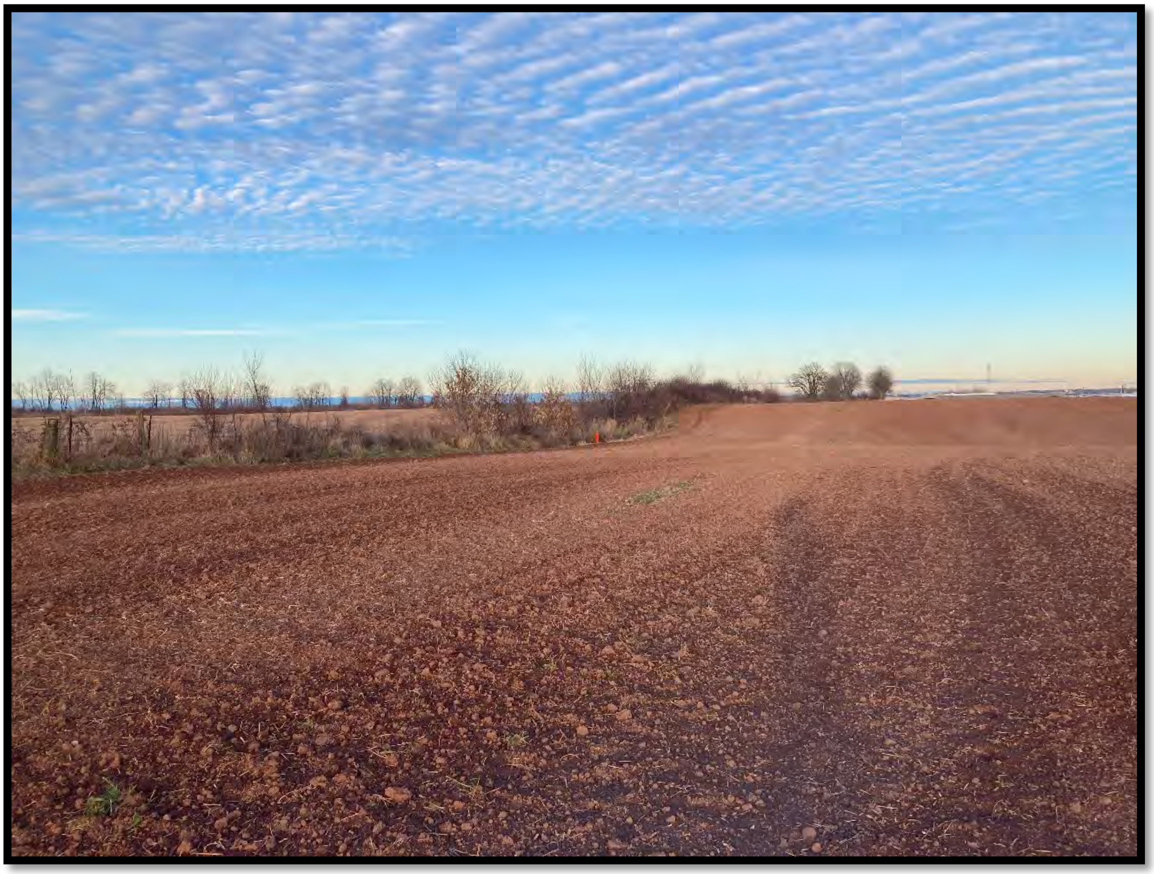


Figure 2: Overview of western section of Émard Street extensions (MH1326-D042).

Figure 3: Overview of northern section of Robot Street extension (MH1326-D025).

Figure 4: Overview of southern section of Robot Street extension (MH1326-D021).

Figure 5: General conditions of central forested section of Robot Street extension (MH1326-D022).

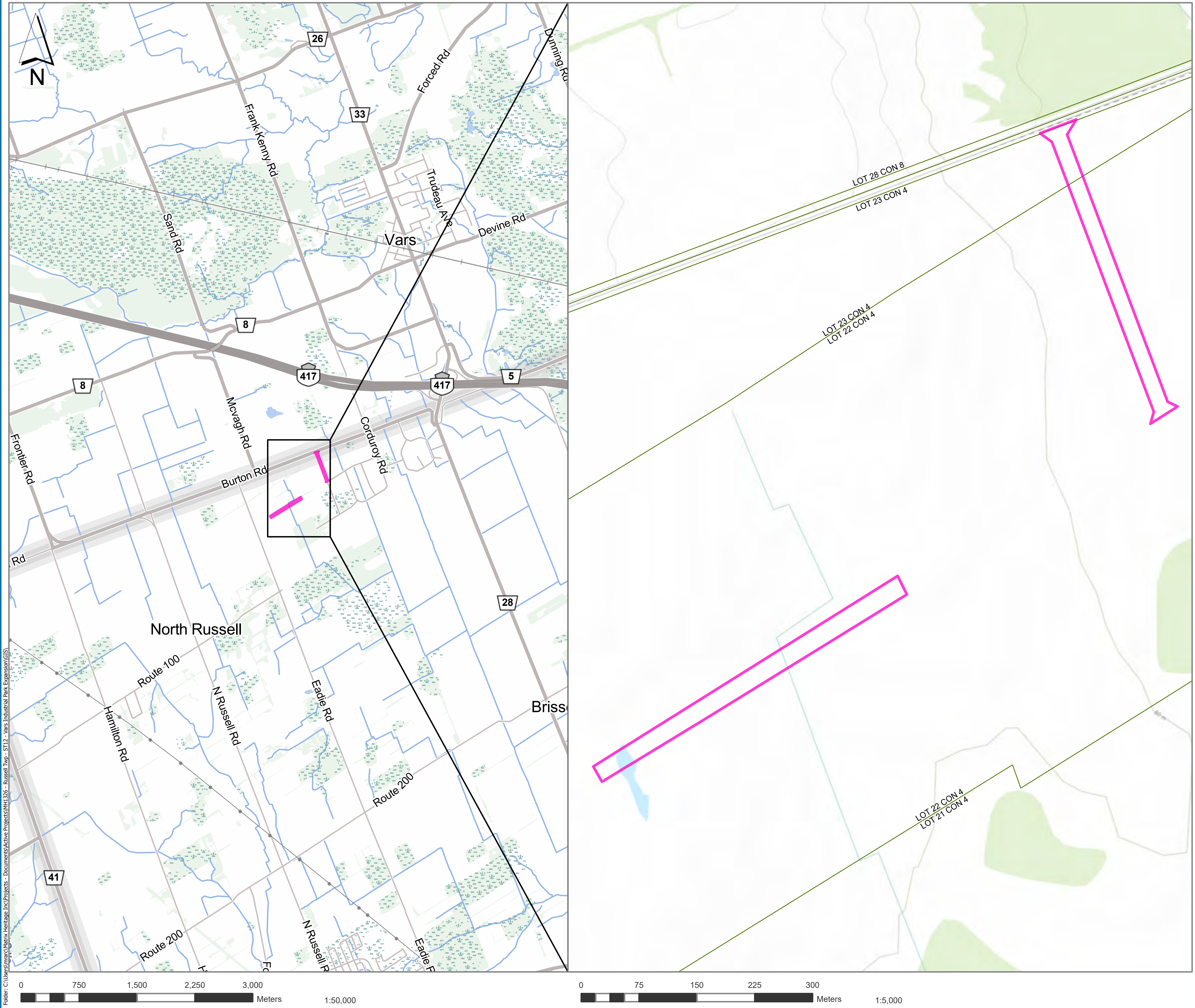
Figure 6: Pedestrian survey of eastern section of Émard Street extension (MH1326-D018).

Figure 7: Pedestrian survey of northern section of Robot Street extension (MH1326-D034).

Figure 8: Test pitting central forested section of Robot Street extension (MH1326-D019).

Figure 9: Typical stratigraphy found throughout test pitting section of Robot Street extension (MH1326-D027).

13.0 Maps



LEGEND

▭ STUDY AREA

Matrix

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FILE M1326
DATE 2024-09-18
CREATED BY: DW
CHECKED BY: NK
PROJECTION: NAD 1983 UTM Zone 18N

PROJECT
STAGE 1 AND 2 ARCHAEOLOGICAL ASSESSMENT
INDUSTRIAL PARK EXPANSION, VARS, ON

TITLE
LOCATION

MAP
1

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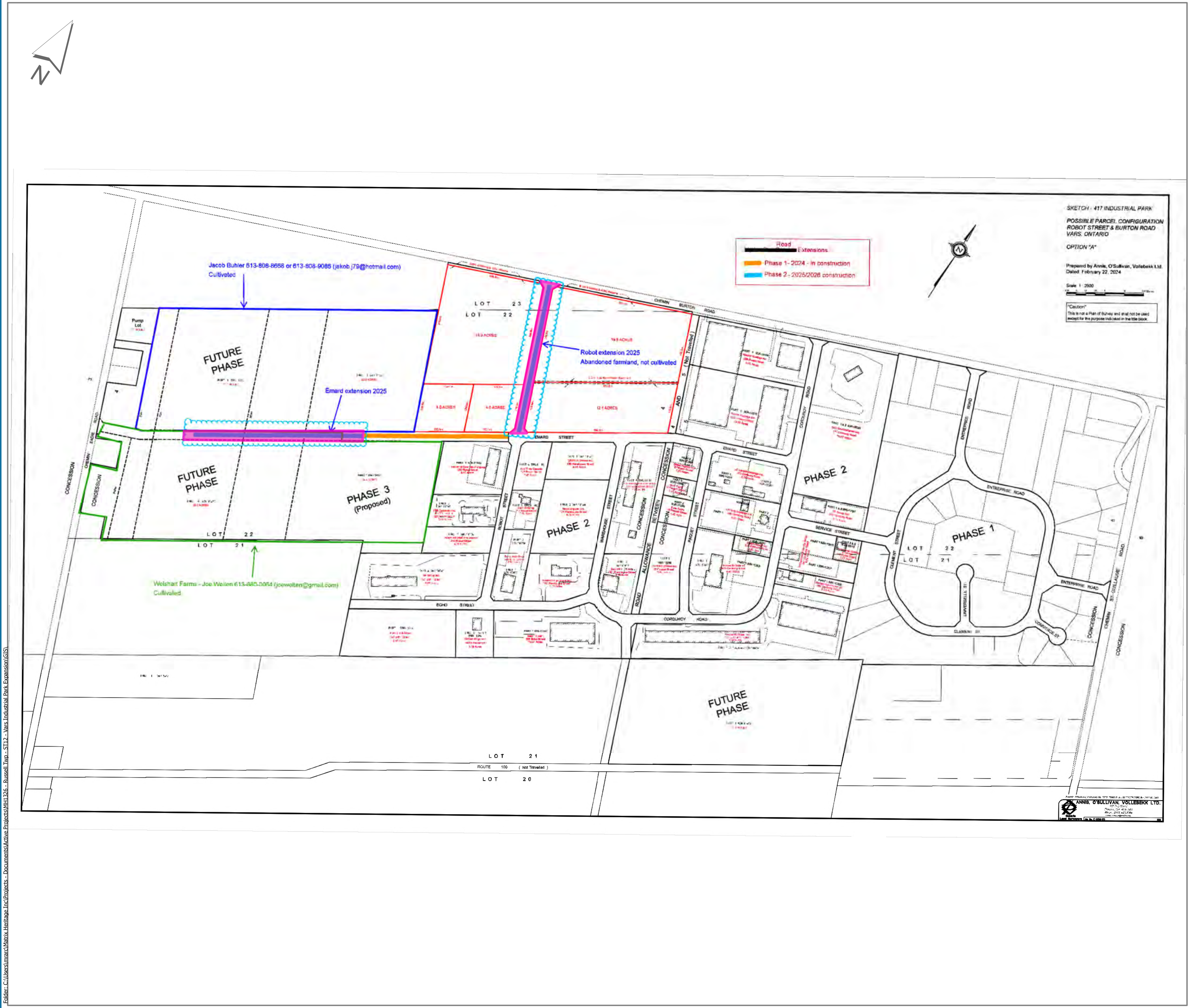

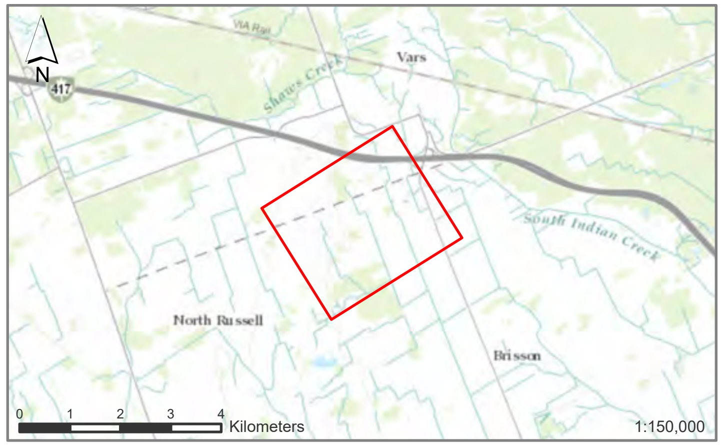

LEGEND

🟪 STUDY AREA

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REFERENCES:
CITY OF OTTAWA, PROVINCE OF ONTARIO, ESRI CANADA, ESRI, HERE, GARMIN, USGS, NGA, EPA, USDA, NPS, AAFC, NRCAN
PLAN PROVIDED BY THE PROPONENT

FILE M1326
DATE 2024-09-18
CREATED BY: DW
CHECKED BY: BM
PROJECTION: NAD 1983 UTM Zone 18N

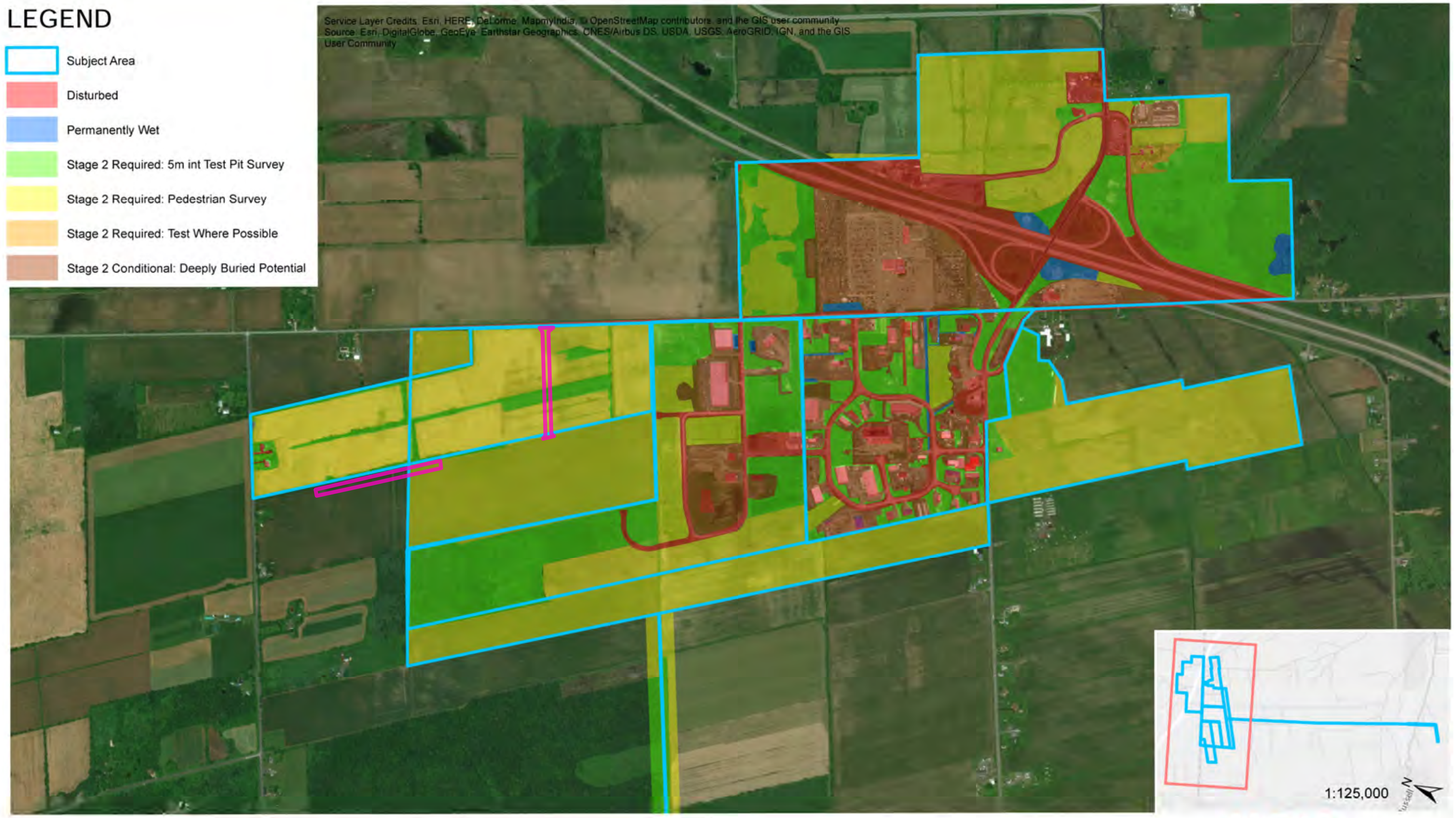
PROJECT
STAGE 1 AND 2 ARCHAEOLOGICAL ASSESSMENT
INDUSTRIAL PARK EXPANSION, VARS, ON

TITLE
DRAFT PLAN

MAP
2

Folder: C:\Users\mrarc\Matrix Heritage Inc\Projects - Documents\Active Projects\MH1326 - Russell Twp - ST12 - Vars Industrial Park Expansion\GIS\

VARS INDUSTRIAL PARK - STAGE 1 RESULTS (OVERVIEW) 1:12,500 FIGURE 3a



wsp

0 130 260 520 M

N

PROJECT:
STAGE 1 ARCHAEOLOGICAL ASSESSMENT:
VARS INDUSTRIAL PARK

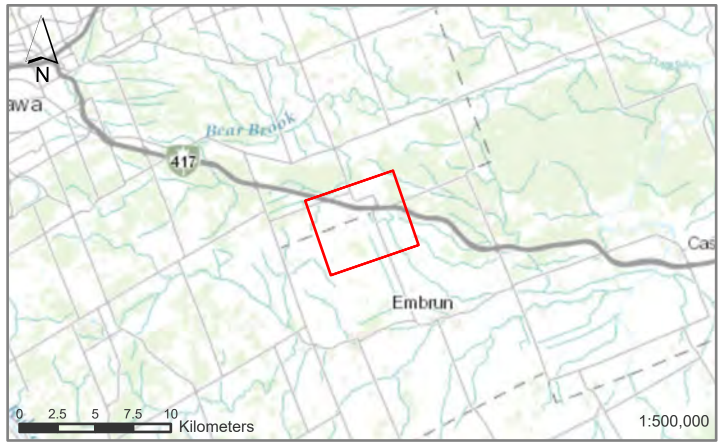
PROJECT NO.:
161-08735-00

DRAWN BY:
JAS

CLIENT:
TOWNSHIP OF RUSSELL AND CITY OF OTTAWA

DATE:
9/18/2017

CHECKED BY:
DAY



LEGEND

STUDY AREA

Matrix

0 300 600 900 1,200 Meters

1:20,000

REFERENCES:
CITY OF OTTAWA, ONTARIO BASE MAP, PROVINCE OF ONTARIO, ESRI CANADA, ESRI, © OPENSTREETMAP CONTRIBUTORS, HERE, GARMIN, USGS, NGA, EPA, USDA, NPS, AAFC, NRCAN

PREVIOUS STAGE 1 ASSESSMENT MAP FROM WSP 2018 (P365-0119-2017)

FILE M1326

DATE 2024-12-15
CREATED BY: DW
CHECKED BY: NK

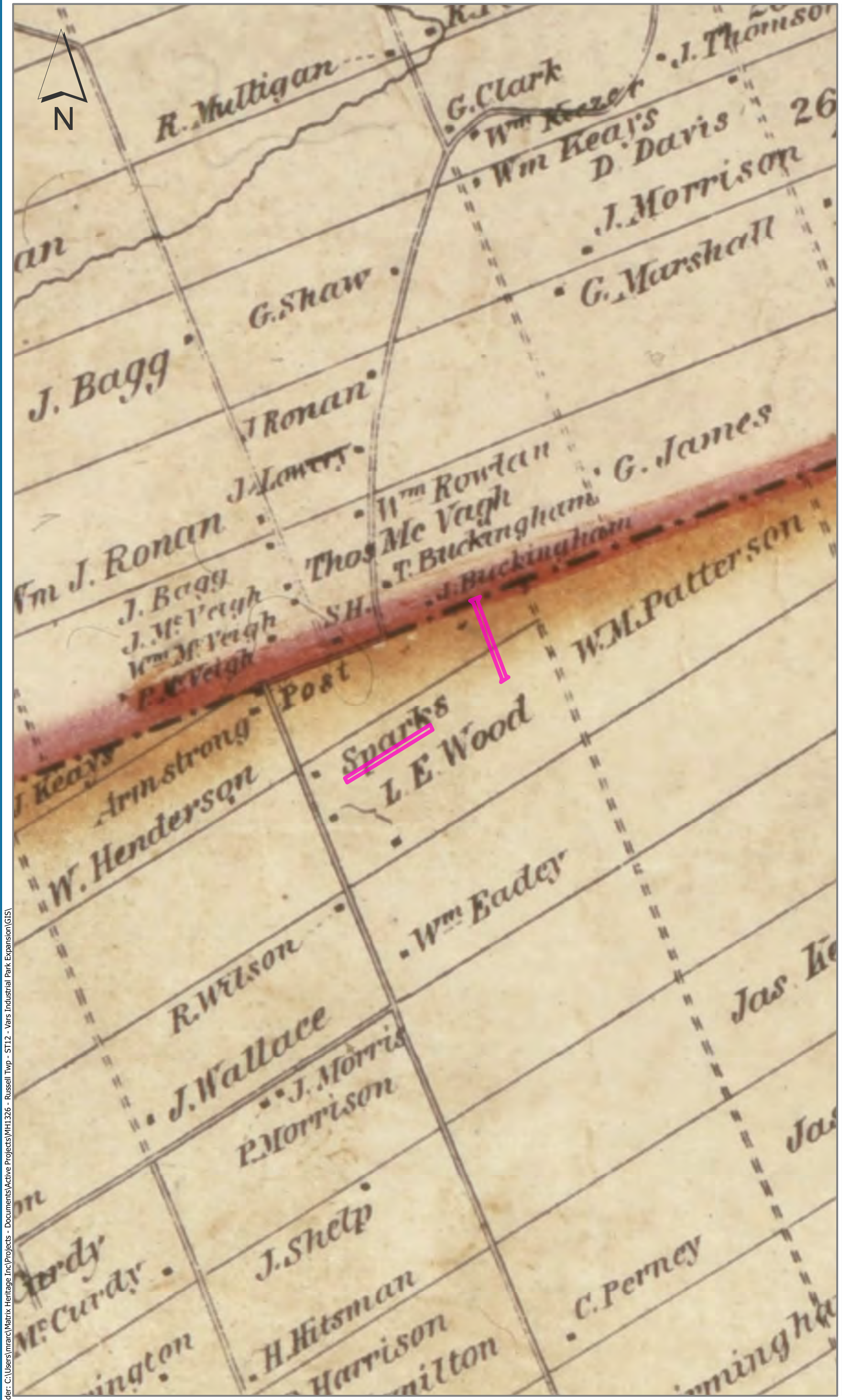
PROJECTION: NAD 1983 UTM Zone 18N

PROJECT
STAGE 1 AND 2 ARCHAEOLOGICAL ASSESSMENT
INDUSTRIAL PARK EXPANSION, VARS, ON

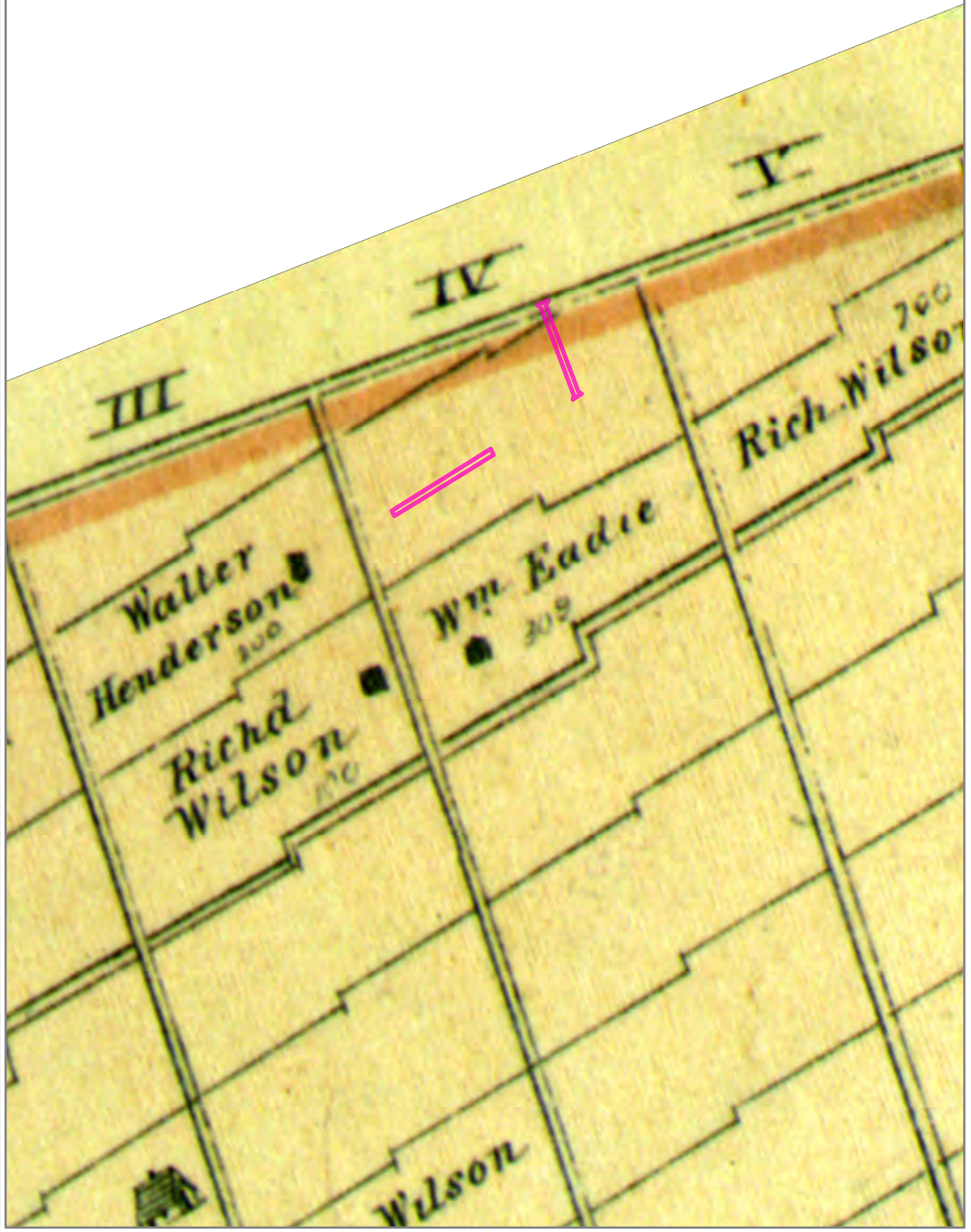
TITLE
PREVIOUS ASSESSMENT

MAP
3

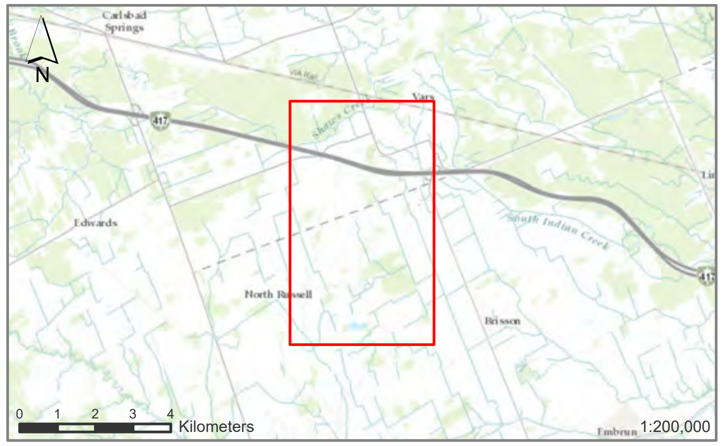
Folder: C:\Users\BenMortimer\Matrix Heritage Inc\Projects - Documents\Active Projects\MH1326 - Russell Twp - ST12 - Vars Industrial Park Expansion\GIS



WALLING 1862



BELDEN 1881



LEGEND

▭ STUDY AREA

0 210 420 630 840
Meters

1:25,000

REFERENCES:
CITY OF OTTAWA, PROVINCE OF ONTARIO, ESRI CANADA, ESRI, HERE, GARMIN, USGS, NGA, EPA, USDA, NPS, AAFC, NRCAN

SEGMENT OF THE 1862 STORMONT, DUNDAS, GLENGARRY, PRESCOTT AND RUSSELL MAP BY D. P. PUTNAM

SEGMENT OF RUSSELL IN THE 1881 PRESCOTT & RUSSELL CO. SUPPLEMENT IN THE ILLUSTRATED ATLAS OF THE DOMINION OF CANADA, BY H. BELDEN

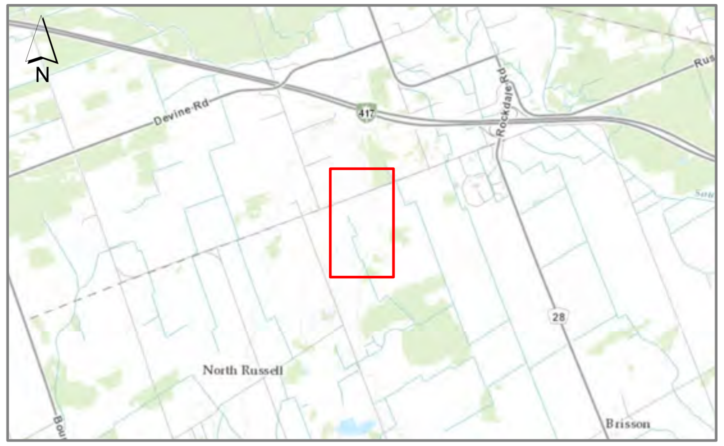
FILE M1326
DATE 2024-09-18
CREATED BY: DW
PROJECTION: NAD 1983 UTM Zone 18N
CHECKED BY: BM

PROJECT
STAGE 1 AND 2 ARCHAEOLOGICAL ASSESSMENT
INDUSTRIAL PARK EXPANSION, VARS, ON

TITLE
HISTORIC

MAP
4

Folder: C:\Users\mrarc\Matrix Heritage Inc\Projects - Documents\Active Projects\MH1326 - Russell Twp - ST12 - Vars Industrial Park Expansion\GIS\



LEGEND

▭ STUDY AREA

METHODS

AREAS OF ARCHAEOLOGICAL POTENTIAL

🟦 SHOVEL TEST (5 M INTERVAL)

🟩 PEDESTRIAN; PEDESTRIAN (5 M)

△ PHOTO LOCATION, DIRECTION, AND FIGURE NUMBER

Matrix

0 90 180 270 360 Meters 1:5,500

REFERENCES:
CITY OF OTTAWA, PROVINCE OF ONTARIO, ESRI CANADA, ESRI, HERE, GARMIN, INCREMENT P, USGS, METI/NASA, NGA, EPA, USDA, AAFC, NRCAN, GOOGLE, SDG COUNTIES, MAXAR

FILE M1326

DATE 2024-12-15

CREATED BY: DW

CHECKED BY: BM

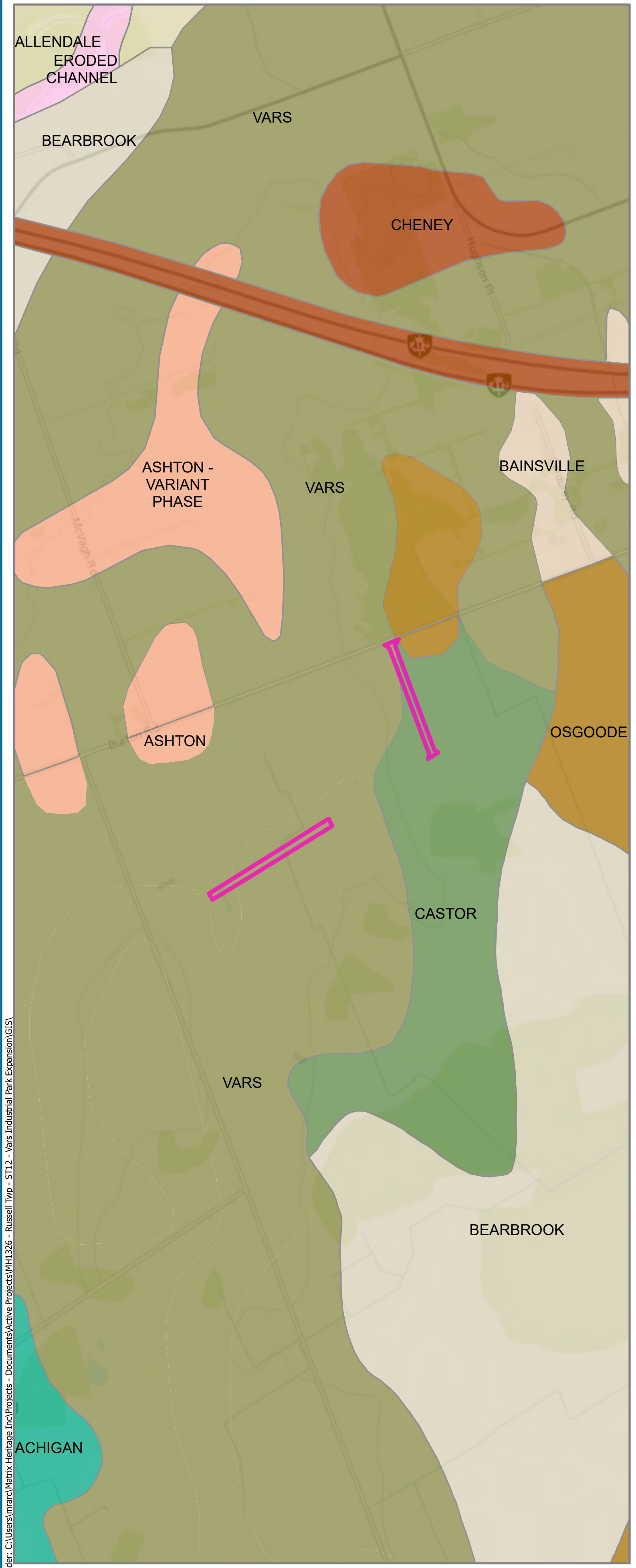
PROJECTION: NAD 1983 UTM Zone 18N

PROJECT
STAGE 1 AND 2 ARCHAEOLOGICAL ASSESSMENT
INDUSTRIAL PARK EXPANSION, VARS, ON

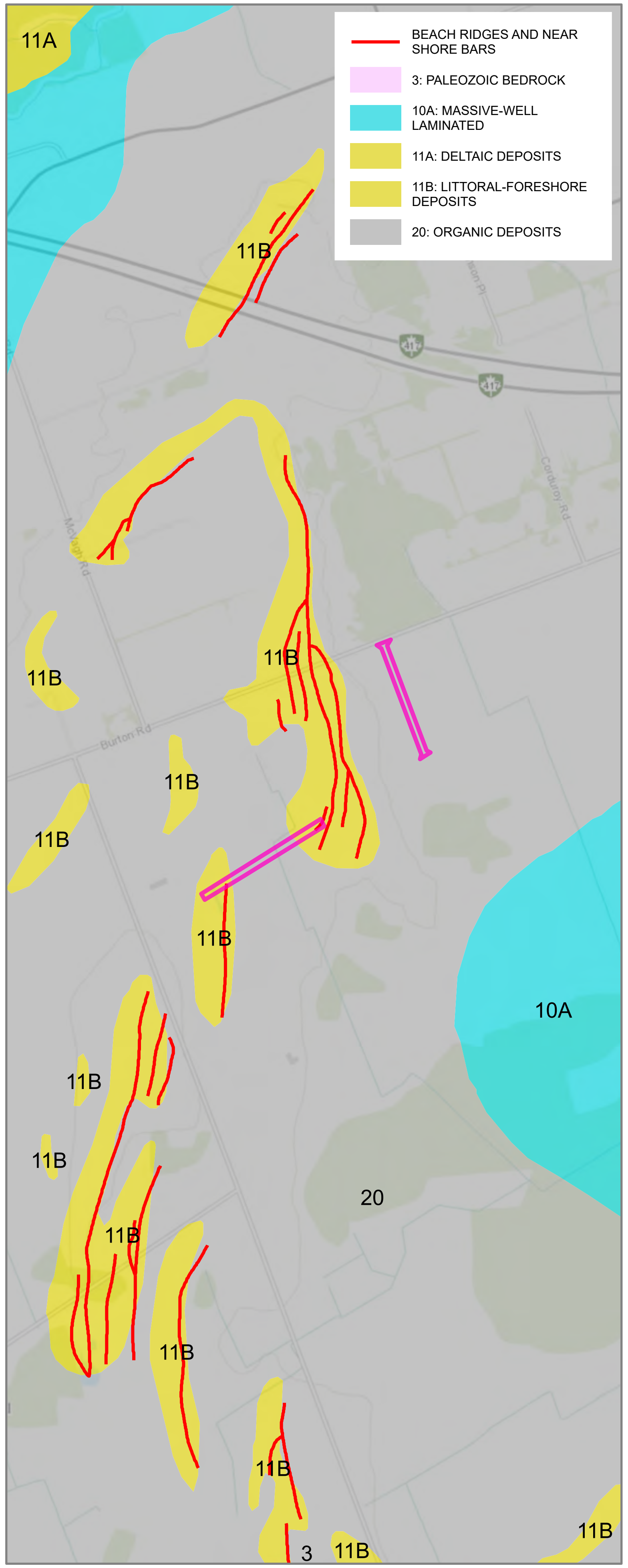
TITLE
CONDITIONS, METHODS, KEY

MAP 5

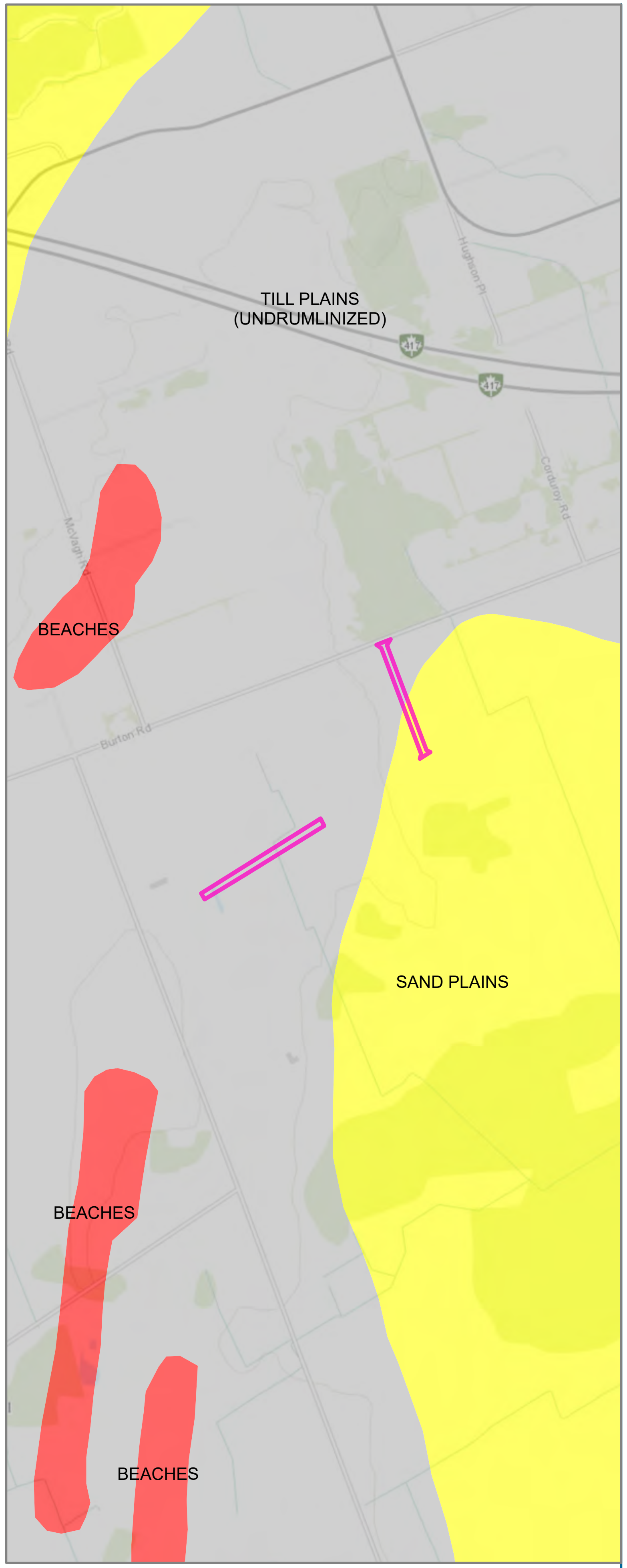
Folder: C:\Users\mrarc\Matrix Heritage Inc\Projects - Documents\Active Projects\MH1326 - Russell Twp - ST12 - Vars Industrial Park Expansion\GIS\



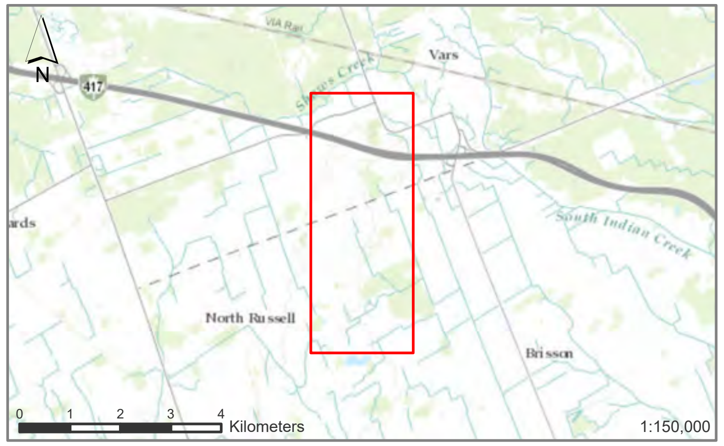
SOIL SURVEY COMPLEX



SURFICIAL GEOLOGY



PHYSIOGRAPHY



LEGEND

☐ STUDY AREA

0 340 680 1,020 1,360 Meters

1:20,000

REFERENCES:
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SOIL SURVEY COMPLEX LIO
SURFICIAL GEOLOGY OF SOUTHERN ONTARIO 2003
CHAPMAN AND PUTNAM 2007 PHYSIOGRAPHY OF SOUTHERN ONTARIO

FILE M1326
DATE 2024-09-18
CREATED BY: DW
PROJECTION: NAD 1983 UTM Zone 18N
CHECKED BY: BM

PROJECT
STAGE 1 AND 2 ARCHAEOLOGICAL ASSESSMENT
INDUSTRIAL PARK EXPANSION, VARS, ON

TITLE
SOILS AND GEOLOGY

MAP
6

Folder: C:\Users\mrarc\Matrix Heritage Inc\Projects - Documents\Active Projects\MH1326 - Russell Twp - ST12 - Vars Industrial Park Expansion\GIS\

Appendix A: Photographic Catalogue

Photo #	Description	Bearing	Date	Photographer
MH1326-D001	Overview of eastern section of Émard Street extension	222	3-Oct-2024	N. Kopp
MH1326-D002	Overview of eastern section of Émard Street extension	58	3-Oct-2024	N. Kopp
MH1326-D003	Overview of eastern section of Émard Street extension	109	3-Oct-2024	N. Kopp
MH1326-D004	Overview of eastern section of Émard Street extension	266	3-Oct-2024	N. Kopp
MH1326-D005	Overview of eastern section of Émard Street extension	99	3-Oct-2024	N. Kopp
MH1326-D006	Overview of eastern section of Émard Street extension	72	3-Oct-2024	N. Kopp
MH1326-D007	Overview of eastern section of Émard Street extension	178	3-Oct-2024	N. Kopp
MH1326-D008	Overview of eastern section of Émard Street extension	221	3-Oct-2024	N. Kopp
MH1326-D009	Pedestrian survey of eastern section of Émard Street extension	276	3-Oct-2024	N. Kopp
MH1326-D010	Overview of eastern section of Émard Street extension	178	3-Oct-2024	N. Kopp
MH1326-D011	Overview of eastern section of Émard Street extension	220	3-Oct-2024	N. Kopp
MH1326-D012	Overview of eastern section of Émard Street extension	192	3-Oct-2024	N. Kopp
MH1326-D013	Pedestrian survey of eastern section of Émard Street extension	295	3-Oct-2024	N. Kopp
MH1326-D014	Overview of eastern section of Émard Street extension	97	3-Oct-2024	N. Kopp
MH1326-D015	Overview of eastern section of Émard Street extension	85	3-Oct-2024	N. Kopp
MH1326-D016	Pedestrian survey of eastern section of Émard Street extension	33	3-Oct-2024	N. Kopp
MH1326-D017	Pedestrian survey of eastern section of Émard Street extension	285	3-Oct-2024	N. Kopp
MH1326-D018	Pedestrian survey of eastern section of Émard Street extension	285	3-Oct-2024	N. Kopp
MH1326-D019	Test pitting central forested section of Robot Street extension	165	15-Oct-2024	M. Hunter
MH1326-D020	Pedestrian survey of southern section of Robot Street extension	128	15-Oct-2024	M. Hunter
MH1326-D021	Overview of southern section of Robot Street extension	148	15-Oct-2024	M. Hunter
MH1326-D022	General conditions of central forested section of Robot Street extension	96	15-Oct-2024	M. Hunter
MH1326-D023	General conditions of central forested section of Robot Street extension	80	15-Oct-2024	M. Hunter
MH1326-D024	Pedestrian survey of southern section of Robot Street extension	343	15-Oct-2024	M. Hunter
MH1326-D025	Overview of northern section of Robot Street extension	193	15-Oct-2024	M. Hunter
MH1326-D026	General conditions of central forested section of Robot Street extension	89	15-Oct-2024	M. Hunter
MH1326-D027	Typical stratigraphy found throughout test pitting section of Robot Street extension	167	15-Oct-2024	M. Hunter
MH1326-D028	Test pitting central forested section of Robot Street extension	173	15-Oct-2024	M. Hunter
MH1326-D029	Test pitting central forested section of Robot Street extension	344	15-Oct-2024	M. Hunter
MH1326-D030	Pedestrian survey of northern section of Robot Street extension	344	15-Oct-2024	M. Hunter
MH1326-D031	Test pitting central forested section of Robot Street extension	255	15-Oct-2024	M. Hunter
MH1326-D032	Field conditions of Robot Street extension	359	15-Oct-2024	M. Hunter

MH1326-D033	Pedestrian survey of northern section of Robot Street extension	331	15-Oct-2024	M. Hunter
MH1326-D034	Pedestrian survey of northern section of Robot Street extension	272	15-Oct-2024	M. Hunter
MH1326-D035	Overview of western section of Émard Street extensions	E	25-Nov-2024	A. Jackson
MH1326-D036	Overview of western section of Émard Street extensions	E	25-Nov-2024	A. Jackson
MH1326-D037	Overview of western section of Émard Street extensions	NW	25-Nov-2024	A. Jackson
MH1326-D038	Close up overview of western section of Émard Street extensions	E	25-Nov-2024	A. Jackson
MH1326-D039	Close up overview of western section of Émard Street extensions	E	25-Nov-2024	A. Jackson
MH1326-D040	Overview of western section of Émard Street extensions	E	25-Nov-2024	A. Jackson
MH1326-D041	Overview of western section of Émard Street extensions	Down	25-Nov-2024	A. Jackson
MH1326-D042	Overview of western section of Émard Street extensions	45	25-Nov-2024	A. Jackson
MH1326-D043	Overview of western section of Émard Street extensions	E	25-Nov-2024	A. Jackson
MH1326-D044	Overview of western section of Émard Street extensions	N	25-Nov-2024	A. Jackson

Appendix B: Document Catalogue

Project	Description	Created By
MH1326	Vars Industrial Park Expansion Field Notes - Stage 2 (One Note File)	N. Kopp

Appendix C: Map Catalogue

Map Number	Description	Created By
1	Location	B. Mortimer
2	Development Plan	B. Mortimer
3	Previous Assessment	B. Mortimer
4	Historic	B. Mortimer
5	Methodology, Photo Key, Conditions	B. Mortimer
6	Soils and Geology	B. Mortimer

APPENDIX E

Built Heritage Resources and Cultural Heritage Assessment

Ministry of Tourism,
Culture and Sport

Programs & Services Branch
401 Bay Street, Suite 1700
Toronto ON M7A 0A7

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
417 Industrial Park, Road Network Expansion, Township of Russell, ON

Project or Property Location (upper and lower or single tier municipality)
Emard St, Russell, ON

Proponent Name
Township of Russell

Proponent Contact Information
François Landry (613-809-1963)

Screening Questions

	Yes	No
1. Is there a pre-approved screening checklist, methodology or process in place?	☐	☑

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?	☐	☑

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 *Ontario Heritage Act* as being of cultural heritage value?	☐	☑
b. a National Historic Site (or part of)?	☐	☑
c. designated under the *Heritage Railway Stations Protection Act*?	☐	☑
d. designated under the *Heritage Lighthouse Protection Act*?	☐	☑
e. identified as a Federal Heritage Building by the Federal Heritage Buildings Review Office (FHBRO)?	☐	☑
f. located within a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site?	☐	☑

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?	☐	☑
b. has or is adjacent to a known burial site and/or cemetery?	☐	☑
c. is in a Canadian Heritage River watershed?	☐	☑
d. contains buildings or structures that are 40 or more years old?	☐	☑

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?	☐	☑
b. has a special association with a community, person or historical event?	☐	☑
c. contains or is part of a cultural heritage landscape?	☐	☑

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)

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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)

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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

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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@ontario.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.

APPENDIX F

Traffic Impact Study

417 Industrial Park Expansion

Traffic Impact Study

Township of Russell, Ontario

Presented to:

François Landry
Project Manager, Infrastructure Services
Township of Russell

January 28, 2025

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1. INTRODUCTION

Morrison Hershfield now Stantec has been retained by the Township of Russell to prepare a Traffic Impact Study (TIS) for further development within the 417 Industrial Park located in Township of Russell, Ontario. The proposed development is poised to be constructed north and west of the existing intersection of Emard Street and Robot Street, south of Burton Road. The overall development site will include an overall area of 58.2 acres (23.55 hectares), split into five (5) parcels. The purpose of this report is to identify traffic related impacts on the adjacent road network resulting from the additional trips generated from the new development and recommend improvements to existing intersections, if applicable. This report is structured to describe the proposed development, existing traffic conditions, and assessment of the future condition with or without the proposed development.

Since no TIS guidelines were available for the Township of Russell, this report generally follows the MTO TIS guidelines and documents the findings related to traffic operations in the vicinity of the proposed commercial development for existing and future scenarios.

We acknowledge there are no functional designs for the entrances to the proposed commercial subdivision as part of this submission.

2. PROPOSED DEVELOPMENT

The municipal address of the proposed development is currently unknown. The subject lands are generally situated within the area bound by Burton Road to the north, Emard Street to the south, and Corduroy Road to the east, as shown in **Figure 1**.

Figure 1: Site Location

2.1.1 Land Uses, Permitted Use and Relevant Planning Regulations

Under the Schedule A-5 of the Township of Russell Official Plan, the proposed site is designated as an Industrial Park. In the Township of Russell Official Plan Review Final Policy Directions Report, completed in September 2024, an expansion of the 417 Industrial Park is identified. The changes approved by the County in OP Schedule 2A includes additional lands west and south of the current limits, adding an additional 112 hectares designated for employment uses. However, the changes will have no impact on the proposed development.

2.1.2 Site Layout and Access

The overall development site comprises of five (5) parcels totalling 58.2 acres or 23.55 hectares. **Figure 2** illustrates the boundaries of the proposed development provided by the Township of Russell. The development will be bound by Burton Road to the north and Emard Street to the south. Additionally, the proposed extension to Robot Street is anticipated to be constructed by 2026 which will run through the proposed development while providing site access.

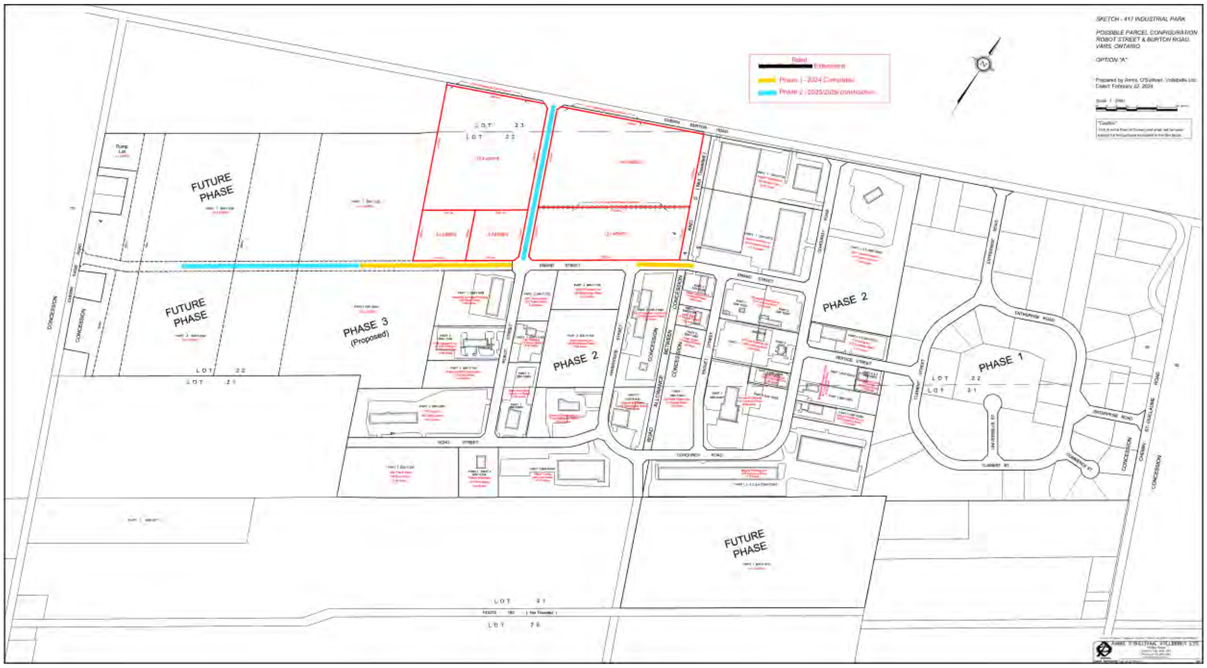

Figure 2: Proposed Site Plan *(Source: Township of Russell)*

2.1.2.1 Driveways

The main access to the parcels within the proposed development are expected to be provided from the extension of Robot Street or Emard Street. It is not expected access will be provided on Burton Road as the main access will be provided through the internal access roadways within the industrial park.

Based on the Transportation Association of Canada Geometric Design Guideline for Canadian Roads, the maximum number of driveway accesses to the property is based on the frontage. The parcels will have varying frontages as low as 116m up to 256m on either Robot Street or Emard Street. Based on this range, each parcel could have up to 3 driveways for frontages from 51 – 150m or 4+ for frontages exceeding 150m.

Each driveway should be spaced at least 3m apart and should be spaced at a sufficient distance (minimum corner radius) away from the property line to accommodate the turning path on inbound and outbound vehicles. The driveway accesses should consider driveways on the opposite side of the road on the spacing and location.

2.1.3 Estimated Date of Occupancy and Planned Phasing of Development

It is anticipated construction within the 5 parcels within the site will be phased and developed over a course of the next 5 to 10 years.

2.1.4 Anticipated Hours of Operation

It is anticipated that the proposed development will operate throughout the day with hours similar to that of other existing businesses within the industrial park. A review of existing businesses in the industrial park have operating hours ranging from 7:00 AM to 5:00 PM during the weekday and are closed during weekends.

2.1.5 Parking Spaces

The number of parking spaces within each parcel is currently unknown and will be identified during the development of each respective site plan.

3. EXISTING CONDITIONS

3.1 Road Network

All roadways within the project limits have a rural cross section with shoulders and ditching.

Burton Road / Eadie Road - The Burton Road / Eadie intersection is an unsignalized, T-intersection. The east and west approaches (Burton Road) have a posted speed limit of 80 km/h and consist of one lane in each direction. The south approach (Eadie Road) has a posted speed limit of 80 km/h and consists of a single lane in each direction. Traffic along the east and west approaches is free-flow, whereas the southern approach on Eadie Road is stop-controlled. Pedestrian crosswalks are absent at this intersection.

St. Guillaume Road / Burton Road / St. Pierre Road - The St. Guillaume Road / Burton Road / St. Pierre Road intersection is a roundabout. The east and west approaches (Burton Road and St. Pierre Road, respectively) have a posted speed limit of 80 km/h and consist of one lane each along each direction. The north and south approach (St. Guillaume Road) has a posted speed limit of 50 km/h and consists of one lane in each direction. Ladder style pedestrian crosswalks are provided on the north, east and west approaches at this intersection.

St. Guillaume Road / Enterprise Road - The St. Guillaume Road / Enterprise Road intersection is an unsignalized T-intersection. The north and south approaches (St. Guillaume Road) have a posted speed limit of 50 km/h and consist of one lane in each direction. The west approach (Enterprise Road) has a posted speed limit of 50 km/h and consist of one lane each along each direction. Traffic along the north and south approaches is free-flow, whereas the western approach on Enterprise Road is stop-controlled. Pedestrian crosswalks are absent at this intersection.

Burton Road / Corduroy Road – The Burton Road / Corduroy Road intersection is a signalized four-legged intersection. The east and west approaches (Burton Road) consist of a single lane in each direction and have a posted speed limit of 80 km/h. The north and south approaches (Corduroy Road) consist of a single lane in each direction and have a posted speed limit of 50 km/h. Traffic along east and west approaches (Burton Road) is free flow, whereas traffic along the north and south approaches (Corduroy Road) is stop-controlled. Pedestrian crosswalks are absent at this intersection.

Burton Road / Enterprise Road - The Burton Road / Enterprise Road intersection is an unsignalized T-intersection. The east and west approaches (Burton Road) have a posted speed limit of 80 km/h and consist of one lane in each direction. The south approach (Enterprise Road) has a posted speed limit of 50 km/h and consists of a single lane in each direction. Traffic along the east and west approaches is free-flow, whereas the southern approach on Enterprise Road is stop-controlled. Pedestrian crosswalks are absent at this intersection.

Burton Road / Robot Street- The Burton Road / Robot Street intersection is a planned intersection expected to be constructed by 2025-2026. This intersection is anticipated to be an unsignalized T-intersection. The east and west approaches (Burton Road) have a posted speed limit of 80 km/h and consist of one lane in each direction. The southern approach (Robot Street) has an assumed unposted speed limit of 50 km/h. Traffic along the east and west approaches is expected to be free flow, whereas traffic along the southern approach is expected to be stop-controlled. No pedestrian crosswalks are expected at this intersection. This intersection is not considered in the analysis of existing conditions but is included in the analysis of future scenarios

3.2 Pedestrian Network

The pedestrian network within the study area is non-existent, with no sidewalks or pedestrian crossings at any of the roads and intersections, respectively.

3.3 Cycling Network

Cycling network within the vicinity of the proposed site is non-existent.

3.4 Transit Network

There are no transit routes currently operating on the streets included within the study area.

3.5 Existing Road Safety Conditions

Collision information was not provided by the Township of Russell for the intersections within the study area. Therefore, no analysis of collision data is included in the TIS.

3.6 Road Network

For the purpose of this assessment, six study area intersections have been identified for intersection capacity analysis, as noted below. Weekday AM and PM peak hour turning movement counts for three of the subject intersections (Eadie / Burton, St. Guillaume / Enterprise, and Burton / St. Guillaume / St. Pierre) were collected as part of the Russell Transportation Master Plan Update. Turning movement counts for the remaining intersections were carried out by Ontario Traffic Inc. The dates when the traffic counts were conducted are included in parentheses. The detailed turning movement counts obtained for the five intersections can be found in **Appendix A**.

- **Unsignalized**
    - Eadie Road / Burton Road (21 March 2024)
    - St. Guillaume Road / Enterprise Road (24 April 2024)
    - Burton Road / Corduroy Road (6 November 2024)
    - Burton Road / Enterprise Street (6 November 2024)
    - Burton Road / Robot Street (Future intersection expected to be constructed by 2026)
- **Roundabout**
    - Burton Road / St. Guillaume Road / St. Pierre Road (24 April 2024)

These are the six closest intersections within the vicinity of the proposed development and are anticipated to experience additional traffic impacts resulting from the trips generated to / from the site.

Figure 3 portrays the existing (2024) traffic conditions within the study area, excluding the Burton Road and Robot Street intersection.

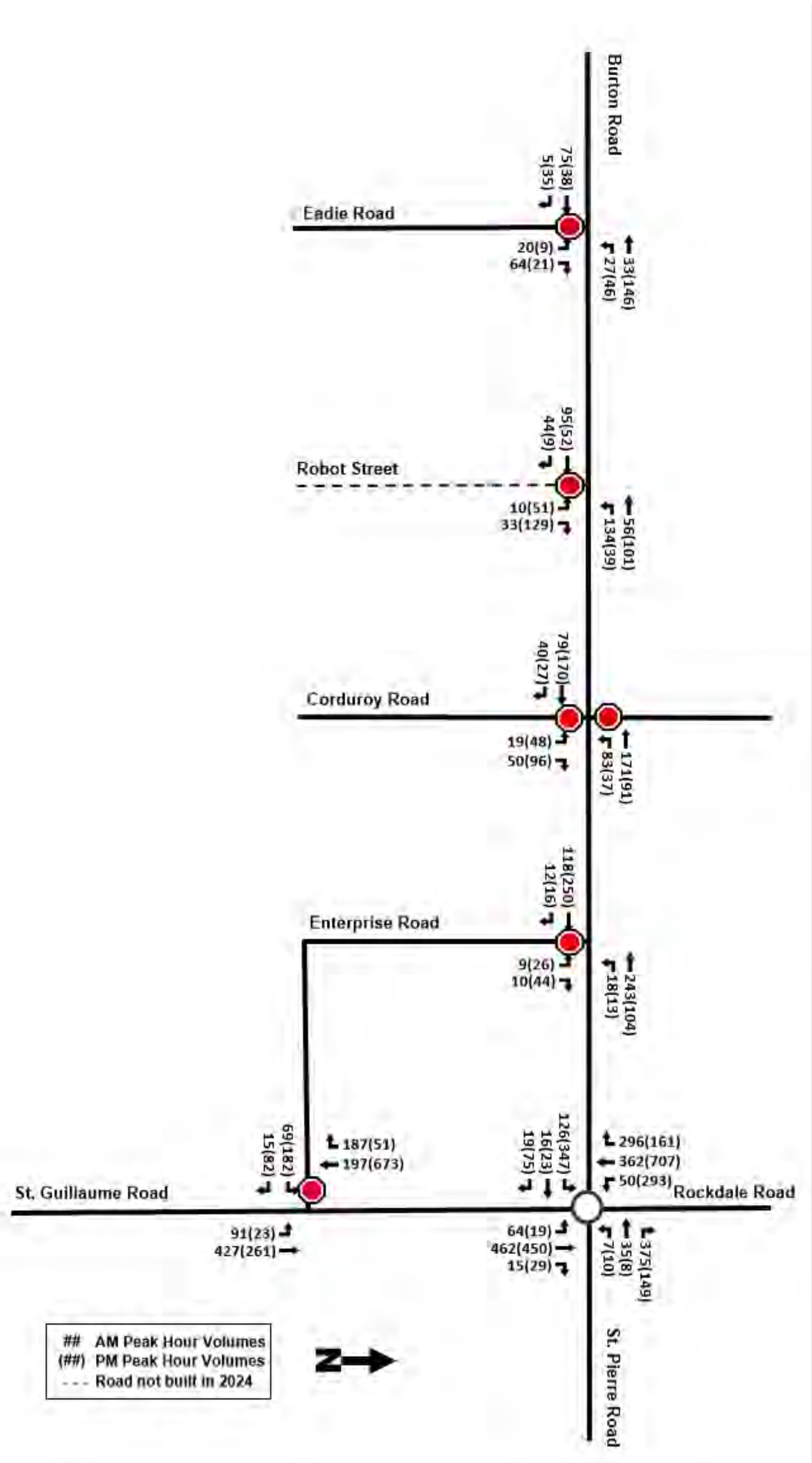

Figure 3: Existing Traffic Volumes (2024)

4. PLANNED CONDITIONS

4.1 Study Area and Time Periods

4.1.1 Study Area

The following study area intersections were examined for this TIS:

- Eadie Road / Burton Road
- St. Guillaume Road / Enterprise Road
- Burton Road / Corduroy Road
- Burton Road / Enterprise Street
- Burton Road / Robot Street (Future planned intersection)
- Burton Road / St. Guillaume Road / St. Pierre Road (roundabout)

It is anticipated that these six intersections will capture most of the projected traffic generated by the proposed development. The traffic impacts from the proposed development beyond the six identified intersections should be minimal relative to existing traffic volumes.

4.1.2 Time Periods

Given the surrounding road network (e.g., Burton Road, St. Guillaume Road) typically experiences the heaviest traffic volumes during the weekday morning and evening peak hours, this TIS considers weekday morning and evening peak hours.

4.1.3 Horizon Years

The following scenarios are analyzed as part of this TIS for both the AM and PM peak hours:

- Existing Conditions (2024)
- Background (No-build) Conditions (2034)
- Future (Build) Conditions (2034)

4.2 Growth Rate

Given the 10-year horizon period for this study, a nominal growth rate of 2% per year is assumed for all the study area intersections to reflect increasing traffic volumes in the area and generate background growth.

5. FORECASTING

5.1 Development-Generated Travel Demand

5.1.1 Trip Generation

For the purpose of this assessment, projected site-generated vehicular trips to / from the proposed development were estimated using the ITE Trip Generation Online Tool which makes use of the Trip Generation Manual, 11th Edition as its data source. The land use code '110 – General Light Industrial is used as an input for generating the site trips. The Independent Variable (IV) used for site trip generation is 'Employees'. An employee density of 20 employees per hectare was considered as an estimate during the ongoing Russell Transportation Master Plan Update. Since the total for the development parcels is identified to be 23.55 hectares, a requirement of 471 employees is estimated. Consequently, the independent variable (IV) used as the input for generating trips is 471 and the 'average rate' methodology was used to calculate trip ends.

Based on the information provided, **Table 1** displays the resulting projected two-way vehicular site trip generation for the given land use of development.

Table 1: Projected Site Vehicular Trip Generation, Peak Hours

Land Use	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
110 – General Light Industrial	207	43	250	51	180	231
Total Vehicular Trips	207	43	250	51	180	231

As shown in **Table 1**, the site is expected to generate a total of 481 vehicular trips during both peak hours. 250 vehicular trips are expected to be made in the AM peak hour, and 231 vehicular trips are expected to be made in the PM peak hour.

5.1.2 Trip Distribution and Assignment

The projected distribution of site-generated vehicular traffic is assumed to be like the existing travel patterns, considering the site's connections to / from the surrounding road network, and local area knowledge. Based on the assumed trip distribution, projected site-generated traffic was assigned to the study area network, which is depicted in the following **Figure 4**.

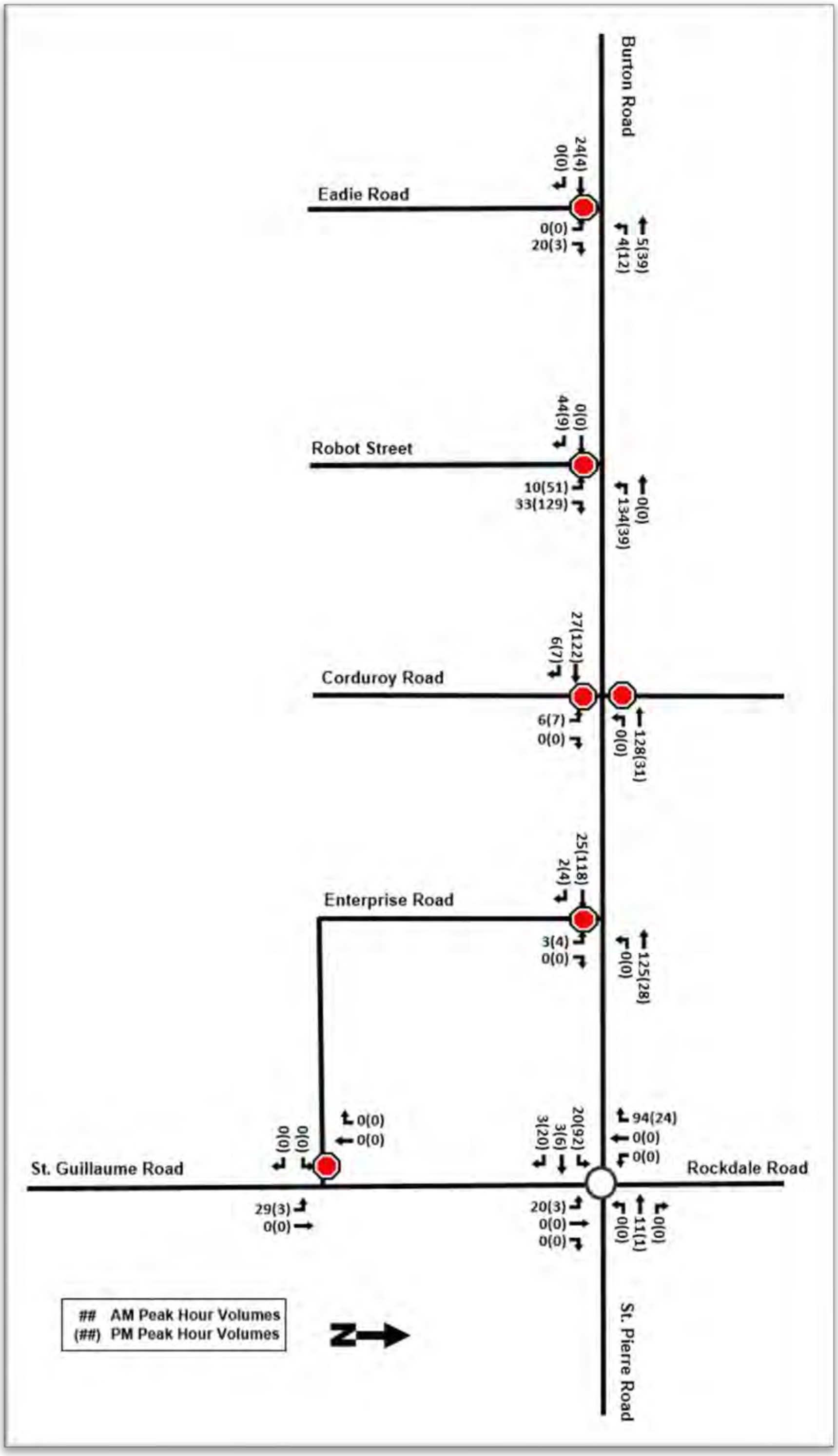

Figure 4: Site Generated Vehicular Trips

6. DEMAND RATIONALIZATION

The following section summarizes the study area intersection capacity analysis for Existing, Background and Future Traffic Volume scenarios. The scenarios to be analyzed are described in **Section 4.1.3**.

Using the intersection capacity analysis software Synchro (v12), study area intersections were assessed in terms of vehicle delay, volume-to-capacity ratio (v/c) and the corresponding Level of Service (LOS) as per the Highway Capacity Manual (HCM) 2000 standards. Junctions 9 (Arcady) software is used to evaluate roundabout traffic operations. **Table 2** shows the vehicular level of service that corresponds to each v/c ratio.

Table 2: Level of Service vs. V/C Ratio

Level of Service	Volume to Capacity Ratio
A	0 to 0.60
B	0.61 to 0.70
C	0.71 to 0.80
D	0.81 to 0.90
E	0.91 to 1.00
F	> 1.00

7. ANALYSIS SCENARIOS

7.1 Existing Traffic Conditions (2024)

Based on volumes depicted in **Figure 3**, **Table 3** and **Table 4** summarize the existing performance of the unsignalized study area intersections and the roundabout, respectively. Detailed Synchro and Junctions 9 output data is provided in **Appendix B** and **Appendix C**, respectively.

Table 3: Unsignalized Intersection Operations – Existing (2024) Conditions AM (PM)

Intersections	Movement	LOS	V/C	Delay (s)	95th %^{ile} Queue (m)
Eadie / Burton	EBT	A (A)	0.03 (0.04)	0.0 (0.0)	0.0 (0.0)
	EBR	A (A)	0.03 (0.04)	0.0 (0.0)	0.0 (0.0)
	WBL	A (A)	0.01 (0.02)	0.1 (0.2)	0.3 (0.4)
	WBT	A (A)	0.01 (0.02)	3.4 (1.9)	0.3 (0.4)
	NBL	A (A)	0.06 (0.03)	9.0 (9.0)	1.4 (0.6)
	NBR	A (A)	0.06 (0.03)	9.0 (9.0)	1.4 (0.6)
	Overall	**A (A)**	**0.19 (0.23)**	**4.3 (2.1)**	**-**
St. Guillaume / Enterprise	EBL	C (D)	0.22 (0.68)	18.7 (35.0)	6.4 (36.1)
	EBR	C (D)	0.22 (0.68)	18.7 (35.0)	6.4 (36.1)
	NBL	A (A)	0.05 (0.02)	0.5 (0.2)	1.1 (0.5)
	NBT	A (A)	0.05 (0.02)	1.4 (0.8)	1.1 (0.5)
	SBT	A (A)	0.20 (0.38)	0.0 (0.0)	0.0 (0.0)
	SBR	A (A)	0.20 (0.38)	0.0 (0.0)	0.0 (0.0)
	Overall	**A (A)**	**0.53 (0.51)**	**2.4 (7.4)**	**-**
Burton / Corduroy	EBT	A (A)	0.00 (0.00)	0.0 (0.0)	0.0 (0.0)
	EBR	A (A)	0.00 (0.00)	0.0 (0.0)	0.0 (0.0)
	WBL	A (A)	0.05 (0.03)	0.4 (0.2)	1.2 (0.6)
	WBT	A (A)	0.05 (0.03)	5.2 (3.1)	1.2 (0.6)
	NBL	A (A)	0.07 (0.13)	9.8 (9.5)	1.7 (3.5)
	NBR	A (A)	0.07 (0.13)	9.8 (9.5)	1.7 (3.5)
	Overall	**A (A)**	**0.22 (0.24)**	**4.6 (5.4)**	**-**
Burton / Enterprise	EBT	A (A)	0.05 (0.08)	0.0 (0.0)	0.0 (0.0)
	EBR	A (A)	0.05 (0.08)	0.0 (0.0)	0.0 (0.0)
	WBL	A (A)	0.01 (0.01)	0.1 (0.1)	0.3 (0.2)
	WBT	A (A)	0.01 (0.01)	1.1 (1.3)	0.3 (0.2)
	NBL	A (A)	0.02 (0.07)	9.5 (9.6)	0.4 (1.7)
	NBR	A (A)	0.02 (0.07)	9.5 (9.6)	0.4 (1.7)
	Overall	**A (A)**	**0.23 (0.21)**	**1.2 (2.5)**	**-**

Table 4: Roundabout Operations – Existing (2024) Conditions AM (PM)

Intersections	Approach	LOS	V/C	Delay (s)	Queue (m)
St. Guillaume / St. Pierre / Burton	East	A (A)	0.20 (0.09)	2.38 (2.39)	0.2 (0.1)
	West	A (A)	0.07 (0.15)	2.08 (2.09)	0.1 (0.2)
	North	A (A)	0.25 (0.47)	2.16 (3.12)	0.3 (0.9)
	South	A (A)	0.25 (0.21)	2.58 (2.20)	0.3 (0.3)

All four unsignalized intersections within the study area are observed to be functioning reasonably well, operating at LOS C or better in the AM peak hour and LOS D or better in the PM peak hour in the existing conditions. The V/C ratios for these also indicate smooth intersection operations, with intersections operating at V/C ratio of 0.22 or better in the AM peak hour, and 0.68 or better in the PM peak hour. The highest LOS (C) is observed for the EBL and EBR movements at the St. Guillaume / Enterprise intersection in the AM peak hour, while the same movements operate at LOS D in the PM peak hour. There is some queue building up for this movement, specifically in the PM peak with a 36.1 metre 95th percentile queue. This can be attributed to the presence of a single lane facilitating both the EBL and EBR movements and the limited opportunities for vehicles to identify gaps in traffic along St. Guillaume Road to complete the turning manoeuvre. However, the identified queues are contained within the available storage length (~180 meters) on Enterprise Street. Overall, the intersection is seen to be functioning well, operating under capacity during the existing (2024) conditions in both peak hours.

Smooth traffic operations are observed at the St. Guillaume / St. Pierre / Burton roundabout in existing conditions, with all approaches operating at LOS A and V/C ratio of 0.47 or better in both peak hours. Queuing concerns are minimal at all approaches of the roundabout, with a maximum queue of 0.9 metres observed for the north approach in the PM peak hour.

7.2 Background Traffic Conditions (2034)

The traffic volumes comprising of existing trips projected to the year 2034 using the growth considerations mentioned earlier in **Section 4.2** is shown in **Figure 5**. This scenario depicts the future traffic volumes within the study area if the proposed development is not constructed. Based on the background traffic volumes depicted in **Figure 5**, the projected performance of unsignalized study area intersections and the roundabout are summarized in **Table 5** and **Table 6**, respectively. Critical movements are highlighted in red. Detailed Synchro and Junctions 9 output data is provided in **Appendix B** and **Appendix C**, respectively.

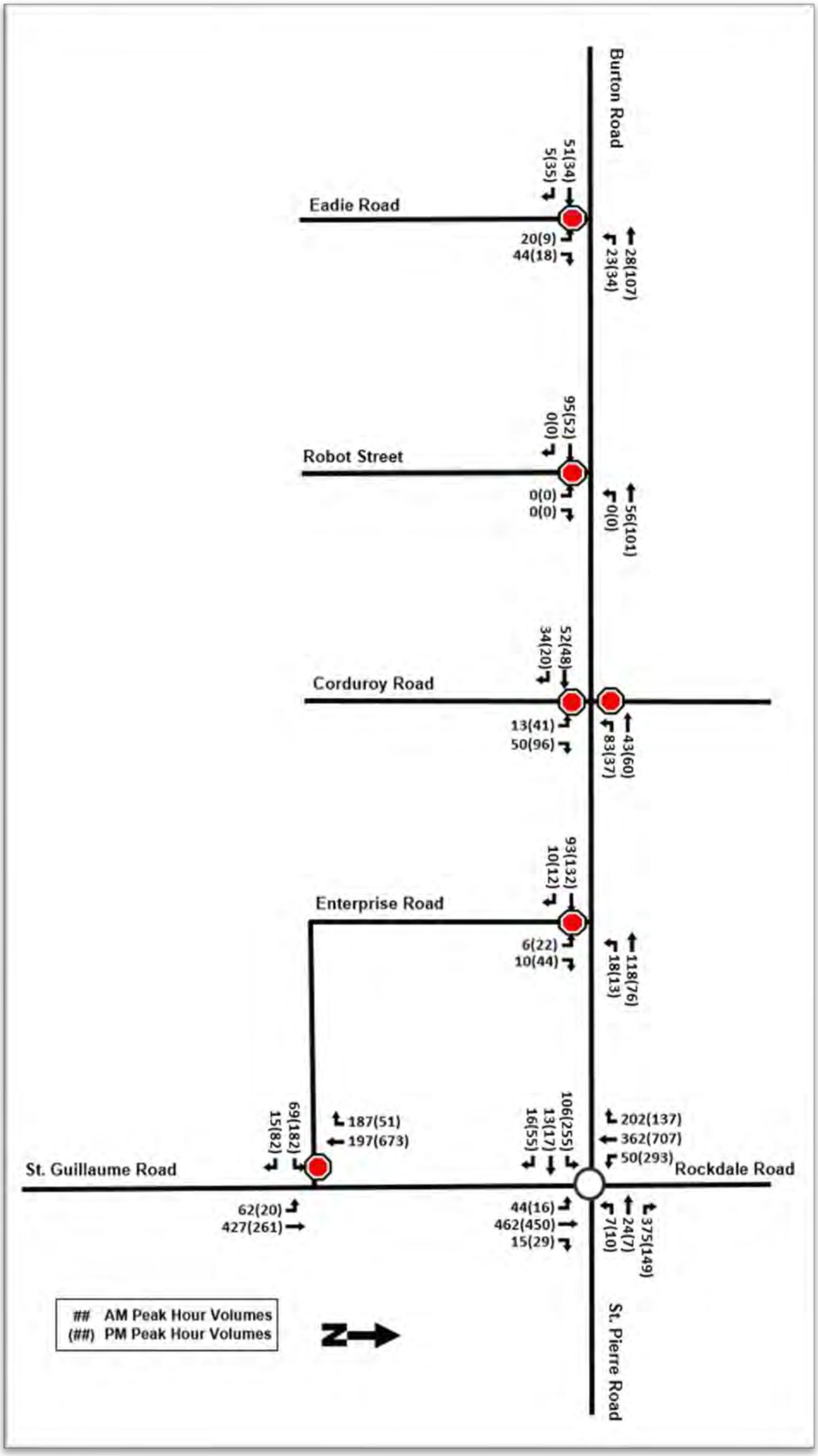

Figure 5: Background (No-build) Conditions (2034)

Table 5: Unsignalized Intersection Operations – Background (No-build) Conditions (2034) AM(PM)

Intersections	Movement	LOS	V/C	Delay (s)	95th %^{ile} Queue (m)
Eadie / Burton	EBT	A (A)	0.04 (0.04)	0.0 (0.0)	0.0 (0.0)
	EBR	A (A)	0.04 (0.04)	0.0 (0.0)	0.0 (0.0)
	WBL	A (A)	0.02 (0.02)	0.1 (0.2)	0.4 (0.6)
	WBT	A (A)	0.02 (0.02)	3.4 (1.9)	0.4 (0.6)
	NBL	A (A)	0.07 (0.03)	9.1 (9.2)	1.8 (0.8)
	NBR	A (A)	0.07 (0.03)	9.1 (9.2)	1.8 (0.8)
	Overall	**A (A)**	**0.20 (0.23)**	**4.5 (2.2)**	**-**
St. Guillaume / Enterprise	EBL	D (F)	0.34 (1.08)	25.4 (118.6)	11.1 (89.2)
	EBR	D (F)	0.34 (1.08)	25.4 (118.6)	11.1 (89.2)
	NBL	A (A)	0.06 (0.03)	0.7 (0.3)	1.4 (0.7)
	NBT	A (A)	0.06 (0.03)	1.6 (1.0)	1.4 (0.7)
	SBT	A (A)	0.25 (0.46)	0.0 (0.0)	0.0 (0.0)
	SBR	A (A)	0.25 (0.46)	0.0 (0.0)	0 (0.0)
	Overall	**B (B)**	**0.62 (0.60)**	**3.1 (24.9)**	**-**
Burton / Corduroy	EBT	A (A)	0.00 (0.00)	0.0 (0.0)	0.0 (0.0)
	EBR	A (A)	0.00 (0.00)	0.0 (0.0)	0.0 (0.0)
	WBL	A (A)	0.06 (0.03)	0.5 (0.3)	1.5 (0.7)
	WBT	A (A)	0.06 (0.03)	5.2 (3.2)	1.5 (0.7)
	NBL	B (A)	0.09 (0.17)	10.1 (9.9)	2.2 (4.6)
	NBR	B (A)	0.09 (0.17)	10.1 (9.9)	2.2 (4.6)
	Overall	**A (A)**	**0.24 (0.27)**	**4.7 (5.5)**	**-**
Burton / Enterprise	EBT	A (A)	0.07 (0.09)	0.0 (0.0)	0.0 (0.0)
	EBR	A (A)	0.07 (0.09)	0.0 (0.0)	0.0 (0.0)
	WBL	A (A)	0.01 (0.01)	0.1 (0.1)	0.3 (0.3)
	WBT	A (A)	0.01 (0.01)	1.1 (1.3)	0.3 (0.3)
	NBL	A (A)	0.02 (0.09)	9.8 (9.9)	0.5 (2.2)
	NBR	A (A)	0.02 (0.09)	9.8 (9.9)	0.5 (2.2)
	Overall	**A (A)**	**0.24 (0.26)**	**1.2 (2.6)**	**-**
Robot / Burton	EBT	A (A)	0.06 (0.03)	0.0 (0.0)	0.0 (0.0)
	EBR	-	-	-	-
	WBL	-	-	-	-
	WBT	A (A)	0.00 (0.00)	0.0 (0.0)	0.0 (0.0)
	NBL	-	-	-	-
	NBR	-	-	-	-
	Overall	**A (A)**	**0.08 (0.09)**	**0.08 (0.09)**	**-**

Table 6: Roundabout Operations – Background (No-build) Conditions (2034) AM(PM)

Intersections	Approach	LOS	V/C	Delay (s)	Queue (m)
St. Guillaume / St. Pierre / Burton	East	A (A)	0.25 (0.12)	2.68 (2.69)	0.3 (0.1)
	West	A (A)	0.09 (0.19)	2.29 (2.31)	0.1 (0.3)
	North	A (A)	0.31 (0.58)	2.34 (3.95)	0.5 (1.5)
	South	A (A)	0.32 (0.27)	3.00 (2.42)	0.5 (0.4)

Like the existing (2024), all unsignalized intersections operate at LOS D or better and V/C ratio of 0.34 or better in the AM peak hour. Similar behaviour is observed for these intersections in the PM peak hour except for the EBL and EBR movements at St. Guillaume / Enterprise intersection, which now operate at LOS F and V/C ratio 1.08. The deteriorated performance at this movement can be attributed to the single lane facilitating both turning movements as well as the background growth in traffic volumes. Queue build-up at this movement is expected to be approximately 89.2 metres which can be completely accommodated by the existing available storage of 180 metres. Overall, the unsignalized intersections function well and operate under capacity in the background (2034) conditions in both peak hours, much like in the existing (2024) conditions.

Smooth traffic operations are observed at the St. Guillaume / St. Pierre / Burton roundabout in background (No-build) conditions, with all approaches operating at LOS A and V/C ratio of 0.58 or better in both peak hours. Queuing concerns are minimal at all approaches of the roundabout, with a maximum queue of 1.5 metres observed for the north approach in the PM peak hour. Viewing the modelling results, it can be concluded that the anticipated background growth does not significantly deteriorate traffic operations at the St. Guillaume / St. Pierre / Burton roundabout.

7.3 Future Traffic Conditions (2034)

The total traffic volumes comprising of future (2034) trips include the existing 2024 traffic volumes projected to the year 2034 using the growth rate assumptions stated in **Section 4.2** and site generated vehicular trips from the proposed development that are shown in **Figure 6**. Based on the future traffic volumes depicted in **Figure 6**, the future projected performance of unsignalized study area intersections and the roundabout are summarized in

Table 7 and

Table 8 respectively. Critical movements are highlighted in red. Detailed Synchro and Junctions 9 output data is provided in **Appendix B** and **Appendix C**, respectively.

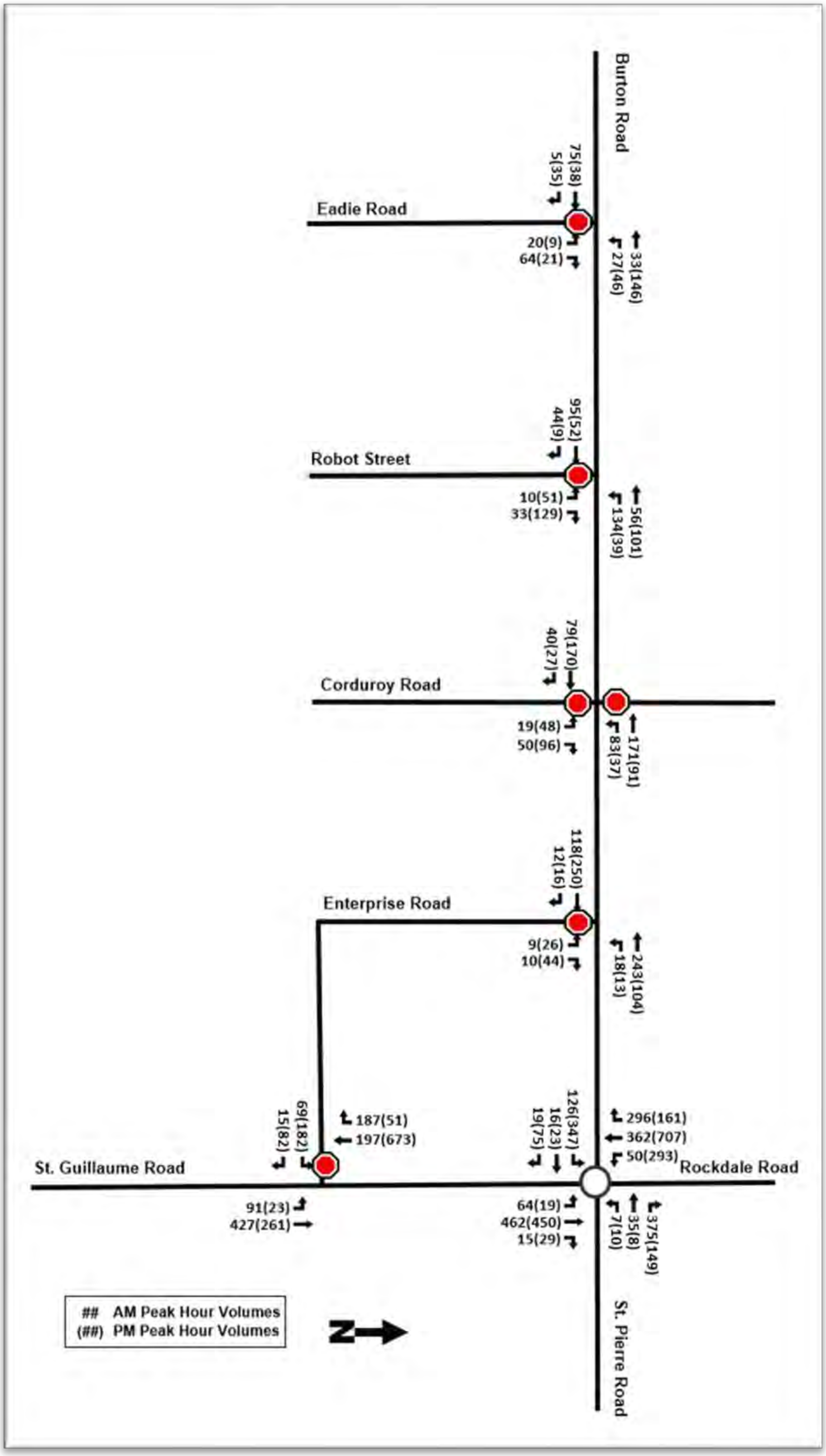

Figure 6: Future (Build) Traffic Volumes (2034)

Table 7: Intersection Operations – Future (Build) Conditions (2034) AM (PM)

Intersections	Movement	LOS	V/C	Delay (s)	95th %^{ile} Queue (m)
Eadie / Burton	EBT	A (A)	0.05 (0.05)	0.0 (0.0)	0.0 (0.0)
	EBR	A (A)	0.05 (0.05)	0.0 (0.0)	0.0 (0.0)
	WBL	A (A)	0.02 (0.03)	0.1 (0.3)	0.5 (0.8)
	WBT	A (A)	0.02 (0.03)	3.4 (2.0)	0.5 (0.8)
	NBL	A (A)	0.10 (0.04)	9.4 (9.4)	2.5 (0.9)
	NBR	A (A)	0.10 (0.04)	9.4 (9.4)	2.5 (0.9)
	Overall	**A (A)**	**0.22 (0.27)**	**4.4 (2.3)**	**-**
St. Guillaume / Enterprise	EBL	D (F)	0.38 (1.09)	29.3 (122.5)	13.0 (90.6)
	EBR	D (F)	0.38 (1.09)	29.3 (122.5)	13.0 (90.6)
	NBL	A (A)	0.09 (0.03)	1.0 (0.4)	2.2 (0.8)
	NBT	A (A)	0.09 (0.03)	2.3 (1.2)	2.2 (0.8)
	SBT	A (A)	0.25 (0.46)	0.0 (0.0)	0.0 (0.0)
	SBR	A (A)	0.25 (0.46)	0.0 (0.0)	0.0 (0.0)
	Overall	**C (B)**	**0.64 (0.60)**	**3.7 (25.7)**	**-**
Burton / Corduroy	EBT	A (A)	0.00 (0.00)	0.0 (0.0)	0.0 (0.0)
	EBR	A (A)	0.00 (0.00)	0.0 (0.0)	0.0 (0.0)
	WBL	A (A)	0.07 (0.04)	0.6 (0.3)	1.6 (0.8)
	WBT	A (A)	0.07 (0.04)	2.9 (2.6)	1.6 (0.8)
	NBL	B (B)	0.11 (0.22)	11.2 (11.5)	2.9 (6.3)
	NBR	B (B)	0.11 (0.22)	11.2 (11.5)	2.9 (6.3)
	Overall	**A (A)**	**0.24 (0.36)**	**3.4 (4.2)**	**-**
Burton / Enterprise	EBT	A (A)	0.08 (0.17)	0.0 (0.0)	0.0 (0.0)
	EBR	A (A)	0.08 (0.17)	0.0 (0.0)	0.0 (0.0)
	WBL	A (A)	0.01 (0.01)	0.1 (0.1)	0.3 (0.3)
	WBT	A (A)	0.01 (0.01)	0.7 (1.1)	0.3 (0.3)
	NBL	B (B)	0.03 (0.11)	10.7 (11.1)	0.8 (2.9)
	NBR	B (B)	0.03 (0.11)	10.7 (11.1)	0.8 (2.9)
	Overall	**A (A)**	**0.34 (0.27)**	**0.9 (2.0)**	**-**
Robot / Burton	EBT	A (A)	0.09 (0.04)	0.0 (0.0)	0.0 (0.0)
	EBR	A (A)	0.09 (0.04)	0.0 (0.0)	0.0 (0.0)
	WBL	A (A)	0.10 (0.03)	0.8 (0.2)	2.6 (0.6)
	WBT	A (A)	0.10 (0.03)	5.7 (2.2)	2.6 (0.6)
	NBL	B (B)	0.06 (0.22)	10.0 (10.1)	1.5 (6.3)
	NBR	B (B)	0.06 (0.22)	10.0 (10.1)	1.5 (6.3)
	Overall	**A (A)**	**0.31 (0.32)**	**4.1 (5.6)**	**-**

Table 8: Roundabout Operations – Future (Build) Conditions (2034) AM(PM)

Intersections	Approach	LOS	V/C	Delay (s)	Queue (m)
St. Guillaume / St. Pierre / Burton	East	A (A)	0.27 (0.12)	2.88 (2.77)	0.4 (0.1)
	West	A (A)	0.10 (0.26)	2.33 (2.52)	0.1 (0.3)
	North	A (A)	0.35 (0.60)	2.52 (4.17)	0.5 (1.5)
	South	A (A)	0.35 (0.27)	3.31 (2.46)	0.5 (0.4)

With the addition of the site trips, all unsignalized intersections continue to operate at LOS D or better and V/C ratio of 0.38 or better in the AM peak hour. Similar behaviour is observed for these intersections in the PM peak hour except for the EBL and EBR movements at St. Guillaume / Enterprise intersection, which continue to operate at LOS F and V/C ratio 1.09. The deteriorated performance at this movement can be attributed to the single lane facilitating both turning movements, the background growth in traffic volumes and the additional site trips using this intersection to get to the site. Queue build-up at this movement is expected to be approximately 90.6 metres which can be completely accommodated by the existing available storage of 180 metres. Overall, the unsignalized intersections function well and operate under capacity in the future (Build, 2034) conditions in both peak hours, much like in the existing (2024) and background (No-build, 2034) conditions.

Smooth traffic operations are observed at the St. Guillaume / St. Pierre / Burton roundabout in future (Build) conditions, with all approaches operating at LOS A and V/C ratio of 0.60 or better in both peak hours. Queuing concerns are minimal at all approaches of the roundabout, with a maximum queue of 1.5 metres observed for the north approach in the PM peak hour. Viewing the modelling results, it can be concluded that the additional trips generated from the proposed development are not expected to significantly deteriorate traffic operations at the St. Guillaume / St. Pierre / Burton roundabout.

8. CONCLUSION AND RECOMMENDATION

The analysis for the proposed development considered four (4) unsignalized intersections at Burton Road / Eadie Road, St. Guillaume Road / Enterprise Street, Burton Road / Corduroy Road, Burton Road / Enterprise Street, and one (1) roundabout at St. Guillaume Road / St. Pierre Road / Burton Road. Additionally, a future road extension of Robot Street to intersect with Burton Road is also considered in the background (without site trips) and future (with site trips) scenarios. Based on the capacity analysis for the existing conditions, all intersections within the study area operate well with LOS 'C', or better in the AM peak hour and with LOS 'D' or better in the PM peak hour.

Similarly, for the background scenario in 2034 with no development, all intersections operate with a LOS 'D' or better in both peak hours except for the eastbound movements at the St. Guillaume Road / Enterprise Street, which operates at LOS 'F' and V/C ratio of 1.08 in the PM peak hour. Operational failure of the eastbound movements at this intersection is attributed to the background growth in the vicinity, presence of one lane facilitating both left and right turn movements, and the ability of vehicles to find gaps in between the north-south flowing traffic along St. Guillaume Road to complete the turn. As a result, queue buildup (89.2 metres) is observed for this movement but is completely serviced by the available storage (180 metres).

The proposed 417 Industrial Park is anticipated to have a total area of 58.2 acres (23.55 hectares). Using the ITE's Trip Generation for a 'General Light Industrial' (Land Use Code = 110), the facility is expected to generate 250 vehicular trips in the AM peak hour, and 231 vehicular trips in the PM peak hour. The trip distribution from the proposed development is consistent with the existing travel patterns observed in the vicinity.

The analysis for the future scenario in 2034 with the proposed development resulted in a marginal decline in traffic operations. All the intersections continue to operate at LOS D or better during both peak hours except the eastbound movement at the St. Guillaume Road / Enterprise Street intersection in the PM peak hour, which continues to operate at LOS 'F' with a V/C ratio of 1.09. As noted previously, poor traffic operations at this movement stem from background growth and existing lane configurations, and not the proposed site itself. The queue buildup in this scenario (90.6 metres) is still accommodated by the available storage at this approach (180 metres).

Traffic operations at the St. Guillaume /St. Pierre / Burton roundabout remain consistent across the existing, background (no-build), and future (build) scenarios, with a marginal deterioration which is expected. Overall, the traffic operates at LOS A during both peak hours in all three scenarios which indicates that the additional trips generated from the proposed development will not significantly impact traffic operations at the roundabout.

Appendix A: Turning Movement Counts

Project #24-107 - Morrison Hershfield

Intersection Count Report

Intersection:	Eadie Rd & Burton Rd
Municipality:	Russell Twp
Count Date:	Thursday, Mar 21, 2024
Site Code:	2410700001
Count Categories:	Cars, Trucks, Bicycles, Pedestrians
Count Period:	07:00-10:00, 11:00-13:00, 15:00-18:00
Weather:	Clear
Comments:	

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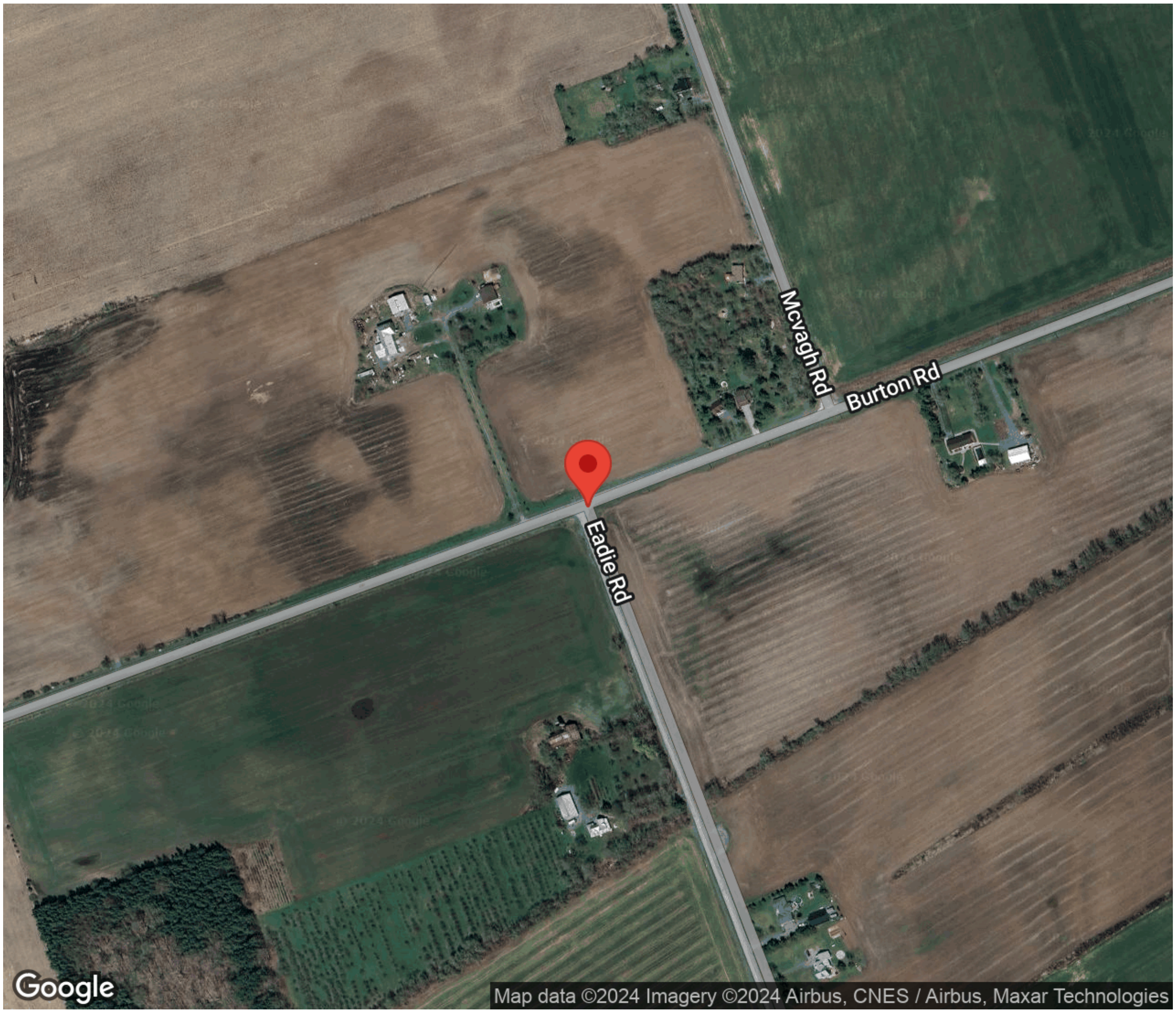
Traffic Count Map

Intersection:	Eadie Rd & Burton Rd
Site Code:	2410700001
Municipality:	Russell Twp
Count Date:	Mar 21, 2024



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Traffic Count Summary

Intersection:	Eadie Rd & Burton Rd
Site Code:	2410700001
Municipality:	Russell Twp
Count Date:	Mar 21, 2024

Eadie Rd - Traffic Summary

	North Approach Totals						South Approach Totals						
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
Hour	**Left**	**Thru**	**Right**	**U-Turn**	**Total**	**Peds**	**Left**	**Thru**	**Right**	**U-Turn**	**Total**	**Peds**	**Total**
07:00 - 08:00	0	0	0	0	0	0	29	0	28	1	58	0	58
08:00 - 09:00	0	0	0	0	0	0	8	0	16	0	24	0	24
09:00 - 10:00	0	0	0	0	0	0	17	0	21	0	38	0	38
BREAK													
11:00 - 12:00	0	0	0	0	0	0	6	0	15	0	21	0	21
12:00 - 13:00	0	0	0	0	0	0	11	0	13	0	24	0	24
BREAK													
15:00 - 16:00	0	0	0	0	0	0	5	0	19	0	24	0	24
16:00 - 17:00	0	0	0	0	0	0	8	0	24	0	32	0	32
17:00 - 18:00	0	0	0	0	0	0	7	0	15	0	22	0	22
GRAND TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**91**	**0**	**151**	**1**	**243**	**0**	**243**

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Traffic Count Summary

Intersection: Eadie Rd & Burton Rd
Site Code: 2410700001
Municipality: Russell Twp
Count Date: Mar 21, 2024

Burton Rd - Traffic Summary

	East Approach Totals						West Approach Totals						
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
Hour	**Left**	**Thru**	**Right**	**U-Turn**	**Total**	**Peds**	**Left**	**Thru**	**Right**	**U-Turn**	**Total**	**Peds**	**Total**
07:00 - 08:00	18	20	0	0	38	0	0	33	5	0	38	0	76
08:00 - 09:00	10	25	0	0	35	0	0	42	2	0	44	0	79
09:00 - 10:00	11	25	0	0	36	0	0	15	3	0	18	0	54
BREAK													
11:00 - 12:00	7	13	0	0	20	0	0	18	4	0	22	0	42
12:00 - 13:00	14	17	0	0	31	0	0	15	3	0	18	0	49
BREAK													
15:00 - 16:00	37	33	0	1	71	0	0	45	22	0	67	0	138
16:00 - 17:00	36	32	0	4	72	0	0	35	29	0	64	0	136
17:00 - 18:00	28	88	0	0	116	0	0	28	29	0	57	0	173
GRAND TOTAL	**161**	**253**	**0**	**5**	**419**	**0**	**0**	**231**	**97**	**0**	**328**	**0**	**747**

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Traffic Count Data

Intersection: Eadie Rd & Burton Rd
Site Code: 2410700001
Municipality: Russell Twp
Count Date: Mar 21, 2024

South Approach - Eadie Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	**Total Peds**
07:00	2	0	4	0	6	0	0	0	0	0	0	0	0	0	0	0
07:15	12	0	3	0	15	0	0	0	0	0	0	0	0	0	0	0
07:30	10	0	11	0	21	0	0	0	0	0	0	0	0	0	0	0
07:45	5	0	9	0	14	0	0	1	1	2	0	0	0	0	0	0
08:00	0	0	8	0	8	0	0	0	0	0	0	0	0	0	0	0
08:15	1	0	6	0	7	0	0	0	0	0	0	0	0	0	0	0
08:30	2	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0
08:45	5	0	1	0	6	0	0	0	0	0	0	0	0	0	0	0
09:00	1	0	2	0	3	1	0	1	0	2	0	0	0	0	0	0
09:15	3	0	4	0	7	0	0	0	0	0	0	0	0	0	0	0
09:30	7	0	6	0	13	0	0	0	0	0	0	0	0	0	0	0
09:45	5	0	8	0	13	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	53	0	63	0	116	1	0	2	1	4	0	0	0	0	0	0

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Traffic Count Data

Intersection: Eadie Rd & Burton Rd
Site Code: 2410700001
Municipality: Russell Twp
Count Date: Mar 21, 2024

South Approach - Eadie Rd

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	
11:00	1	0	3	0	4	0	0	0	0	0	0	0	0	0	0	0
11:15	4	0	2	0	6	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	5	0	5	0	0	1	0	1	0	0	0	0	0	0
11:45	1	0	4	0	5	0	0	0	0	0	0	0	0	0	0	0
12:00	3	0	7	0	10	0	0	0	0	0	0	0	0	0	0	0
12:15	2	0	2	0	4	1	0	0	0	1	0	0	0	0	0	0
12:30	4	0	3	0	7	0	0	0	0	0	0	0	0	0	0	0
12:45	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	16	0	27	0	43	1	0	1	0	2	0	0	0	0	0	0

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Traffic Count Data

Intersection: Eadie Rd & Burton Rd
Site Code: 2410700001
Municipality: Russell Twp
Count Date: Mar 21, 2024

South Approach - Eadie Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	**Total Peds**
15:00	1	0	4	0	5	0	0	0	0	0	0	0	0	0	0	0
15:15	0	0	6	0	6	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0
15:45	4	0	5	0	9	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	8	0	8	0	0	2	0	2	0	0	0	0	0	0
16:15	2	0	6	0	8	0	0	0	0	0	0	0	0	0	0	0
16:30	2	0	4	0	6	0	0	0	0	0	0	0	0	0	0	0
16:45	4	0	4	0	8	0	0	0	0	0	0	0	0	0	0	0
17:00	2	0	2	0	4	0	0	0	0	0	0	0	0	0	0	0
17:15	1	0	4	0	5	0	0	1	0	1	0	0	0	0	0	0
17:30	2	0	7	0	9	0	0	0	0	0	0	0	0	0	0	0
17:45	2	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	20	0	55	0	75	0	0	3	0	3	0	0	0	0	0	0
GRAND TOTAL	**89**	**0**	**145**	**0**	**234**	**2**	**0**	**6**	**1**	**9**	**0**	**0**	**0**	**0**	**0**	**0**

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Traffic Count Data

Intersection:	Eadie Rd & Burton Rd
Site Code:	2410700001
Municipality:	Russell Twp
Count Date:	Mar 21, 2024

East Approach - Burton Rd

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	
07:00	3	4	0	0	7	0	2	0	0	2	0	0	0	0	0	0
07:15	1	4	0	0	5	0	1	0	0	1	0	0	0	0	0	0
07:30	9	3	0	0	12	1	2	0	0	3	0	0	0	0	0	0
07:45	4	3	0	0	7	0	1	0	0	1	0	0	0	0	0	0
08:00	2	7	0	0	9	0	0	0	0	0	0	0	0	0	0	0
08:15	3	5	0	0	8	0	2	0	0	2	0	0	0	0	0	0
08:30	3	4	0	0	7	0	0	0	0	0	0	0	0	0	0	0
08:45	2	5	0	0	7	0	2	0	0	2	0	0	0	0	0	0
09:00	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	0
09:15	3	5	0	0	8	0	1	0	0	1	0	0	0	0	0	0
09:30	4	7	0	0	11	0	1	0	0	1	0	0	0	0	0	0
09:45	4	3	0	0	7	0	2	0	0	2	0	0	0	0	0	0
SUBTOTAL	38	56	0	0	94	1	14	0	0	15	0	0	0	0	0	0

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Traffic Count Data

Intersection:	Eadie Rd & Burton Rd
Site Code:	2410700001
Municipality:	Russell Twp
Count Date:	Mar 21, 2024

East Approach - Burton Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	**Total Peds**
11:00	2	1	0	0	3	0	1	0	0	1	0	0	0	0	0	0
11:15	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0
11:30	1	2	0	0	3	0	2	0	0	2	0	0	0	0	0	0
11:45	3	4	0	0	7	1	1	0	0	2	0	0	0	0	0	0
12:00	5	3	0	0	8	0	1	0	0	1	0	0	0	0	0	0
12:15	3	2	0	0	5	0	0	0	0	0	0	0	0	0	0	0
12:30	4	5	0	0	9	0	1	0	0	1	0	0	0	0	0	0
12:45	2	5	0	0	7	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	20	24	0	0	44	1	6	0	0	7	0	0	0	0	0	0

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Traffic Count Data

Intersection: Eadie Rd & Burton Rd
Site Code: 2410700001
Municipality: Russell Twp
Count Date: Mar 21, 2024

East Approach - Burton Rd

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	
15:00	4	7	0	0	11	0	1	0	0	1	0	0	0	0	0	0
15:15	7	6	0	0	13	0	0	0	0	0	0	0	0	0	0	0
15:30	9	5	0	1	15	1	3	0	0	4	0	0	0	0	0	0
15:45	16	9	0	0	25	0	2	0	0	2	0	0	0	0	0	0
16:00	11	7	0	2	20	0	1	0	0	1	0	0	0	0	0	0
16:15	8	8	0	1	17	0	0	0	0	0	0	0	0	0	0	0
16:30	9	8	0	1	18	0	1	0	0	1	0	0	0	0	0	0
16:45	8	7	0	0	15	0	0	0	0	0	0	0	0	0	0	0
17:00	7	22	0	0	29	0	1	0	0	1	0	0	0	0	0	0
17:15	12	16	0	0	28	0	0	0	0	0	0	0	0	0	0	0
17:30	5	26	0	0	31	0	0	0	0	0	0	0	0	0	0	0
17:45	4	19	0	0	23	0	4	0	0	4	0	0	0	0	0	0
SUBTOTAL	100	140	0	5	245	1	13	0	0	14	0	0	0	0	0	0
GRAND TOTAL	**158**	**220**	**0**	**5**	**383**	**3**	**33**	**0**	**0**	**36**	**0**	**0**	**0**	**0**	**0**	**0**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Eadie Rd & Burton Rd
Site Code: 2410700001
Municipality: Russell Twp
Count Date: Mar 21, 2024

West Approach - Burton Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	Total Peds
07:00	0	8	1	0	9	0	0	0	0	0	0	0	0	0	0	0
07:15	0	9	0	0	9	0	0	0	0	0	0	0	0	0	0	0
07:30	0	7	2	0	9	0	1	1	0	2	0	0	0	0	0	0
07:45	0	8	1	0	9	0	0	0	0	0	0	0	0	0	0	0
08:00	0	10	0	0	10	0	1	0	0	1	0	0	0	0	0	0
08:15	0	15	0	0	15	0	0	0	0	0	0	0	0	0	0	0
08:30	0	10	0	0	10	0	1	0	0	1	0	0	0	0	0	0
08:45	0	4	2	0	6	0	1	0	0	1	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15	0	7	1	0	8	0	1	0	0	1	0	0	0	0	0	0
09:30	0	3	1	0	4	0	1	0	0	1	0	0	0	0	0	0
09:45	0	2	1	0	3	0	1	0	0	1	0	0	0	0	0	0
SUBTOTAL	0	83	9	0	92	0	7	1	0	8	0	0	0	0	0	0

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Eadie Rd & Burton Rd
Site Code: 2410700001
Municipality: Russell Twp
Count Date: Mar 21, 2024

West Approach - Burton Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	**Total Peds**
11:00	0	5	2	0	7	0	0	0	0	0	0	0	0	0	0	0
11:15	0	2	0	0	2	0	1	0	0	1	0	0	0	0	0	0
11:30	0	7	1	0	8	0	0	0	0	0	0	0	0	0	0	0
11:45	0	2	1	0	3	0	1	0	0	1	0	0	0	0	0	0
12:00	0	1	0	0	1	0	2	0	0	2	0	0	0	0	0	0
12:15	0	3	2	0	5	0	0	0	0	0	0	0	0	0	0	0
12:30	0	5	1	0	6	0	2	0	0	2	0	0	0	0	0	0
12:45	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	0	27	7	0	34	0	6	0	0	6	0	0	0	0	0	0

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection:	Eadie Rd & Burton Rd
Site Code:	2410700001
Municipality:	Russell Twp
Count Date:	Mar 21, 2024

West Approach - Burton Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	Total Peds
15:00	0	7	4	0	11	0	3	0	0	3	0	0	0	0	0	0
15:15	0	12	3	0	15	0	0	0	0	0	0	0	0	0	0	0
15:30	0	10	8	0	18	0	2	0	0	2	0	0	0	0	0	0
15:45	0	9	7	0	16	0	2	0	0	2	0	0	0	0	0	0
16:00	0	5	7	0	12	0	2	0	0	2	0	0	0	0	0	0
16:15	0	10	9	0	19	0	3	0	0	3	0	0	0	0	0	0
16:30	0	8	6	0	14	0	3	0	0	3	0	0	0	0	0	0
16:45	0	4	7	0	11	0	0	0	0	0	0	0	0	0	0	0
17:00	0	9	5	0	14	0	1	0	0	1	0	0	0	0	0	0
17:15	0	5	13	0	18	0	2	0	0	2	0	0	0	0	0	0
17:30	0	8	6	0	14	0	0	0	0	0	0	0	0	0	0	0
17:45	0	2	5	0	7	0	1	0	0	1	0	0	0	0	0	0
SUBTOTAL	0	89	80	0	169	0	19	0	0	19	0	0	0	0	0	0
GRAND TOTAL	0	199	96	0	295	0	32	1	0	33	0	0	0	0	0	0

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		**One Hour Peak**	
From:	07:00:00	From:	07:30:00
To:	10:00:00	To:	08:30:00

Intersection: Eadie Rd & Burton Rd
Site Code: 2410700001
Count Date: Mar 21, 2024

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Burton Rd runs E/W

East Approach

	Out	In	Total
🚗	36	74	110
🚚	6	3	9
🚲	0	0	0
	42	**77**	**119**

Peds: 0

Burton Rd

🚲	🚚	🚗	Totals	
0	0	0	**0**	↶
0	2	40	**42**	→
0	1	3	**4**	↓

Peds: 0

N
W E
S

Peds: 0

Burton Rd

	Totals	🚗	🚚	🚲
↷	**0**	0	0	0
←	**23**	18	5	0
↓	**19**	18	1	0

Peds: 0

West Approach

	Out	In	Total
🚗	43	34	77
🚚	3	5	8
🚲	0	0	0
	46	**39**	**85**

	↰	↱	↶
Totals	**16**	**35**	**1**
🚗	16	34	0
🚚	0	1	1
🚲	0	0	0

Eadie Rd

South Approach

	Out	In	Total
🚗	50	21	71
🚚	2	3	5
🚲	0	0	0
	52	**24**	**76**

🚗 - Cars
🚚 - Trucks
🚲 - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Summary

Intersection:	Eadie Rd & Burton Rd
Site Code:	2410700001
Count Date:	Mar 21, 2024
Period:	07:00 - 10:00

Peak Hour Data (07:30 - 08:30)

	North Approach						South Approach Eadie Rd						East Approach Burton Rd						West Approach Burton Rd						Total Vehicles
Start Time	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	
07:30					0		10		11	0	0	21	10	5		0	0	15		8	3	0	0	11	47
07:45					0		5		10	1	0	16	4	4		0	0	8		8	1	0	0	9	33
08:00					0		0		8	0	0	8	2	7		0	0	9		11	0	0	0	11	28
08:15					0		1		6	0	0	7	3	7		0	0	10		15	0	0	0	15	32
Grand Total					**0**	**0**	**16**		**35**	**1**	**0**	**52**	**19**	**23**		**0**	**0**	**42**		**42**	**4**	**0**	**0**	**46**	**140**
Approach %						-	30.8		67.3	1.9		-	45.2	54.8		0		-		91.3	8.7	0		-	
Totals %						0	11.4		25	0.7		37.1	13.6	16.4		0		30		30	2.9	0		32.9	
PHF						**0**	**0.4**		**0.8**	**0.25**		**0.62**	**0.48**	**0.82**		**0**		**0.7**		**0.7**	**0.33**	**0**		**0.77**	**0.74**
Cars						0	16		34	0		50	18	18		0		36		40	3	0		43	129
% Cars						0	100		97.1	0		96.2	94.7	78.3		0		85.7		95.2	75	0		93.5	92.1
Trucks						0	0		1	1		2	1	5		0		6		2	1	0		3	11
% Trucks						0	0		2.9	100		3.8	5.3	21.7		0		14.3		4.8	25	0		6.5	7.9
Bicycles						0	0		0	0		0	0	0		0		0		0	0	0		0	0
% Bicycles						0	0		0	0		0	0	0		0		0		0	0	0		0	0
Peds					0	-					0	-					0	-					0	-	0
% Peds					0	-					0	-					0	-					0	-	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		**One Hour Peak**	
From:	11:00:00	From:	11:45:00
To:	13:00:00	To:	12:45:00

Intersection: Eadie Rd & Burton Rd
Site Code: 2410700001
Count Date: Mar 21, 2024

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Burton Rd runs E/W

East Approach

	Out	In	Total
🚗	29	27	56
🚚	4	5	9
🚲	0	0	0
	33	**32**	**65**

Peds: 0

Burton Rd

🚲	🚚	🚗	Totals	
0	0	0	**0**	↶
0	5	11	**16**	→
0	0	4	**4**	↴

Peds: 0

Peds: 0

Burton Rd

	Totals	🚗	🚚	🚲
↷	**0**	0	0	0
←	**17**	14	3	0
↲	**16**	15	1	0

Peds: 0

West Approach

	Out	In	Total
🚗	15	24	39
🚚	5	4	9
🚲	0	0	0
	20	**28**	**48**

Totals	↰ **11**	↱ **16**	↶ **0**
🚗	10	16	0
🚚	1	0	0
🚲	0	0	0

Eadie Rd

South Approach

	Out	In	Total
🚗	26	19	45
🚚	1	1	2
🚲	0	0	0
	27	**20**	**47**

🚗 - Cars 🚚 - Trucks 🚲 - Bicycles

Comments

Peak Hour Summary

Intersection: Eadie Rd & Burton Rd
Site Code: 2410700001
Count Date: Mar 21, 2024
Period: 11:00 - 13:00

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Data (11:45 - 12:45)

	North Approach						South Approach Eadie Rd						East Approach Burton Rd						West Approach Burton Rd						Total Vehicles
Start Time	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	
11:45					0		1		4	0	0	5	4	5		0	0	9		3	1	0	0	4	18
12:00					0		3		7	0	0	10	5	4		0	0	9		3	0	0	0	3	22
12:15					0		3		2	0	0	5	3	2		0	0	5		3	2	0	0	5	15
12:30					0		4		3	0	0	7	4	6		0	0	10		7	1	0	0	8	25
Grand Total					**0**	**0**	**11**		**16**	**0**	**0**	**27**	**16**	**17**		**0**	**0**	**33**		**16**	**4**	**0**	**0**	**20**	**80**
Approach %						-	40.7		59.3	0		-	48.5	51.5		0		-		80	20	0		-	
Totals %						0	13.8		20	0		33.8	20	21.3		0		41.3		20	5	0		25	
PHF						**0**	**0.69**		**0.57**	**0**		**0.68**	**0.8**	**0.71**		**0**		**0.83**		**0.57**	**0.5**	**0**		**0.63**	**0.8**
Cars						0	10		16	0		26	15	14		0		29		11	4	0		15	70
% Cars						0	90.9		100	0		96.3	93.8	82.4		0		87.9		68.8	100	0		75	87.5
Trucks						0	1		0	0		1	1	3		0		4		5	0	0		5	10
% Trucks						0	9.1		0	0		3.7	6.3	17.6		0		12.1		31.3	0	0		25	12.5
Bicycles						0	0		0	0		0	0	0		0		0		0	0	0		0	0
% Bicycles						0	0		0	0		0	0	0		0		0		0	0	0		0	0
Peds					0	-					0	-					0	-					0	-	0
% Peds					0	-					0	-					0	-					0	-	

Peak Hour Diagram

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Specified Period		**One Hour Peak**	
From:	15:00:00	From:	17:00:00
To:	18:00:00	To:	18:00:00

Intersection: Eadie Rd & Burton Rd
Site Code: 2410700001
Count Date: Mar 21, 2024

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Burton Rd runs E/W

East Approach

	Out	In	Total
🚗	111	38	149
🚚	5	5	10
🚲	0	0	0
	116	**43**	**159**

Peds: 0

Burton Rd

🚲	🚚	🚗	Totals	
0	0	0	**0**	↶
0	4	24	**28**	→
0	0	29	**29**	↓

Peds: 0

N
W E
S

Peds: 0

Burton Rd

	Totals	🚗	🚚	🚲
↷	**0**	0	0	0
←	**88**	83	5	0
↓	**28**	28	0	0

Peds: 0

West Approach

	Out	In	Total
🚗	53	90	143
🚚	4	5	9
🚲	0	0	0
	57	**95**	**152**

	↰	↱	↷
Totals	**7**	**15**	**0**
🚗	7	14	0
🚚	0	1	0
🚲	0	0	0

Eadie Rd

South Approach

	Out	In	Total
🚗	21	57	78
🚚	1	0	1
🚲	0	0	0
	22	**57**	**79**

🚗 - Cars 🚚 - Trucks 🚲 - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Summary

Intersection:	Eadie Rd & Burton Rd
Site Code:	2410700001
Count Date:	Mar 21, 2024
Period:	15:00 - 18:00

Peak Hour Data (17:00 - 18:00)

	North Approach						South Approach Eadie Rd						East Approach Burton Rd						West Approach Burton Rd						Total Vehicles
Start Time	↰	↑	↱	⮌	Peds	Total	↰	↑	↱	⮌	Peds	Total	↰	↑	↱	⮌	Peds	Total	↰	↑	↱	⮌	Peds	Total	
17:00					0		2		2	0	0	4	7	23		0	0	30		10	5	0	0	15	49
17:15					0		1		5	0	0	6	12	16		0	0	28		7	13	0	0	20	54
17:30					0		2		7	0	0	9	5	26		0	0	31		8	6	0	0	14	54
17:45					0		2		1	0	0	3	4	23		0	0	27		3	5	0	0	8	38
Grand Total					**0**	**0**	**7**		**15**	**0**	**0**	**22**	**28**	**88**		**0**	**0**	**116**		**28**	**29**	**0**	**0**	**57**	**195**
Approach %						-	31.8		68.2	0		-	24.1	75.9		0		-		49.1	50.9	0		-	
Totals %						0	3.6		7.7	0		11.3	14.4	45.1		0		59.5		14.4	14.9	0		29.2	
PHF						**0**	**0.88**		**0.54**	**0**		**0.61**	**0.58**	**0.85**		**0**		**0.94**		**0.7**	**0.56**	**0**		**0.71**	**0.9**
Cars						0	7		14	0		21	28	83		0		111		24	29	0		53	185
% Cars						0	100		93.3	0		95.5	100	94.3		0		95.7		85.7	100	0		93	94.9
Trucks						0	0		1	0		1	0	5		0		5		4	0	0		4	10
% Trucks						0	0		6.7	0		4.5	0	5.7		0		4.3		14.3	0	0		7	5.1
Bicycles						0	0		0	0		0	0	0		0		0		0	0	0		0	0
% Bicycles						0	0		0	0		0	0	0		0		0		0	0	0		0	0
Peds					0	-					0	-					0	-					0	-	0
% Peds					0	-					0	-					0	-					0	-	

Project #24-169 - Morrison Hershfield

Intersection Count Report

Intersection:	St. Guillaume Rd & Enterprise Rd
Municipality:	Russell Twp
Count Date:	Wednesday, Apr 24, 2024
Site Code:	2416900021
Count Categories:	Cars, Trucks, Bicycles, Pedestrians
Count Period:	07:00-10:00, 11:00-13:00, 15:00-18:00
Weather:	Clear
Comments:	

Traffic Count Map

Intersection:	St. Guillaume Rd & Enterprise Rd
Site Code:	2416900021
Municipality:	Russell Twp
Count Date:	Apr 24, 2024

Map data ©2024 Imagery ©2024 Airbus, CNES / Airbus, Maxar Technologies

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Summary

Intersection: St. Guillaume Rd & Enterprise Rd
Site Code: 2416900021
Municipality: Russell Twp
Count Date: Apr 24, 2024

St. Guillaume Rd - Traffic Summary

	North Approach Totals						South Approach Totals						
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
Hour	**Left**	**Thru**	**Right**	**U-Turn**	**Total**	**Peds**	**Left**	**Thru**	**Right**	**U-Turn**	**Total**	**Peds**	**Total**
07:00 - 08:00	0	162	153	0	315	0	52	350	0	0	402	0	717
08:00 - 09:00	0	151	79	0	230	0	20	241	0	0	261	0	491
09:00 - 10:00	0	155	60	0	215	0	28	177	0	0	205	0	420
BREAK													
11:00 - 12:00	0	206	52	0	258	0	21	176	0	0	197	0	455
12:00 - 13:00	0	203	60	0	263	0	33	143	0	0	176	0	439
BREAK													
15:00 - 16:00	0	420	47	0	467	0	16	161	0	0	177	0	644
16:00 - 17:00	0	547	53	1	601	0	16	205	0	0	221	0	822
17:00 - 18:00	0	425	30	0	455	0	11	185	0	0	196	0	651
GRAND TOTAL	**0**	**2269**	**534**	**1**	**2804**	**0**	**197**	**1638**	**0**	**0**	**1835**	**0**	**4639**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Summary

Intersection:	St. Guillaume Rd & Enterprise Rd
Site Code:	2416900021
Municipality:	Russell Twp
Count Date:	Apr 24, 2024

Enterprise Rd - Traffic Summary

	East Approach Totals						West Approach Totals						
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
Hour	**Left**	**Thru**	**Right**	**U-Turn**	**Total**	**Peds**	**Left**	**Thru**	**Right**	**U-Turn**	**Total**	**Peds**	**Total**
07:00 - 08:00	0	0	0	0	0	0	57	0	12	0	69	0	69
08:00 - 09:00	0	0	0	0	0	0	54	0	14	0	68	0	68
09:00 - 10:00	0	0	0	0	0	0	69	0	21	0	90	0	90
BREAK													
11:00 - 12:00	0	0	0	0	0	0	64	0	46	0	110	0	110
12:00 - 13:00	0	0	0	0	0	0	50	0	38	0	88	0	88
BREAK													
15:00 - 16:00	0	0	0	0	0	0	80	0	29	0	109	0	109
16:00 - 17:00	0	0	0	0	0	0	139	0	62	0	201	0	201
17:00 - 18:00	0	0	0	0	0	0	164	0	49	0	213	0	213
GRAND TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**677**	**0**	**271**	**0**	**948**	**0**	**948**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection:	St. Guillaume Rd & Enterprise Rd
Site Code:	2416900021
Municipality:	Russell Twp
Count Date:	Apr 24, 2024

North Approach - St. Guillaume Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	**Total Peds**
07:00	0	29	35	0	64	0	3	2	0	5	0	0	0	0	0	0
07:15	0	37	48	0	85	0	3	2	0	5	0	0	0	0	0	0
07:30	0	41	25	0	66	0	1	3	0	4	0	0	0	0	0	0
07:45	0	45	36	0	81	0	3	2	0	5	0	0	0	0	0	0
08:00	0	30	22	0	52	0	5	2	0	7	0	0	0	0	0	0
08:15	0	36	14	0	50	0	6	3	0	9	0	0	0	0	0	0
08:30	0	33	16	0	49	0	1	3	0	4	0	0	0	0	0	0
08:45	0	34	14	0	48	0	6	5	0	11	0	0	0	0	0	0
09:00	0	34	15	0	49	0	5	0	0	5	0	0	0	0	0	0
09:15	0	44	14	0	58	0	4	3	0	7	0	0	0	0	0	0
09:30	0	27	15	0	42	0	0	2	0	2	0	0	0	0	0	0
09:45	0	39	9	0	48	0	2	2	0	4	0	0	0	0	0	0
SUBTOTAL	0	429	263	0	692	0	39	29	0	68	0	0	0	0	0	0

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: St. Guillaume Rd & Enterprise Rd
Site Code: 2416900021
Municipality: Russell Twp
Count Date: Apr 24, 2024

North Approach - St. Guillaume Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	Total Peds
11:00	0	49	9	0	58	0	4	4	0	8	0	0	0	0	0	0
11:15	0	51	10	0	61	0	5	3	0	8	0	0	0	0	0	0
11:30	0	42	7	0	49	0	4	5	0	9	0	0	0	0	0	0
11:45	0	49	11	0	60	0	2	3	0	5	0	0	0	0	0	0
12:00	0	41	8	0	49	0	4	2	0	6	0	0	0	0	0	0
12:15	0	43	17	0	60	0	6	0	0	6	0	0	0	0	0	0
12:30	0	46	13	0	59	0	4	1	0	5	0	0	0	0	0	0
12:45	0	59	16	0	75	0	0	3	0	3	0	0	0	0	0	0
SUBTOTAL	0	380	91	0	471	0	29	21	0	50	0	0	0	0	0	0

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: St. Guillaume Rd & Enterprise Rd
Site Code: 2416900021
Municipality: Russell Twp
Count Date: Apr 24, 2024

North Approach - St. Guillaume Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	**Total Peds**
15:00	0	75	9	0	84	0	5	3	0	8	0	0	0	0	0	0
15:15	0	104	6	0	110	0	2	5	0	7	0	0	0	0	0	0
15:30	0	114	8	0	122	0	5	6	0	11	0	0	0	0	0	0
15:45	0	113	9	0	122	0	2	1	0	3	0	0	0	0	0	0
16:00	0	118	12	0	130	0	2	9	0	11	0	0	0	0	0	0
16:15	0	148	7	0	155	0	2	6	0	8	0	0	0	0	0	0
16:30	0	154	2	0	156	0	2	5	1	8	0	0	0	0	0	0
16:45	0	121	7	0	128	0	0	5	0	5	0	0	0	0	0	0
17:00	0	121	7	0	128	0	4	3	0	7	0	0	0	0	0	0
17:15	0	128	2	0	130	0	0	1	0	1	0	0	0	0	0	0
17:30	0	97	4	0	101	0	2	7	0	9	0	0	0	0	0	0
17:45	0	73	2	0	75	0	0	4	0	4	0	0	0	0	0	0
SUBTOTAL	0	1366	75	0	1441	0	26	55	1	82	0	0	0	0	0	0
GRAND TOTAL	**0**	**2175**	**429**	**0**	**2604**	**0**	**94**	**105**	**1**	**200**	**0**	**0**	**0**	**0**	**0**	**0**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: St. Guillaume Rd & Enterprise Rd
Site Code: 2416900021
Municipality: Russell Twp
Count Date: Apr 24, 2024

South Approach - St. Guillaume Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	**Total Peds**
07:00	11	97	0	0	108	0	0	0	0	0	1	0	0	0	1	0
07:15	15	93	0	0	108	0	3	0	0	3	0	0	0	0	0	0
07:30	12	80	0	0	92	0	6	0	0	6	0	0	0	0	0	0
07:45	12	68	0	0	80	1	3	0	0	4	0	0	0	0	0	0
08:00	6	66	0	0	72	3	3	0	0	6	0	0	0	0	0	0
08:15	3	60	0	0	63	0	8	0	0	8	0	0	0	0	0	0
08:30	4	54	0	0	58	0	3	0	0	3	0	0	0	0	0	0
08:45	3	44	0	0	47	1	3	0	0	4	0	0	0	0	0	0
09:00	5	40	0	0	45	0	2	0	0	2	0	0	0	0	0	0
09:15	9	50	0	0	59	1	3	0	0	4	0	0	0	0	0	0
09:30	2	43	0	0	45	1	4	0	0	5	0	0	0	0	0	0
09:45	9	35	0	0	44	1	0	0	0	1	0	0	0	0	0	0
SUBTOTAL	91	730	0	0	821	8	38	0	0	46	1	0	0	0	1	0

Traffic Count Data

Intersection: St. Guillaume Rd & Enterprise Rd
Site Code: 2416900021
Municipality: Russell Twp
Count Date: Apr 24, 2024

South Approach - St. Guillaume Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	⮌	**Total**	↰	↑	↱	⮌	**Total**	↰	↑	↱	⮌	**Total**	**Total Peds**
11:00	5	40	0	0	45	1	0	0	0	1	0	0	0	0	0	0
11:15	5	42	0	0	47	2	4	0	0	6	0	0	0	0	0	0
11:30	3	51	0	0	54	1	3	0	0	4	0	0	0	0	0	0
11:45	4	34	0	0	38	0	2	0	0	2	0	0	0	0	0	0
12:00	10	35	0	0	45	0	4	0	0	4	0	0	0	0	0	0
12:15	12	34	0	0	46	0	3	0	0	3	0	0	0	0	0	0
12:30	5	30	0	0	35	1	2	0	0	3	0	0	0	0	0	0
12:45	5	32	0	0	37	0	3	0	0	3	0	0	0	0	0	0
SUBTOTAL	49	298	0	0	347	5	21	0	0	26	0	0	0	0	0	0

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: St. Guillaume Rd & Enterprise Rd
Site Code: 2416900021
Municipality: Russell Twp
Count Date: Apr 24, 2024

South Approach - St. Guillaume Rd

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	
15:00	4	44	0	0	48	1	3	0	0	4	0	0	0	0	0	0
15:15	2	38	0	0	40	2	1	0	0	3	0	0	0	0	0	0
15:30	2	37	0	0	39	1	3	0	0	4	0	0	0	0	0	0
15:45	4	35	0	0	39	0	0	0	0	0	0	0	0	0	0	0
16:00	2	55	0	0	57	1	3	0	0	4	0	0	0	0	0	0
16:15	5	47	0	0	52	1	2	0	0	3	0	0	0	0	0	0
16:30	5	62	0	0	67	0	1	0	0	1	0	0	0	0	0	0
16:45	1	35	0	0	36	1	0	0	0	1	0	0	0	0	0	0
17:00	2	67	0	0	69	1	0	0	0	1	0	0	0	0	0	0
17:15	1	46	0	0	47	1	0	0	0	1	0	0	0	0	0	0
17:30	5	37	0	0	42	1	0	0	0	1	0	0	0	0	0	0
17:45	0	35	0	0	35	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	33	538	0	0	571	10	13	0	0	23	0	0	0	0	0	0
GRAND TOTAL	**173**	**1566**	**0**	**0**	**1739**	**23**	**72**	**0**	**0**	**95**	**1**	**0**	**0**	**0**	**1**	**0**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection:	St. Guillaume Rd & Enterprise Rd
Site Code:	2416900021
Municipality:	Russell Twp
Count Date:	Apr 24, 2024

West Approach - Enterprise Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	Total Peds
07:00	5	0	2	0	7	5	0	1	0	6	0	0	0	0	0	0
07:15	7	0	2	0	9	9	0	0	0	9	0	0	0	0	0	0
07:30	12	0	2	0	14	3	0	2	0	5	0	0	0	0	0	0
07:45	5	0	1	0	6	11	0	2	0	13	0	0	0	0	0	0
08:00	6	0	4	0	10	2	0	0	0	2	0	0	0	0	0	0
08:15	6	0	5	0	11	6	0	0	0	6	0	0	0	0	0	0
08:30	6	0	1	0	7	4	0	0	0	4	0	0	0	0	0	0
08:45	14	0	3	0	17	10	0	1	0	11	0	0	0	0	0	0
09:00	15	0	6	0	21	15	0	5	0	20	0	0	0	0	0	0
09:15	10	0	1	0	11	7	0	1	0	8	0	0	0	0	0	0
09:30	9	0	6	0	15	2	0	0	0	2	0	0	0	0	0	0
09:45	6	0	2	0	8	5	0	0	0	5	0	0	0	0	0	0
SUBTOTAL	101	0	35	0	136	79	0	12	0	91	0	0	0	0	0	0

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: St. Guillaume Rd & Enterprise Rd
Site Code: 2416900021
Municipality: Russell Twp
Count Date: Apr 24, 2024

West Approach - Enterprise Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	**Total Peds**
11:00	8	0	5	0	13	3	0	0	0	3	0	0	0	0	0	0
11:15	11	0	9	0	20	5	0	1	0	6	0	0	0	0	0	0
11:30	18	0	11	0	29	2	0	0	0	2	0	0	0	0	0	0
11:45	11	0	18	0	29	6	0	2	0	8	0	0	0	0	0	0
12:00	18	0	14	0	32	4	0	0	0	4	0	0	0	0	0	0
12:15	7	0	11	0	18	1	0	1	0	2	0	0	0	0	0	0
12:30	10	0	5	0	15	2	0	0	0	2	0	0	0	0	0	0
12:45	6	0	7	0	13	2	0	0	0	2	0	0	0	0	0	0
SUBTOTAL	89	0	80	0	169	25	0	4	0	29	0	0	0	0	0	0

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection:	St. Guillaume Rd & Enterprise Rd
Site Code:	2416900021
Municipality:	Russell Twp
Count Date:	Apr 24, 2024

West Approach - Enterprise Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	Total Peds
15:00	12	0	4	0	16	6	0	1	0	7	0	0	0	0	0	0
15:15	21	0	5	0	26	2	0	1	0	3	0	0	0	0	0	0
15:30	12	0	9	0	21	3	0	0	0	3	0	0	0	0	0	0
15:45	22	0	8	0	30	2	0	1	0	3	0	0	0	0	0	0
16:00	51	0	14	0	65	4	0	1	0	5	0	0	0	0	0	0
16:15	21	0	14	0	35	3	0	0	0	3	0	0	0	0	0	0
16:30	46	0	24	0	70	0	0	0	0	0	0	0	0	0	0	0
16:45	13	0	8	0	21	1	0	1	0	2	0	0	0	0	0	0
17:00	64	0	19	0	83	1	0	1	0	2	0	0	0	0	0	0
17:15	33	0	8	0	41	3	0	0	0	3	0	0	0	0	0	0
17:30	42	0	13	0	55	0	0	1	0	1	0	0	0	0	0	0
17:45	21	0	6	0	27	0	0	1	0	1	0	0	0	0	0	0
SUBTOTAL	358	0	132	0	490	25	0	8	0	33	0	0	0	0	0	0
GRAND TOTAL	**548**	**0**	**247**	**0**	**795**	**129**	**0**	**24**	**0**	**153**	**0**	**0**	**0**	**0**	**0**	**0**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		**One Hour Peak**	
From:	07:00:00	From:	07:00:00
To:	10:00:00	To:	08:00:00

Intersection: St. Guillaume Rd & Enterprise Rd
Site Code: 2416900021
Count Date: Apr 24, 2024

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: St. Guillaume Rd runs N/S

North Approach

	Out	In	Total
🚗	296	367	663
🚚	19	40	59
🚲	0	0	0
	315	**407**	**722**

St. Guillaume Rd

🚲	0	0	0
🚚	9	10	0
🚗	144	152	0
Totals	**153**	**162**	**0**
	↲	⬇	⮌

Peds: 0

Enterprise Rd

🚲	🚚	🚗	**Totals**	
0	0	0	**0**	⮌
0	28	29	**57**	⬏
0	5	7	**12**	⬎

Peds: 0

Peds: 0

Peds: 0

West Approach

	Out	In	Total
🚗	36	194	230
🚚	33	10	43
🚲	0	1	1
	69	**205**	**274**

	↰	⬆	⮌
Totals	**52**	**350**	**0**
🚗	50	338	0
🚚	1	12	0
🚲	1	0	0

St. Guillaume Rd

South Approach

	Out	In	Total
🚗	388	159	547
🚚	13	15	28
🚲	1	0	1
	402	**174**	**576**

🚗 - Cars
🚚 - Trucks
🚲 - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Summary

Intersection:	St. Guillaume Rd & Enterprise Rd
Site Code:	2416900021
Count Date:	Apr 24, 2024
Period:	07:00 - 10:00

Peak Hour Data (07:00 - 08:00)

Start Time	North Approach St. Guillaume Rd						South Approach St. Guillaume Rd						East Approach						West Approach Enterprise Rd						Total Vehicles
	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	
07:00		32	37	0	0	69	12	97		0	0	109					0		10		3	0	0	13	191
07:15		40	50	0	0	90	15	96		0	0	111					0		16		2	0	0	18	219
07:30		42	28	0	0	70	12	86		0	0	98					0		15		4	0	0	19	187
07:45		48	38	0	0	86	13	71		0	0	84					0		16		3	0	0	19	189
Grand Total		**162**	**153**	**0**	**0**	**315**	**52**	**350**		**0**	**0**	**402**					**0**	**0**	**57**		**12**	**0**	**0**	**69**	**786**
Approach %		51.4	48.6	0		-	12.9	87.1		0		-						-	82.6		17.4	0		-	
Totals %		20.6	19.5	0		40.1	6.6	44.5		0		51.1						0	7.3		1.5	0		8.8	
PHF		**0.84**	**0.77**	**0**		**0.88**	**0.87**	**0.9**		**0**		**0.91**						**0**	**0.89**		**0.75**	**0**		**0.91**	**0.9**
Cars		152	144	0		296	50	338		0		388						0	29		7	0		36	720
% Cars		93.8	94.1	0		94	96.2	96.6		0		96.5						0	50.9		58.3	0		52.2	91.6
Trucks		10	9	0		19	1	12		0		13						0	28		5	0		33	65
% Trucks		6.2	5.9	0		6	1.9	3.4		0		3.2						0	49.1		41.7	0		47.8	8.3
Bicycles		0	0	0		0	1	0		0		1						0	0		0	0		0	1
% Bicycles		0	0	0		0	1.9	0		0		0.2						0	0		0	0		0	0.1
Peds					0	-					0	-					0	-					0	-	0
% Peds					0	-					0	-					0	-					0	-	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		**One Hour Peak**	
From:	11:00:00	From:	11:15:00
To:	13:00:00	To:	12:15:00

Intersection: St. Guillaume Rd & Enterprise Rd
Site Code: 2416900021
Count Date: Apr 24, 2024

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: St. Guillaume Rd runs N/S

North Approach

	Out	In	Total
🚗	219	220	439
🚚	28	30	58
🚲	0	0	0
	247	**250**	**497**

St. Guillaume Rd

🚲	0	0	0
🚚	13	15	0
🚗	36	183	0
Totals	**49**	**198**	**0**
	↲	↓	↻

Peds: 0

Enterprise Rd

🚲	🚚	🚗	**Totals**	
0	0	0	**0**	↷
0	17	58	**75**	↱
0	3	52	**55**	↴

Peds: 0

N
W E
S

Peds: 0

Peds: 0

West Approach

	Out	In	Total
🚗	110	58	168
🚚	20	16	36
🚲	0	0	0
	130	**74**	**204**

	↰	↑	↷
Totals	**25**	**175**	**0**
🚗	22	162	0
🚚	3	13	0
🚲	0	0	0

St. Guillaume Rd

South Approach

	Out	In	Total
🚗	184	235	419
🚚	16	18	34
🚲	0	0	0
	200	**253**	**453**

🚗 - Cars 🚚 - Trucks 🚲 - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Summary

Intersection:	St. Guillaume Rd & Enterprise Rd
Site Code:	2416900021
Count Date:	Apr 24, 2024
Period:	11:00 - 13:00

Peak Hour Data (11:15 - 12:15)

	North Approach St. Guillaume Rd						South Approach St. Guillaume Rd						East Approach						West Approach Enterprise Rd						Total Vehicles
Start Time	↰	↑	↱	↶	**Peds**	**Total**	↰	↑	↱	↶	**Peds**	**Total**	↰	↑	↱	↶	**Peds**	**Total**	↰	↑	↱	↶	**Peds**	**Total**	
11:15		56	13	0	0	69	7	46		0	0	53					0		16		10	0	0	26	148
11:30		46	12	0	0	58	4	54		0	0	58					0		20		11	0	0	31	147
11:45		51	14	0	0	65	4	36		0	0	40					0		17		20	0	0	37	142
12:00		45	10	0	0	55	10	39		0	0	49					0		22		14	0	0	36	140
Grand Total		**198**	**49**	**0**	**0**	**247**	**25**	**175**		**0**	**0**	**200**					**0**	**0**	**75**		**55**	**0**	**0**	**130**	**577**
Approach %		80.2	19.8	0		-	12.5	87.5		0		-						-	57.7		42.3	0		-	
Totals %		34.3	8.5	0		42.8	4.3	30.3		0		34.7						0	13		9.5	0		22.5	
PHF		**0.88**	**0.88**	**0**		**0.89**	**0.63**	**0.81**		**0**		**0.86**						**0**	**0.85**		**0.69**	**0**		**0.88**	**0.97**
Cars		183	36	0		219	22	162		0		184						0	58		52	0		110	513
% Cars		92.4	73.5	0		88.7	88	92.6		0		92						0	77.3		94.5	0		84.6	88.9
Trucks		15	13	0		28	3	13		0		16						0	17		3	0		20	64
% Trucks		7.6	26.5	0		11.3	12	7.4		0		8						0	22.7		5.5	0		15.4	11.1
Bicycles		0	0	0		0	0	0		0		0						0	0		0	0		0	0
% Bicycles		0	0	0		0	0	0		0		0						0	0		0	0		0	0
Peds					0	-					0	-					0	-					0	-	0
% Peds					0	-					0	-					0	-					0	-	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		**One Hour Peak**	
From:	15:00:00	From:	16:15:00
To:	18:00:00	To:	17:15:00

Intersection: St. Guillaume Rd & Enterprise Rd
Site Code: 2416900021
Count Date: Apr 24, 2024

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: St. Guillaume Rd runs N/S

North Approach

	Out	In	Total
🚗	567	355	922
🚚	28	9	37
🚲	0	0	0
	595	**364**	**959**

St. Guillaume Rd

🚲	0	0	0
🚚	19	8	1
🚗	23	544	0
Totals	**42**	**552**	**1**
	↲	↓	↻

Peds: 0

Enterprise Rd

🚲	🚚	🚗	**Totals**	
0	0	0	**0**	↺
0	5	144	**149**	↰
0	2	65	**67**	↴

Peds: 0

Peds: 0

Peds: 0

West Approach

	Out	In	Total
🚗	209	36	245
🚚	7	22	29
🚲	0	0	0
	216	**58**	**274**

	↰	↑	↷
Totals	**16**	**214**	**0**
🚗	13	211	0
🚚	3	3	0
🚲	0	0	0

St. Guillaume Rd

South Approach

	Out	In	Total
🚗	224	609	833
🚚	6	10	16
🚲	0	0	0
	230	**619**	**849**

🚗 - Cars
🚚 - Trucks
🚲 - Bicycles

Comments

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Peak Hour Summary

Intersection: St. Guillaume Rd & Enterprise Rd
Site Code: 2416900021
Count Date: Apr 24, 2024
Period: 15:00 - 18:00

Peak Hour Data (16:15 - 17:15)

Start Time	North Approach St. Guillaume Rd						South Approach St. Guillaume Rd						East Approach						West Approach Enterprise Rd						Total Vehicles
	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	
16:15		150	13	0	0	163	6	49		0	0	55					0		24		14	0	0	38	256
16:30		156	7	1	0	164	5	63		0	0	68					0		46		24	0	0	70	302
16:45		121	12	0	0	133	2	35		0	0	37					0		14		9	0	0	23	193
17:00		125	10	0	0	135	3	67		0	0	70					0		65		20	0	0	85	290
Grand Total		**552**	**42**	**1**	**0**	**595**	**16**	**214**		**0**	**0**	**230**					**0**	**0**	**149**		**67**	**0**	**0**	**216**	**1041**
Approach %		92.8	7.1	0.2		-	7	93		0		-						-	69		31	0		-	
Totals %		53	4	0.1		57.2	1.5	20.6		0		22.1						0	14.3		6.4	0		20.7	
PHF		**0.88**	**0.81**	**0.25**		**0.91**	**0.67**	**0.8**		**0**		**0.82**						**0**	**0.57**		**0.7**	**0**		**0.64**	**0.86**
Cars		544	23	0		567	13	211		0		224						0	144		65	0		209	1000
% Cars		98.6	54.8	0		95.3	81.3	98.6		0		97.4						0	96.6		97	0		96.8	96.1
Trucks		8	19	1		28	3	3		0		6						0	5		2	0		7	41
% Trucks		1.4	45.2	100		4.7	18.8	1.4		0		2.6						0	3.4		3	0		3.2	3.9
Bicycles		0	0	0		0	0	0		0		0						0	0		0	0		0	0
% Bicycles		0	0	0		0	0	0		0		0						0	0		0	0		0	0
Peds					0	-					0	-					0	-					0	-	0
% Peds					0	-					0	-					0	-					0	-	

Ontario Traffic Inc.
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Project #24-466 - Stantec

Intersection Count Report

Intersection:	Burton Rd & Corduroy Rd
Municipality:	Russell Twp
Count Date:	Wednesday, Nov 06, 2024
Site Code:	2446600001
Count Categories:	Cars, Trucks, Bicycles, Pedestrians
Count Period:	07:00-10:00, 11:00-13:00, 15:00-18:00
Weather:	Clear
Comments:	

Traffic Count Map

Intersection:	Burton Rd & Corduroy Rd
Site Code:	2446600001
Municipality:	Russell Twp
Count Date:	Nov 06, 2024

Map data ©2024 Imagery ©2024 Airbus, CNES / Airbus, Maxar Technologies

Traffic Count Summary

Intersection: Burton Rd & Corduroy Rd
Site Code: 2446600001
Municipality: Russell Twp
Count Date: Nov 06, 2024

Corduroy Rd - Traffic Summary

	North Approach Totals						South Approach Totals						
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
Hour	**Left**	**Thru**	**Right**	**U-Turn**	**Total**	**Peds**	**Left**	**Thru**	**Right**	**U-Turn**	**Total**	**Peds**	**Total**
07:00 - 08:00	0	0	0	0	0	0	11	0	41	0	52	0	52
08:00 - 09:00	0	0	0	0	0	0	11	0	45	0	56	0	56
09:00 - 10:00	1	0	0	0	1	0	9	0	48	0	57	0	58
BREAK													
11:00 - 12:00	0	0	0	0	0	0	17	0	43	0	60	0	60
12:00 - 13:00	0	0	0	0	0	0	17	0	51	0	68	0	68
BREAK													
15:00 - 16:00	1	0	0	0	1	0	17	0	54	1	72	0	73
16:00 - 17:00	0	0	0	0	0	0	36	0	79	0	115	0	115
17:00 - 18:00	0	0	0	0	0	0	19	0	43	0	62	0	62
GRAND TOTAL	**2**	**0**	**0**	**0**	**2**	**0**	**137**	**0**	**404**	**1**	**542**	**0**	**544**

Ontario Traffic Inc.
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Traffic Count Summary

Intersection:	Burton Rd & Corduroy Rd
Site Code:	2446600001
Municipality:	Russell Twp
Count Date:	Nov 06, 2024

Burton Rd - Traffic Summary

	East Approach Totals						West Approach Totals						
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
Hour	**Left**	**Thru**	**Right**	**U-Turn**	**Total**	**Peds**	**Left**	**Thru**	**Right**	**U-Turn**	**Total**	**Peds**	**Total**
07:00 - 08:00	68	35	0	0	103	0	0	43	28	0	71	0	174
08:00 - 09:00	33	26	0	0	59	0	0	34	28	0	62	0	121
09:00 - 10:00	34	32	4	0	70	0	1	25	11	0	37	0	107
BREAK													
11:00 - 12:00	51	39	0	0	90	0	0	41	10	0	51	0	141
12:00 - 13:00	46	24	0	0	70	0	0	49	18	0	67	0	137
BREAK													
15:00 - 16:00	38	36	2	0	76	0	0	46	17	0	63	0	139
16:00 - 17:00	35	44	0	0	79	0	0	39	13	0	52	0	131
17:00 - 18:00	14	40	0	0	54	0	0	25	9	0	34	0	88
GRAND TOTAL	**319**	**276**	**6**	**0**	**601**	**0**	**1**	**302**	**134**	**0**	**437**	**0**	**1038**

Ontario Traffic Inc.
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Traffic Count Data

Intersection: Burton Rd & Corduroy Rd
Site Code: 2446600001
Municipality: Russell Twp
Count Date: Nov 06, 2024

North Approach - Corduroy Rd

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0

Ontario Traffic Inc.
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Traffic Count Data

Intersection:	Burton Rd & Corduroy Rd
Site Code:	2446600001
Municipality:	Russell Twp
Count Date:	Nov 06, 2024

North Approach - Corduroy Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	Total Peds
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ontario Traffic Inc.
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Traffic Count Data

Intersection:	Burton Rd & Corduroy Rd
Site Code:	2446600001
Municipality:	Russell Twp
Count Date:	Nov 06, 2024

North Approach - Corduroy Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↻	**Total**	↰	↑	↱	↻	**Total**	↰	↑	↱	↻	**Total**	**Total Peds**
15:00	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
GRAND TOTAL	**2**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Ontario Traffic Inc.
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Traffic Count Data

Intersection: Burton Rd & Corduroy Rd
Site Code: 2446600001
Municipality: Russell Twp
Count Date: Nov 06, 2024

South Approach - Corduroy Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	**Total Peds**
07:00	1	0	4	0	5	1	0	6	0	7	0	0	0	0	0	0
07:15	1	0	3	0	4	2	0	5	0	7	0	0	0	0	0	0
07:30	5	0	6	0	11	0	0	4	0	4	0	0	0	0	0	0
07:45	0	0	8	0	8	1	0	5	0	6	0	0	0	0	0	0
08:00	2	0	11	0	13	0	0	3	0	3	0	0	0	0	0	0
08:15	3	0	12	0	15	1	0	3	0	4	0	0	0	0	0	0
08:30	2	0	5	0	7	1	0	1	0	2	0	0	0	0	0	0
08:45	1	0	5	0	6	1	0	5	0	6	0	0	0	0	0	0
09:00	3	0	11	0	14	1	0	3	0	4	0	0	0	0	0	0
09:15	2	0	6	0	8	1	0	5	0	6	0	0	0	0	0	0
09:30	2	0	9	0	11	0	0	6	0	6	0	0	0	0	0	0
09:45	0	0	5	0	5	0	0	3	0	3	0	0	0	0	0	0
SUBTOTAL	22	0	85	0	107	9	0	49	0	58	0	0	0	0	0	0

Ontario Traffic Inc.
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Traffic Count Data

Intersection:	Burton Rd & Corduroy Rd
Site Code:	2446600001
Municipality:	Russell Twp
Count Date:	Nov 06, 2024

South Approach - Corduroy Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	**Total Peds**
11:00	4	0	6	0	10	0	0	1	0	1	0	0	0	0	0	0
11:15	2	0	7	0	9	1	0	2	0	3	0	0	0	0	0	0
11:30	2	0	8	0	10	1	0	3	0	4	0	0	0	0	0	0
11:45	4	0	12	0	16	3	0	4	0	7	0	0	0	0	0	0
12:00	4	0	16	0	20	1	0	5	0	6	0	0	0	0	0	0
12:15	3	0	8	0	11	2	0	2	0	4	0	0	0	0	0	0
12:30	2	0	4	0	6	1	0	4	0	5	0	0	0	0	0	0
12:45	3	0	7	0	10	1	0	5	0	6	0	0	0	0	0	0
SUBTOTAL	24	0	68	0	92	10	0	26	0	36	0	0	0	0	0	0

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Traffic Count Data

Intersection: Burton Rd & Corduroy Rd
Site Code: 2446600001
Municipality: Russell Twp
Count Date: Nov 06, 2024

South Approach - Corduroy Rd

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	
15:00	2	0	10	0	12	1	0	2	0	3	0	0	0	0	0	0
15:15	5	0	6	0	11	1	0	3	0	4	0	0	0	0	0	0
15:30	6	0	11	1	18	0	0	3	0	3	0	0	0	0	0	0
15:45	2	0	16	0	18	0	0	3	0	3	0	0	0	0	0	0
16:00	14	0	18	0	32	1	0	3	0	4	0	0	0	0	0	0
16:15	4	0	13	0	17	1	0	2	0	3	0	0	0	0	0	0
16:30	12	0	22	0	34	0	0	1	0	1	0	0	0	0	0	0
16:45	3	0	18	0	21	1	0	2	0	3	0	0	0	0	0	0
17:00	13	0	20	0	33	0	0	1	0	1	0	0	0	0	0	0
17:15	1	0	6	0	7	0	0	2	0	2	0	0	0	0	0	0
17:30	1	0	6	0	7	0	0	1	0	1	0	0	0	0	0	0
17:45	4	0	6	0	10	0	0	1	0	1	0	0	0	0	0	0
SUBTOTAL	67	0	152	1	220	5	0	24	0	29	0	0	0	0	0	0
GRAND TOTAL	**113**	**0**	**305**	**1**	**419**	**24**	**0**	**99**	**0**	**123**	**0**	**0**	**0**	**0**	**0**	**0**

Ontario Traffic Inc.
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Traffic Count Data

Intersection: Burton Rd & Corduroy Rd
Site Code: 2446600001
Municipality: Russell Twp
Count Date: Nov 06, 2024

East Approach - Burton Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	Total Peds
07:00	14	3	0	0	17	5	1	0	0	6	0	0	0	0	0	0
07:15	9	9	0	0	18	2	1	0	0	3	0	0	0	0	0	0
07:30	15	10	0	0	25	4	2	0	0	6	0	0	0	0	0	0
07:45	19	8	0	0	27	0	1	0	0	1	0	0	0	0	0	0
08:00	4	4	0	0	8	3	0	0	0	3	0	0	0	0	0	0
08:15	5	4	0	0	9	1	0	0	0	1	0	0	0	0	0	0
08:30	4	10	0	0	14	3	1	0	0	4	0	0	0	0	0	0
08:45	11	7	0	0	18	2	0	0	0	2	0	0	0	0	0	0
09:00	9	8	0	0	17	3	1	0	0	4	0	0	0	0	0	0
09:15	3	3	0	0	6	2	0	0	0	2	0	0	0	0	0	0
09:30	5	12	1	0	18	3	0	3	0	6	0	0	0	0	0	0
09:45	8	7	0	0	15	1	1	0	0	2	0	0	0	0	0	0
SUBTOTAL	106	85	1	0	192	29	8	3	0	40	0	0	0	0	0	0

Ontario Traffic Inc.
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Traffic Count Data

Intersection: Burton Rd & Corduroy Rd
Site Code: 2446600001
Municipality: Russell Twp
Count Date: Nov 06, 2024

East Approach - Burton Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	Total Peds
11:00	5	8	0	0	13	4	0	0	0	4	0	0	0	0	0	0
11:15	12	8	0	0	20	5	2	0	0	7	0	0	0	0	0	0
11:30	8	5	0	0	13	4	3	0	0	7	0	0	0	0	0	0
11:45	9	12	0	0	21	4	1	0	0	5	0	0	0	0	0	0
12:00	6	9	0	0	15	2	1	0	0	3	0	0	0	0	0	0
12:15	10	5	0	0	15	6	0	0	0	6	0	0	0	0	0	0
12:30	4	4	0	0	8	4	0	0	0	4	0	0	0	0	0	0
12:45	11	5	0	0	16	3	0	0	0	3	0	0	0	0	0	0
SUBTOTAL	65	56	0	0	121	32	7	0	0	39	0	0	0	0	0	0

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection:	Burton Rd & Corduroy Rd
Site Code:	2446600001
Municipality:	Russell Twp
Count Date:	Nov 06, 2024

East Approach - Burton Rd

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	
15:00	7	5	1	0	13	4	2	0	0	6	0	0	0	0	0	0
15:15	7	11	1	0	19	2	2	0	0	4	0	0	0	0	0	0
15:30	4	9	0	0	13	3	1	0	0	4	0	0	0	0	0	0
15:45	8	5	0	0	13	3	1	0	0	4	0	0	0	0	0	0
16:00	4	7	0	0	11	4	1	0	0	5	0	0	0	0	0	0
16:15	8	8	0	0	16	3	1	0	0	4	0	0	0	0	0	0
16:30	4	14	0	0	18	3	2	0	0	5	0	0	0	0	0	0
16:45	2	9	0	0	11	7	2	0	0	9	0	0	0	0	0	0
17:00	1	12	0	0	13	2	1	0	0	3	0	0	0	0	0	0
17:15	5	8	0	0	13	1	1	0	0	2	0	0	0	0	0	0
17:30	0	8	0	0	8	2	3	0	0	5	0	0	0	0	0	0
17:45	1	7	0	0	8	2	0	0	0	2	0	0	0	0	0	0
SUBTOTAL	51	103	2	0	156	36	17	0	0	53	0	0	0	0	0	0
GRAND TOTAL	**222**	**244**	**3**	**0**	**469**	**97**	**32**	**3**	**0**	**132**	**0**	**0**	**0**	**0**	**0**	**0**

Ontario Traffic Inc.
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Traffic Count Data

Intersection: Burton Rd & Corduroy Rd
Site Code: 2446600001
Municipality: Russell Twp
Count Date: Nov 06, 2024

West Approach - Burton Rd

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	⮌	Total	↰	↑	↱	⮌	Total	↰	↑	↱	⮌	Total	
07:00	0	12	8	0	20	0	3	1	0	4	0	0	0	0	0	0
07:15	0	6	6	0	12	0	1	0	0	1	0	0	0	0	0	0
07:30	0	7	4	0	11	0	2	1	0	3	0	0	0	0	0	0
07:45	0	11	8	0	19	0	1	0	0	1	0	0	0	0	0	0
08:00	0	11	8	0	19	0	1	1	0	2	0	0	0	0	0	0
08:15	0	8	8	0	16	0	0	0	0	0	0	0	0	0	0	0
08:30	0	5	7	0	12	0	1	0	0	1	0	0	0	0	0	0
08:45	0	7	4	0	11	0	1	0	0	1	0	0	0	0	0	0
09:00	0	5	1	0	6	0	2	1	0	3	0	0	0	0	0	0
09:15	1	6	1	0	8	0	3	0	0	3	0	0	0	0	0	0
09:30	0	2	2	0	4	0	0	0	0	0	0	0	0	0	0	0
09:45	0	4	4	0	8	0	3	2	0	5	0	0	0	0	0	0
SUBTOTAL	1	84	61	0	146	0	18	6	0	24	0	0	0	0	0	0

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Burton Rd & Corduroy Rd
Site Code: 2446600001
Municipality: Russell Twp
Count Date: Nov 06, 2024

West Approach - Burton Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	**Total Peds**
11:00	0	10	3	0	13	0	2	1	0	3	0	0	0	0	0	0
11:15	0	8	1	0	9	0	0	0	0	0	0	0	0	0	0	0
11:30	0	13	1	0	14	0	0	1	0	1	0	0	0	0	0	0
11:45	0	6	3	0	9	0	2	0	0	2	0	0	0	0	0	0
12:00	0	18	8	0	26	0	2	0	0	2	0	0	0	0	0	0
12:15	0	11	2	0	13	0	0	1	0	1	0	1	0	0	1	0
12:30	0	6	4	0	10	0	1	0	0	1	0	0	0	0	0	0
12:45	0	8	1	0	9	0	2	2	0	4	0	0	0	0	0	0
SUBTOTAL	0	80	23	0	103	0	9	5	0	14	0	1	0	0	1	0

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Burton Rd & Corduroy Rd
Site Code: 2446600001
Municipality: Russell Twp
Count Date: Nov 06, 2024

West Approach - Burton Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↷	**Total**	↰	↑	↱	↷	**Total**	↰	↑	↱	↷	**Total**	**Total Peds**
15:00	0	12	3	0	15	0	4	0	0	4	0	0	0	0	0	0
15:15	0	9	5	0	14	0	1	3	0	4	0	0	0	0	0	0
15:30	0	10	2	0	12	0	1	0	0	1	0	0	0	0	0	0
15:45	0	8	1	0	9	0	1	3	0	4	0	0	0	0	0	0
16:00	0	8	1	0	9	0	2	1	0	3	0	0	0	0	0	0
16:15	0	8	4	0	12	0	2	0	0	2	0	0	0	0	0	0
16:30	0	13	3	0	16	0	0	3	0	3	0	0	0	0	0	0
16:45	0	6	1	0	7	0	0	0	0	0	0	0	0	0	0	0
17:00	0	7	2	0	9	0	3	3	0	6	0	0	0	0	0	0
17:15	0	4	0	0	4	0	0	1	0	1	0	0	0	0	0	0
17:30	0	4	0	0	4	0	1	1	0	2	0	0	0	0	0	0
17:45	0	6	0	0	6	0	0	2	0	2	0	0	0	0	0	0
SUBTOTAL	0	95	22	0	117	0	15	17	0	32	0	0	0	0	0	0
GRAND TOTAL	**1**	**259**	**106**	**0**	**366**	**0**	**42**	**28**	**0**	**70**	**0**	**1**	**0**	**0**	**1**	**0**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		One Hour Peak	
From:	07:00:00	From:	07:00:00
To:	10:00:00	To:	08:00:00

Intersection: Burton Rd & Corduroy Rd
Site Code: 2446600001
Count Date: Nov 06, 2024

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Burton Rd runs E/W

North Approach

	Out	In	Total
🚗	0	0	0
🚚	0	0	0
🚲	0	0	0
	0	**0**	**0**

Corduroy Rd

🚲	0	0	0	0
🚚	0	0	0	0
🚗	0	0	0	0
Totals	**0**	**0**	**0**	**0**
	↲	↓	↳	↻

East Approach

	Out	In	Total
🚗	87	57	144
🚚	16	27	43
🚲	0	0	0
	103	**84**	**187**

Burton Rd

🚲	🚚	🚗	Totals	
0	0	0	**0**	↶
0	0	0	**0**	↑
0	7	36	**43**	→
0	2	26	**28**	↓

Peds: 0

Peds: 0

Peds: 0

Peds: 0

Burton Rd

	Totals	🚗	🚚	🚲
↷	**0**	0	0	0
↑	**0**	0	0	0
←	**35**	30	5	0
↓	**68**	57	11	0

West Approach

	Out	In	Total
🚗	62	37	99
🚚	9	9	18
🚲	0	0	0
	71	**46**	**117**

	↰	↑	↱	↶
Totals	**11**	**0**	**41**	**0**
🚗	7	0	21	0
🚚	4	0	20	0
🚲	0	0	0	0

Corduroy Rd

South Approach

	Out	In	Total
🚗	28	83	111
🚚	24	13	37
🚲	0	0	0
	52	**96**	**148**

🚗 - Cars 🚚 - Trucks 🚲 - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Summary

Intersection: Burton Rd & Corduroy Rd
Site Code: 2446600001
Count Date: Nov 06, 2024
Period: 07:00 - 10:00

Peak Hour Data (07:00 - 08:00)

	North Approach Corduroy Rd						South Approach Corduroy Rd						East Approach Burton Rd						West Approach Burton Rd						Total Vehicles
Start Time	↰	↑	↱	↶	**Peds**	**Total**	↰	↑	↱	↶	**Peds**	**Total**	↰	↑	↱	↶	**Peds**	**Total**	↰	↑	↱	↶	**Peds**	**Total**	
07:00	0	0	0	0	0	0	2	0	10	0	0	12	19	4	0	0	0	23	0	15	9	0	0	24	59
07:15	0	0	0	0	0	0	3	0	8	0	0	11	11	10	0	0	0	21	0	7	6	0	0	13	45
07:30	0	0	0	0	0	0	5	0	10	0	0	15	19	12	0	0	0	31	0	9	5	0	0	14	60
07:45	0	0	0	0	0	0	1	0	13	0	0	14	19	9	0	0	0	28	0	12	8	0	0	20	62
Grand Total	**0**	**0**	**0**	**0**	**0**	**0**	**11**	**0**	**41**	**0**	**0**	**52**	**68**	**35**	**0**	**0**	**0**	**103**	**0**	**43**	**28**	**0**	**0**	**71**	**226**
Approach %	0	0	0	0		-	21.2	0	78.8	0		-	66	34	0	0		-	0	60.6	39.4	0		-	
Totals %	0	0	0	0		0	4.9	0	18.1	0		23	30.1	15.5	0	0		45.6	0	19	12.4	0		31.4	
PHF	**0**	**0**	**0**	**0**		**0**	**0.55**	**0**	**0.79**	**0**		**0.87**	**0.89**	**0.73**	**0**	**0**		**0.83**	**0**	**0.72**	**0.78**	**0**		**0.74**	**0.91**
Cars	0	0	0	0		0	7	0	21	0		28	57	30	0	0		87	0	36	26	0		62	177
% Cars	0	0	0	0		0	63.6	0	51.2	0		53.8	83.8	85.7	0	0		84.5	0	83.7	92.9	0		87.3	78.3
Trucks	0	0	0	0		0	4	0	20	0		24	11	5	0	0		16	0	7	2	0		9	49
% Trucks	0	0	0	0		0	36.4	0	48.8	0		46.2	16.2	14.3	0	0		15.5	0	16.3	7.1	0		12.7	21.7
Bicycles	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0
% Bicycles	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0
Peds					0	-					0	-					0	-					0	-	0
% Peds					0	-					0	-					0	-					0	-	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		**One Hour Peak**	
From:	11:00:00	From:	11:30:00
To:	13:00:00	To:	12:30:00

Intersection: Burton Rd & Corduroy Rd
Site Code: 2446600001
Count Date: Nov 06, 2024

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Burton Rd runs E/W

North Approach

	Out	In	Total
🚗	0	0	0
🚚	0	0	0
🚲	0	0	0
	0	**0**	**0**

Corduroy Rd

🚲	0	0	0	0
🚚	0	0	0	0
🚗	0	0	0	0
Totals	**0**	**0**	**0**	**0**
	↲	↓	↳	↻

East Approach

	Out	In	Total
🚗	64	92	156
🚚	21	18	39
🚲	0	1	1
	85	**111**	**196**

Peds: 0

Burton Rd

🚲	🚚	🚗	Totals	
0	0	0	**0**	↺
0	0	0	**0**	↰
1	4	48	**53**	→
0	2	14	**16**	↴

Peds: 0

Peds: 0

Burton Rd

	Totals	🚗	🚚	🚲
↻	**0**	0	0	0
↱	**0**	0	0	0
←	**36**	31	5	0
↲	**49**	33	16	0

Peds: 0

West Approach

	Out	In	Total
🚗	62	44	106
🚚	6	12	18
🚲	1	0	1
	69	**56**	**125**

	↰	↑	↱	↺
Totals	**20**	**0**	**58**	**0**
🚗	13	0	44	0
🚚	7	0	14	0
🚲	0	0	0	0

Corduroy Rd

South Approach

	Out	In	Total
🚗	57	47	104
🚚	21	18	39
🚲	0	0	0
	78	**65**	**143**

🚗 - Cars 🚚 - Trucks 🚲 - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Summary

Intersection:	Burton Rd & Corduroy Rd
Site Code:	2446600001
Count Date:	Nov 06, 2024
Period:	11:00 - 13:00

Peak Hour Data (11:30 - 12:30)

	North Approach Corduroy Rd						South Approach Corduroy Rd						East Approach Burton Rd						West Approach Burton Rd						Total Vehicles
Start Time	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	
11:30	0	0	0	0	0	0	3	0	11	0	0	14	12	8	0	0	0	20	0	13	2	0	0	15	49
11:45	0	0	0	0	0	0	7	0	16	0	0	23	13	13	0	0	0	26	0	8	3	0	0	11	60
12:00	0	0	0	0	0	0	5	0	21	0	0	26	8	10	0	0	0	18	0	20	8	0	0	28	72
12:15	0	0	0	0	0	0	5	0	10	0	0	15	16	5	0	0	0	21	0	12	3	0	0	15	51
Grand Total	**0**	**0**	**0**	**0**	**0**	**0**	**20**	**0**	**58**	**0**	**0**	**78**	**49**	**36**	**0**	**0**	**0**	**85**	**0**	**53**	**16**	**0**	**0**	**69**	**232**
Approach %	0	0	0	0		-	25.6	0	74.4	0		-	57.6	42.4	0	0		-	0	76.8	23.2	0		-	
Totals %	0	0	0	0		0	8.6	0	25	0		33.6	21.1	15.5	0	0		36.6	0	22.8	6.9	0		29.7	
PHF	**0**	**0**	**0**	**0**		**0**	**0.71**	**0**	**0.69**	**0**		**0.75**	**0.77**	**0.69**	**0**	**0**		**0.82**	**0**	**0.66**	**0.5**	**0**		**0.62**	**0.81**
Cars	0	0	0	0		0	13	0	44	0		57	33	31	0	0		64	0	48	14	0		62	183
% Cars	0	0	0	0		0	65	0	75.9	0		73.1	67.3	86.1	0	0		75.3	0	90.6	87.5	0		89.9	78.9
Trucks	0	0	0	0		0	7	0	14	0		21	16	5	0	0		21	0	4	2	0		6	48
% Trucks	0	0	0	0		0	35	0	24.1	0		26.9	32.7	13.9	0	0		24.7	0	7.5	12.5	0		8.7	20.7
Bicycles	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	1	0	0		1	1
% Bicycles	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	1.9	0	0		1.4	0.4
Peds					0	-					0	-					0	-					0	-	0
% Peds					0	-					0	-					0	-					0	-	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		**One Hour Peak**	
From:	15:00:00	From:	16:15:00
To:	18:00:00	To:	17:15:00

Intersection: Burton Rd & Corduroy Rd
Site Code: 2446600001
Count Date: Nov 06, 2024

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Burton Rd runs E/W

North Approach

	Out	In	Total
🚗	0	0	0
🚚	0	0	0
🚲	0	0	0
	0	**0**	**0**

Corduroy Rd

	↲	↓	↳	↺
🚲	0	0	0	0
🚚	0	0	0	0
🚗	0	0	0	0
Totals	**0**	**0**	**0**	**0**

East Approach

	Out	In	Total
🚗	58	107	165
🚚	21	11	32
🚲	0	0	0
	79	**118**	**197**

Peds: 0

Burton Rd

🚲	🚚	🚗	**Totals**	
0	0	0	**0**	↶
0	0	0	**0**	↑
0	5	34	**39**	→
0	6	10	**16**	↓

Peds: 0

Peds: 0

Burton Rd

	Totals	🚗	🚚	🚲
↷	**0**	0	0	0
↑	**0**	0	0	0
←	**49**	43	6	0
↓	**30**	15	15	0

Peds: 0

West Approach

	Out	In	Total
🚗	44	75	119
🚚	11	8	19
🚲	0	0	0
	55	**83**	**138**

	↰	↑	↱	↶
Totals	**34**	**0**	**79**	**0**
🚗	32	0	73	0
🚚	2	0	6	0
🚲	0	0	0	0

Corduroy Rd

South Approach

	Out	In	Total
🚗	105	25	130
🚚	8	21	29
🚲	0	0	0
	113	**46**	**159**

🚗 - Cars

🚚 - Trucks

🚲 - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Summary

Intersection: Burton Rd & Corduroy Rd
Site Code: 2446600001
Count Date: Nov 06, 2024
Period: 15:00 - 18:00

Peak Hour Data (16:15 - 17:15)

Start Time	North Approach Corduroy Rd						South Approach Corduroy Rd						East Approach Burton Rd						West Approach Burton Rd						Total Vehicles
	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	
16:15	0	0	0	0	0	0	5	0	15	0	0	20	11	9	0	0	0	20	0	10	4	0	0	14	54
16:30	0	0	0	0	0	0	12	0	23	0	0	35	7	16	0	0	0	23	0	13	6	0	0	19	77
16:45	0	0	0	0	0	0	4	0	20	0	0	24	9	11	0	0	0	20	0	6	1	0	0	7	51
17:00	0	0	0	0	0	0	13	0	21	0	0	34	3	13	0	0	0	16	0	10	5	0	0	15	65
Grand Total	**0**	**0**	**0**	**0**	**0**	**0**	**34**	**0**	**79**	**0**	**0**	**113**	**30**	**49**	**0**	**0**	**0**	**79**	**0**	**39**	**16**	**0**	**0**	**55**	**247**
Approach %	0	0	0	0		-	30.1	0	69.9	0		-	38	62	0	0		-	0	70.9	29.1	0		-	
Totals %	0	0	0	0		0	13.8	0	32	0		45.7	12.1	19.8	0	0		32	0	15.8	6.5	0		22.3	
PHF	**0**	**0**	**0**	**0**		**0**	**0.65**	**0**	**0.86**	**0**		**0.81**	**0.68**	**0.77**	**0**	**0**		**0.86**	**0**	**0.75**	**0.67**	**0**		**0.72**	**0.8**
Cars	0	0	0	0		0	32	0	73	0		105	15	43	0	0		58	0	34	10	0		44	207
% Cars	0	0	0	0		0	94.1	0	92.4	0		92.9	50	87.8	0	0		73.4	0	87.2	62.5	0		80	83.8
Trucks	0	0	0	0		0	2	0	6	0		8	15	6	0	0		21	0	5	6	0		11	40
% Trucks	0	0	0	0		0	5.9	0	7.6	0		7.1	50	12.2	0	0		26.6	0	12.8	37.5	0		20	16.2
Bicycles	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0
% Bicycles	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0
Peds					0	-					0	-					0	-					0	-	0
% Peds					0	-					0	-					0	-					0	-	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Project #24-466 - Stantec

Intersection Count Report

Intersection: Burton Rd & Enterprise Rd

Municipality: Russell Twp

Count Date: Wednesday, Nov 06, 2024

Site Code: 2446600002

Count Categories: Cars, Trucks, Bicycles, Pedestrians

Count Period: 07:00-10:00, 11:00-13:00, 15:00-18:00

Weather: Clear

Comments:

Traffic Count Map

Intersection: Burton Rd & Enterprise Rd
Site Code: 2446600002
Municipality: Russell Twp
Count Date: Nov 06, 2024

Map data ©2024 Imagery ©2024 Airbus, CNES / Airbus, Maxar Technologies

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Summary

Intersection:	Burton Rd & Enterprise Rd
Site Code:	2446600002
Municipality:	Russell Twp
Count Date:	Nov 06, 2024

Enterprise Rd - Traffic Summary

	North Approach Totals						South Approach Totals						
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
Hour	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	Total
07:00 - 08:00	0	0	0	0	0	0	5	0	8	0	13	0	13
08:00 - 09:00	0	0	0	0	0	0	3	0	10	0	13	0	13
09:00 - 10:00	0	0	0	0	0	0	7	0	11	0	18	0	18
BREAK													
11:00 - 12:00	0	0	0	0	0	0	6	0	11	0	17	0	17
12:00 - 13:00	0	0	0	0	0	0	6	0	13	0	19	0	19
BREAK													
15:00 - 16:00	0	0	0	0	0	0	8	0	15	0	23	0	23
16:00 - 17:00	0	0	0	0	0	0	18	0	36	0	54	0	54
17:00 - 18:00	0	0	0	0	0	0	9	0	18	0	27	0	27
GRAND TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**62**	**0**	**122**	**0**	**184**	**0**	**184**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Summary

Intersection:	Burton Rd & Enterprise Rd
Site Code:	2446600002
Municipality:	Russell Twp
Count Date:	Nov 06, 2024

Burton Rd - Traffic Summary

	East Approach Totals						West Approach Totals						
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
Hour	**Left**	**Thru**	**Right**	**U-Turn**	**Total**	**Peds**	**Left**	**Thru**	**Right**	**U-Turn**	**Total**	**Peds**	**Total**
07:00 - 08:00	15	97	0	0	112	0	0	76	8	0	84	0	196
08:00 - 09:00	16	56	0	1	73	0	0	74	5	0	79	0	152
09:00 - 10:00	12	62	0	0	74	0	0	69	6	0	75	0	149
BREAK													
11:00 - 12:00	13	86	0	0	99	0	0	77	7	0	84	0	183
12:00 - 13:00	20	62	0	0	82	0	0	98	4	0	102	0	184
BREAK													
15:00 - 16:00	12	66	0	0	78	0	0	92	9	0	101	0	179
16:00 - 17:00	11	62	0	1	74	0	0	108	10	0	118	0	192
17:00 - 18:00	14	46	0	0	60	0	0	64	4	0	68	0	128
GRAND TOTAL	**113**	**537**	**0**	**2**	**652**	**0**	**0**	**658**	**53**	**0**	**711**	**0**	**1363**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Burton Rd & Enterprise Rd
Site Code: 2446600002
Municipality: Russell Twp
Count Date: Nov 06, 2024

South Approach - Enterprise Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	Total Peds
07:00	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0	0
07:15	2	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0
07:30	1	0	1	0	2	1	0	2	0	3	0	0	0	0	0	0
07:45	1	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
08:15	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0
08:30	2	0	1	0	3	0	0	1	0	1	0	0	0	0	0	0
08:45	1	0	4	0	5	0	0	1	0	1	0	0	0	0	0	0
09:00	1	0	1	0	2	1	0	0	0	1	0	0	0	0	0	0
09:15	2	0	3	0	5	0	0	0	0	0	0	0	0	0	0	0
09:30	2	0	2	0	4	1	0	0	0	1	0	0	0	0	0	0
09:45	0	0	3	0	3	0	0	2	0	2	0	0	0	0	0	0
SUBTOTAL	12	0	21	0	33	3	0	8	0	11	0	0	0	0	0	0

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Burton Rd & Enterprise Rd
Site Code: 2446600002
Municipality: Russell Twp
Count Date: Nov 06, 2024

South Approach - Enterprise Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	**Total Peds**
11:00	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
11:15	1	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0
11:30	1	0	3	0	4	1	0	1	0	2	0	0	0	0	0	0
11:45	2	0	4	0	6	1	0	0	0	1	0	0	0	0	0	0
12:00	0	0	5	0	5	0	0	1	0	1	0	0	0	0	0	0
12:15	2	0	2	0	4	1	0	1	0	2	0	0	0	0	0	0
12:30	2	0	2	0	4	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	1	0	1	1	0	1	0	2	0	0	0	0	0	0
SUBTOTAL	8	0	19	0	27	4	0	5	0	9	0	0	0	0	0	0

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection:	Burton Rd & Enterprise Rd
Site Code:	2446600002
Municipality:	Russell Twp
Count Date:	Nov 06, 2024

South Approach - Enterprise Rd

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	
15:00	1	0	3	0	4	0	0	1	0	1	0	0	0	0	0	0
15:15	4	0	4	0	8	0	0	2	0	2	0	0	0	0	0	0
15:30	1	0	3	0	4	1	0	1	0	2	0	0	0	0	0	0
15:45	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0
16:00	3	0	7	0	10	1	0	0	0	1	0	0	0	0	0	0
16:15	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
16:30	7	0	20	0	27	0	0	2	0	2	0	0	0	0	0	0
16:45	3	0	7	0	10	2	0	0	0	2	0	0	0	0	0	0
17:00	3	0	5	0	8	0	0	0	0	0	0	0	0	0	0	0
17:15	1	0	7	0	8	0	0	0	0	0	0	0	0	0	0	0
17:30	2	0	2	0	4	0	0	0	0	0	0	0	0	0	0	0
17:45	3	0	3	0	6	0	0	1	0	1	0	0	0	0	0	0
SUBTOTAL	31	0	62	0	93	4	0	7	0	11	0	0	0	0	0	0
GRAND TOTAL	**51**	**0**	**102**	**0**	**153**	**11**	**0**	**20**	**0**	**31**	**0**	**0**	**0**	**0**	**0**	**0**

Traffic Count Data

Intersection: Burton Rd & Enterprise Rd
Site Code: 2446600002
Municipality: Russell Twp
Count Date: Nov 06, 2024

East Approach - Burton Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	Total Peds
07:00	4	16	0	0	20	0	5	0	0	5	0	0	0	0	0	0
07:15	5	16	0	0	21	1	4	0	0	5	0	0	0	0	0	0
07:30	2	24	0	0	26	1	5	0	0	6	0	0	0	0	0	0
07:45	1	26	0	0	27	1	1	0	0	2	0	0	0	0	0	0
08:00	3	8	0	0	11	0	3	0	0	3	0	0	0	0	0	0
08:15	2	8	0	0	10	1	2	0	0	3	0	0	0	0	0	0
08:30	5	12	0	1	18	0	3	0	0	3	0	0	0	0	0	0
08:45	3	17	0	0	20	2	3	0	0	5	0	0	0	0	0	0
09:00	3	16	0	0	19	0	3	0	0	3	0	0	0	0	0	0
09:15	1	4	0	0	5	0	2	0	0	2	0	0	0	0	0	0
09:30	4	16	0	0	20	2	5	0	0	7	0	0	0	0	0	0
09:45	1	15	0	0	16	1	1	0	0	2	0	0	0	0	0	0
SUBTOTAL	34	178	0	1	213	9	37	0	0	46	0	0	0	0	0	0

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Burton Rd & Enterprise Rd
Site Code: 2446600002
Municipality: Russell Twp
Count Date: Nov 06, 2024

East Approach - Burton Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	⮌	**Total**	↰	↑	↱	⮌	**Total**	↰	↑	↱	⮌	**Total**	**Total Peds**
11:00	4	13	0	0	17	2	4	0	0	6	0	0	0	0	0	0
11:15	2	19	0	0	21	2	7	0	0	9	0	0	0	0	0	0
11:30	1	14	0	0	15	2	6	0	0	8	0	0	0	0	0	0
11:45	0	19	0	0	19	0	4	0	0	4	0	0	0	0	0	0
12:00	3	15	0	0	18	2	3	0	0	5	0	0	0	0	0	0
12:15	5	13	0	0	18	1	5	0	0	6	0	0	0	0	0	0
12:30	4	6	0	0	10	2	4	0	0	6	0	0	0	0	0	0
12:45	2	14	0	0	16	1	2	0	0	3	0	0	0	0	0	0
SUBTOTAL	21	113	0	0	134	12	35	0	0	47	0	0	0	0	0	0

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Burton Rd & Enterprise Rd
Site Code: 2446600002
Municipality: Russell Twp
Count Date: Nov 06, 2024

East Approach - Burton Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	**Total Peds**
15:00	3	12	0	0	15	2	6	0	0	8	0	0	0	0	0	0
15:15	2	14	0	0	16	1	4	0	0	5	0	0	0	0	0	0
15:30	1	11	0	0	12	0	3	0	0	3	0	0	0	0	0	0
15:45	1	12	0	0	13	2	4	0	0	6	0	0	0	0	0	0
16:00	1	8	0	1	10	1	4	0	0	5	0	0	0	0	0	0
16:15	1	15	0	0	16	2	4	0	0	6	0	0	0	0	0	0
16:30	1	11	0	0	12	3	5	0	0	8	0	0	0	0	0	0
16:45	1	8	0	0	9	1	7	0	0	8	0	0	0	0	0	0
17:00	4	10	0	0	14	1	3	0	0	4	0	0	0	0	0	0
17:15	3	12	0	0	15	0	2	0	0	2	0	0	0	0	0	0
17:30	2	6	0	0	8	2	5	0	0	7	0	0	0	0	0	0
17:45	1	6	0	0	7	1	2	0	0	3	0	0	0	0	0	0
SUBTOTAL	21	125	0	1	147	16	49	0	0	65	0	0	0	0	0	0
GRAND TOTAL	**76**	**416**	**0**	**2**	**494**	**37**	**121**	**0**	**0**	**158**	**0**	**0**	**0**	**0**	**0**	**0**

Traffic Count Data

Intersection: Burton Rd & Enterprise Rd
Site Code: 2446600002
Municipality: Russell Twp
Count Date: Nov 06, 2024

West Approach - Burton Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	⮌	**Total**	↰	↑	↱	⮌	**Total**	↰	↑	↱	⮌	**Total**	**Total Peds**
07:00	0	15	1	0	16	0	9	0	0	9	0	0	0	0	0	0
07:15	0	8	1	0	9	0	5	1	0	6	0	0	0	0	0	0
07:30	0	12	1	0	13	0	6	0	0	6	0	0	0	0	0	0
07:45	0	16	3	0	19	0	5	1	0	6	0	0	0	0	0	0
08:00	0	21	1	0	22	0	4	0	0	4	0	0	0	0	0	0
08:15	0	20	0	0	20	0	3	0	0	3	0	0	0	0	0	0
08:30	0	8	2	0	10	0	1	1	0	2	0	0	0	0	0	0
08:45	0	11	1	0	12	0	6	0	0	6	0	0	0	0	0	0
09:00	0	13	2	0	15	0	5	0	0	5	0	0	0	0	0	0
09:15	0	10	3	0	13	0	8	0	0	8	0	0	0	0	0	0
09:30	0	13	0	0	13	0	6	0	0	6	0	0	0	0	0	0
09:45	0	9	0	0	9	0	5	1	0	6	0	0	0	0	0	0
SUBTOTAL	0	156	15	0	171	0	63	4	0	67	0	0	0	0	0	0

Traffic Count Data

Intersection: Burton Rd & Enterprise Rd
Site Code: 2446600002
Municipality: Russell Twp
Count Date: Nov 06, 2024

West Approach - Burton Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	**Total Peds**
11:00	0	15	1	0	16	0	3	1	0	4	0	0	0	0	0	0
11:15	0	14	0	0	14	0	2	0	0	2	0	0	0	0	0	0
11:30	0	18	4	0	22	0	3	0	0	3	0	0	0	0	0	0
11:45	0	17	0	0	17	0	5	1	0	6	0	0	0	0	0	0
12:00	0	34	2	0	36	0	7	0	0	7	0	0	0	0	0	0
12:15	0	20	0	0	20	0	1	0	0	1	0	0	1	0	1	0
12:30	0	10	0	0	10	0	4	1	0	5	0	0	0	0	0	0
12:45	0	15	0	0	15	0	7	0	0	7	0	0	0	0	0	0
SUBTOTAL	0	143	7	0	150	0	32	3	0	35	0	0	1	0	1	0

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection:	Burton Rd & Enterprise Rd
Site Code:	2446600002
Municipality:	Russell Twp
Count Date:	Nov 06, 2024

West Approach - Burton Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	**Total Peds**
15:00	0	22	1	0	23	0	5	1	0	6	0	0	0	0	0	0
15:15	0	15	0	0	15	0	3	1	0	4	0	0	0	0	0	0
15:30	0	19	2	0	21	0	4	0	0	4	0	0	0	0	0	0
15:45	0	20	4	0	24	0	4	0	0	4	0	0	0	0	0	0
16:00	0	25	1	0	26	0	4	1	0	5	0	0	0	0	0	0
16:15	0	21	0	0	21	0	3	1	0	4	0	0	0	0	0	0
16:30	0	32	3	0	35	0	1	0	0	1	0	0	0	0	0	0
16:45	0	21	3	0	24	0	1	1	0	2	0	0	0	0	0	0
17:00	0	25	2	0	27	0	4	0	0	4	0	0	0	0	0	0
17:15	0	10	0	0	10	0	2	0	0	2	0	0	0	0	0	0
17:30	0	10	0	0	10	0	1	1	0	2	0	0	0	0	0	0
17:45	0	11	1	0	12	0	1	0	0	1	0	0	0	0	0	0
SUBTOTAL	0	231	17	0	248	0	33	6	0	39	0	0	0	0	0	0
GRAND TOTAL	**0**	**530**	**39**	**0**	**569**	**0**	**128**	**13**	**0**	**141**	**0**	**0**	**1**	**0**	**1**	**0**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		**One Hour Peak**	
From:	07:00:00	From:	07:00:00
To:	10:00:00	To:	08:00:00

Intersection: Burton Rd & Enterprise Rd
Site Code: 2446600002
Count Date: Nov 06, 2024

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Burton Rd runs E/W

East Approach

	Out	In	Total
🚗	94	56	150
🚚	18	28	46
🚲	0	0	0
	112	**84**	**196**

Peds: 0

Peds: 0

Peds: 0

Peds: 0

N
W E
S

Burton Rd

🚲	🚚	🚗	Totals	
0	0	0	**0**	↶
0	25	51	**76**	→
0	2	6	**8**	↓

Burton Rd

	Totals	🚗	🚚	🚲
↷	**0**	0	0	0
←	**97**	82	15	0
↓	**15**	12	3	0

West Approach

	Out	In	Total
🚗	57	86	143
🚚	27	16	43
🚲	0	0	0
	84	**102**	**186**

	↰	↱	↶
Totals	**5**	**8**	**0**
🚗	4	5	0
🚚	1	3	0
🚲	0	0	0

Enterprise Rd

South Approach

	Out	In	Total
🚗	9	18	27
🚚	4	5	9
🚲	0	0	0
	13	**23**	**36**

🚗 - Cars 🚚 - Trucks 🚲 - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Summary

Intersection: Burton Rd & Enterprise Rd
Site Code: 2446600002
Count Date: Nov 06, 2024
Period: 07:00 - 10:00

Peak Hour Data (07:00 - 08:00)

	North Approach						South Approach Enterprise Rd						East Approach Burton Rd						West Approach Burton Rd						Total Vehicles
Start Time	↰	↑	↱	⮌	Peds	Total	↰	↑	↱	⮌	Peds	Total	↰	↑	↱	⮌	Peds	Total	↰	↑	↱	⮌	Peds	Total	
07:00					0		0		2	0	0	2	4	21		0	0	25		24	1	0	0	25	52
07:15					0		2		1	0	0	3	6	20		0	0	26		13	2	0	0	15	44
07:30					0		2		3	0	0	5	3	29		0	0	32		18	1	0	0	19	56
07:45					0		1		2	0	0	3	2	27		0	0	29		21	4	0	0	25	57
Grand Total					**0**	**0**	**5**		**8**	**0**	**0**	**13**	**15**	**97**		**0**	**0**	**112**		**76**	**8**	**0**	**0**	**84**	**209**
Approach %						-	38.5		61.5	0		-	13.4	86.6		0		-		90.5	9.5	0		-	
Totals %						0	2.4		3.8	0		6.2	7.2	46.4		0		53.6		36.4	3.8	0		40.2	
PHF						**0**	**0.63**		**0.67**	**0**		**0.65**	**0.63**	**0.84**		**0**		**0.88**		**0.79**	**0.5**	**0**		**0.84**	**0.92**
Cars						0	4		5	0		9	12	82		0		94		51	6	0		57	160
% Cars						0	80		62.5	0		69.2	80	84.5		0		83.9		67.1	75	0		67.9	76.6
Trucks						0	1		3	0		4	3	15		0		18		25	2	0		27	49
% Trucks						0	20		37.5	0		30.8	20	15.5		0		16.1		32.9	25	0		32.1	23.4
Bicycles						0	0		0	0		0	0	0		0		0		0	0	0		0	0
% Bicycles						0	0		0	0		0	0	0		0		0		0	0	0		0	0
Peds					0	-					0	-					0	-					0	-	0
% Peds					0	-					0	-					0	-					0	-	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		**One Hour Peak**	
From:	11:00:00	From:	11:30:00
To:	13:00:00	To:	12:30:00

Intersection: Burton Rd & Enterprise Rd
Site Code: 2446600002
Count Date: Nov 06, 2024

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Burton Rd runs E/W

East Approach

	Out	In	Total
🚗	70	103	173
🚚	23	19	42
🚲	0	0	0
	93	**122**	**215**

Burton Rd

🚲	🚚	🚗	Totals	
0	0	0	**0**	↶
0	16	89	**105**	→
1	1	6	**8**	↓

Peds: 0

Peds: 0

N

W E

S

Peds: 0

Peds: 0

Burton Rd

	Totals	🚗	🚚	🚲
↶	**0**	0	0	0
←	**79**	61	18	0
↓	**14**	9	5	0

West Approach

	Out	In	Total
🚗	95	66	161
🚚	17	21	38
🚲	1	0	1
	113	**87**	**200**

	↰	↱	↶
Totals	**8**	**17**	**0**
🚗	5	14	0
🚚	3	3	0
🚲	0	0	0

Enterprise Rd

South Approach

	Out	In	Total
🚗	19	15	34
🚚	6	6	12
🚲	0	1	1
	25	**22**	**47**

🚗 - Cars

🚚 - Trucks

🚲 - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Summary

Intersection:	Burton Rd & Enterprise Rd
Site Code:	2446600002
Count Date:	Nov 06, 2024
Period:	11:00 - 13:00

Peak Hour Data (11:30 - 12:30)

	North Approach						South Approach Enterprise Rd						East Approach Burton Rd						West Approach Burton Rd						Total Vehicles
Start Time	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	
11:30					0		2		4	0	0	6	3	20		0	0	23		21	4	0	0	25	54
11:45					0		3		4	0	0	7	0	23		0	0	23		22	1	0	0	23	53
12:00					0		0		6	0	0	6	5	18		0	0	23		41	2	0	0	43	72
12:15					0		3		3	0	0	6	6	18		0	0	24		21	1	0	0	22	52
Grand Total					**0**	**0**	**8**		**17**	**0**	**0**	**25**	**14**	**79**		**0**	**0**	**93**		**105**	**8**	**0**	**0**	**113**	**231**
Approach %						-	32		68	0		-	15.1	84.9		0		-		92.9	7.1	0		-	
Totals %						0	3.5		7.4	0		10.8	6.1	34.2		0		40.3		45.5	3.5	0		48.9	
PHF						**0**	**0.67**		**0.71**	**0**		**0.89**	**0.58**	**0.86**		**0**		**0.97**		**0.64**	**0.5**	**0**		**0.66**	**0.8**
Cars						0	5		14	0		19	9	61		0		70		89	6	0		95	184
% Cars						0	62.5		82.4	0		76	64.3	77.2		0		75.3		84.8	75	0		84.1	79.7
Trucks						0	3		3	0		6	5	18		0		23		16	1	0		17	46
% Trucks						0	37.5		17.6	0		24	35.7	22.8		0		24.7		15.2	12.5	0		15	19.9
Bicycles						0	0		0	0		0	0	0		0		0		0	1	0		1	1
% Bicycles						0	0		0	0		0	0	0		0		0		0	12.5	0		0.9	0.4
Peds					0	-					0	-					0	-					0	-	0
% Peds					0	-					0	-					0	-					0	-	

Ontario Traffic Inc.
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Peak Hour Diagram

Specified Period		**One Hour Peak**	
From:	15:00:00	From:	16:00:00
To:	18:00:00	To:	17:00:00

Intersection: Burton Rd & Enterprise Rd
Site Code: 2446600002
Count Date: Nov 06, 2024

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Burton Rd runs E/W

East Approach

	Out	In	Total
🚗	47	134	181
🚚	27	11	38
🚲	0	0	0
	74	**145**	**219**

Burton Rd

🚲	🚚	🚗	Totals	
0	0	0	**0**	↶
0	9	99	**108**	→
0	3	7	**10**	↓

Peds: 0

Peds: 0

N
W E
S

Peds: 0

Peds: 0

Burton Rd

	Totals	🚗	🚚	🚲
↷	**1**	1	0	0
←	**62**	42	20	0
↓	**11**	4	7	0

West Approach

	Out	In	Total
🚗	106	57	163
🚚	12	23	35
🚲	0	0	0
	118	**80**	**198**

	←	→	↶
Totals	**18**	**36**	**0**
🚗	15	34	0
🚚	3	2	0
🚲	0	0	0

Enterprise Rd

South Approach

	Out	In	Total
🚗	49	11	60
🚚	5	10	15
🚲	0	0	0
	54	**21**	**75**

🚗 - Cars

🚚 - Trucks

🚲 - Bicycles

Comments

Ontario Traffic Inc.
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Peak Hour Summary

Intersection:	Burton Rd & Enterprise Rd
Site Code:	2446600002
Count Date:	Nov 06, 2024
Period:	15:00 - 18:00

Peak Hour Data (16:00 - 17:00)

	North Approach						South Approach Enterprise Rd						East Approach Burton Rd						West Approach Burton Rd						Total Vehicles
Start Time	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	
16:00					0		4		7	0	0	11	2	12		1	0	15		29	2	0	0	31	57
16:15					0		2		0	0	0	2	3	19		0	0	22		24	1	0	0	25	49
16:30					0		7		22	0	0	29	4	16		0	0	20		33	3	0	0	36	85
16:45					0		5		7	0	0	12	2	15		0	0	17		22	4	0	0	26	55
Grand Total					**0**	**0**	**18**		**36**	**0**	**0**	**54**	**11**	**62**		**1**	**0**	**74**		**108**	**10**	**0**	**0**	**118**	**246**
Approach %						-	33.3		66.7	0		-	14.9	83.8		1.4		-		91.5	8.5	0		-	
Totals %						0	7.3		14.6	0		22	4.5	25.2		0.4		30.1		43.9	4.1	0		48	
PHF						**0**	**0.64**		**0.41**	**0**		**0.47**	**0.69**	**0.82**		**0.25**		**0.84**		**0.82**	**0.63**	**0**		**0.82**	**0.72**
Cars						0	15		34	0		49	4	42		1		47		99	7	0		106	202
% Cars						0	83.3		94.4	0		90.7	36.4	67.7		100		63.5		91.7	70	0		89.8	82.1
Trucks						0	3		2	0		5	7	20		0		27		9	3	0		12	44
% Trucks						0	16.7		5.6	0		9.3	63.6	32.3		0		36.5		8.3	30	0		10.2	17.9
Bicycles						0	0		0	0		0	0	0		0		0		0	0	0		0	0
% Bicycles						0	0		0	0		0	0	0		0		0		0	0	0		0	0
Peds					0	-					0	-					0	-					0	-	0
% Peds					0	-					0	-					0	-					0	-	

Ontario Traffic Inc.
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Project #24-169 - Morrison Hershfield

Intersection Count Report

Intersection:	St. Guillaume Rd & Burton Rd - St Pierre Rd
Municipality:	Russell Twp
Count Date:	Wednesday, Apr 24, 2024
Site Code:	2416900020
Count Categories:	Cars, Trucks, Bicycles, Pedestrians
Count Period:	07:00-10:00, 11:00-13:00, 15:00-18:00
Weather:	Clear
Comments:	

Traffic Count Map

Intersection: St. Guillaume Rd & Burton Rd - St Pierre Rd
Site Code: 2416900020
Municipality: Russell Twp
Count Date: Apr 24, 2024

Ontario Traffic Inc.
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Traffic Count Summary

Intersection: St. Guillaume Rd & Burton Rd - St Pierre Rd
Site Code: 2416900020
Municipality: Russell Twp
Count Date: Apr 24, 2024

St. Guillaume Rd - Traffic Summary

	North Approach Totals						South Approach Totals						
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
Hour	**Left**	**Thru**	**Right**	**U-Turn**	**Total**	**Peds**	**Left**	**Thru**	**Right**	**U-Turn**	**Total**	**Peds**	**Total**
07:00 - 08:00	41	297	166	0	504	0	36	379	12	3	430	0	934
08:00 - 09:00	32	231	133	0	396	0	20	284	5	2	311	0	707
09:00 - 10:00	28	197	87	1	313	0	17	244	8	7	276	0	589
BREAK													
11:00 - 12:00	39	245	101	0	385	0	14	230	6	2	252	0	637
12:00 - 13:00	45	255	101	0	401	0	15	171	8	0	194	0	595
BREAK													
15:00 - 16:00	159	463	143	0	765	0	13	247	10	0	270	0	1035
16:00 - 17:00	233	594	109	0	936	0	14	342	25	0	381	0	1317
17:00 - 18:00	154	445	100	0	699	0	9	365	15	2	391	0	1090
GRAND TOTAL	**731**	**2727**	**940**	**1**	**4399**	**0**	**138**	**2262**	**89**	**16**	**2505**	**0**	**6904**

Ontario Traffic Inc.
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Traffic Count Summary

Intersection: St. Guillaume Rd & Burton Rd - St Pierre Rd
Site Code: 2416900020
Municipality: Russell Twp
Count Date: Apr 24, 2024

St Pierre Rd - Traffic Summary

	East Approach Totals						West Approach Totals						
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
Hour	**Left**	**Thru**	**Right**	**U-Turn**	**Total**	**Peds**	**Left**	**Thru**	**Right**	**U-Turn**	**Total**	**Peds**	**Total**
07:00 - 08:00	6	20	308	0	334	0	87	11	13	0	111	0	445
08:00 - 09:00	8	10	172	0	190	0	105	7	8	0	120	0	310
09:00 - 10:00	3	9	106	0	118	0	97	8	20	0	125	0	243
BREAK													
11:00 - 12:00	11	5	68	0	84	0	93	6	22	0	121	0	205
12:00 - 13:00	5	9	88	0	102	0	97	6	20	0	123	0	225
BREAK													
15:00 - 16:00	11	3	89	0	103	0	138	4	25	0	167	0	270
16:00 - 17:00	12	6	124	0	142	0	181	15	37	0	233	0	375
17:00 - 18:00	8	2	82	0	92	0	167	14	26	0	207	0	299
GRAND TOTAL	**64**	**64**	**1037**	**0**	**1165**	**0**	**965**	**71**	**171**	**0**	**1207**	**0**	**2372**

Ontario Traffic Inc.
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Traffic Count Data

Intersection: St. Guillaume Rd & Burton Rd - St Pierre Rd
Site Code: 2416900020
Municipality: Russell Twp
Count Date: Apr 24, 2024

North Approach - St. Guillaume Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	**Total Peds**
07:00	9	56	27	0	92	1	5	5	0	11	0	0	0	0	0	0
07:15	12	78	47	0	137	2	5	2	0	9	0	0	0	0	0	0
07:30	8	69	35	0	112	0	4	4	0	8	0	0	0	0	0	0
07:45	8	75	44	0	127	1	5	2	0	8	0	0	0	0	0	0
08:00	9	50	34	0	93	1	7	11	0	19	0	0	0	0	0	0
08:15	4	55	25	0	84	0	5	9	0	14	0	0	0	0	0	0
08:30	10	48	20	0	78	0	5	7	0	12	0	0	0	0	0	0
08:45	8	51	21	0	80	0	10	6	0	16	0	0	0	0	0	0
09:00	5	45	21	0	71	0	4	1	0	5	0	0	0	0	0	0
09:15	3	52	17	0	72	1	5	5	0	11	0	0	0	0	0	0
09:30	10	39	17	0	66	0	2	3	0	5	0	0	0	0	0	0
09:45	9	45	20	1	75	0	5	3	0	8	0	0	0	0	0	0
SUBTOTAL	95	663	328	1	1087	6	62	58	0	126	0	0	0	0	0	0

Ontario Traffic Inc.
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Traffic Count Data

Intersection: St. Guillaume Rd & Burton Rd - St Pierre Rd
Site Code: 2416900020
Municipality: Russell Twp
Count Date: Apr 24, 2024

North Approach - St. Guillaume Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	**Total Peds**
11:00	9	54	22	0	85	1	8	5	0	14	0	0	0	0	0	0
11:15	12	54	8	0	74	1	5	5	0	11	0	0	0	0	0	0
11:30	5	49	23	0	77	1	10	4	0	15	0	0	0	0	0	0
11:45	10	61	28	0	99	0	4	6	0	10	0	0	0	0	0	0
12:00	11	44	33	0	88	0	6	2	0	8	0	0	0	0	0	0
12:15	12	59	15	0	86	2	5	6	0	13	0	0	0	0	0	0
12:30	11	59	19	0	89	0	6	2	0	8	0	0	0	0	0	0
12:45	8	71	19	0	98	1	5	5	0	11	0	0	0	0	0	0
SUBTOTAL	78	451	167	0	696	6	49	35	0	90	0	0	0	0	0	0

Ontario Traffic Inc.
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Traffic Count Data

Intersection: St. Guillaume Rd & Burton Rd - St Pierre Rd
Site Code: 2416900020
Municipality: Russell Twp
Count Date: Apr 24, 2024

North Approach - St. Guillaume Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	**Total Peds**
15:00	42	89	29	0	160	0	4	5	0	9	0	0	0	0	0	0
15:15	34	106	33	0	173	2	6	5	0	13	0	0	0	0	0	0
15:30	32	116	26	0	174	1	10	4	0	15	0	0	0	0	0	0
15:45	45	126	30	0	201	3	6	11	0	20	0	0	0	0	0	0
16:00	47	129	21	0	197	1	10	6	0	17	0	0	0	0	0	0
16:15	63	157	22	0	242	0	10	4	0	14	0	0	0	0	0	0
16:30	68	147	23	0	238	2	7	4	0	13	0	0	0	0	0	0
16:45	52	128	27	0	207	0	6	2	0	8	0	0	0	0	0	0
17:00	53	118	27	0	198	2	7	3	0	12	0	0	0	0	0	0
17:15	37	123	21	0	181	1	3	5	0	9	0	0	0	0	0	0
17:30	39	107	23	0	169	0	7	2	0	9	0	0	0	0	0	0
17:45	21	76	19	0	116	1	4	0	0	5	0	0	0	0	0	0
SUBTOTAL	533	1422	301	0	2256	13	80	51	0	144	0	0	0	0	0	0
GRAND TOTAL	**706**	**2536**	**796**	**1**	**4039**	**25**	**191**	**144**	**0**	**360**	**0**	**0**	**0**	**0**	**0**	**0**

Ontario Traffic Inc.
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Traffic Count Data

Intersection: St. Guillaume Rd & Burton Rd - St Pierre Rd
Site Code: 2416900020
Municipality: Russell Twp
Count Date: Apr 24, 2024

South Approach - St. Guillaume Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	Total Peds
07:00	6	94	2	0	102	1	7	0	0	8	0	0	0	0	0	0
07:15	8	99	1	0	108	1	11	1	0	13	0	0	0	0	0	0
07:30	8	74	4	2	88	1	8	0	0	9	0	0	0	0	0	0
07:45	10	74	4	1	89	1	12	0	0	13	0	0	0	0	0	0
08:00	10	69	1	0	80	0	7	0	0	7	0	0	0	0	0	0
08:15	3	62	0	1	66	0	13	1	1	15	0	0	0	0	0	0
08:30	4	53	0	0	57	0	6	0	0	6	0	0	0	0	0	0
08:45	3	65	1	0	69	0	9	2	0	11	0	0	0	0	0	0
09:00	3	46	2	4	55	0	18	0	0	18	0	0	0	0	0	0
09:15	4	65	1	1	71	0	10	0	0	10	0	0	0	0	0	0
09:30	7	44	1	0	52	1	6	1	1	9	0	0	0	0	0	0
09:45	1	47	3	1	52	1	8	0	0	9	0	0	0	0	0	0
SUBTOTAL	67	792	20	10	889	6	115	5	2	128	0	0	0	0	0	0

Ontario Traffic Inc.
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Traffic Count Data

Intersection: St. Guillaume Rd & Burton Rd - St Pierre Rd
Site Code: 2416900020
Municipality: Russell Twp
Count Date: Apr 24, 2024

South Approach - St. Guillaume Rd

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	
11:00	3	45	2	1	51	0	2	0	0	2	0	0	0	0	0	0
11:15	2	54	1	0	57	0	10	0	0	10	0	0	0	0	0	0
11:30	2	67	2	0	71	0	4	0	0	4	0	0	0	0	0	0
11:45	6	41	1	1	49	1	7	0	0	8	0	0	0	0	0	0
12:00	6	45	1	0	52	0	6	0	0	6	0	0	0	0	0	0
12:15	3	36	2	0	41	1	6	0	0	7	0	0	0	0	0	0
12:30	2	34	4	0	40	0	4	0	0	4	0	0	0	0	0	0
12:45	3	37	1	0	41	0	3	0	0	3	0	0	0	0	0	0
SUBTOTAL	27	359	14	2	402	2	42	0	0	44	0	0	0	0	0	0

Ontario Traffic Inc.
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Traffic Count Data

Intersection:	St. Guillaume Rd & Burton Rd - St Pierre Rd
Site Code:	2416900020
Municipality:	Russell Twp
Count Date:	Apr 24, 2024

South Approach - St. Guillaume Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	**Total Peds**
15:00	3	61	2	0	66	1	8	0	0	9	0	0	0	0	0	0
15:15	3	57	0	0	60	0	3	0	0	3	0	0	0	0	0	0
15:30	3	59	3	0	65	0	2	2	0	4	0	0	0	0	0	0
15:45	2	55	3	0	60	1	2	0	0	3	0	0	0	0	0	0
16:00	3	98	5	0	106	1	6	1	0	8	0	0	0	0	0	0
16:15	3	72	3	0	78	0	2	2	0	4	0	0	0	0	0	0
16:30	3	107	10	0	120	0	2	0	0	2	0	0	0	0	0	0
16:45	4	55	4	0	63	0	0	0	0	0	0	0	0	0	0	0
17:00	3	129	5	0	137	0	2	0	0	2	0	0	0	0	0	0
17:15	1	86	7	0	94	0	3	0	0	3	0	0	0	0	0	0
17:30	1	88	3	0	92	0	0	0	0	0	0	0	0	0	0	0
17:45	4	57	0	2	63	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	33	924	45	2	1004	3	30	5	0	38	0	0	0	0	0	0
GRAND TOTAL	**127**	**2075**	**79**	**14**	**2295**	**11**	**187**	**10**	**2**	**210**	**0**	**0**	**0**	**0**	**0**	**0**

Ontario Traffic Inc.
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Traffic Count Data

Intersection: St. Guillaume Rd & Burton Rd - St Pierre Rd
Site Code: 2416900020
Municipality: Russell Twp
Count Date: Apr 24, 2024

East Approach - St Pierre Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	**Total Peds**
07:00	2	2	94	0	98	0	0	2	0	2	0	0	0	0	0	0
07:15	3	3	77	0	83	1	0	1	0	2	0	0	0	0	0	0
07:30	0	8	77	0	85	0	0	2	0	2	0	0	0	0	0	0
07:45	0	6	54	0	60	0	1	1	0	2	0	0	0	0	0	0
08:00	2	2	47	0	51	1	0	0	0	1	0	0	0	0	0	0
08:15	1	5	55	0	61	0	1	1	0	2	0	0	0	0	0	0
08:30	3	0	47	0	50	0	0	1	0	1	0	0	0	0	0	0
08:45	1	1	21	0	23	0	1	0	0	1	0	0	0	0	0	0
09:00	0	3	26	0	29	0	0	1	0	1	0	0	0	0	0	0
09:15	2	2	34	0	38	0	0	0	0	0	0	0	0	0	0	0
09:30	0	1	18	0	19	0	0	0	0	0	0	0	0	0	0	0
09:45	0	2	25	0	27	1	1	2	0	4	0	0	0	0	0	0
SUBTOTAL	14	35	575	0	624	3	4	11	0	18	0	0	0	0	0	0

Ontario Traffic Inc.
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Traffic Count Data

Intersection: St. Guillaume Rd & Burton Rd - St Pierre Rd
Site Code: 2416900020
Municipality: Russell Twp
Count Date: Apr 24, 2024

East Approach - St Pierre Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	**Total Peds**
11:00	4	1	10	0	15	0	1	2	0	3	0	0	0	0	0	0
11:15	3	2	17	0	22	0	1	0	0	1	0	0	0	0	0	0
11:30	2	0	15	0	17	0	0	3	0	3	0	0	0	0	0	0
11:45	2	0	19	0	21	0	0	2	0	2	0	0	0	0	0	0
12:00	2	2	16	0	20	0	0	1	0	1	0	0	0	0	0	0
12:15	1	6	18	0	25	0	0	2	0	2	0	0	0	0	0	0
12:30	0	0	28	0	28	0	0	0	0	0	0	0	0	0	0	0
12:45	2	1	22	0	25	0	0	1	0	1	0	0	0	0	0	0
SUBTOTAL	16	12	145	0	173	0	2	11	0	13	0	0	0	0	0	0

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: St. Guillaume Rd & Burton Rd - St Pierre Rd
Site Code: 2416900020
Municipality: Russell Twp
Count Date: Apr 24, 2024

East Approach - St Pierre Rd

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	
15:00	1	0	16	0	17	1	0	3	0	4	0	0	0	0	0	0
15:15	2	1	21	0	24	1	0	0	0	1	0	0	0	0	0	0
15:30	1	0	22	0	23	0	1	1	0	2	0	0	0	0	0	0
15:45	4	1	24	0	29	1	0	2	0	3	0	0	0	0	0	0
16:00	5	1	23	0	29	2	0	1	0	3	0	0	0	0	0	0
16:15	0	3	29	0	32	0	0	1	0	1	0	0	0	0	0	0
16:30	4	1	30	0	35	0	0	2	0	2	0	0	0	0	0	0
16:45	1	1	37	0	39	0	0	1	0	1	0	0	0	0	0	0
17:00	3	1	20	0	24	0	0	2	0	2	0	0	0	0	0	0
17:15	3	0	24	0	27	0	0	0	0	0	0	0	0	0	0	0
17:30	2	0	21	0	23	0	0	0	0	0	0	0	0	0	0	0
17:45	0	1	15	0	16	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	26	10	282	0	318	5	1	13	0	19	0	0	0	0	0	0
GRAND TOTAL	**56**	**57**	**1002**	**0**	**1115**	**8**	**7**	**35**	**0**	**50**	**0**	**0**	**0**	**0**	**0**	**0**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: St. Guillaume Rd & Burton Rd - St Pierre Rd
Site Code: 2416900020
Municipality: Russell Twp
Count Date: Apr 24, 2024

West Approach - Burton Rd

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↻	Total	↰	↑	↱	↻	Total	↰	↑	↱	↻	Total	
07:00	13	3	2	0	18	4	0	0	0	4	0	0	0	0	0	0
07:15	21	1	0	0	22	8	1	0	0	9	0	0	0	0	0	0
07:30	15	3	5	0	23	4	1	0	0	5	0	0	0	0	0	0
07:45	20	2	6	0	28	2	0	0	0	2	0	0	0	0	0	0
08:00	13	1	2	0	16	4	1	0	0	5	0	0	0	0	0	0
08:15	19	1	0	0	20	9	0	0	0	9	0	0	0	0	0	0
08:30	24	2	3	0	29	7	1	0	0	8	0	0	0	0	0	0
08:45	23	1	1	0	25	6	0	2	0	8	0	0	0	0	0	0
09:00	17	1	5	0	23	5	1	2	0	8	0	0	0	0	0	0
09:15	20	1	5	0	26	7	1	1	0	9	0	0	0	0	0	0
09:30	16	2	2	0	20	6	0	0	0	6	0	0	0	0	0	0
09:45	20	2	4	0	26	6	0	1	0	7	0	0	0	0	0	0
SUBTOTAL	221	20	35	0	276	68	6	6	0	80	0	0	0	0	0	0

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection:	St. Guillaume Rd & Burton Rd - St Pierre Rd
Site Code:	2416900020
Municipality:	Russell Twp
Count Date:	Apr 24, 2024

West Approach - Burton Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	Total Peds
11:00	23	1	3	0	27	3	1	1	0	5	0	0	0	0	0	0
11:15	16	2	3	0	21	5	0	1	0	6	0	0	0	0	0	0
11:30	22	2	9	0	33	5	0	0	0	5	0	0	0	0	0	0
11:45	13	0	4	0	17	6	0	1	0	7	0	0	0	0	0	0
12:00	19	3	5	0	27	5	0	0	0	5	0	0	0	0	0	0
12:15	20	1	3	0	24	6	0	1	0	7	0	0	0	0	0	0
12:30	22	2	8	0	32	5	0	0	0	5	0	0	0	0	0	0
12:45	14	0	3	0	17	5	0	0	0	5	1	0	0	0	1	0
SUBTOTAL	149	11	38	0	198	40	1	4	0	45	1	0	0	0	1	0

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: St. Guillaume Rd & Burton Rd - St Pierre Rd
Site Code: 2416900020
Municipality: Russell Twp
Count Date: Apr 24, 2024

West Approach - Burton Rd

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	↰	↑	↱	↶	**Total**	**Total Peds**
15:00	30	1	3	0	34	3	0	4	0	7	0	0	0	0	0	0
15:15	25	0	2	0	27	3	0	1	0	4	0	0	0	0	0	0
15:30	36	1	6	0	43	7	0	1	0	8	0	0	0	0	0	0
15:45	27	2	8	0	37	7	0	0	0	7	0	0	0	0	0	0
16:00	34	4	7	0	45	6	1	0	0	7	0	0	0	0	0	0
16:15	38	5	7	0	50	7	0	0	0	7	0	0	0	0	0	0
16:30	45	2	12	0	59	3	0	0	0	3	0	0	0	0	0	0
16:45	46	3	11	0	60	2	0	0	0	2	0	0	0	0	0	0
17:00	65	4	14	0	83	3	0	1	0	4	0	0	0	0	0	0
17:15	34	3	3	0	40	1	0	1	0	2	0	0	0	0	0	0
17:30	33	3	2	0	38	2	0	0	0	2	0	0	0	0	0	0
17:45	27	4	5	0	36	2	0	0	0	2	0	0	0	0	0	0
SUBTOTAL	440	32	80	0	552	46	1	8	0	55	0	0	0	0	0	0
GRAND TOTAL	**810**	**63**	**153**	**0**	**1026**	**154**	**8**	**18**	**0**	**180**	**1**	**0**	**0**	**0**	**1**	**0**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		**One Hour Peak**	
From:	07:00:00	From:	07:00:00
To:	10:00:00	To:	08:00:00

Intersection: St. Guillaume Rd & Burton Rd - St Pierre Rd
Site Code: 2416900020
Count Date: Apr 24, 2024

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: St. Guillaume Rd runs N/S

North Approach

	Out	In	Total
🚗	468	712	1180
🚚	36	62	98
🚲	0	0	0
	504	**774**	**1278**

St. Guillaume Rd

🚲	0	0	0	0
🚚	13	19	4	0
🚗	153	278	37	0
Totals	**166**	**297**	**41**	**0**
	↲	↓	↳	↺

East Approach

	Out	In	Total
🚗	326	57	383
🚚	8	7	15
🚲	0	0	0
	334	**64**	**398**

Peds: 0

Burton Rd

🚲	🚚	🚗	Totals	
0	0	0	**0**	↺
0	18	69	**87**	↑
0	2	9	**11**	→
0	0	13	**13**	↓

Peds: 0

Peds: 0

St Pierre Rd

	Totals	🚗	🚚	🚲
↻	**0**	0	0	0
↑	**308**	302	6	0
←	**20**	19	1	0
↓	**6**	5	1	0

Peds: 0

West Approach

	Out	In	Total
🚗	91	204	295
🚚	20	18	38
🚲	0	0	0
	111	**222**	**333**

	←	↑	→	↻
Totals	**36**	**379**	**12**	**3**
🚗	32	341	11	3
🚚	4	38	1	0
🚲	0	0	0	0

St. Guillaume Rd

South Approach

	Out	In	Total
🚗	387	299	686
🚚	43	20	63
🚲	0	0	0
	430	**319**	**749**

🚗 - Cars
🚚 - Trucks
🚲 - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Summary

Intersection: St. Guillaume Rd & Burton Rd - St Pierre Rd
Site Code: 2416900020
Count Date: Apr 24, 2024
Period: 07:00 - 10:00

Peak Hour Data (07:00 - 08:00)

	North Approach St. Guillaume Rd						South Approach St. Guillaume Rd						East Approach St Pierre Rd						West Approach Burton Rd						Total Vehicles
Start Time	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	
07:00	10	61	32	0	0	103	7	101	2	0	0	110	2	2	96	0	0	100	17	3	2	0	0	22	335
07:15	14	83	49	0	0	146	9	110	2	0	0	121	4	3	78	0	0	85	29	2	0	0	0	31	383
07:30	8	73	39	0	0	120	9	82	4	2	0	97	0	8	79	0	0	87	19	4	5	0	0	28	332
07:45	9	80	46	0	0	135	11	86	4	1	0	102	0	7	55	0	0	62	22	2	6	0	0	30	329
Grand Total	**41**	**297**	**166**	**0**	**0**	**504**	**36**	**379**	**12**	**3**	**0**	**430**	**6**	**20**	**308**	**0**	**0**	**334**	**87**	**11**	**13**	**0**	**0**	**111**	**1379**
Approach %	8.1	58.9	32.9	0		-	8.4	88.1	2.8	0.7		-	1.8	6	92.2	0		-	78.4	9.9	11.7	0		-	
Totals %	3	21.5	12	0		36.5	2.6	27.5	0.9	0.2		31.2	0.4	1.5	22.3	0		24.2	6.3	0.8	0.9	0		8	
PHF	**0.73**	**0.89**	**0.85**	**0**		**0.86**	**0.82**	**0.86**	**0.75**	**0.38**		**0.89**	**0.38**	**0.63**	**0.8**	**0**		**0.84**	**0.75**	**0.69**	**0.54**	**0**		**0.9**	**0.9**
Cars	37	278	153	0		468	32	341	11	3		387	5	19	302	0		326	69	9	13	0		91	1272
% Cars	90.2	93.6	92.2	0		92.9	88.9	90	91.7	100		90	83.3	95	98.1	0		97.6	79.3	81.8	100	0		82	92.2
Trucks	4	19	13	0		36	4	38	1	0		43	1	1	6	0		8	18	2	0	0		20	107
% Trucks	9.8	6.4	7.8	0		7.1	11.1	10	8.3	0		10	16.7	5	1.9	0		2.4	20.7	18.2	0	0		18	7.8
Bicycles	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0
% Bicycles	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0
Peds					0	-					0	-					0	-					0	-	0
% Peds					0	-					0	-					0	-					0	-	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		One Hour Peak	
From:	11:00:00	From:	11:30:00
To:	13:00:00	To:	12:30:00

Intersection: St. Guillaume Rd & Burton Rd - St Pierre Rd
Site Code: 2416900020
Count Date: Apr 24, 2024

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: St. Guillaume Rd runs N/S

North Approach

	Out	In	Total
🚗	350	331	681
🚚	46	53	99
🚲	0	0	0
	396	**384**	**780**

St. Guillaume Rd

🚲	0	0	0	0
🚚	18	25	3	0
🚗	99	213	38	0
Totals	**117**	**238**	**41**	**0**
	↲	↓	↳	↺

East Approach

	Out	In	Total
🚗	83	50	133
🚚	8	3	11
🚲	0	0	0
	91	**53**	**144**

Peds: 0

Burton Rd

🚲	🚚	🚗	**Totals**	
0	0	0	**0**	↺
0	22	74	**96**	↑
0	0	6	**6**	→
0	2	21	**23**	↓

Peds: 0

Peds: 0

St Pierre Rd

	Totals	🚗	🚚	🚲
↻	**0**	0	0	0
↑	**76**	68	8	0
←	**8**	8	0	0
↓	**7**	7	0	0

Peds: 0

West Approach

	Out	In	Total
🚗	101	124	225
🚚	24	20	44
🚲	0	0	0
	125	**144**	**269**

St. Guillaume Rd

	↰	↑	↱	↶
Totals	**19**	**212**	**6**	**1**
🚗	17	189	6	1
🚚	2	23	0	0
🚲	0	0	0	0

South Approach

	Out	In	Total
🚗	213	242	455
🚚	25	27	52
🚲	0	0	0
	238	**269**	**507**

🚗 - Cars
🚚 - Trucks
🚲 - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Summary

Intersection: St. Guillaume Rd & Burton Rd - St Pierre Rd
Site Code: 2416900020
Count Date: Apr 24, 2024
Period: 11:00 - 13:00

Peak Hour Data (11:30 - 12:30)

Start Time	North Approach St. Guillaume Rd						South Approach St. Guillaume Rd						East Approach St Pierre Rd						West Approach Burton Rd						Total Vehicles
	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	↰	↑	↱	↶	Peds	Total	
11:30	6	59	27	0	0	92	2	71	2	0	0	75	2	0	18	0	0	20	27	2	9	0	0	38	225
11:45	10	65	34	0	0	109	7	48	1	1	0	57	2	0	21	0	0	23	19	0	5	0	0	24	213
12:00	11	50	35	0	0	96	6	51	1	0	0	58	2	2	17	0	0	21	24	3	5	0	0	32	207
12:15	14	64	21	0	0	99	4	42	2	0	0	48	1	6	20	0	0	27	26	1	4	0	0	31	205
Grand Total	**41**	**238**	**117**	**0**	**0**	**396**	**19**	**212**	**6**	**1**	**0**	**238**	**7**	**8**	**76**	**0**	**0**	**91**	**96**	**6**	**23**	**0**	**0**	**125**	**850**
Approach %	10.4	60.1	29.5	0		-	8	89.1	2.5	0.4		-	7.7	8.8	83.5	0		-	76.8	4.8	18.4	0		-	
Totals %	4.8	28	13.8	0		46.6	2.2	24.9	0.7	0.1		28	0.8	0.9	8.9	0		10.7	11.3	0.7	2.7	0		14.7	
PHF	**0.73**	**0.92**	**0.84**	**0**		**0.91**	**0.68**	**0.75**	**0.75**	**0.25**		**0.79**	**0.88**	**0.33**	**0.9**	**0**		**0.84**	**0.89**	**0.5**	**0.64**	**0**		**0.82**	**0.94**
Cars	38	213	99	0		350	17	189	6	1		213	7	8	68	0		83	74	6	21	0		101	747
% Cars	92.7	89.5	84.6	0		88.4	89.5	89.2	100	100		89.5	100	100	89.5	0		91.2	77.1	100	91.3	0		80.8	87.9
Trucks	3	25	18	0		46	2	23	0	0		25	0	0	8	0		8	22	0	2	0		24	103
% Trucks	7.3	10.5	15.4	0		11.6	10.5	10.8	0	0		10.5	0	0	10.5	0		8.8	22.9	0	8.7	0		19.2	12.1
Bicycles	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0
% Bicycles	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0
Peds					0	-					0	-					0	-					0	-	0
% Peds					0	-					0	-					0	-					0	-	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		**One Hour Peak**	
From:	15:00:00	From:	16:15:00
To:	18:00:00	To:	17:15:00

Intersection: St. Guillaume Rd & Burton Rd - St Pierre Rd
Site Code: 2416900020
Count Date: Apr 24, 2024

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: St. Guillaume Rd runs N/S

North Approach

	Out	In	Total
🚗	885	673	1558
🚚	47	27	74
🚲	0	0	0
	932	**700**	**1632**

St. Guillaume Rd

🚲	0	0	0	0
🚚	13	30	4	0
🚗	99	550	236	0
Totals	**112**	**580**	**240**	**0**
	↲	↓	↳	↶

East Approach

	Out	In	Total
🚗	130	272	402
🚚	6	6	12
🚲	0	0	0
	136	**278**	**414**

Peds: 0

Burton Rd

🚲	🚚	🚗	Totals	
0	0	0	**0**	↶
0	15	194	**209**	↑
0	0	14	**14**	→
0	1	44	**45**	↓

Peds: 0

Peds: 0

St Pierre Rd

	Totals	🚗	🚚	🚲
↷	**0**	0	0	0
↑	**122**	116	6	0
←	**6**	6	0	0
↓	**8**	8	0	0

Peds: 0

West Approach

	Out	In	Total
🚗	252	118	370
🚚	16	13	29
🚲	0	0	0
	268	**131**	**399**

	↰	↑	↱	↷
Totals	**13**	**369**	**24**	**0**
🚗	13	363	22	0
🚚	0	6	2	0
🚲	0	0	0	0

St. Guillaume Rd

South Approach

	Out	In	Total
🚗	398	602	1000
🚚	8	31	39
🚲	0	0	0
	406	**633**	**1039**

🚗 - Cars 🚚 - Trucks 🚲 - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Summary

Intersection: St. Guillaume Rd & Burton Rd - St Pierre Rd
Site Code: 2416900020
Count Date: Apr 24, 2024
Period: 15:00 - 18:00

Peak Hour Data (16:15 - 17:15)

	North Approach St. Guillaume Rd						South Approach St. Guillaume Rd						East Approach St Pierre Rd						West Approach Burton Rd						Total Vehicles
Start Time	↰	↑	↱	↺	**Peds**	**Total**	↰	↑	↱	↺	**Peds**	**Total**	↰	↑	↱	↺	**Peds**	**Total**	↰	↑	↱	↺	**Peds**	**Total**	
16:15	63	167	26	0	0	256	3	74	5	0	0	82	0	3	30	0	0	33	45	5	7	0	0	57	428
16:30	70	154	27	0	0	251	3	109	10	0	0	122	4	1	32	0	0	37	48	2	12	0	0	62	472
16:45	52	134	29	0	0	215	4	55	4	0	0	63	1	1	38	0	0	40	48	3	11	0	0	62	380
17:00	55	125	30	0	0	210	3	131	5	0	0	139	3	1	22	0	0	26	68	4	15	0	0	87	462
Grand Total	**240**	**580**	**112**	**0**	**0**	**932**	**13**	**369**	**24**	**0**	**0**	**406**	**8**	**6**	**122**	**0**	**0**	**136**	**209**	**14**	**45**	**0**	**0**	**268**	**1742**
Approach %	25.8	62.2	12	0		-	3.2	90.9	5.9	0		-	5.9	4.4	89.7	0		-	78	5.2	16.8	0		-	
Totals %	13.8	33.3	6.4	0		53.5	0.7	21.2	1.4	0		23.3	0.5	0.3	7	0		7.8	12	0.8	2.6	0		15.4	
PHF	**0.86**	**0.87**	**0.93**	**0**		**0.91**	**0.81**	**0.7**	**0.6**	**0**		**0.73**	**0.5**	**0.5**	**0.8**	**0**		**0.85**	**0.77**	**0.7**	**0.75**	**0**		**0.77**	**0.92**
Cars	236	550	99	0		885	13	363	22	0		398	8	6	116	0		130	194	14	44	0		252	1665
% Cars	98.3	94.8	88.4	0		95	100	98.4	91.7	0		98	100	100	95.1	0		95.6	92.8	100	97.8	0		94	95.6
Trucks	4	30	13	0		47	0	6	2	0		8	0	0	6	0		6	15	0	1	0		16	77
% Trucks	1.7	5.2	11.6	0		5	0	1.6	8.3	0		2	0	0	4.9	0		4.4	7.2	0	2.2	0		6	4.4
Bicycles	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0
% Bicycles	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0
Peds					0	-					0	-					0	-					0	-	0
% Peds					0	-					0	-					0	-					0	-	

Appendix B: Synchro Outputs

HCM Unsignalized Intersection Capacity Analysis
3: Eadie Rd. & Burton Rd.

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	Y	
Traffic Volume (veh/h)	42	4	19	23	16	36
Future Volume (Veh/h)	42	4	19	23	16	36
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	46	4	21	25	17	39
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			50		115	48
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			50		115	48
tC, single (s)			4.1		6.4	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.4
p0 queue free %			99		98	96
cM capacity (veh/h)			1537		874	1010

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	50	46	56
Volume Left	0	21	17
Volume Right	4	0	39
cSH	1700	1537	964
Volume to Capacity	0.03	0.01	0.06
Queue Length 95th (m)	0.0	0.3	1.4
Control Delay (s/veh)	0.0	3.4	9.0
Lane LOS		A	A
Approach Delay (s/veh)	0.0	3.4	9.0
Approach LOS			A

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	18.9%	ICU Level of Service	A
Analysis Period (min)	15		

	↗	↘	↖	↑	↓	↙
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖↗			↰	↱	
Traffic Volume (veh/h)	57	12	51	350	162	153
Future Volume (Veh/h)	57	12	51	350	162	153
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	62	13	55	380	176	166
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	749	259	342			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	749	259	342			
tC, single (s)	6.9	6.6	4.1			
tC, 2 stage (s)						
tF (s)	3.9	3.7	2.2			
p0 queue free %	80	98	95			
cM capacity (veh/h)	305	692	1217			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	75	435	342
Volume Left	62	55	0
Volume Right	13	0	166
cSH	338	1217	1700
Volume to Capacity	0.22	0.05	0.20
Queue Length 95th (m)	6.4	1.1	0.0
Control Delay (s/veh)	18.7	1.4	0.0
Lane LOS	C	A	
Approach Delay (s/veh)	18.7	1.4	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	53.0%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
9: Corduroy Rd. & Burton Rd.

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Volume (veh/h)	0	43	28	68	35	0	11	0	41	0	0	0
Future Volume (Veh/h)	0	43	28	68	35	0	11	0	41	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	47	30	74	38	0	12	0	45	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	38			77			248	248	62	293	263	38
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	38			77			248	248	62	293	263	38
tC, single (s)	4.1			4.3			7.5	6.5	6.7	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.8	4.0	3.7	3.5	4.0	3.3
p0 queue free %	100			95			98	100	95	100	100	100
cM capacity (veh/h)	1585			1438			615	624	886	605	612	1040

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	77	112	57	0
Volume Left	0	74	12	0
Volume Right	30	0	45	0
cSH	1585	1438	811	1700
Volume to Capacity	0.00	0.05	0.07	0.00
Queue Length 95th (m)	0.0	1.2	1.7	0.0
Control Delay (s/veh)	0.0	5.2	9.8	0.0
Lane LOS		A	A	A
Approach Delay (s/veh)	0.0	5.2	9.8	0.0
Approach LOS			A	A

Intersection Summary			
Average Delay	4.6		
Intersection Capacity Utilization	22.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
11: Enterprise St. & Burton Rd.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	↔	
Traffic Volume (veh/h)	76	8	15	97	5	8
Future Volume (Veh/h)	76	8	15	97	5	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	83	9	16	105	5	9
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			92		225	88
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			92		225	88
tC, single (s)			4.3		6.6	6.6
tC, 2 stage (s)						
tF (s)			2.4		3.7	3.6
p0 queue free %			99		99	99
cM capacity (veh/h)			1397		717	880

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	92	121	14
Volume Left	0	16	5
Volume Right	9	0	9
cSH	1700	1397	814
Volume to Capacity	0.05	0.01	0.02
Queue Length 95th (m)	0.0	0.3	0.4
Control Delay (s/veh)	0.0	1.1	9.5
Lane LOS		A	A
Approach Delay (s/veh)	0.0	1.1	9.5
Approach LOS			A

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	22.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Eadie Rd. & Burton Rd.

11/27/2024

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	↰↱	
Traffic Volume (veh/h)	28	29	28	88	7	15
Future Volume (Veh/h)	28	29	28	88	7	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	30	32	30	96	8	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			62		202	46
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			62		202	46
tC, single (s)			4.1		6.4	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.4
p0 queue free %			98		99	98
cM capacity (veh/h)			1554		776	1009

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	62	126	24
Volume Left	0	30	8
Volume Right	32	0	16
cSH	1700	1554	917
Volume to Capacity	0.04	0.02	0.03
Queue Length 95th (m)	0.0	0.4	0.6
Control Delay (s/veh)	0.0	1.9	9.0
Lane LOS		A	A
Approach Delay (s/veh)	0.0	1.9	9.0
Approach LOS			A

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	22.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
8: St. Guillaume Rd. & Enterprise St.

11/27/2024

	↗	↘	↖	↑	↓	↙
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			↰	↱	
Traffic Volume (veh/h)	149	67	16	214	552	42
Future Volume (Veh/h)	149	67	16	214	552	42
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	162	73	17	233	600	46
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	890	623	646			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	890	623	646			
tC, single (s)	6.4	6.2	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.4			
p0 queue free %	47	85	98			
cM capacity (veh/h)	306	484	863			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	235	250	646
Volume Left	162	17	0
Volume Right	73	0	46
cSH	345	863	1700
Volume to Capacity	0.68	0.02	0.38
Queue Length 95th (m)	36.1	0.5	0.0
Control Delay (s/veh)	35.0	0.8	0.0
Lane LOS	D	A	
Approach Delay (s/veh)	35.0	0.8	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	50.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
9: Corduroy Rd. & Burton Rd.

11/27/2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Volume (veh/h)	0	39	16	30	49	0	34	0	79	0	0	0
Future Volume (Veh/h)	0	39	16	30	49	0	34	0	79	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	42	17	33	53	0	37	0	86	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	53			59			170	170	51	256	178	53
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	53			59			170	170	51	256	178	53
tC, single (s)	4.1			4.6			7.2	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.7			3.6	4.0	3.4	3.5	4.0	3.3
p0 queue free %	100			97			95	100	91	100	100	100
cM capacity (veh/h)	1566			1287			770	708	1001	629	701	1020

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	59	86	123	0
Volume Left	0	33	37	0
Volume Right	17	0	86	0
cSH	1566	1287	918	1700
Volume to Capacity	0.00	0.03	0.13	0.00
Queue Length 95th (m)	0.0	0.6	3.5	0.0
Control Delay (s/veh)	0.0	3.1	9.5	0.0
Lane LOS		A	A	A
Approach Delay (s/veh)	0.0	3.1	9.5	0.0
Approach LOS			A	A

Intersection Summary			
Average Delay	5.4		
Intersection Capacity Utilization	24.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
11: Enterprise St. & Burton Rd.

11/27/2024

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	Y	
Traffic Volume (veh/h)	108	10	11	62	18	36
Future Volume (Veh/h)	108	10	11	62	18	36
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	117	11	12	67	20	39
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			128		214	123
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			128		214	123
tC, single (s)			4.7		6.6	6.3
tC, 2 stage (s)						
tF (s)			2.8		3.7	3.4
p0 queue free %			99		97	96
cM capacity (veh/h)			1151		735	918

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	128	79	59
Volume Left	0	12	20
Volume Right	11	0	39
cSH	1700	1151	846
Volume to Capacity	0.08	0.01	0.07
Queue Length 95th (m)	0.0	0.2	1.7
Control Delay (s/veh)	0.0	1.3	9.6
Lane LOS		A	A
Approach Delay (s/veh)	0.0	1.3	9.6
Approach LOS			A

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	20.5%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Eadie Rd. & Burton Rd.

11/27/2024

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→↘			↙←	↖↗	
Traffic Volume (veh/h)	51	5	23	28	20	44
Future Volume (Veh/h)	51	5	23	28	20	44
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	55	5	25	30	22	48
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			60		138	58
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			60		138	58
tC, single (s)			4.1		6.4	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.4
p0 queue free %			98		97	95
cM capacity (veh/h)			1525		846	997

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	60	55	70
Volume Left	0	25	22
Volume Right	5	0	48
cSH	1700	1525	945
Volume to Capacity	0.04	0.02	0.07
Queue Length 95th (m)	0.0	0.4	1.8
Control Delay (s/veh)	0.0	3.4	9.1
Lane LOS		A	A
Approach Delay (s/veh)	0.0	3.4	9.1
Approach LOS			A

Intersection Summary			
Average Delay	4.5		
Intersection Capacity Utilization	19.9%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
8: St. Guillaume Rd. & Enterprise St.

11/27/2024

	↗	↘	↖	↑	↓	↙
Movement	**EBL**	**EBR**	**NBL**	**NBT**	**SBT**	**SBR**
Lane Configurations	Y			↰	↱	
Traffic Volume (veh/h)	69	15	62	427	197	187
Future Volume (Veh/h)	69	15	62	427	197	187
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	75	16	67	464	214	203
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	914	316	417			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	914	316	417			
tC, single (s)	6.9	6.6	4.1			
tC, 2 stage (s)						
tF (s)	3.9	3.7	2.2			
p0 queue free %	68	98	94			
cM capacity (veh/h)	237	641	1142			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	91	531	417
Volume Left	75	67	0
Volume Right	16	0	203
cSH	266	1142	1700
Volume to Capacity	0.34	0.06	0.25
Queue Length 95th (m)	11.1	1.4	0.0
Control Delay (s/veh)	25.4	1.6	0.0
Lane LOS	D	A	
Approach Delay (s/veh)	25.4	1.6	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	62.4%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
9: Corduroy Rd. & Burton Rd.

11/27/2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Volume (veh/h)	0	52	34	83	43	0	13	0	50	0	0	0
Future Volume (Veh/h)	0	52	34	83	43	0	13	0	50	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	57	37	90	47	0	14	0	54	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	47			94			303	303	76	357	321	47
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	47			94			303	303	76	357	321	47
tC, single (s)	4.1			4.3			7.5	6.5	6.7	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.8	4.0	3.7	3.5	4.0	3.3
p0 queue free %	100			94			97	100	94	100	100	100
cM capacity (veh/h)	1573			1417			560	575	870	538	561	1028

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	94	137	68	0
Volume Left	0	90	14	0
Volume Right	37	0	54	0
cSH	1573	1417	781	1700
Volume to Capacity	0.00	0.06	0.09	0.00
Queue Length 95th (m)	0.0	1.5	2.2	0.0
Control Delay (s/veh)	0.0	5.2	10.1	0.0
Lane LOS		A	B	A
Approach Delay (s/veh)	0.0	5.2	10.1	0.0
Approach LOS			B	A

Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	24.0%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
11: Enterprise St. & Burton Rd.

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	Y	
Traffic Volume (veh/h)	93	10	18	118	6	10
Future Volume (Veh/h)	93	10	18	118	6	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	101	11	20	128	7	11
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			112		275	107
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			112		275	107
tC, single (s)			4.3		6.6	6.6
tC, 2 stage (s)						
tF (s)			2.4		3.7	3.6
p0 queue free %			99		99	99
cM capacity (veh/h)			1373		668	858

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	112	148	18
Volume Left	0	20	7
Volume Right	11	0	11
cSH	1700	1373	773
Volume to Capacity	0.07	0.01	0.02
Queue Length 95th (m)	0.0	0.3	0.5
Control Delay (s/veh)	0.0	1.1	9.8
Lane LOS		A	A
Approach Delay (s/veh)	0.0	1.1	9.8
Approach LOS			A

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	23.9%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
15: Robot St. & Burton Rd.

11/27/2024

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	Y	
Traffic Volume (veh/h)	95	0	0	56	0	0
Future Volume (Veh/h)	95	0	0	56	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	103	0	0	61	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			103		164	103
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			103		164	103
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1489		827	952

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	103	61	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1489	1700
Volume to Capacity	0.06	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s/veh)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s/veh)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	8.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Eadie Rd. & Burton Rd.

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↳			↰	↖↗	
Traffic Volume (veh/h)	34	35	34	107	9	18
Future Volume (Veh/h)	34	35	34	107	9	18
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	37	38	37	116	10	20
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			75		246	56
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			75		246	56
tC, single (s)			4.1		6.4	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.4
p0 queue free %			98		99	98
cM capacity (veh/h)			1537		729	997

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	75	153	30
Volume Left	0	37	10
Volume Right	38	0	20
cSH	1700	1537	888
Volume to Capacity	0.04	0.02	0.03
Queue Length 95th (m)	0.0	0.6	0.8
Control Delay (s/veh)	0.0	1.9	9.2
Lane LOS		A	A
Approach Delay (s/veh)	0.0	1.9	9.2
Approach LOS			A

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	24.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
8: St. Guillaume Rd. & Enterprise St.

11/27/2024

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰↱			↰↑	↑↱	
Traffic Volume (veh/h)	182	82	20	261	673	51
Future Volume (Veh/h)	182	82	20	261	673	51
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	198	89	22	284	732	55
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1088	760	787			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1088	760	787			
tC, single (s)	6.4	6.2	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.4			
p0 queue free %	14	78	97			
cM capacity (veh/h)	231	405	762			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	287	306	787
Volume Left	198	22	0
Volume Right	89	0	55
cSH	266	762	1700
Volume to Capacity	1.08	0.03	0.46
Queue Length 95th (m)	89.2	0.7	0.0
Control Delay (s/veh)	118.6	1.0	0.0
Lane LOS	F	A	
Approach Delay (s/veh)	118.6	1.0	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	24.9		
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
9: Corduroy Rd. & Burton Rd.

11/27/2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Volume (veh/h)	0	48	20	37	60	0	41	0	96	0	0	0
Future Volume (Veh/h)	0	48	20	37	60	0	41	0	96	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	52	22	40	65	0	45	0	104	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	65			74			208	208	63	312	219	65
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	65			74			208	208	63	312	219	65
tC, single (s)	4.1			4.6			7.2	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.7			3.6	4.0	3.4	3.5	4.0	3.3
p0 queue free %	100			97			94	100	89	100	100	100
cM capacity (veh/h)	1550			1270			723	671	985	563	661	1005

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	74	105	149	0
Volume Left	0	40	45	0
Volume Right	22	0	104	0
cSH	1550	1270	888	1700
Volume to Capacity	0.00	0.03	0.17	0.00
Queue Length 95th (m)	0.0	0.7	4.6	0.0
Control Delay (s/veh)	0.0	3.2	9.9	0.0
Lane LOS		A	A	A
Approach Delay (s/veh)	0.0	3.2	9.9	0.0
Approach LOS			A	A

Intersection Summary			
Average Delay	5.5		
Intersection Capacity Utilization	26.7%	ICU Level of Service	A
Analysis Period (min)	15		

11: Enterprise St. & Burton Rd.

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	Y	
Traffic Volume (veh/h)	132	12	13	76	22	44
Future Volume (Veh/h)	132	12	13	76	22	44
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	143	13	14	83	24	48
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			156		261	150
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			156		261	150
tC, single (s)			4.7		6.6	6.3
tC, 2 stage (s)						
tF (s)			2.8		3.7	3.4
p0 queue free %			99		97	95
cM capacity (veh/h)			1121		688	887

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	156	97	72
Volume Left	0	14	24
Volume Right	13	0	48
cSH	1700	1121	809
Volume to Capacity	0.09	0.01	0.09
Queue Length 95th (m)	0.0	0.3	2.2
Control Delay (s/veh)	0.0	1.3	9.9
Lane LOS		A	A
Approach Delay (s/veh)	0.0	1.3	9.9
Approach LOS			A

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	25.6%	ICU Level of Service	A
Analysis Period (min)	15		

15: Robot St. & Burton Rd.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	↰↱	
Traffic Volume (veh/h)	52	0	0	101	0	0
Future Volume (Veh/h)	52	0	0	101	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	57	0	0	110	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			57		167	57
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			57		167	57
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1547		823	1009

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	57	110	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1547	1700
Volume to Capacity	0.03	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s/veh)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s/veh)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	8.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Eadie Rd. & Burton Rd.

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	Y	
Traffic Volume (veh/h)	75	5	27	33	20	64
Future Volume (Veh/h)	75	5	27	33	20	64
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	82	5	29	36	22	70
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			87		179	85
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			87		179	85
tC, single (s)			4.1		6.4	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.4
p0 queue free %			98		97	93
cM capacity (veh/h)			1490		800	964

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	87	65	92
Volume Left	0	29	22
Volume Right	5	0	70
cSH	1700	1490	919
Volume to Capacity	0.05	0.02	0.10
Queue Length 95th (m)	0.0	0.5	2.5
Control Delay (s/veh)	0.0	3.4	9.4
Lane LOS		A	A
Approach Delay (s/veh)	0.0	3.4	9.4
Approach LOS			A

Intersection Summary			
Average Delay	4.4		
Intersection Capacity Utilization	21.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
8: St. Guillaume Rd. & Enterprise St.

11/27/2024

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰↱			↰↑	↑↱	
Traffic Volume (veh/h)	69	15	91	427	197	187
Future Volume (Veh/h)	69	15	91	427	197	187
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	75	16	99	464	214	203
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	978	316	417			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	978	316	417			
tC, single (s)	6.9	6.6	4.1			
tC, 2 stage (s)						
tF (s)	3.9	3.7	2.2			
p0 queue free %	64	98	91			
cM capacity (veh/h)	209	641	1142			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	91	563	417
Volume Left	75	99	0
Volume Right	16	0	203
cSH	237	1142	1700
Volume to Capacity	0.38	0.09	0.25
Queue Length 95th (m)	13.0	2.2	0.0
Control Delay (s/veh)	29.3	2.3	0.0
Lane LOS	D	A	
Approach Delay (s/veh)	29.3	2.3	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	64.0%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
9: Corduroy Rd. & Burton Rd.

11/27/2024

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Volume (veh/h)	0	79	40	83	171	0	19	0	50	0	0	0
Future Volume (Veh/h)	0	79	40	83	171	0	19	0	50	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	86	43	90	186	0	21	0	54	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	186			129			474	474	108	528	495	186
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	186			129			474	474	108	528	495	186
tC, single (s)	4.1			4.3			7.5	6.5	6.7	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.8	4.0	3.7	3.5	4.0	3.3
p0 queue free %	100			93			95	100	94	100	100	100
cM capacity (veh/h)	1401			1375			427	460	833	413	447	861

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	129	276	75	0
Volume Left	0	90	21	0
Volume Right	43	0	54	0
cSH	1401	1375	658	1700
Volume to Capacity	0.00	0.07	0.11	0.00
Queue Length 95th (m)	0.0	1.6	2.9	0.0
Control Delay (s/veh)	0.0	2.9	11.2	0.0
Lane LOS		A	B	A
Approach Delay (s/veh)	0.0	2.9	11.2	0.0
Approach LOS			B	A

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	31.1%	ICU Level of Service	A
Analysis Period (min)	15		

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	Y	
Traffic Volume (veh/h)	118	12	18	243	9	10
Future Volume (Veh/h)	118	12	18	243	9	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	128	13	20	264	10	11
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			141		439	135
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			141		439	135
tC, single (s)			4.3		6.6	6.6
tC, 2 stage (s)						
tF (s)			2.4		3.7	3.6
p0 queue free %			99		98	99
cM capacity (veh/h)			1339		535	827

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	141	284	21
Volume Left	0	20	10
Volume Right	13	0	11
cSH	1700	1339	656
Volume to Capacity	0.08	0.01	0.03
Queue Length 95th (m)	0.0	0.3	0.8
Control Delay (s/veh)	0.0	0.7	10.7
Lane LOS		A	B
Approach Delay (s/veh)	0.0	0.7	10.7
Approach LOS			B

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	34.1%	ICU Level of Service	A
Analysis Period (min)	15		

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	↰↱	
Traffic Volume (veh/h)	95	44	134	56	10	33
Future Volume (Veh/h)	95	44	134	56	10	33
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	103	48	146	61	11	36
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			151		480	127
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			151		480	127
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			90		98	96
cM capacity (veh/h)			1430		489	923

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	151	207	47
Volume Left	0	146	11
Volume Right	48	0	36
cSH	1700	1430	764
Volume to Capacity	0.09	0.10	0.06
Queue Length 95th (m)	0.0	2.6	1.5
Control Delay (s/veh)	0.0	5.7	10.0
Lane LOS		A	B
Approach Delay (s/veh)	0.0	5.7	10.0
Approach LOS			B

Intersection Summary			
Average Delay	4.1		
Intersection Capacity Utilization	31.4%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Eadie Rd. & Burton Rd.

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	Y	
Traffic Volume (veh/h)	38	35	46	146	9	21
Future Volume (Veh/h)	38	35	46	146	9	21
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	41	38	50	159	10	23
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			79		319	60
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			79		319	60
tC, single (s)			4.1		6.4	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.4
p0 queue free %			97		98	98
cM capacity (veh/h)			1532		656	992

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	79	209	33
Volume Left	0	50	10
Volume Right	38	0	23
cSH	1700	1532	859
Volume to Capacity	0.05	0.03	0.04
Queue Length 95th (m)	0.0	0.8	0.9
Control Delay (s/veh)	0.0	2.0	9.4
Lane LOS		A	A
Approach Delay (s/veh)	0.0	2.0	9.4
Approach LOS			A

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	26.9%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
8: St. Guillaume Rd. & Enterprise St.

11/27/2024

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	182	82	23	261	673	51
Future Volume (Veh/h)	182	82	23	261	673	51
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	198	89	25	284	732	55
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1094	760	787			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1094	760	787			
tC, single (s)	6.4	6.2	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.4			
p0 queue free %	13	78	97			
cM capacity (veh/h)	228	405	762			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	287	309	787
Volume Left	198	25	0
Volume Right	89	0	55
cSH	264	762	1700
Volume to Capacity	1.09	0.03	0.46
Queue Length 95th (m)	90.6	0.8	0.0
Control Delay (s/veh)	122.5	1.2	0.0
Lane LOS	F	A	
Approach Delay (s/veh)	122.5	1.2	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	25.7		
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
9: Corduroy Rd. & Burton Rd.

11/27/2024

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Volume (veh/h)	0	170	27	37	91	0	48	0	96	0	0	0
Future Volume (Veh/h)	0	170	27	37	91	0	48	0	96	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	185	29	40	99	0	52	0	104	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	99			214			379	379	200	483	393	99
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	99			214			379	379	200	483	393	99
tC, single (s)	4.1			4.6			7.2	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.7			3.6	4.0	3.4	3.5	4.0	3.3
p0 queue free %	100			96			91	100	87	100	100	100
cM capacity (veh/h)	1507			1117			556	537	826	423	527	962

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	214	139	156	0
Volume Left	0	40	52	0
Volume Right	29	0	104	0
cSH	1507	1117	711	1700
Volume to Capacity	0.00	0.04	0.22	0.00
Queue Length 95th (m)	0.0	0.8	6.3	0.0
Control Delay (s/veh)	0.0	2.6	11.5	0.0
Lane LOS		A	B	A
Approach Delay (s/veh)	0.0	2.6	11.5	0.0
Approach LOS			B	A

Intersection Summary			
Average Delay	4.2		
Intersection Capacity Utilization	36.0%	ICU Level of Service	A
Analysis Period (min)	15		

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	Y	
Traffic Volume (veh/h)	250	16	13	104	26	44
Future Volume (Veh/h)	250	16	13	104	26	44
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	272	17	14	113	28	48
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			289		422	281
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			289		422	281
tC, single (s)			4.7		6.6	6.3
tC, 2 stage (s)						
tF (s)			2.8		3.7	3.4
p0 queue free %			99		95	94
cM capacity (veh/h)			989		553	749

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	289	127	76
Volume Left	0	14	28
Volume Right	17	0	48
cSH	1700	989	663
Volume to Capacity	0.17	0.01	0.11
Queue Length 95th (m)	0.0	0.3	2.9
Control Delay (s/veh)	0.0	1.1	11.1
Lane LOS		A	B
Approach Delay (s/veh)	0.0	1.1	11.1
Approach LOS			B

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	27.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
15: Robot St. & Burton Rd.

11/27/2024

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	↰↱	
Traffic Volume (veh/h)	52	9	39	101	51	129
Future Volume (Veh/h)	52	9	39	101	51	129
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	57	10	42	110	55	140
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			67		256	62
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			67		256	62
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		92	86
cM capacity (veh/h)			1535		713	1003

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	67	152	195
Volume Left	0	42	55
Volume Right	10	0	140
cSH	1700	1535	900
Volume to Capacity	0.04	0.03	0.22
Queue Length 95th (m)	0.0	0.6	6.3
Control Delay (s/veh)	0.0	2.2	10.1
Lane LOS		A	B
Approach Delay (s/veh)	0.0	2.2	10.1
Approach LOS			B

Intersection Summary			
Average Delay	5.6		
Intersection Capacity Utilization	31.6%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix C: Junctions 9 Outputs

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.2.1013

For sales and distribution information, program advice and maintenance, contact TRL:
+44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk

Filename: St. Guillaume & St. Pierre.j9
Path: C:\Users\cqi\OneDrive - Stantec\Desktop
Report generation date: 2024-11-27 3:35:18 PM

»Roundabout Analysis - 2024, AM
»Roundabout Analysis - 2024, PM

Summary of intersection performance

	AM					PM				
	Set ID	Queue (Veh)	Delay (s)	V/C Ratio	LOS	Set ID	Queue (Veh)	Delay (s)	V/C Ratio	LOS
	Roundabout Analysis - 2024									
Leg 1	D1	0.2	2.38	0.20	A	D2	0.1	2.39	0.09	A
Leg 2		0.3	2.58	0.25	A		0.3	2.20	0.21	A
Leg 3		0.1	2.08	0.07	A		0.2	2.09	0.15	A
Leg 4		0.3	2.16	0.25	A		0.9	3.12	0.47	A

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	Russell Township TMP
Location	St. Guillaume / St. Pierre / Burton
Site number	
Date	2024-06-05
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Analyst	MH\MMathew
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	s	-Min	perMin

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	V/C Ratio Threshold	Average Delay threshold (s)	Queue threshold (PCE)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2024	AM	AM Peak Hour	ONE HOUR	08:00	09:30	15
D2	2024	PM	PM Peak Hour	ONE HOUR	17:00	18:30	15

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Roundabout Analysis	100.000

Roundabout Analysis - 2024, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Pedestrian Crossing	Leg 1 - Pedestrian crossing	Pedestrian crossing uses default settings only. Is this correct?
Warning	Pedestrian Crossing	Leg 1 - Pedestrian crossing	Pedestrian crossing uses default flow of 0. Is this correct?
Warning	Pedestrian Crossing	Leg 3 - Pedestrian crossing	Pedestrian crossing uses default settings only. Is this correct?
Warning	Pedestrian Crossing	Leg 3 - Pedestrian crossing	Pedestrian crossing uses default flow of 0. Is this correct?
Warning	Pedestrian Crossing	Leg 4 - Pedestrian crossing	Pedestrian crossing uses default settings only. Is this correct?
Warning	Pedestrian Crossing	Leg 4 - Pedestrian crossing	Pedestrian crossing uses default flow of 0. Is this correct?
Warning	Vehicle Mix		Truck% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If Truck% at the intersection is genuinely zero, please ignore this warning.

Intersection Network

Intersections

Intersection	Name	Intersection type	Use circulating lanes	Leg order	Intersection Delay (s)	Intersection LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	2.34	A

Intersection Network Options

Driving side	Lighting
Left	Normal/unknown

Legs

Legs

Leg	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Leg	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	5.50	7.75	10.3	20.0	45.5	0.0	
2	5.75	7.02	13.1	32.2	45.5	0.0	
3	6.98	7.43	9.6	22.5	45.5	0.0	
4	5.75	7.10	9.9	22.5	45.5	0.0	

Unsignalled Pedestrian Crossing Crossings

Leg	Space between crossing and intersection entry (Unsignalled Pedestrian	Vehicles queueing on exit (Unsignalled Pedestrian Crossing) (PCE)	Central Refuge	Crossing data type	Crossing length (m)	Crossing time (s)	Crossing length (entry side) (m)	Crossing time (entry side) (s)	Crossing length (exit side) (m)	Crossing time (exit side) (s)

	Crossing) (PCE)									
1	1.00	1.00	✓	Distance			0.00	0.00	0.00	0.00
3	1.00	1.00		Distance	0.00	0.00				
4	1.00	1.00		Distance	0.00	0.00				

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Leg	Final slope	Final intercept (PCE/hr)
1	0.770	2283
2	0.776	2285
3	0.810	2478
4	0.765	2249

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2024	AM	AM Peak Hour	ONE HOUR	08:00	09:30	15

Vehicle mix source	PCE Factor for a Truck (PCE)
Truck Percentages	2.00

Demand overview (Traffic)

Leg	Linked leg	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		✓	334	100.000
2		✓	427	100.000
3		✓	111	100.000
4		✓	504	100.000

Demand overview (Pedestrians)

Leg	Average pedestrian flow (Ped/hr)
1	0.00
2	
3	0.00
4	0.00

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	**2**	**3**	**4**
From	**1**	0	6	20	308
	2	12	0	36	379
	3	11	13	0	87
	4	41	297	166	0

Vehicle Mix

Truck Percentages

		To			
From		1	2	3	4
	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (Veh)	Max LOS
1	0.20	2.38	0.2	A
2	0.25	2.58	0.3	A
3	0.07	2.08	0.1	A
4	0.25	2.16	0.3	A

Main Results for each time segment

08:00 - 08:15

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	251	358	0.00	2008	0.125	251	0.1	2.049	A
2	321	371		1997	0.161	321	0.2	2.146	A
3	84	525	0.00	2053	0.041	83	0.0	1.827	A
4	379	27	0.00	2228	0.170	379	0.2	1.945	A

08:15 - 08:30

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	300	428	0.00	1954	0.154	300	0.2	2.177	A
2	384	444		1941	0.198	384	0.2	2.311	A
3	100	628	0.00	1970	0.051	100	0.1	1.925	A
4	453	32	0.00	2224	0.204	453	0.3	2.032	A

08:30 - 08:45

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	368	524	0.00	1880	0.196	367	0.2	2.380	A
2	470	544		1863	0.252	470	0.3	2.583	A
3	122	769	0.00	1855	0.066	122	0.1	2.076	A
4	555	40	0.00	2218	0.250	555	0.3	2.163	A

08:45 - 09:00

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	368	524	0.00	1879	0.196	368	0.2	2.381	A
2	470	544		1863	0.252	470	0.3	2.583	A
3	122	770	0.00	1855	0.066	122	0.1	2.077	A
4	555	40	0.00	2218	0.250	555	0.3	2.163	A

09:00 - 09:15

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	300	428	0.00	1953	0.154	301	0.2	2.178	A
2	384	444		1940	0.198	384	0.2	2.313	A
3	100	629	0.00	1969	0.051	100	0.1	1.927	A
4	453	32	0.00	2224	0.204	453	0.3	2.033	A

09:15 - 09:30

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	251	359	0.00	2007	0.125	252	0.1	2.050	A
2	321	372		1996	0.161	322	0.2	2.149	A
3	84	527	0.00	2052	0.041	84	0.0	1.828	A
4	379	27	0.00	2228	0.170	380	0.2	1.949	A

Roundabout Analysis - 2024, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Pedestrian Crossing	Leg 1 - Pedestrian crossing	Pedestrian crossing uses default settings only. Is this correct?
Warning	Pedestrian Crossing	Leg 1 - Pedestrian crossing	Pedestrian crossing uses default flow of 0. Is this correct?
Warning	Pedestrian Crossing	Leg 3 - Pedestrian crossing	Pedestrian crossing uses default settings only. Is this correct?
Warning	Pedestrian Crossing	Leg 3 - Pedestrian crossing	Pedestrian crossing uses default flow of 0. Is this correct?
Warning	Pedestrian Crossing	Leg 4 - Pedestrian crossing	Pedestrian crossing uses default settings only. Is this correct?
Warning	Pedestrian Crossing	Leg 4 - Pedestrian crossing	Pedestrian crossing uses default flow of 0. Is this correct?
Warning	Vehicle Mix		Truck% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If Truck% at the intersection is genuinely zero, please ignore this warning.

Intersection Network

Intersections

Intersection	Name	Intersection type	Use circulating lanes	Leg order	Intersection Delay (s)	Intersection LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	2.69	A

Intersection Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2024	PM	PM Peak Hour	ONE HOUR	17:00	18:30	15

Vehicle mix source	PCE Factor for a Truck (PCE)
Truck Percentages	2.00

Demand overview (Traffic)

Leg	Linked leg	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		✓	136	100.000
2		✓	406	100.000
3		✓	268	100.000
4		✓	932	100.000

Demand overview (Pedestrians)

Leg	Average pedestrian flow (Ped/hr)
1	0.00

2	
3	0.00
4	0.00

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	**2**	**3**	**4**
From	**1**	0	8	6	122
	2	24	0	13	369
	3	14	45	0	209
	4	240	580	112	0

Vehicle Mix

Truck Percentages

		To			
		1	**2**	**3**	**4**
From	**1**	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (Veh)	Max LOS
1	0.09	2.39	0.1	A
2	0.21	2.20	0.3	A
3	0.15	2.09	0.2	A
4	0.47	3.12	0.9	A

Main Results for each time segment

17:00 - 17:15

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	102	553	0.00	1857	0.055	102	0.1	2.051	A
2	306	180		2145	0.142	305	0.2	1.956	A
3	202	387	0.00	2165	0.093	201	0.1	1.832	A
4	702	62	0.00	2201	0.319	700	0.5	2.395	A

17:15 - 17:30

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	122	662	0.00	1773	0.069	122	0.1	2.180	A
2	365	216		2118	0.172	365	0.2	2.053	A
3	241	463	0.00	2103	0.115	241	0.1	1.932	A

4	838	75	0.00	2192	0.382	837	0.6	2.656	A

17:30 - 17:45

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	150	811	0.00	1659	0.090	150	0.1	2.385	A
2	447	264		2080	0.215	447	0.3	2.203	A
3	295	567	0.00	2019	0.146	295	0.2	2.087	A
4	1026	91	0.00	2179	0.471	1025	0.9	3.117	A

17:45 - 18:00

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	150	811	0.00	1658	0.090	150	0.1	2.386	A
2	447	264		2080	0.215	447	0.3	2.203	A
3	295	567	0.00	2019	0.146	295	0.2	2.088	A
4	1026	91	0.00	2179	0.471	1026	0.9	3.122	A

18:00 - 18:15

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	122	663	0.00	1772	0.069	122	0.1	2.183	A
2	365	216		2118	0.172	365	0.2	2.054	A
3	241	463	0.00	2103	0.115	241	0.1	1.935	A
4	838	75	0.00	2191	0.382	839	0.6	2.665	A

18:15 - 18:30

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	102	555	0.00	1855	0.055	102	0.1	2.053	A
2	306	181		2145	0.143	306	0.2	1.958	A
3	202	388	0.00	2164	0.093	202	0.1	1.833	A
4	702	63	0.00	2201	0.319	702	0.5	2.404	A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.2.1013

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Filename: St. Guillaume & St. Pierre-Background.j9
Path: C:\Users\cqi\OneDrive - Stantec\Desktop
Report generation date: 2024-11-27 3:42:17 PM

»Roundabout Analysis - 2024, AM
»Roundabout Analysis - 2024, PM

Summary of intersection performance

	AM					PM				
	Set ID	**Queue (Veh)**	**Delay (s)**	**V/C Ratio**	**LOS**	**Set ID**	**Queue (Veh)**	**Delay (s)**	**V/C Ratio**	**LOS**
	Roundabout Analysis - 2024									
Leg 1	D1	0.3	2.68	0.25	A	D2	0.1	2.69	0.12	A
Leg 2		0.5	3.00	0.32	A		0.4	2.42	0.27	A
Leg 3		0.1	2.29	0.09	A		0.2	2.31	0.19	A
Leg 4		0.4	2.34	0.31	A		1.4	3.95	0.58	A

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	Russell Township TMP
Location	St. Guillaume / St. Pierre / Burton
Site number	
Date	2024-06-05
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Analyst	MH\MMathew
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	s	-Min	perMin

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	V/C Ratio Threshold	Average Delay threshold (s)	Queue threshold (PCE)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2024	AM	AM Peak Hour	ONE HOUR	08:00	09:30	15
D2	2024	PM	PM Peak Hour	ONE HOUR	17:00	18:30	15

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Roundabout Analysis	100.000

Roundabout Analysis - 2024, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Pedestrian Crossing	Leg 1 - Pedestrian crossing	Pedestrian crossing uses default settings only. Is this correct?
Warning	Pedestrian Crossing	Leg 1 - Pedestrian crossing	Pedestrian crossing uses default flow of 0. Is this correct?
Warning	Pedestrian Crossing	Leg 3 - Pedestrian crossing	Pedestrian crossing uses default settings only. Is this correct?
Warning	Pedestrian Crossing	Leg 3 - Pedestrian crossing	Pedestrian crossing uses default flow of 0. Is this correct?
Warning	Pedestrian Crossing	Leg 4 - Pedestrian crossing	Pedestrian crossing uses default settings only. Is this correct?
Warning	Pedestrian Crossing	Leg 4 - Pedestrian crossing	Pedestrian crossing uses default flow of 0. Is this correct?
Warning	Vehicle Mix		Truck% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If Truck% at the intersection is genuinely zero, please ignore this warning.

Intersection Network

Intersections

Intersection	Name	Intersection type	Use circulating lanes	Leg order	Intersection Delay (s)	Intersection LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	2.63	A

Intersection Network Options

Driving side	Lighting
Left	Normal/unknown

Legs

Legs

Leg	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Leg	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	5.50	7.75	10.3	20.0	45.5	0.0	
2	5.75	7.02	13.1	32.2	45.5	0.0	
3	6.98	7.43	9.6	22.5	45.5	0.0	
4	5.75	7.10	9.9	22.5	45.5	0.0	

Unsignalled Pedestrian Crossing Crossings

Leg	Space between crossing and intersection entry (Unsignalled Pedestrian	Vehicles queueing on exit (Unsignalled Pedestrian Crossing) (PCE)	Central Refuge	Crossing data type	Crossing length (m)	Crossing time (s)	Crossing length (entry side) (m)	Crossing time (entry side) (s)	Crossing length (exit side) (m)	Crossing time (exit side) (s)

	Crossing) (PCE)									
1	1.00	1.00	✓	Distance			0.00	0.00	0.00	0.00
3	1.00	1.00		Distance	0.00	0.00				
4	1.00	1.00		Distance	0.00	0.00				

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Leg	Final slope	Final intercept (PCE/hr)
1	0.770	2283
2	0.776	2285
3	0.810	2478
4	0.765	2249

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2024	AM	AM Peak Hour	ONE HOUR	08:00	09:30	15

Vehicle mix source	PCE Factor for a Truck (PCE)
Truck Percentages	2.00

Demand overview (Traffic)

Leg	Linked leg	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		✓	406	100.000
2		✓	521	100.000
3		✓	135	100.000
4		✓	614	100.000

Demand overview (Pedestrians)

Leg	Average pedestrian flow (Ped/hr)
1	0.00
2	
3	0.00
4	0.00

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	**2**	**3**	**4**
From	**1**	0	7	24	375
	2	15	0	44	462
	3	13	16	0	106
	4	50	362	202	0

Vehicle Mix

Truck Percentages

		To			
		1	**2**	**3**	**4**
From	**1**	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (Veh)	Max LOS
1	0.25	2.68	0.3	A
2	0.32	3.00	0.5	A
3	0.09	2.29	0.1	A
4	0.31	2.34	0.4	A

Main Results for each time segment

08:00 - 08:15

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	306	436	0.00	1947	0.157	305	0.2	2.190	A
2	392	451		1935	0.203	391	0.3	2.331	A
3	102	640	0.00	1960	0.052	101	0.1	1.936	A
4	462	33	0.00	2223	0.208	461	0.3	2.042	A

08:15 - 08:30

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	365	521	0.00	1882	0.194	365	0.2	2.373	A
2	468	540		1866	0.251	468	0.3	2.574	A
3	121	765	0.00	1858	0.065	121	0.1	2.072	A
4	552	40	0.00	2218	0.249	552	0.3	2.160	A

08:30 - 08:45

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	447	638	0.00	1791	0.250	447	0.3	2.677	A
2	574	661		1772	0.324	573	0.5	3.000	A
3	149	937	0.00	1719	0.086	149	0.1	2.291	A
4	676	48	0.00	2212	0.306	676	0.4	2.344	A

08:45 - 09:00

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	447	639	0.00	1791	0.250	447	0.3	2.677	A
2	574	662		1772	0.324	574	0.5	3.004	A
3	149	938	0.00	1718	0.087	149	0.1	2.292	A
4	676	48	0.00	2212	0.306	676	0.4	2.344	A

09:00 - 09:15

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	365	522	0.00	1881	0.194	365	0.2	2.375	A
2	468	541		1866	0.251	469	0.3	2.580	A
3	121	767	0.00	1857	0.065	121	0.1	2.073	A
4	552	40	0.00	2218	0.249	552	0.3	2.162	A

09:15 - 09:30

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	306	437	0.00	1946	0.157	306	0.2	2.195	A
2	392	453		1934	0.203	393	0.3	2.335	A
3	102	642	0.00	1958	0.052	102	0.1	1.938	A
4	462	33	0.00	2223	0.208	463	0.3	2.044	A

Roundabout Analysis - 2024, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Pedestrian Crossing	Leg 1 - Pedestrian crossing	Pedestrian crossing uses default settings only. Is this correct?
Warning	Pedestrian Crossing	Leg 1 - Pedestrian crossing	Pedestrian crossing uses default flow of 0. Is this correct?
Warning	Pedestrian Crossing	Leg 3 - Pedestrian crossing	Pedestrian crossing uses default settings only. Is this correct?
Warning	Pedestrian Crossing	Leg 3 - Pedestrian crossing	Pedestrian crossing uses default flow of 0. Is this correct?
Warning	Pedestrian Crossing	Leg 4 - Pedestrian crossing	Pedestrian crossing uses default settings only. Is this correct?
Warning	Pedestrian Crossing	Leg 4 - Pedestrian crossing	Pedestrian crossing uses default flow of 0. Is this correct?
Warning	Vehicle Mix		Truck% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If Truck% at the intersection is genuinely zero, please ignore this warning.

Intersection Network

Intersections

Intersection	Name	Intersection type	Use circulating lanes	Leg order	Intersection Delay (s)	Intersection LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	3.24	A

Intersection Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2024	PM	PM Peak Hour	ONE HOUR	17:00	18:30	15

Vehicle mix source	PCE Factor for a Truck (PCE)
Truck Percentages	2.00

Demand overview (Traffic)

Leg	Linked leg	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		✓	166	100.000
2		✓	495	100.000
3		✓	327	100.000
4		✓	1137	100.000

Demand overview (Pedestrians)

Leg	Average pedestrian flow (Ped/hr)
1	0.00

2	
3	0.00
4	0.00

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	**2**	**3**	**4**
From	**1**	0	10	7	149
	2	29	0	16	450
	3	17	55	0	255
	4	293	707	137	0

Vehicle Mix

Truck Percentages

		To			
		1	**2**	**3**	**4**
From	**1**	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (Veh)	Max LOS
1	0.12	2.69	0.1	A
2	0.27	2.42	0.4	A
3	0.19	2.31	0.2	A
4	0.58	3.95	1.4	A

Main Results for each time segment

17:00 - 17:15

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	125	675	0.00	1763	0.071	125	0.1	2.197	A
2	373	220		2115	0.176	372	0.2	2.064	A
3	246	472	0.00	2096	0.117	246	0.1	1.945	A
4	856	76	0.00	2191	0.391	853	0.6	2.688	A

17:15 - 17:30

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	149	807	0.00	1661	0.090	149	0.1	2.380	A
2	445	263		2081	0.214	445	0.3	2.200	A
3	294	564	0.00	2021	0.145	294	0.2	2.083	A

4	1022	91	0.00	2179	0.469	1021	0.9	3.105	A

17:30 - 17:45

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	183	988	0.00	1522	0.120	183	0.1	2.688	A
2	545	322		2035	0.268	545	0.4	2.415	A
3	360	691	0.00	1919	0.188	360	0.2	2.309	A
4	1252	111	0.00	2164	0.579	1250	1.4	3.933	A

17:45 - 18:00

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	183	990	0.00	1521	0.120	183	0.1	2.690	A
2	545	323		2035	0.268	545	0.4	2.415	A
3	360	691	0.00	1918	0.188	360	0.2	2.310	A
4	1252	111	0.00	2163	0.579	1252	1.4	3.948	A

18:00 - 18:15

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	149	810	0.00	1659	0.090	149	0.1	2.383	A
2	445	264		2081	0.214	445	0.3	2.203	A
3	294	565	0.00	2021	0.145	294	0.2	2.085	A
4	1022	91	0.00	2179	0.469	1024	0.9	3.123	A

18:15 - 18:30

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	125	678	0.00	1761	0.071	125	0.1	2.200	A
2	373	221		2114	0.176	373	0.2	2.069	A
3	246	473	0.00	2095	0.118	246	0.1	1.947	A
4	856	76	0.00	2190	0.391	857	0.6	2.701	A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.2.1013

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Filename: St. Guillaume & St. Pierre-Future.j9
Path: C:\Users\cqi\OneDrive - Stantec\Desktop
Report generation date: 2024-11-27 4:01:06 PM

»Roundabout Analysis - 2024, AM
»Roundabout Analysis - 2024, PM

Summary of intersection performance

	AM					PM				
	Set ID	Queue (Veh)	Delay (s)	V/C Ratio	LOS	Set ID	Queue (Veh)	Delay (s)	V/C Ratio	LOS
	Roundabout Analysis - 2024									
Leg 1	D1	0.4	2.88	0.27	A	D2	0.1	2.77	0.12	A
Leg 2		0.5	3.31	0.35	A		0.4	2.46	0.27	A
Leg 3		0.1	2.33	0.10	A		0.3	2.52	0.26	A
Leg 4		0.5	2.52	0.35	A		1.5	4.17	0.60	A

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	Russell Township TMP
Location	St. Guillaume / St. Pierre / Burton
Site number	
Date	2024-06-05
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Analyst	MH\MMathew
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	s	-Min	perMin

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	V/C Ratio Threshold	Average Delay threshold (s)	Queue threshold (PCE)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2024	AM	AM Peak Hour	ONE HOUR	08:00	09:30	15
D2	2024	PM	PM Peak Hour	ONE HOUR	17:00	18:30	15

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Roundabout Analysis	100.000

Roundabout Analysis - 2024, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Pedestrian Crossing	Leg 1 - Pedestrian crossing	Pedestrian crossing uses default settings only. Is this correct?
Warning	Pedestrian Crossing	Leg 1 - Pedestrian crossing	Pedestrian crossing uses default flow of 0. Is this correct?
Warning	Pedestrian Crossing	Leg 3 - Pedestrian crossing	Pedestrian crossing uses default settings only. Is this correct?
Warning	Pedestrian Crossing	Leg 3 - Pedestrian crossing	Pedestrian crossing uses default flow of 0. Is this correct?
Warning	Pedestrian Crossing	Leg 4 - Pedestrian crossing	Pedestrian crossing uses default settings only. Is this correct?
Warning	Pedestrian Crossing	Leg 4 - Pedestrian crossing	Pedestrian crossing uses default flow of 0. Is this correct?
Warning	Vehicle Mix		Truck% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If Truck% at the intersection is genuinely zero, please ignore this warning.

Intersection Network

Intersections

Intersection	Name	Intersection type	Use circulating lanes	Leg order	Intersection Delay (s)	Intersection LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	2.82	A

Intersection Network Options

Driving side	Lighting
Left	Normal/unknown

Legs

Legs

Leg	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Leg	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	5.50	7.75	10.3	20.0	45.5	0.0	
2	5.75	7.02	13.1	32.2	45.5	0.0	
3	6.98	7.43	9.6	22.5	45.5	0.0	
4	5.75	7.10	9.9	22.5	45.5	0.0	

Unsignalled Pedestrian Crossing Crossings

Leg	Space between crossing and intersection entry (Unsignalled Pedestrian	Vehicles queueing on exit (Unsignalled Pedestrian Crossing) (PCE)	Central Refuge	Crossing data type	Crossing length (m)	Crossing time (s)	Crossing length (entry side) (m)	Crossing time (entry side) (s)	Crossing length (exit side) (m)	Crossing time (exit side) (s)

	Crossing) (PCE)									
1	1.00	1.00	✓	Distance			0.00	0.00	0.00	0.00
3	1.00	1.00		Distance	0.00	0.00				
4	1.00	1.00		Distance	0.00	0.00				

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Leg	Final slope	Final intercept (PCE/hr)
1	0.770	2283
2	0.776	2285
3	0.810	2478
4	0.765	2249

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2024	AM	AM Peak Hour	ONE HOUR	08:00	09:30	15

Vehicle mix source	PCE Factor for a Truck (PCE)
Truck Percentages	2.00

Demand overview (Traffic)

Leg	Linked leg	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		✓	417	100.000
2		✓	541	100.000
3		✓	161	100.000
4		✓	708	100.000

Demand overview (Pedestrians)

Leg	Average pedestrian flow (Ped/hr)
1	0.00
2	
3	0.00
4	0.00

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	**2**	**3**	**4**
From	**1**	0	7	35	375
	2	15	0	64	462
	3	16	19	0	126
	4	50	362	296	0

Vehicle Mix

Truck Percentages

		To			
		1	**2**	**3**	**4**
From	**1**	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (Veh)	Max LOS
1	0.27	2.88	0.4	A
2	0.35	3.31	0.5	A
3	0.10	2.33	0.1	A
4	0.35	2.52	0.5	A

Main Results for each time segment

08:00 - 08:15

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	314	508	0.00	1891	0.166	313	0.2	2.280	A
2	407	530		1874	0.217	406	0.3	2.452	A
3	121	640	0.00	1960	0.062	121	0.1	1.957	A
4	533	38	0.00	2220	0.240	532	0.3	2.132	A

08:15 - 08:30

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	375	608	0.00	1815	0.207	375	0.3	2.500	A
2	486	634		1793	0.271	486	0.4	2.754	A
3	145	765	0.00	1858	0.078	145	0.1	2.100	A
4	636	45	0.00	2214	0.287	636	0.4	2.281	A

08:30 - 08:45

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	459	745	0.00	1709	0.269	459	0.4	2.878	A
2	596	777		1682	0.354	595	0.5	3.309	A
3	177	937	0.00	1719	0.103	177	0.1	2.334	A
4	780	55	0.00	2206	0.353	779	0.5	2.520	A

08:45 - 09:00

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	459	745	0.00	1709	0.269	459	0.4	2.879	A
2	596	777		1682	0.354	596	0.5	3.313	A
3	177	938	0.00	1718	0.103	177	0.1	2.335	A
4	780	55	0.00	2206	0.353	780	0.5	2.522	A

09:00 - 09:15

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	375	609	0.00	1814	0.207	375	0.3	2.502	A
2	486	635		1792	0.271	487	0.4	2.761	A
3	145	767	0.00	1857	0.078	145	0.1	2.102	A
4	636	45	0.00	2214	0.287	637	0.4	2.284	A

09:15 - 09:30

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	314	510	0.00	1890	0.166	314	0.2	2.286	A
2	407	532		1872	0.218	408	0.3	2.457	A
3	121	642	0.00	1958	0.062	121	0.1	1.959	A
4	533	38	0.00	2220	0.240	533	0.3	2.134	A

Roundabout Analysis - 2024, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Pedestrian Crossing	Leg 1 - Pedestrian crossing	Pedestrian crossing uses default settings only. Is this correct?
Warning	Pedestrian Crossing	Leg 1 - Pedestrian crossing	Pedestrian crossing uses default flow of 0. Is this correct?
Warning	Pedestrian Crossing	Leg 3 - Pedestrian crossing	Pedestrian crossing uses default settings only. Is this correct?
Warning	Pedestrian Crossing	Leg 3 - Pedestrian crossing	Pedestrian crossing uses default flow of 0. Is this correct?
Warning	Pedestrian Crossing	Leg 4 - Pedestrian crossing	Pedestrian crossing uses default settings only. Is this correct?
Warning	Pedestrian Crossing	Leg 4 - Pedestrian crossing	Pedestrian crossing uses default flow of 0. Is this correct?
Warning	Vehicle Mix		Truck% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If Truck% at the intersection is genuinely zero, please ignore this warning.

Intersection Network

Intersections

Intersection	Name	Intersection type	Use circulating lanes	Leg order	Intersection Delay (s)	Intersection LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	3.37	A

Intersection Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2024	PM	PM Peak Hour	ONE HOUR	17:00	18:30	15

Vehicle mix source	PCE Factor for a Truck (PCE)
Truck Percentages	2.00

Demand overview (Traffic)

Leg	Linked leg	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		✓	167	100.000
2		✓	498	100.000
3		✓	445	100.000
4		✓	1161	100.000

Demand overview (Pedestrians)

Leg	Average pedestrian flow (Ped/hr)
1	0.00

2	
3	0.00
4	0.00

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	**2**	**3**	**4**
From	**1**	0	10	8	149
	2	29	0	19	450
	3	23	75	0	347
	4	293	707	161	0

Vehicle Mix

Truck Percentages

		To			
		1	**2**	**3**	**4**
From	**1**	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (Veh)	Max LOS
1	0.12	2.77	0.1	A
2	0.27	2.46	0.4	A
3	0.26	2.52	0.3	A
4	0.60	4.17	1.5	A

Main Results for each time segment

17:00 - 17:15

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	126	708	0.00	1738	0.072	125	0.1	2.232	A
2	375	239		2100	0.179	374	0.2	2.084	A
3	335	472	0.00	2096	0.160	334	0.2	2.042	A
4	874	95	0.00	2176	0.402	871	0.7	2.754	A

17:15 - 17:30

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	150	847	0.00	1631	0.092	150	0.1	2.431	A
2	448	286		2064	0.217	447	0.3	2.227	A
3	400	564	0.00	2021	0.198	400	0.2	2.220	A

4	1044	114	0.00	2161	0.483	1043	0.9	3.215	A

17:30 - 17:45

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	184	1037	0.00	1485	0.124	184	0.1	2.767	A
2	548	350		2014	0.272	548	0.4	2.455	A
3	490	691	0.00	1919	0.255	490	0.3	2.519	A
4	1278	140	0.00	2142	0.597	1276	1.5	4.149	A

17:45 - 18:00

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	184	1038	0.00	1483	0.124	184	0.1	2.769	A
2	548	350		2014	0.272	548	0.4	2.456	A
3	490	691	0.00	1918	0.255	490	0.3	2.520	A
4	1278	140	0.00	2142	0.597	1278	1.5	4.169	A

18:00 - 18:15

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	150	849	0.00	1629	0.092	150	0.1	2.436	A
2	448	286		2063	0.217	448	0.3	2.229	A
3	400	565	0.00	2021	0.198	400	0.2	2.224	A
4	1044	114	0.00	2161	0.483	1046	0.9	3.235	A

18:15 - 18:30

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	126	711	0.00	1736	0.072	126	0.1	2.236	A
2	375	240		2099	0.179	375	0.2	2.089	A
3	335	473	0.00	2095	0.160	335	0.2	2.045	A
4	874	96	0.00	2175	0.402	875	0.7	2.772	A

APPENDIX G

Phase 1 Environmental Site Assessment

Phase I
Environmental Site Assessment

417 Industrial Park
Phase 3
Russell, Ontario

Prepared for:

Russell Township
717 Notre-Dame
Embrun, Ontario
K0A 1W0

Attention: François Landry

LRL File No.: 230216

August 28 2024

EXECUTIVE SUMMARY

Russell Township has retained LRL Engineering (LRL) to complete a Phase I Environmental Site Assessment (ESA) in support of the proposed Phase 3 Extension of the 417 Industrial Park located in Vars, Ontario (herein referred to as the “Site”). The legal description of the Site is Part Lots 22 and 23 Concession 4 Russell, Parts 1, 2, 3, and 4 50R11230, and Part 1 50R10831, Except Parts 1 and 2 50R11445, Part 2 50R10969, Parts 1, 2, 3, 4 and 5 50R11106, Part 1 50R11049, and Parts 1 and 2 50R11139; Subject to an easement in gross over Part 9 50R11286 as in RC165382; Township of Russell, Ontario. The Site is set within an agricultural, industrial and residential area of Vars, Ontario. The nearest open body of water identified is Quarry Lake that is located approximately 1.6 km south of the Site, which according to available topographic resources (The Atlas of Canada – *Toporama*) flows in a southernly direction. There are also several smaller channels within the surrounding area of the Site for agricultural drainage that also flow in a southeastern direction. The inferred groundwater flow direction in the vicinity of the Site is south to southeast towards Quarry Lake and Castor River. The Site’s topography is generally flat with some small hills with elevations ranging between approximately 77 m to 89 m amsl.

This assessment was conducted to identify potential environmental concerns or liabilities related to the past and present operations conducted on the property and the adjacent lands. The assessment included a review of the history of the Site, contact with relevant regulatory agencies, a walk-through Site inspection of the property and interviews with those knowledgeable of the Site. This assessment was conducted for due diligence purposes in the context of property development. The Phase I ESA identifies the existing environmental conditions and potential environmental liabilities associated with the subject property, focusing on the possible presence of contamination on the property. It includes a review of available information (historical data and aerial photographs) and a visual Site inspection to assess potential contamination of past or present activities conducted on the property itself and on adjacent properties.

Potential contamination represents the uncontrolled release of foreign substances within the natural environment. Such an event can result in air, soil and groundwater contamination that may represent environmental liabilities towards the Site and perhaps towards adjacent properties. The ESA evaluates in a consistent manner, within the time constraints imposed for this report, whether such events have occurred at this Site. This level of work is a method of risk reduction and does not eliminate risk for the client.

The activities on the lands within 250 m are presently agricultural, industrial and residential. Based on review of available aerial photographs and the interview with a Site representative, the Site has been developed with agricultural fields since at least 1946 and has remained used for agricultural purposes up to present day.

There are no records of a waste disposal site, coal tar industrial site, or PCB storage site within a 250 m radius. No records were retrieved in the National Pollutant Release Inventory; Certificates of Approval; or Scott's Manufacturing Directory within 250 m radius from the Site. No records were retrieved within the Private and Retail Fuel Storage Tanks inventory which compiles data from between 1989 and 1996.

A potentially contaminating activity is a use or activity set out in Table 2 of Schedule D of the O. Reg. 153/04. The activities on the Site and lands within 250 m generally consist of the activities on the Site and lands within 250 m generally consist of commercial, agricultural and residential.

Based on the results of the Phase I Environmental Site Assessment, no potential contaminating activities (PCAs) were identified within 250 m of the Site. Records retrieved of potentially contaminating activities or incidents were identified on properties located down-/ trans-gradient of the Site and are not considered a potential risk for environmental concern. As such, no further environmental assessment work is warranted at the Site at this time. A Phase II Environmental Site Assessment is not considered warranted at this time.

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Figure 1 **Site Location**
Figure 2 **Site Plan**

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Appendix A **City Directories**
Appendix B **Land Title Search**
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Appendix I **Table 2 of Schedule D of O. Reg. 153/04**

1 INTRODUCTION

Russell Township has retained LRL Engineering (LRL) to complete a Phase I Environmental Site Assessment (ESA) in support of the proposed Phase 3 Extension of the 417 Industrial Park located in Vars, Ontario (herein referred to as the "Site"). The legal description of the Site is Part Lots 22 and 23 Concession 4 Russell, Parts 1, 2, 3, and 4 50R11230, and Part 1 50R10831, Except Parts 1 and 2 50R11445, Part 2 50R10969, Parts 1, 2, 3, 4 and 5 50R11106, Part 1 50R11049, and Parts 1 and 2 50R11139; Subject to an easement in gross over Part 9 50R11286 as in RC165382; Township of Russell, Ontario. The Site is set within an agricultural, industrial and residential area of Vars, Ontario. The nearest open body of water identified is Quarry Lake that is located approximately 1.6 km south of the Site, which according to available topographic resources (The Atlas of Canada – *Toporama*) flows in a southernly direction. There are also several smaller channels within the surrounding area of the Site for agricultural drainage that also flow in a southeastern direction. The inferred groundwater flow direction in the vicinity of the Site is south to southeast towards Quarry Lake and Castor River. The Site's topography is generally flat with some small hills with elevations ranging between approximately 77 m to 89 m amsl. The Site is currently undeveloped and contains various agricultural fields. The Site's location is shown in **Figure 1**.

This assessment was conducted to identify potential environmental concerns or liabilities related to the past and present operations conducted on the property and the adjacent lands. The assessment included a review of the history of the Site, contact with relevant regulatory agencies, a walk-through Site inspection of the property and interviews with those knowledgeable of the Site. This assessment was conducted for due diligence purposes in the context of property development.

The Phase I ESA identifies the existing environmental conditions and potential environmental liabilities associated with the subject property, focusing on the possible presence of contamination on the property. It includes a review of available information (historical data and aerial photographs) and a visual Site inspection to assess potential contamination of past or present activities conducted on the property itself and on adjacent properties.

Potential contamination represents the uncontrolled release of foreign substances within the natural environment. Such an event can result in air, soil and groundwater contamination that may represent environmental liabilities towards the Site and perhaps towards adjacent properties. The ESA evaluates in a consistent manner, within the time constraints imposed for this report, whether such events have occurred at this Site. This level of work is a method of risk reduction and does not eliminate risk for the client.

1.1 Property Information

Address:	Not Applicable
Frontage:	Burton Road
Zoning:	Agricultural (A2-70, A2-ar)
Legal description:	Part Lots 22 and 23 Concession 4 Russell, Parts 1, 2, 3, and 4 50R11230, and Part 1 50R10831, Except Parts 1 and 2 50R11445, Part 2 50R10969, Parts 1, 2, 3, 4 and 5 50R11106, Part 1 50R11049, and Parts 1 and 2 50R11139; Subject to an easement in gross over Part 9 50R11286 as in RC165382; Township of Russell, Ontario.
Dimensions:	Irregularly Shaped: Being between approximately 835 and 1,375 m wide (west-east) by approximately 600 m and 385 m deep (north-south).
Area:	Approximate area of 744,821 m² (184 acres).

The Site's location is shown in **Figure 1** and the general Site configuration is shown on the Site Plan in **Figure 2**. For the purposes of this report, Burton Road will be inferred as running in a west-east direction.

1.2 Site Occupancy

Current owner:	The Corporation of the Township of Russell
Owner since:	April 2019
Current use:	Agricultural
Current use since:	At least the late early to mid - 1940's (1946 - According to Aerial Photographs).

2 SCOPE OF INVESTIGATION

LRL conducted this work in accordance with the standard Phase I ESA procedures, which generally reflect the requirements of the Canadian Standards Association document entitled Phase I Environmental Site Assessment, Z768-01 (R2016). The scope of work for the Phase I ESA consisted of the following:

- Reviewing reasonably ascertainable records regarding the occupancy of the Site and surrounding properties (i.e. business directories, fire insurance plans and aerial photographs);
- Interviewing current and previous owners and/or tenants and local and provincial authorities;
- Conducting a Site visit that consists of a "walk-through" visual assessment of the Site and adjacent properties (from publicly accessible areas); and
- Evaluation of the information collected.

This report will present the results of the ESA carried out between July 30th and August 19th, 2024.

3 RECORDS REVIEW

3.1 General

3.1.1 Phase I Study Area Determination

Study area:	250 m
Rational for extending study area beyond the minimum 250 m	
Not Applicable.	

3.1.2 First Developed Use Determination

First developed use is defined by O. Reg. 153/04 Section 22(1) as the first property use after 1875 that resulted in a building or structure or the first potentially contaminating activity, whichever is earlier.

First developed use:	Agricultural
Year	At least the 1940's
Basis for determination of first developed use	
Aerial Photographs.	

3.1.3 Fire Insurance Plans

Fire Insurance Plans (FIP) mapped streets and buildings of urban Canada in great detail and illustrate building construction, occupancy and potential fire hazards. They also provide detailed information regarding storage tanks, transformers, boilers and electrical rooms. The original plans were produced between 1875 and 1923 and continued to be produced and updated until production ceased in 1974. No FIPs were available for the Site.

3.1.4 Property Underwriters' Report

Property Underwriters Site Plans and Reports provide detailed information on a site-specific basis and include descriptions of building construction, heating sources, production processes, and the presence of chemicals or materials which may be stored on Site. They also indicate the presence of environmental hazards such as electrical rooms, transformers, boilers, and storage tanks. No Property Underwriters' Reports were found for the Site.

3.2 City Directories

City directories have been produced for most urban and some rural areas since the late 1800's. These directories are often archived in research and municipal libraries. The directories are generally not comprehensive and may contain gaps in time periods. Where available, city directories were reviewed in a minimum five-year increment to determine historical property use of the subject and adjoining properties. A copy of the city directories is included in **Appendix A**.

Source	ERIS City Directory (Polks, Digital Business Directory)
Years Searched:	1997 to 2021
Historical Property Uses:	
Subject Site:	Not Listed
Adjacent Land:	The neighbouring lands within 250 m of the Site were not listed until 2000: **136 Eadie Road:** RESIDENTIAL (2 TENANTS) (2000); **147 Eadie Road:** RESIDENTIAL (1 TENANT) (2000); UNIQUE PANS (2017-2021). **191 Eadie Road:** RESIDENTIAL (2 TENANTS) (2000); **244 Eadie Road:** RESIDENTIAL (3 TENANTS) (2000); **247 Eadie Road:** RESIDENTIAL (1 TENANT) (2000); **276 Eadie Road:** RESIDENTIAL (1 TENANT) (2000); **652 Burton Road:** RESIDENTIAL (1 TENANT) (2000); **755 Burton Road:** RESIDENTIAL (1 TENANT) (2000); STEWART ROBERT FARMS (2017).
Relevant information regarding potentially contaminating activity and areas of potential environmental concern	
No information from the City Directory reveals potentially contaminating activity to the Site.	

3.3 Chain of Title

Land Titles contain legal title information concerning property ownership, transfer details, and any encumbrances such as mortgages or easements. Each time a new transaction occurs, property records are updated as soon as the instrument is registered. A copy of the Chain of Title is included in **Appendix B**.

Records search provider:	Service Ontario Land Registry Office
Date of search:	July 31, 2024
Pertinent Information:	The search covered the period from July 1969 to November 2023. From April 2019 to March 2023, various parcels of the Site have been transferred to The Corporation of the Township of Russell.

3.4 Environmental Reports

No previous environmental reports were provided to LRL as part of this investigation.

3.5 Environmental Source Information

3.5.1 Township of Russell Freedom of Information Request

The Township of Russell was contacted to obtain available information for the Site.

Interview subject:	Township of Russell
Date:	August 2, 2024
Pertinent information: Under the Freedom of Information Act, a Freedom of Information Request was made to the Township of Russell. A formal response is expected and will be reviewed by LRL. If the response details any issues of potential environmental concern with respect to the Site, a copy will be forwarded to the client so that it can be appended to this report.	

3.5.2 Ontario Ministry of Environment, Conservation and Parks Freedom of Information Act

The Ontario Ministry of the Environment, Conservation and Parks (MECP) was contacted under the Freedom of Information Act (FOI) to obtain available information for the Site regarding:

- Certificates of Approvals or any permits relating to air emissions (including noise), water taking and discharging, waste disposal sites, septic systems, pesticides storage or other similar instruments;
- Incidents, orders, offences, spills, discharges of contaminants or inspections;
- Waste management records, including current and historical waste storage locations and waste generator and waste receiver information; and
- Reports submitted to the MECP related to the environmental conditions of the property.

Interview subject:	FOI Office
Date:	August 19, 2024
Pertinent information: Under the Freedom of Information Act, a FOI request was made to the MECP. The MECP has acknowledged receipt of the request. A formal response is expected and will be reviewed by LRL. If the response details any issues of potential environmental concern with respect to the Site, a copy will be forwarded to the client so that it can be appended to this report.	

3.5.3 Inventory of Coal Tar Industrial Sites in Ontario

The MECP has created an inventory of all known and historical coal gasification plants. It identifies industrial sites that produced and continue to produce or use coal tar or other related tars. The program was discontinued in 1988.

Database:	Inventory of Industrial Sites Producing or Using Coal Tar and Related Tars in Ontario
Years covered:	Up to 1988
Search radius:	250 m
Description of data, analysis and findings relevant to the Phase I ESA: No records were found within a 250 m radius from the Site.	

3.5.4 Technical Standards and Safety Authority

Fuel storage at commercial and industrial facilities is regulated by the Technical Standards and Safety Authority (TSSA). Records of aboveground storage tanks are maintained for bulk storage facilities only. Underground storage tanks (USTs) are required to be registered with the TSSA.

There are no requirements to register private underground and aboveground fuel oil storage tanks for heating or waste oil. Records of registered and licensed tanks have been maintained since 1990.

Interview subject: Public Information Services

Date: July 30, 2024

Pertinent information:
The TSSA was contacted regarding available information concerning the presence of petroleum storage tanks, fuel spill records, accidents or fuel-related incidents which may be registered on the Site or surrounding properties. Ms. Fowler has indicated that there are no records of aboveground storage tanks (ASTs) or USTs on the Site or in the surrounding areas. The email correspondence provided by the TSSA can be found in **Appendix C**.

3.5.5 Ministry of the Environment, Conservation and Parks Well Records

The Ministry of the Environment, Conservation and Parks well records database provides information of locations and characteristics of water wells throughout Canada in accordance with Ontario Regulation 903. Information of the stratigraphy, depth of bedrock and approximate depth of water table is also provided. Copies of the water well records retrieved are included in **Appendix D**.

Database: MECP Well Records

Search radius: 250 m

Date accessed: August 12, 2024

Description of data, analysis and findings relevant to the Phase I ESA:

Records of twenty-two wells located within a 250 m radius of the Site were available in the MECP well record database. Details provided for select wells are as follows:

- Well No. 5602926 (Lot 21 Con 4.), a domestic supply well which was installed in 1984. Red hard pan with clay and stone was encountered to 6.4 m below ground surface (bgs) followed by soft red shale to 7.0 m bgs, overlaying hard red shale and rock to 16.8 m bgs where the well was terminated. Fresh water was found at 15.9 m bgs.
- Well No. 5601875 (Lot 21 Con 3.), a domestic supply well which was extended in 1976. The previously dug well was encountered until 7.3 m bgs, followed by hard red shale to 21.3 m bgs where the well was terminated. Fresh water was found at 20.7 m bgs.
- Well No. 5606152 (Lot 22 Con 4.), a domestic supply well which was installed in 2005. A softer material was encountered to 6.1 m bgs, followed by red layered shale and rock encountered until 23.8 m bgs where the well was terminated. Fresh water was found at 22 m bgs.
- Well No. 5602324 (Lot 24 Con 3.), a domestic supply well which was installed in 1976. Fine brown sand was encountered to 3.1 m bgs, followed by had packed sand and clay to 6.1 m bgs, overlaying grey limestone and rock to 67.1 m bgs where the well was terminated. Fresh water was found at 64.0 m bgs.
- Well No. 5605467 (Lot 23 Con 3.), a domestic supply well which was installed in 2000. Red till and boulders were encountered to 3.7 m bgs, followed by red shale to 18.3 m bgs, overlaying blue shale to 32.0 m bgs where the well was terminated. Fresh water was found at 30.5 m bgs.

- Well No. 5600956 (Lot 23 Con 3.), a domestic supply well which was installed in 1964. Red shale was encountered to 6.1 m bgs, followed by red rock to 24.7 m bgs where the well was terminated. Fresh water was found at 24.4 m bgs.
- Well No. 5602067 (Lot 23 Con 4.), a domestic supply well which was installed in 1977. Red hardpan was encountered to 6.7 m bgs, followed by red shale to 21.3 m bgs, overlaying grey sandstone to 23.8 m bgs where the well was terminated. Fresh water was found at 22.9 m bgs.
- Well No. 1528200 (Lot 28 Con 8.), a domestic supply well which was installed in 1994. Brown soil was encountered to 0.6 m bgs, followed by brown hardpan/boulders to 4.0 m bgs, followed by grey hardpan and gravel to 7.0 m bgs, overlaying soft grey limestone to 37.5 m bgs where the well was terminated. Water was found at 22.6 m bgs.
- Well No. 1528758 (Lot 28 Con 8.), a domestic supply well which was installed in 1995. Black topsoil was encountered to 0.6 m bgs, followed by grey clay to 7.6 m bgs, followed by blue clay and sand to 12.8 m bgs, followed by grey gravel to 18.3 m bgs, followed by red porous shale to 18.9 m bgs, overlaying grey hard limestone to 19.2 m bgs where the well was terminated. Fresh water was found at 19.2 m bgs.
- Well No. 7422318 (Lot 22 Con 5.), a well installed in 2022. No other information is given.
- Well No. 7432535 (Lot 22 Con 5), a well installed in 2022. No other information is given.
- Well No. 7411241 (Lot 22 Con 5.), a well installed in 2022. No other information is given.
- Well No. 7247455 (Lot 22 Con 5.), a commercial supply well which was installed in 2015. Brown clay was encountered to 2.4 m bgs, followed by grey clay to 7.3 m bgs, followed by grey gravel and sand to 9.8 m bgs, overlaying grey rock to 36.6 m bgs where the well was terminated. Water was found at 11.6 m bgs.
- Well No. 7311396 (Lot 22 Con 5.), a domestic and commercial supply well which was installed in 2018. Grey gravel was encountered to 0.9 m bgs, followed by brown sand to 1.8 m bgs, followed by grey clay to 5.5 m bgs, followed by clay, gravel and sand to 9.7 m bgs, overlaying grey limestone to 40 m bgs where the well was terminated. Fresh water was at 39.4 m bgs.
- Well No. 7372246 (Lot 22 Con 5.), domestic supply well which was installed in 2020. Boulders and clay were encountered to 7.9 m bgs, followed by grey limestone to 25.3 m bgs, followed by grey and black limestone to 91.4 m bgs where the well was terminated. Water was found at 77.4 m bgs.
- Well No. 7385814 (Lot 22 Con 4.), a well installed in 2021. Water was found at 6.45 m bgs. No other information is given.
- Well No. 7446938 (Lot 21 Con 4.), a well installed 2022. No other information is given.
- Well No. 5603492 (Lot 22 Con 4.), a domestic supply well which was installed in 1987. Red topsoil was encountered to 0.6 m bgs, followed by red hard pan and clay to 2.4 m bgs, overlaying red shale to 18.3 m bgs where the well was terminated. Fresh water was found at 17.7 m bgs.
- Well No. 5603895 (Lot 22 Con 4.), a domestic supply well which was installed in 1990. Brown hard pan and stone 2.7 m bgs, overlaying red soft limestone to 25.9 m bgs where the well was terminated. Fresh water was found at 25.3 m bgs.

- Well No. 5604087 (Lot 22 Con 4.), a domestic supply well which was installed in 1991. Red clay and gravel to 2.7 m bgs, followed by red shale to 4.6 m bgs, overlaying soft red limestone to 24.4 m bgs where the well was terminated. Water was found at 23.8 m bgs.
- Well No. 7449813 (Lot 22 Con 4.), a well installed in 2023. No other information is given.
- Well No. 7449812 (Lot 22 Con 4.), a well installed in 2023. No other information is given.

3.5.6 National Pollutant Release Inventory

The National Pollutant Release Inventory is maintained by Environment Canada. It is designed to collect comprehensive data regarding releases to air, water or land, and water transfers for recycling. The database was accessed through a database service provider (Ecolog Eris, Toronto, Ontario) and their report is included in **Appendix E**.

Database:	National Pollutant Release Inventory
Years covered:	1993 to Sept 2020
Search radius:	250 m
Description of data, analysis and findings relevant to the Phase I ESA: No records were found within a 250 m radius from the Site.	

3.5.7 Inventory of PCB Storage Sites

The MECP Waste Management Branch maintains an inventory of PCB storage Sites within the province. The Environmental Protection Act requires the registration inactive PCB storage equipment and/or disposal Sites. The database covers a period between 1987 and 2004. The database was accessed through a database service provider (Ecolog Eris, Toronto, Ontario) and their report is included in **Appendix E**.

Database:	Inventory of PCB Storage Sites
Years covered:	1987 to Oct 2004; 2012 to Dec 2013
Search radius:	250 m
Description of data, analysis and findings relevant to the Phase I ESA: No records were found within a 250 m radius from the Site.	

3.5.8 Certificates of Approvals

Any facility that releases emissions to the atmosphere, discharges contaminants to ground or surface water, provides potable water supplies, or stores, transports or disposes of waste, must have a Certificate of Approval (C of A) before it can operate lawfully. The database was accessed through a database service provider (Ecolog Eris, Toronto, Ontario) and their report is included in **Appendix E**.

Database:	MECP Certificates of Approval
Years covered:	1985 to October 30, 2011
Search radius:	250 m
Description of data, analysis and findings relevant to the Phase I ESA: No records were found within a 250 m radius from the Site.	

3.5.9 Environmental Site Registry

The Environmental Registry lists proposal, decisions and exceptions regarding policies, Acts, instruments or regulations that could significantly affects the environment. Applications for permits, licences or certificates of approval to release substances into the air or water are posted on the registry. The database was accessed through database service provider (Ecolog Eris, Toronto, Ontario) and their report is included in **Appendix E**.

Database:	Environmental Registry
Years covered:	1994 to Mar 31, 2024
Search radius:	250 m
Date accessed:	July 31, 2024
Description of data, analysis and findings relevant to the Phase I ESA: Three (3) records of environmental site registries were found within the 250 m search radius of the subject Site. The records retrieved as summarized as follows: • One (1) record was found at 100 Warehouse Street for Belko Auto Body (1994) Ltd. located approximately 250 m south of the Site (down-gradient). The record was issued in 2021 for an environmental compliance approval for sewage. • One (1) record was found at 17 Paquet Street for Swar Signs Inc. located approximately 120 m southeast of the Site (down-gradient). The record was issued in 2019 for an environmental compliance approval for multiple media. • One (1) record was found at Lot 22 Con 4 for 2806204 Ontario Ltd. located approximately 190 m east of the Site (trans-gradient). The record was issued in 2021 for an environmental compliance approval for sewage.	
Relevant information regarding potentially contaminating activity and areas of potential environmental concern. All the records retrieved are located down/trans-gradient of the Site, therefore they do not present a potential risk for environmental concern to the Site.	

3.5.10 Waste Disposal Site Inventory

The MECP's Waste Management branch maintains an inventory of known open (active or inactive) and closed disposal site in Ontario.

Database:	Waste Disposal Site Inventory
Years covered:	1970 to 1990
Search radius:	1 km
Description of data, analysis and findings relevant to the Phase I ESA: No records were listed within a 1 km radius from the Site.	

3.5.11 Other Databases

Other Databases are covered by the Ecolog Eris Report included in **Appendix E**. They are outlined below.

3.5.11.1 Ontario Regulation 347 Waste Generators Summary

The MECP's Waste Management branch maintains an inventory of Waste Generators in Ontario.

Database:	Ontario Regulation 347 Waste Generators Summary
Years covered:	1986 to 1990; 1992 to Oct 2022
Search radius:	250 m
Date accessed:	July 31, 2024
Description of data, analysis and findings relevant to the Phase I ESA: Two (2) records of waste generators were retrieved for properties within 250 m of the Site, both for Veritiv Canada Inc. located approximately 200 m east (trans-gradient) of the Site at 238 Corduroy Road. In 2020 and 2021 was registered as a waste generator of pigments, coatings, paints, reactive anions, organic chemicals, inorganic acids and chemicals, compressed gases, detergents and soaps. Due to the trans-gradient location from the Site and the inferred southerly groundwater flow direction, these records do not present a potential risk for environmental concern to the Site.	

3.5.11.2 Private and Retail Fuel Storage Tanks

Database:	Private and Retail Fuel Storage Tanks
Years covered:	1989 to 1996 (now collected by TSSA)
Search radius:	250 m
Description of data, analysis and findings relevant to the Phase I ESA: No records were found within a 250 m radius from the Site.	

3.5.11.3 Ontario Spills

List of spills and incidents made available by the Ministry of the Environment, Conservation and Parks.

Database:	Ministry of the Environment, Conservation and Parks
Years covered:	1988 to January 2023
Search radius:	250 m
Date accessed:	July 31, 2024

Description of data, analysis and findings relevant to the Phase I ESA:

Two (2) records of spills were reported within a 250 m radius of the Site:

- One (1) record of a spill occurred in October 2022 at Jack Larabie Distribution Inc. located at 270 Corduroy Road approximately 120 m east of the Site (trans-gradient). The spill consisted of 60 L of engine oil from a freight truck during the loading/unloading processes. Due to the trans-gradient location from the Site and the inferred groundwater flow direction, the incident does not present a potential risk for environmental concern to the Site.
- One (1) record of a spill occurred in September 2015 at 238 Corduroy Road approximately 200 m east of the Site (trans-gradient) from Enbridge Gas Distribution Inc. Due to operator error, a gas line was damaged causing an unknown amount of methane to release into the atmosphere. Due to the nature of the spill (gas) and the trans-gradient location from the Site, the incident does not present a potential risk for environmental concern to the Site.

3.5.11.4 Scott's Manufacturing Directories

Scott's Directories is a data bank containing information on over 70,000 manufacturers in Ontario.

Database:	Scott's Manufacturing Directory
Years covered:	1992 to March 2011
Search radius:	250 m

Description of data, analysis and findings relevant to the Phase I ESA:

No records were found within a 250 m radius from the Site.

3.6 Physical Setting Sources

3.6.1 Aerial Photographs

Aerial photographs were obtained by the database GeoOttawa and the National Air Photo Library. Review of the photographs was completed to develop a general history of the development of the Site and surrounding properties. Aerial photographs may be at a scale that limits a detailed review of the Site and surrounding properties. Copies of select aerial photographs are included in **Appendix F**.

Year	Photo Number	Scale
1946	A10321-41	1:15,000
1955	A14755-63	1:35,000
1966	A19674-30	1:35,000
1976	Not Applicable (GeoOttawa)	Not Applicable
1983	A31330-41	1:15,000
1999	Not Applicable (GeoOttawa)	Not Applicable
2011	Not Applicable (GeoOttawa)	Not Applicable
2022	Not Applicable (GeoOttawa)	Not Applicable

Rational for time period between aerial photographs used

A regular interval of approximately 10 years was used, when possible. No aerial photographs were retrievable for prior to the 1940's.

Summary of information obtained from aerial photographs

The Site is not fully visible in the 1946 aerial photograph, although the Site is assumed to be used for agricultural fields like that of the surrounding area as well as in the 1955 aerial photograph.

No Significant changes were observed from 1946 to 1966 on the subject Site or surrounding properties. In 1976, the 417 Highway located just north of the Site has been constructed, causing development within the area in the coming years. The Site still remains being used for agricultural purposes at this time. In 1983, no significant changes to the Site or surrounding area were observed.

In 1999, the 417 Vars Industrial Park has started to be developed to the east of the Site including several industrial/commercial buildings along with the addition of a few roads within the park area. From 1999 to 2011, the industrial park continued to expand with more buildings developed. No changes occurred to the Site, as it remains used for agricultural purposes.

In 2022, the industrial park has grown significantly and now borders the Site on the east side and most of the south side. This expansion includes the addition of several more buildings and roads within the park. The Site remains used as agricultural fields at this time.

Relevant information regarding potentially contaminating activity and areas of potential environmental concern

The developments identified on the neighbouring properties within the industrial park, and their overall operations and activities are detailed in previous sections of this report. The aerial photographs have not provided addition details related to these properties which present further potential environmental concerns other than those discussed above. No additional potentially contaminating activity or potential environmental concerns were identified.

3.6.2 Topography, Hydrology & Geology

A topographic map was obtained to illustrate the location of the Site in relation to any water bodies in the area and document the regional topography. The map is included in **Appendix G**.

Map:	Ontario Base Map
Approximate elevation:	About 77 to 89 m amsl
Topography:	Generally flat with some small hills
Nearest open water body:	The nearest open body of water identified is Quarry Lake that is located approximately 1.6 km south of the Site, which according to available topographic resources (*The Atlas of Canada – Toporama*) flows in a southernly direction. There are also several smaller channels within the surrounding area of the Site for agricultural drainage that also flow in a southeastern direction. The inferred groundwater flow direction in the vicinity of the Site is south to southeast towards Quarry Lake and Castor River.

Geological maps were reviewed to obtain information on regional geology, surficial soils and bedrock.

Generalized surficial geology:	Glacial Deposits: till; heterogeneous mixture of material ranging from clay to large boulders, generally sandy, grades downwards into unmodified till; surface generally modified by wave or river action; topography flat to hummocky. (S. H. Richard, 1978). Littoral Facies: gravel, coarse sand, and cobbles; containing fossils; in places composed of slabs of bedrock where beach was derived from outcrops of Paleozoic rock. (S. H. Richard, 1978).
Generalized bedrock geology:	Queenston Formation: red shale. (MacDonald, G. & Harrison, J. E., 1979)

4 INTERVIEWS

Interview subject:	François Landry, Project Manager
Date:	August 15, 2024
Pertinent information:	

- Mr. Landry has been familiar with the Site since approximately 2015.
- Mr. Landry understands that prior to The Township of Russell acquiring the property, it was used as agricultural fields.
- To the best of Mr. Landry's knowledge, the Site presently has storm drains, fill material, and pipes, vents or fill ports. Due to the on-going construction on the Site, these items are most likely new.
- Mr. Landry mentioned that there was formerly a pond, pit or lagoon present on the Site.
- To the best of Mr. Landry's knowledge, he is unaware of any potential contaminating activities associated with the Site, including previous uses.

5 SITE RECONNAISSANCE

5.1 Site Visit Information

Date:	August 14, 2024
Time:	8:30am to 10:30am
Weather Conditions:	Sunny, 23°C
Person conducting Site visit:	Olivia Wanamaker, Environmental Technician
Limitation to visit:	A few of the fields on the Site contained tall thick agricultural crops, mature trees and thick bushes, this made some areas not fully accessible to observe. There were two (2) areas of construction on the Site, one (1) was located at the west end of Emard Street, where they are currently extending the road from Robot Street into the Site. The other construction area was the eastern extent of the Site located behind the 812 Burton Road warehouse where it was observed to be sewers put into the ground. These zones made the central and eastern portions of the Site not accessible due to an active construction zone.
Property Use	Agricultural

Photographs from the Site visit is included in **Appendix H.**

5.2 General

5.2.1 Hazardous Materials & Unidentified Substances

Hazardous materials:	Not observed.
Unidentified substances:	Not observed.

5.2.2 Storage Tanks & Containers

Aboveground Storage Tanks (ASTs):	Not observed.
Underground Storage tanks (USTs):	Not observed.
Fill ports, vent pipes:	Not observed.
Storage containers:	Not observed.

5.2.3 Odours

Odours:	Not observed.
Air emissions:	Not observed.

5.3 Exterior Observations

5.3.1 Topographic, Geologic & Hydrogeologic

Landscaped & vegetated area:	Majority of the Site is used as agricultural fields for various crops. The eastern portion surrounding the construction area is vacant land with some overgrown grasses and bushes. Mature trees and shrubs surround each of the fields.
Pavement, roads & driveways:	Emard Street is currently being extended from Robot Street into the central portion of the Site.
Topography	Hilly
Surface drainage	Not observed. Due to the hills and water observed on the southern portion of the Site, it is assumed to flow in a south/southeastern direction.
Drainage improvements:	Not observed. However, during the interview it was noted that storm drains are present on the Site, this is most likely from the on-going construction. The construction areas were avoided during the Site visit due to the active equipment and not having full PPE on.
Receives drainage from adjacent lands:	Not observed.
Watercourses, ditches or standing water:	Water was observed in a stream that flows through the central portion of the Site from the north to the south. Along the stream a frog habitat was identified. Several frogs, insects, cattails and long grasses were observed.
Other observations:	Not observed.

5.3.2 Structures

No structures are present on the Site.

5.3.3 Other Observations

Wells:	Not observed.
Sewage disposal:	Not observed.
Pits and lagoons:	Not observed.
Wastewater:	Not observed.
Solid waste:	Not observed.
Stained material:	Not observed.
Stressed vegetation:	Not observed.
Fill or previous fill activities:	The areas that are currently under construction will use most likely be using fill.
Earth-moving activity:	The two construction areas had excavators, bull dozers and other types of Earth-moving equipment. It is assumed with the construction occurring that Earth-moving activity is currently active.
Other	Not observed.

5.4 Utilities

Potable Water:	Available.
Wastewater:	Available.
Storm Sewer:	Available.
Electricity:	Available.
Telephone:	Available.
Natural Gas:	Available.

5.5 Interior of Structures

No structures are present on the Site.

5.6 Adjacent Land Use

The current land uses of the adjoining properties were observed from the property limits and publicly accessible locations to assess potential impacts to the Site that may arise from off-Site operations. The properties surrounding the subject Site are as follows:

North:	Agricultural / Light Residential
South:	Industrial Park / Agricultural
East:	Industrial Park
West	Agricultural / Light Residential

5.7 Special Attention Items

Eleven chemical contaminants have been identified under the Occupational Health and Safety Act (OHSA) and regulations have been set in place to prohibit, regulate restrict, limit or control workers exposure to these substances. Other hazardous materials not included in the OHSA but under the Environmental Protection Act were also observed. The observations presented herein do not constitute a designated substance/hazardous material survey but are rather for information purposes only.

5.7.1 Designated Substances

Asbestos Containing Material (ACM) Since the late 1970's the manufacture and use of asbestos containing building materials started to decrease. It is commonly presumed that buildings constructed prior to 1980 are more likely to contain both friable and non-friable forms of asbestos. General building constructed up to the mid 1980's is more likely to contain non-friable asbestos (flooring, joint compound). Not Observed. No structures are present on the Site.
Lead Lead may be present in a variety of building materials including paint and water distributions pipes, however, lead based paints (LBP) are considered the most significant hazard. According to published information by Health Canada concerning LBP, buildings constructed before 1980 may contain lead-based interior and exterior paints. Not Observed. No structures are present on the Site.
Mercury Minor amounts of mercury are commonly found in a variety of building material including mercury vapour lamps, fluorescent light tubing and thermostats and other electrically control switches. Not Observed. No structures are present on the Site.
Others No other designated substances were identified (i.e. arsenic, ethylene oxide, vinyl chloride, benzene, coke oven emissions, acrylonitrile, isocyanates, or silica.) Not Observed. No structures are present on the Site.

5.7.2 Other Hazardous Building Materials/Items

Microbial Contamination and Mould:
Not Observed. No structures are present on the Site.

Ozone-Depleting Substances (ODS):
ODS such as chlorofluorocarbons (CFC) and hydrochlorofluorocarbon (HCFC) are typically found in refrigeration equipment, air conditioners, aerosols, cleaning solvents and fire extinguishers. Federal regulations required the elimination of production and import of CFC and a freeze on the production and import of HCFC by January 1, 1996. The regulations govern only the production and import therefore these materials are stilled used if a supply is in place.

Not Observed. No structures are present on the Site.

Polychlorinated Biphenyls (PCB):
The Federal Chlorobiphenyls Regulation, SOR/91-152 prohibits PCBs from being used in products, equipment, machinery, electrical transformers and capacitors which were manufactured or imported into the country after July 1, 1980. However, older equipment in use after this date may still contain PCBs if the equipment fluid has not been replaced. PCB-containing equipment can also include fluorescent, mercury, and sodium vapour light ballasts.

Not Observed. No structures are present on the Site.

Urea Formaldehyde Foam Insulation (UFFI):
UFFI was widely used as an insulating material until December 1980 when a ban was enacted under the Hazardous Products Act. UFFI was commonly injected through walls by drilling injections holes in roof structures, ceilings and overhangs.

Not Observed. No structures are present on the Site.

Radon:
Radon gas is a product of the decay series of uranium that is commonly found in geological units that contain black shale, sandstone or granite. Radon can percolate up through the soil where it may accumulate in basement of buildings with cracks or joints in the foundation. Because the existence of radon is dependent upon geological factors, it is more a regional concern than site specific. Based on the review of radon maps of Eastern Ontario, radon levels in the area of the Site are (moderate to high). High levels of exposure can lead to increased risk of developing lung cancer.

Electric and Magnetic Fields:
Electromagnetic fields are generally associated with high frequency power lines. No high voltage power lines were noted within 250 m of the Site.

Noise and Vibration:
Noise and vibration are typical of a rural environment. Due to the nature of the area and Site's future use, this is not considered a concern.

Methane:
Methane gas is a colourless and odourless gas commonly formed by the decomposition of organic material. The Site is not close to any active or closed waste disposal sites, marshes, swamps or peat deposits therefore methane is not a concern.

6 REVIEW AND EVALUATION OF INFORMATION

6.1 Current and Past Uses

Below is a summary of the current and past uses of the Site:

Year	Name of Owner	Description of Property Use	Property Use	Source of Information
At least 1946 to unknown	Unknown	Agricultural fields	Agricultural	Aerial photographs
Unknown to at least April 2019	Welshart farms Inc.	Agricultural fields	Agricultural	Aerial photographs, land title search
April 2019 - Present	The Corporation of the Township of Russell	Agricultural fields	Agricultural	Aerial photographs, land title search

6.2 Potential Contaminating Activity & Areas of Potential Environmental Concern

A potentially contaminating activity is a use or activity set out in Table 2 of Schedule D of the O. Reg. 153/04. These activities are summarized in the table included in **Appendix I**. The activities on the Site and lands within 250 m generally consist of commercial, residential and agricultural.

Based on the results of the Phase I ESA, no potential areas of environmental concern were identified.

6.3 Phase I Conceptual Site Model

The location of the Site is shown in the attached **Figure 1** and the current layout of the Site is shown in the attached **Figure 2**. The Phase I ESA identified the following:

- The Site is irregularly Shaped: Being between approximately 835 and 1,375 m wide (west-east) by approximately 600 m and 385 m deep (north-south) for a total approximate surface area of 744,821 m² (184 acres).
- The activities on the lands within 250 m are presently agricultural, industrial, and residential. Based on review of available aerial photographs and the interview with a Site representative, the Site has been developed with agricultural fields since at least 1946 and continued to be used as agricultural fields until present day.
- The nearest open body of water identified is Quarry Lake that is located approximately 1.6 km south of the Site. There are also several smaller channels within the surrounding area of the Site for agricultural drainage. The inferred groundwater flow direction in the vicinity of the Site is south to southeast towards Quarry Lake and Castor River. The Site's topography is generally flat with some small hills with elevations ranging between approximately 77 m to 89 m amsl.
- There are no records of a waste disposal site, coal tar industrial site, or PCB storage site within a 250 m radius. No records were retrieved in the National Pollutant Release Inventory; Certificates of Approval; or Scott's Manufacturing Directory within 250 m radius from the Site. No records were retrieved within the Private and Retail Fuel Storage Tanks inventory which compiles data from between 1989 and 1996.
- Records of waste generators, environmental site registry notices and spills were retrieved within 250 m radius of the Site. These records retrieved do not present a potential environmental due to the location trans- or down-gradient from the Site.

7 CONCLUSIONS

Based on the results of the Phase I ESA, no potential areas of environmental concern were identified. As such, no further environmental assessment work is warranted at the Site at this time. A Phase II Environmental Site Assessment is not considered warranted at this time.

8 LIMITATIONS AND USE OF REPORT

The results of this Phase I ESA should not be considered a warranty that the subject property is free from any and all contaminants from former and current practices, other than those noted in this report, nor that all compliance issues have been addressed.

The findings contained in this report are based on data and information collected during the Phase I ESA of the subject property conducted by LRL Engineering. The conclusions and recommendations are based solely on-Site conditions encountered at the time of our inspection on August 14th, 2024, supplemented by historical information and data obtained as described in this report. No assurance is made regarding changes in conditions subsequent to the time of this investigation. If additional information is discovered or obtained, LRL Associates Ltd. should be requested to re-evaluate the conclusions presented in this report and to provide amendments as required.

In evaluating the subject property, LRL Engineering has relied in good faith on information provided by individuals as noted in this report. We assume that the information provided is factual and accurate. We accept no responsibility for any deficiencies, misstatements or inaccuracies contained in this report as a result of omissions, misinterpretation or fraudulent acts of the persons contacted.

This report is intended for the sole use of the Township of Russell and their authorized agents. LRL Engineering will not be responsible for any use of the information contained within this report by any third party.

In addition, LRL Engineering will not be responsible for the real or perceived decrease in the property value, its saleability or ability to gain financing, through the reporting of factual information.

Yours truly,

LRL Engineering

LICENSED PROFESSIONAL ENGINEER
S. LECLERC
90439027
Aug 28/24
PROVINCE OF ONTARIO

Jessica Arthurs
Environmental Engineering Manager

Stephane Leclerc, P. Eng
Vice President

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FIGURES

LRL

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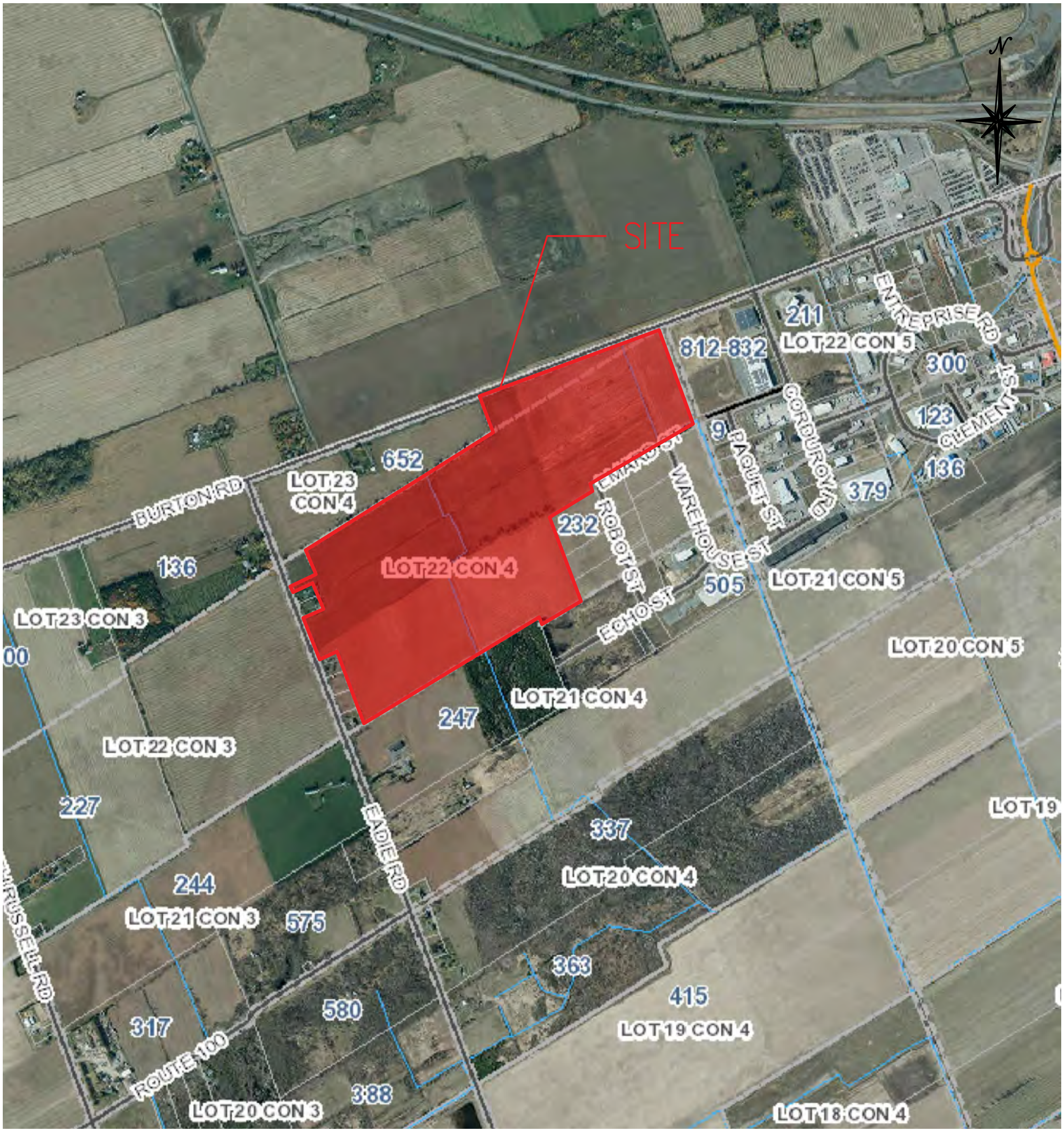
PROJECT

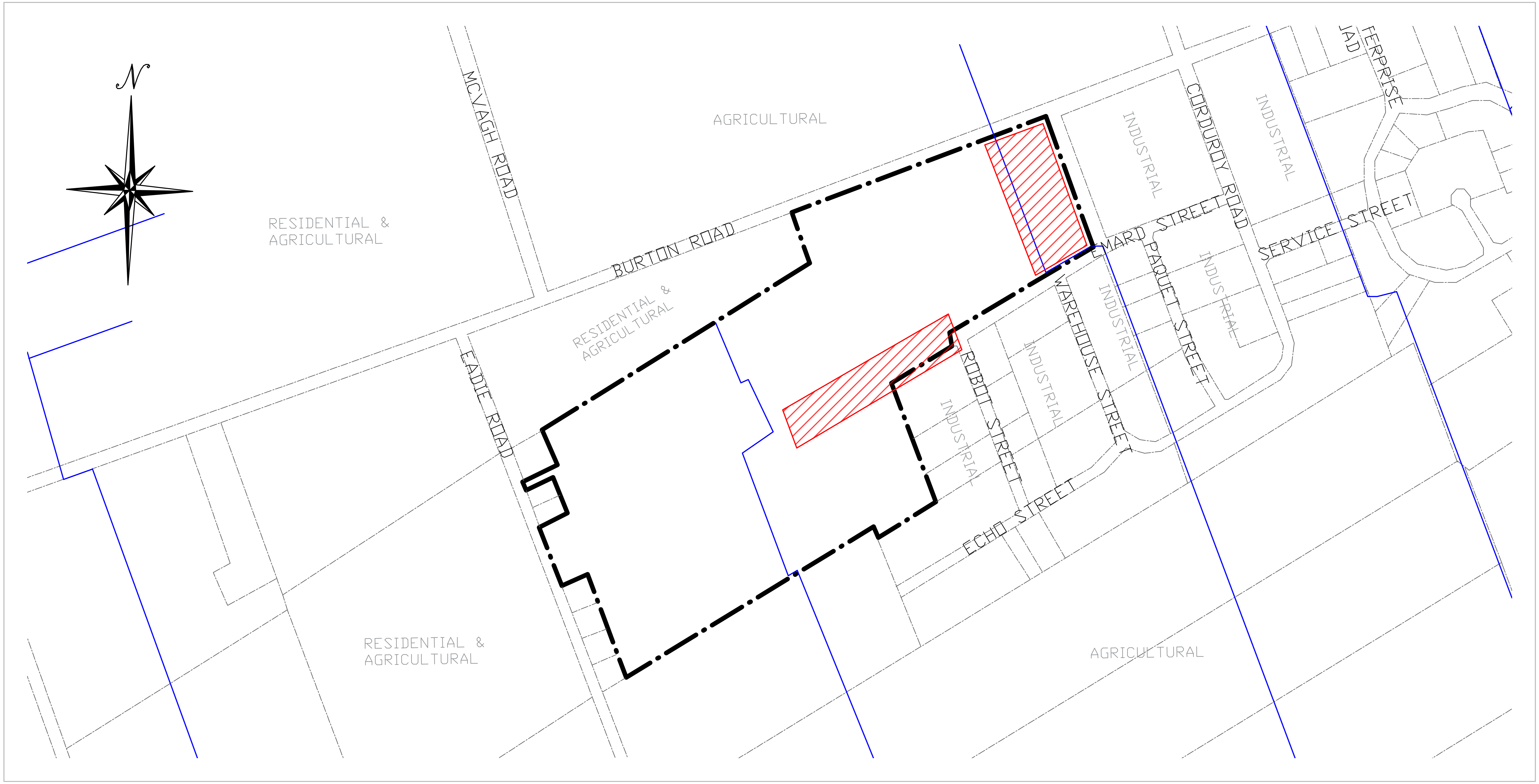
PHASE I ENVIRONMENTAL SITE ASSESSMENT
417 VARS INDUSTRIAL PARK - PHASE 3
TOWNSHIP OF RUSSELL, ONTARIO

DRAWING TITLE

SITE LOCATION
SOURCE: A LA CARTE
(NOT TO SCALE)

CLIENT	DATE	PROJECT	
RUSSELL TOWNSHIP	AUGUST 2024	230216	**FIGURE1**





LEGEND

Property Line - Subject Site

Neighbouring Property Boundaries

Small Water Channels

▨ On-Going Construction Areas

No.	REVISIONS	BY	DATE
01	FINAL	O.W.	12/08/24

LRL
ENGINEERING | INGÉNIERIE
5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

CLIENT
RUSSELL TOWNSHIP

DESIGNED BY: O.W.
DRAWN BY: O.W.
APPROVED BY: S.L.

PROJECT
PHASE I
EVIRONMENTAL SITE ASSESSMENT
417 VARS INDUSTRIAL PARK -
PHASE 3
TOWSHIP OF RUSSELL, ONTARIO

DRAWING TITLE
SITE PLAN

PROJECT NO.
230216

DATE
AUGUST 2024

FIGURE 2

APPENDIX A

CITY DIRECTORIES

ERIS

CITY
DIRECTORY

Project Property:	*230216 - Phase I* *Lot 22 Concession 4* *Vars,ON*
Project No:	*230216*
Requested By:	*LRL Associates Ltd.*
Order No:	*24073000468*
Date Completed:	*July 31, 2024*

Environmental Risk Information Services
A division of Glacier Media Inc.
1.866.517.5204 | info@erisinfo.com | erisinfo.com

July 31, 2024
RE: CITY DIRECTORY RESEARCH
Lot 22 Concession 4
Vars,ON

Thank you for contacting ERIS regarding our City Directory Search services. Our staff has conducted a reverse listing City Directory search to determine prior occupants of the subject site and adjacent properties. When searching a range of addresses, all civic addresses within that range found in the Directory are included.

Note: Reverse Listing Directories generally are focused on highly developed areas, while newly developed areas may be covered in the more recent years, older directories tend to cover only "central" parts of the city. To complete the search, we have either utilized the Toronto Reference Library, Library & Archives Canada and multiple digitized directories. While these do not claim to be a complete collection of all reverse listing city directories produced, ERIS has made every effort to provide accurate and complete information. ERIS shall not be held liable for missing, incomplete, or inaccurate information. If you believe there are additional addresses or streets that require searching, please contact us.

Search Criteria:

650-815 of Burton Road
95-280 of Eadie Road
1-20 of Paquet Street
200-250 of Robot Street
125-130 of Warehouse Street

Search Notes:

Data for Vars, ON is available until 1997.

Search Results Summary

Data from 2012 to 2021 does not include residential information

Date	Source	Comment
2021	DIGITAL BUSINESS DIRECTORY	
2017	DIGITAL BUSINESS DIRECTORY	
2012	DIGITAL BUSINESS DIRECTORY	
2000	POLKS	
1997	POLKS	

2021 BURTON ROAD

SOURCE: DIGITAL BUSINESS DIRECTORY

NO LISTING FOUND

2021 EADIE ROAD

SOURCE: DIGITAL BUSINESS DIRECTORY

147 **UNIQUE PENS...***JEWELERS-WHOLESALE*

2021 PAQUET STREET

SOURCE: DIGITAL BUSINESS DIRECTORY

NO LISTING FOUND

2021 ROBOT STREET

SOURCE: DIGITAL BUSINESS DIRECTORY

NO LISTING FOUND

2021 WAREHOUSE STREET

SOURCE: DIGITAL BUSINESS DIRECTORY

NO LISTING FOUND

2017 BURTON ROAD

SOURCE: DIGITAL BUSINESS DIRECTORY

755	**STEWART ROBERT...***FARMS*

2017 EADIE ROAD

SOURCE: DIGITAL BUSINESS DIRECTORY

147 **UNIQUE PANS...***OTHER COMMERCIAL EQUIP MERCHANT WHOLS*

2017 PAQUET STREET

SOURCE: DIGITAL BUSINESS DIRECTORY

NO LISTING FOUND

2017 ROBOT STREET

SOURCE: DIGITAL BUSINESS DIRECTORY

NO LISTING FOUND

2017 WAREHOUSE STREET

SOURCE: DIGITAL BUSINESS DIRECTORY

NO LISTING FOUND

2012 BURTON ROAD

SOURCE: DIGITAL BUSINESS DIRECTORY

NO LISTING FOUND

2012 EADIE ROAD

SOURCE: DIGITAL BUSINESS DIRECTORY

NO LISTING FOUND

2012 PAQUET STREET

SOURCE: DIGITAL BUSINESS DIRECTORY

NO LISTING FOUND

2012 ROBOT STREET

SOURCE: DIGITAL BUSINESS DIRECTORY

NO LISTING FOUND

2012 WAREHOUSE STREET

SOURCE: DIGITAL BUSINESS DIRECTORY

NO LISTING FOUND

2000 BURTON ROAD

SOURCE: POLKS

652	**RESIDENTIAL (1 TENANT)**
755	**RESIDENTIAL (1 TENANT)**

2000 EADIE ROAD

SOURCE: POLKS

136	**RESIDENTIAL (2 TENANTS)**
147	**RESIDENTIAL (1 TENANT)**
191	**RESIDENTIAL (2 TENANTS)**
244	**RESIDENTIAL (3 TENANTS)**
247	**RESIDENTIAL (1 TENANT)**
276	**RESIDENTIAL (1 TENANT)**

2000 PAQUET STREET

SOURCE: POLKS

STREET NOT LISTED

2000 ROBOT STREET

SOURCE: POLKS

STREET NOT LISTED

2000 WAREHOUSE STREET

SOURCE: POLKS

STREET NOT LISTED

1997 BURTON ROAD

SOURCE: POLKS

STREET NOT LISTED

1997 EADIE ROAD

SOURCE: POLKS

STREET NOT LISTED

1997 PAQUET STREET

SOURCE: POLKS

STREET NOT LISTED

1997 ROBOT STREET

SOURCE: POLKS

STREET NOT LISTED

1997 WAREHOUSE STREET

SOURCE: POLKS

STREET NOT LISTED

APPENDIX B

LAND TITLE SEARCH

PARCEL REGISTER (ABBREVIATED) FOR PROPERTY IDENTIFIER

LAND
REGISTRY
OFFICE #50

69008-0308 (LT)

PAGE 1 OF 2
PREPARED FOR EEGOOLAB
ON 2024/07/31 AT 09:59:32

* CERTIFIED IN ACCORDANCE WITH THE LAND TITLES ACT * SUBJECT TO RESERVATIONS IN CROWN GRANT *

PROPERTY DESCRIPTION: PART LOTS 22 AND 23 CONCESSION 4 RUSSELL, PARTS 1, 2, 3 AND 4 50R11230, AND PART 1 50R10831, EXCEPT PARTS 1 AND 2 50R11445, PART 2 50R10969, PARTS 1, 2, 3, 4 AND 5 50R11106, PART 1 50R11049, AND PARTS 1 AND 2 50R11139; SUBJECT TO AN EASEMENT IN GROSS OVER PART 9 50R11286 AS IN RC165382; TOWNSHIP OF RUSSELL

PROPERTY REMARKS: PLANNING ACT CONSENT IN DOCUMENT RC69385.

ESTATE/QUALIFIER:	RECENTLY:	PIN CREATION DATE:
FEE SIMPLE LT CONVERSION QUALIFIED	CONSOLIDATION FROM 69008-0200, 69008-0294, 69008-0307	2023/11/08

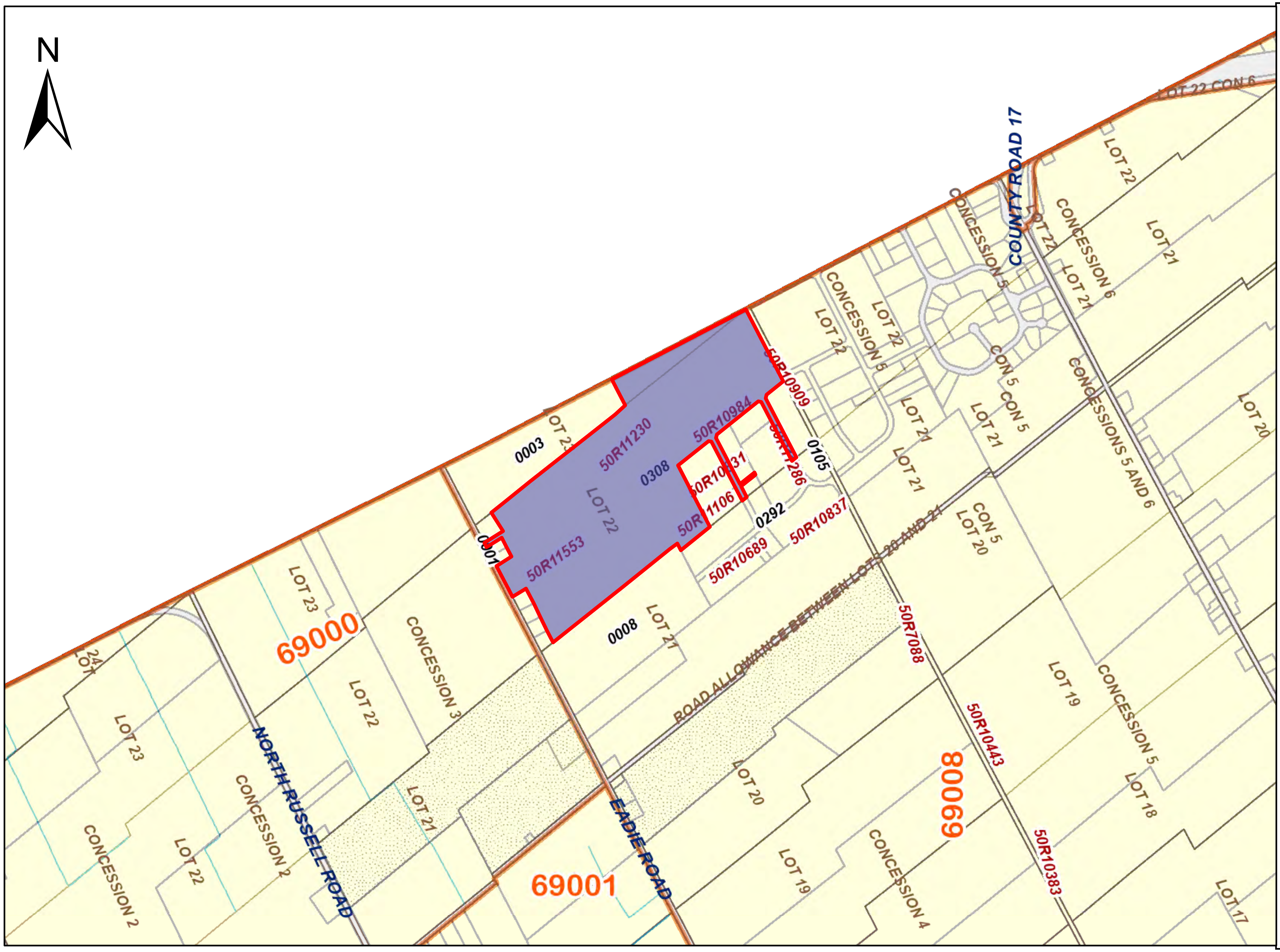
OWNERS' NAMES	CAPACITY	SHARE
THE CORPORATION OF THE TOWNSHIP OF RUSSELL	ROWN	

REG. NUM.	DATE	INSTRUMENT TYPE	AMOUNT	PARTIES FROM	PARTIES TO	CERT/ CHKD
*** PRINTOUT INCLUDES ALL DOCUMENT TYPES (DELETED INSTRUMENTS NOT INCLUDED) ***						
***SUBJECT, ON FIRST REGISTRATION UNDER THE LAND TITLES ACT, TO:*						
*** SUBSECTION 44(1) OF THE LAND TITLES ACT, EXCEPT PARAGRAPH 11, PARAGRAPH 14, PROVINCIAL SUCCESSION DUTIES **						
*** AND ESCHEATS OR FORFEITURE TO THE CROWN.*						
*** THE RIGHTS OF ANY PERSON WHO WOULD, BUT FOR THE LAND TITLES ACT, BE ENTITLED TO THE LAND OR ANY PART OF*						
*** IT THROUGH LENGTH OF ADVERSE POSSESSION, PRESCRIPTION, MISDESCRIPTION OR BOUNDARIES SETTLED BY*						
*** CONVENTION.*						
*** ANY LEASE TO WHICH THE SUBSECTION 70(2) OF THE REGISTRY ACT APPLIES.*						
***DATE OF CONVERSION TO LAND TITLES: 2002/06/17 ***						
BS19916	1969/07/03	ORDER				C
50R10831	2019/03/18	PLAN REFERENCE				C
RC131570	2019/04/08	TRANSFER	$1,500,000	WELSHART FARMS INC.	THE CORPORATION OF THE TOWNSHIP OF RUSSELL	C
REMARKS: PLANNING ACT STATEMENTS.						
50R10984	2020/03/13	PLAN REFERENCE				C
RC148985	2021/01/29	BYLAW PUB HGHWY		THE CORPORATION OF THE TOWNSHIP OF RUSSELL		C
REMARKS: BYLAW 2020-144 - BEING A BYLAW FOR THE PURPOSE OF DEDICATING LANDS AS A PUBLIC HIGHWAY						
50R11230	2021/10/04	PLAN REFERENCE				C
RC157480	2021/10/15	TRANSFER	$6,700,000	MELANIE CONSTRUCTION INC.	THE CORPORATION OF THE TOWNSHIP OF RUSSELL	C
50R11286	2022/02/22	PLAN REFERENCE				C

NOTE: ADJOINING PROPERTIES SHOULD BE INVESTIGATED TO ASCERTAIN DESCRIPTIVE INCONSISTENCIES, IF ANY, WITH DESCRIPTION REPRESENTED FOR THIS PROPERTY.
NOTE: ENSURE THAT YOUR PRINTOUT STATES THE TOTAL NUMBER OF PAGES AND THAT YOU HAVE PICKED THEM ALL UP.

REG. NUM.	DATE	INSTRUMENT TYPE	AMOUNT	PARTIES FROM	PARTIES TO	CERT/ CHKD
RC165382	2022/06/21	TRANSFER EASEMENT	$2	THE CORPORATION OF THE TOWNSHIP OF RUSSELL	HYDRO ONE NETWORKS INC.	C
RC172413	2023/03/27	TRANSFER	$1,196,000	WELSHART FARMS INC.	THE CORPORATION OF THE TOWNSHIP OF RUSSELL	C
REMARKS: PLANNING ACT STATEMENTS.						
RC177061	2023/10/03	APL CONSOLIDATE		THE CORPORATION OF THE TOWNSHIP OF RUSSELL		C
50R11553	2023/11/20	PLAN REFERENCE				C
REMARKS: RC178199.						

NOTE: ADJOINING PROPERTIES SHOULD BE INVESTIGATED TO ASCERTAIN DESCRIPTIVE INCONSISTENCIES, IF ANY, WITH DESCRIPTION REPRESENTED FOR THIS PROPERTY.
NOTE: ENSURE THAT YOUR PRINTOUT STATES THE TOTAL NUMBER OF PAGES AND THAT YOU HAVE PICKED THEM ALL UP.



ServiceOntario

PRINTED ON 31 JUL, 2024 AT 10:00:02
FOR EEGOOLAB

SCALE

0 160 320 480 640 800 960 meters

PROPERTY INDEX MAP
RUSSELL(No. 50)

LEGEND

FREEHOLD PROPERTY	🟨
LEASEHOLD PROPERTY	▨
LIMITED INTEREST PROPERTY	▨
CONDOMINIUM PROPERTY	🟧
RETIRED PIN (MAP UPDATE PENDING)	▨
PROPERTY NUMBER	*0449*
BLOCK NUMBER	**08050**
GEOGRAPHIC FABRIC	—
EASEMENT	- - - -

THIS IS NOT A PLAN OF SURVEY

NOTES

REVIEW THE TITLE RECORDS FOR COMPLETE PROPERTY INFORMATION AS THIS MAP MAY NOT REFLECT RECENT REGISTRATIONS

THIS MAP WAS COMPILED FROM PLANS AND DOCUMENTS RECORDED IN THE LAND REGISTRATION SYSTEM AND HAS BEEN PREPARED FOR PROPERTY INDEXING PURPOSES ONLY

FOR DIMENSIONS OF PROPERTIES BOUNDARIES SEE RECORDED PLANS AND DOCUMENTS

ONLY MAJOR EASEMENTS ARE SHOWN

REFERENCE PLANS UNDERLYING MORE RECENT REFERENCE PLANS ARE NOT ILLUSTRATED

Ontario

APPENDIX C

TSSA CORRESPONDANCE

RE: LRL #230216 - Record Request

Public Information Services <publicinformationservices@tssa.org>
Tue 7/30/2024 1:57 PM
To:Olivia Wanamaker <owanamaker@lrl.ca>

Hello,

NO RECORDS FOUND IN CURRENT DATABASE:

- We confirm that there are NO **fuels records** in our database at the subject address(es).

This is not a confirmation that there are no records in the archives. For a further search in our archives, please go to the **TSSA Client Portal** to complete an Application for Release of Public Information.

Please refer to How to Submit a Public Information Request (tssa.org) for instructions.

The associated fee must be paid via credit card (Visa or MasterCard).

Once all steps have been successfully completed you will receive your payment receipt via email.

TSSA does not make any representations or warranties with respect to the accuracy or completeness of any records released. The requestor assumes all risk in using or relying on the information provided.

If you have any questions or concerns, please do not hesitate to contact our Public Information Release team at publicinformationservices@tssa.org.

Warm regards,

Connie Hill | Public Information Agent
Public Information
345 Carlingview Drive
Toronto, Ontario M9W 6N9
Tel: +1 416-734-3383 | Fax: +1 416-734-3568 | E-Mail: chill@tssa.org
www.tssa.org

Winner of 2024 5-Star Safety Cultures Award

From: Olivia Wanamaker <owanamaker@lrl.ca>
Sent: Tuesday, July 30, 2024 1:54 PM
To: Public Information Services <publicinformationservices@tssa.org>
Subject: LRL #230216 - Record Request

Good morning,

I am contacting the TSSA regarding available information concerning the presence of petroleum storage tanks, fuel spill records, accidents, or fuel-related incidents for the following locations:

- 100 Warehouse St, Russell, ON
- 129 Warehouse St, Russell, ON
- 224 Robot St, Russell, ON
- 540 Echo St, Russell, ON
- 652 Burton Rd, Russell, ON
- 247 Eadie Rd, Russell, ON
- 238 Corduroy St, Russell, ON
- 308 Corduroy Rd, Russell, ON
- 340 Corduroy St, Russell, ON
- 9 Paquet St, Russell, ON

This is apart of an on-going environmental assessment. Some addresses might be listed in "Vars" rather than "Russell".

Thanks,
Olivia

Olivia Wanamaker
Environmental Technician
LRL Engineering | lrl.ca
Cell: (705)330-5234 | owanamaker@lrl.ca

A MULTIDISCIPLINARY ENGINEERING FIRM

LRL

5430 Canotek Rd.,
Ottawa, ON K1J 9G2
(613) 842-3434

APPENDIX D

MECP WATER WELL RECORDS

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 1528200 MUNICIP. 15011 CON. CON 08

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT 25-27
Ottawa Carleton	Cumberland	8	28

OWNER (SURNAME FIRST) 28-47: J. D. Patterson Ltd.
ADDRESS: 28 Concourse Gate Nepean, Ontario K2E 7T7
DATE COMPLETED 48-53: DAY 11 MO 8 YR 94

21 ZONE UTM EASTING NORTHING RC. ELEVATION RC. BASIN CODE

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Brown	Soil		Fill	0	2
Brown	Hardpan	Boulders		2	13
Gray	Hardpan	Gravel Layers		13	23
Gray	Limestone		Soft	23	123

31

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
74	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	NOT TESTED 1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6 1/4	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	.188	0	26
5 12/16	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE 5 ☐ PLASTIC		26	123
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)
DIAMETER INCHES
LENGTH FEET
MATERIAL AND TYPE
DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
25	0	Grouted Cement (8)

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☐ PUMP 2 ☒ BAILER
PUMPING RATE: 5 GPM
DURATION OF PUMPING: 1 HOURS MINS
STATIC LEVEL: 13 FEET
WATER LEVEL END OF PUMPING: 75 FEET
WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY

15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
75 FEET	75 FEET	75 FEET	75 FEET

IF FLOWING, GIVE RATE: GPM
PUMP INTAKE SET AT: FEET
WATER AT END OF TEST: 1 ☐ CLEAR 2 ☒ CLOUDY
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP
RECOMMENDED PUMP SETTING: 110 FEET
RECOMMENDED PUMPING RATE: 5 GPM

FINAL STATUS OF WELL

1 ☒ WATER SUPPLY
2 ☐ OBSERVATION WELL
3 ☐ TEST HOLE
4 ☐ RECHARGE WELL
5 ☐ ABANDONED, INSUFFICIENT SUPPLY
6 ☐ ABANDONED POOR QUALITY
7 ☐ UNFINISHED
☐ DEWATERING

WATER USE

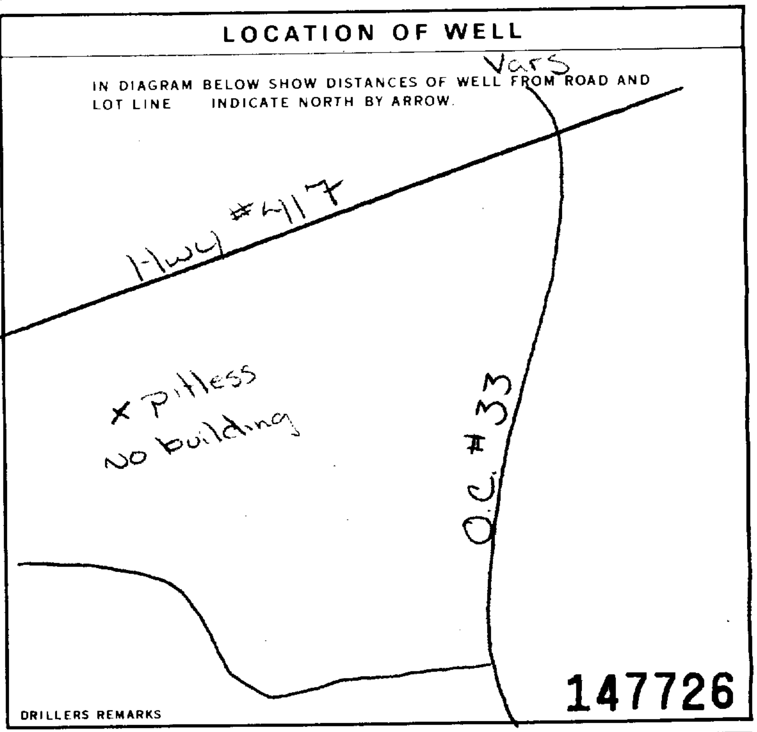
1 ☒ DOMESTIC
2 ☐ STOCK
3 ☐ IRRIGATION
4 ☐ INDUSTRIAL
☐ OTHER
5 ☐ COMMERCIAL
6 ☐ MUNICIPAL
7 ☐ PUBLIC SUPPLY
8 ☐ COOLING OR AIR CONDITIONING
9 ☐ NOT USED

METHOD OF CONSTRUCTION

1 ☒ CABLE TOOL 35–123
2 ☐ ROTARY (CONVENTIONAL)
3 ☐ ROTARY (REVERSE)
4 ☐ ROTARY (AIR)
5 ☒ AIR PERCUSSION 0–35
6 ☐ BORING
7 ☐ DIAMOND
8 ☐ JETTING
9 ☐ DRIVING
☐ DIGGING
☐ OTHER

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE INDICATE NORTH BY ARROW.



147726

DRILLERS REMARKS

CONTRACTOR

NAME OF WELL CONTRACTOR: Capital Water Supply Ltd.
WELL CONTRACTOR'S LICENCE NUMBER: 1558
ADDRESS: P.O. Box 490 Stittsville,Ontario K2S 1A6
NAME OF WELL TECHNICIAN: J.Moore/ S. Miller
WELL TECHNICIAN'S LICENCE NUMBER: T0096/T0097
SIGNATURE OF TECHNICIAN/CONTRACTOR
SUBMISSION DATE: DAY 18 MO. 8 YR. 94

OFFICE USE ONLY

DATA SOURCE
CONTRACTOR: 1558
DATE RECEIVED: OCT 07 1994
DATE OF INSPECTION
INSPECTOR
REMARKS
css.ES

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506 (11/86) FORM 9

Ontario
Ministry of Environment and Energy

The Ontario Water Resources Act

WATER WELL RECORD

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

11

1528758

Municipality: 15011
Con.: CON 10

County or District: [redacted]
Township/Borough/City/Town/Village: Cumberland.
Con block tract survey, etc.: Conc. 10
Lot: 28
Address: 755 - Burton. Russell
Date completed: 14/09/95 (day month year)

21 | Northing | RC | Elevation | RC | Basin Code | ii | iii | iv

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth – feet From	Depth – feet To
Black	Top-Soil.		Soft.	0	2
Grey	Clay		Soft	2	25
Bleu	Clay	Sand.	Soft	25	42
Grey	Gravel.		Soft	42	60
Red.	SHALE		Porous	60	62
Grey	Limestone.		Hard.	62	63

31

32

41 WATER RECORD

Water found at – feet	Kind of water
63	1 ☑ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth – feet From	Depth – feet To
6 5/8	1 ☑ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	1.88	0	62
6	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☑ Open hole 5 ☐ Plastic		62	63
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			

SCREEN

Sizes of opening (Slot No.)	Diameter inches	Length feet

Material and type:
Depth at top of screen: feet

61 PLUGGING & SEALING RECORD

☐ Annular space ☐ Abandonment

Depth set at – feet From	Depth set at – feet To	Material and type (Cement grout, bentonite, etc.)
0	20	Cement Grout.

71 PUMPING TEST

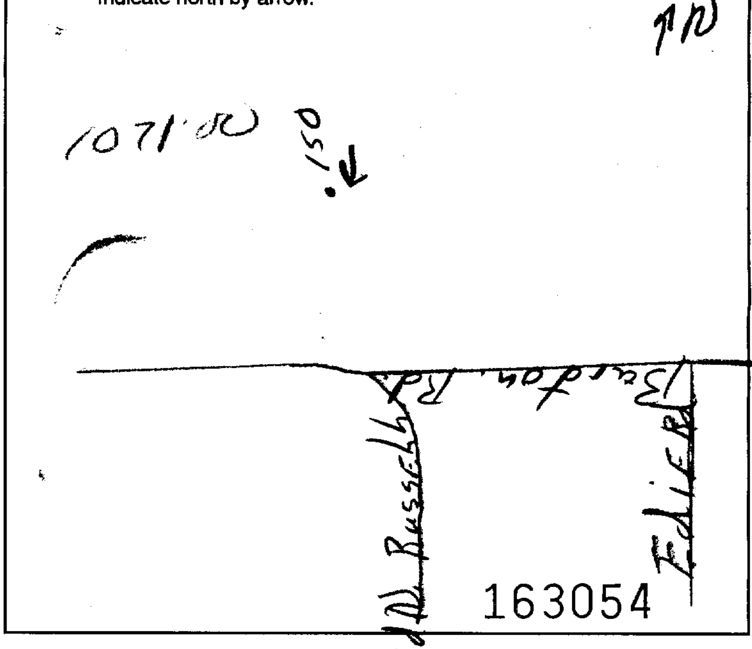
Pumping test method: 1 ☐ Pump 2 ☑ Bailer
Pumping rate: 14 GPM
Duration of pumping: 1 Hours 30 Mins

Static level	Water level end of pumping	15 minutes	30 minutes	45 minutes	60 minutes
17 feet	55 feet	55 feet	55 feet	55 feet	55 feet

Water levels during: 1 ☐ Pumping 2 ☐ Recovery
If flowing give rate: GPM
Pump intake set at: 55 feet
Water at end of test: ☑ Clear ☐ Cloudy
Recommended pump type: ☐ Shallow ☑ Deep
Recommended pump setting: 63 feet
Recommended pump rate: 10 GPM

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



163054

FINAL STATUS OF WELL

1 ☑ Water supply
2 ☐ Observation well
3 ☐ Test hole
4 ☐ Recharge well
5 ☐ Abandoned, insufficient supply
6 ☐ Abandoned, poor quality
7 ☐ Abandoned (Other)
8 ☐ Dewatering
9 ☐ Unfinished
10 ☐ Replacement well

WATER USE

1 ☑ Domestic
2 ☐ Stock
3 ☐ Irrigation
4 ☐ Industrial
5 ☐ Commercial
6 ☐ Municipal
7 ☐ Public supply
8 ☐ Cooling & air conditioning
9 ☐ Not used
10 ☐ Other

METHOD OF CONSTRUCTION

1 ☑ Cable tool
2 ☐ Rotary (conventional)
3 ☐ Rotary (reverse)
4 ☐ Rotary (air)
5 ☐ Air percussion
6 ☐ Boring
7 ☐ Diamond
8 ☐ Jetting
9 ☐ Driving
10 ☐ Digging
11 ☐ Other

Name of Well Contractor: D&R-WATER well-Drilling
Well Contractor's Licence No.: 6006
Address: St-Albert. ont.
Name of Well Technician: Louis-Desnoyers
Well Technician's Licence No.: T-0625
Signature of Technician/Contractor:
Submission date: 14/09/95 (day mo yr)

MINISTRY USE ONLY

Data source:
Contractor: 6006
Date received: OCT 26 1995
Date of inspection:
Inspector:
Remarks:

CSS.ES

2 - MINISTRY OF ENVIRONMENT & ENERGY COPY

0506 (07/94) Front Form 9

UTM 1 8 Z 4 7 0 2 9 0 E

C 5 R 5 0 1 8 6 0 0 N

Elev. 4 R 2 0 2 8 0

Basin 2 5

The Ontario Water Resources Commission Act

WATER WELL RECORD

WATER RESOURCES DIVISION
JAN 20 1965
ONTARIO WATER RESOURCES COMMISSION

56 № 956

County or District Russell 31G6d Township, Village, Town or City Russell

Con. 3 III Lot 23 23 Date completed 7 oct 1964 (day month year)

[redacted]ss R.R.2 Russell

Casing and Screen Record

Inside diameter of casing 4"

Total length of casing 20'

Type of screen

Length of screen

Depth to top of screen

Diameter of finished hole 4"

Pumping Test

Static level 18' from surface

Test-pumping rate 5 G.P.M.

Pumping level 25 from surface

Duration of test pumping 1 hour

Water clear or cloudy at end of test Clear

Recommended pumping rate 5 G.P.M.

with pump setting of 75 feet below ground surface

Well Log

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
red shale	0	20'		
red rock	20	81'	80'	fresh

For what purpose(s) is the water to be used? for home

Is well on upland, in valley, or on hillside? valley

Drilling or Boring Firm Gilles Bourgeois

Address St Albert Ont

Licence Number 1307

Name of Driller or Borer Gilles Bourgeois

Address St Albert Ont

Date

Gilles Bourgeois

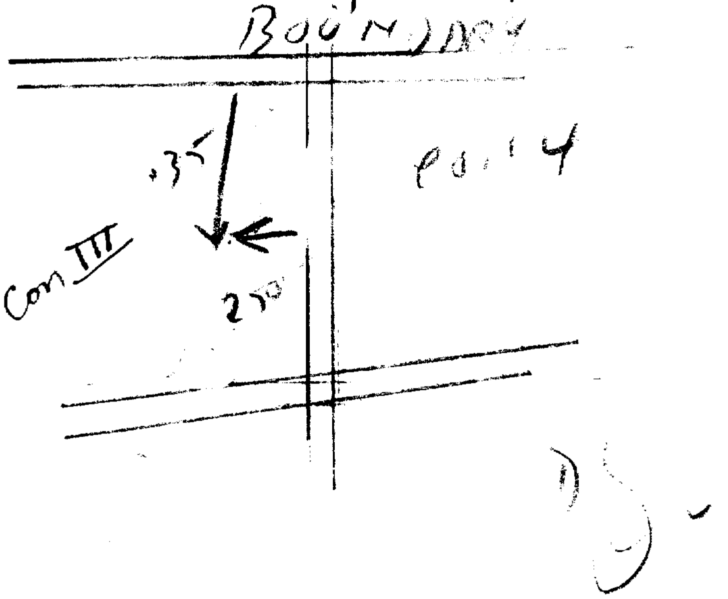
(Signature of Licensed Drilling or Boring Contractor)

Form 7 15M-60-4138

OWRC COPY

Location of Well

In diagram below show distances of well from road and lot line. Indicate north by arrow.



Ontario

MINISTRY OF THE ENVIRONMENT

The Ontario Water Resources Act

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11

5601875.

MUNICIP. 56004 CON. CØN 03

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
Russell	Russell	3	021 ~~Nth.1/2~~

[redacted] R.R.#2 Russell Ontario

DATE COMPLETED DA 07 MO ~~May~~ 05 YR 76

17900 RC 5 ELEVATION 0300 RC 5 BASIN CODE 26

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
			previously dug well	0	24
red	shale		hard	24	70

AUG 16 1976

CORNWALL

31 0024 23 0070711773

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0068	1 ☒ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
06	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	1.88	0	0029
06	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE		29	0070
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

MATERIAL AND TYPE

DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD 1 ☐ PUMP 2 ☒ BAILER

PUMPING RATE 0005 GPM

DURATION OF PUMPING 01 HOURS 00 MINS.

STATIC LEVEL 029 FEET

WATER LEVEL END OF PUMPING 060 FEET

WATER LEVELS DURING 1 ☒ PUMPING 2 ☐ RECOVERY

15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
050 FEET	060 FEET	060 FEET	060 FEET

IF FLOWING, GIVE RATE GPM

PUMP INTAKE SET AT 60 FEET

WATER AT END OF TEST 1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE ☐ SHALLOW ☒ DEEP

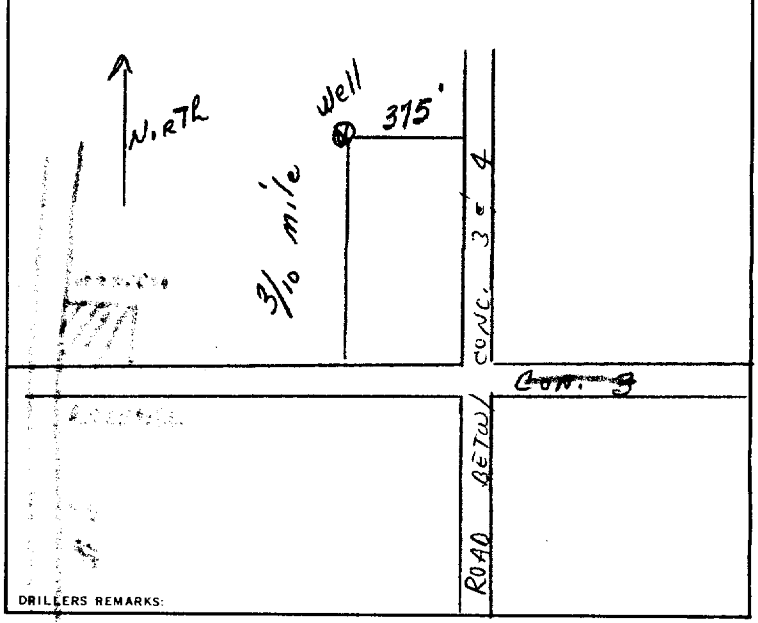
RECOMMENDED PUMP SETTING 060 FEET

RECOMMENDED PUMPING RATE 0005 GPM

GPM./FT. SPECIFIC CAPACITY

LOCATION OF WELL 7017

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS:

FINAL STATUS OF WELL 1

1 ☒ WATER SUPPLY
2 ☐ OBSERVATION WELL
3 ☐ TEST HOLE
4 ☐ RECHARGE WELL
5 ☐ ABANDONED, INSUFFICIENT SUPPLY
6 ☐ ABANDONED, POOR QUALITY
7 ☐ UNFINISHED

WATER USE 01

1 ☒ DOMESTIC
2 ☐ STOCK
3 ☐ IRRIGATION
4 ☐ INDUSTRIAL
☐ OTHER
5 ☐ COMMERCIAL
6 ☐ MUNICIPAL
7 ☐ PUBLIC SUPPLY
8 ☐ COOLING OR AIR CONDITIONING
9 ☐ NOT USED

METHOD OF DRILLING 1

1 ☒ CABLE TOOL
2 ☐ ROTARY (CONVENTIONAL)
3 ☐ ROTARY (REVERSE)
4 ☐ ROTARY (AIR)
5 ☐ AIR PERCUSSION
6 ☐ BORING
7 ☐ DIAMOND
8 ☐ JETTING
9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR Gilles Bourgeois LICENCE NUMBER 1414

ADDRESS St-Albert Ontario

NAME OF DRILLER OR BORER LICENCE NUMBER 1414

SIGNATURE OF CONTRACTOR Gilles Bourgeois

SUBMISSION DATE DAY 7 MO. May YR. 76

OFFICE USE ONLY

DATA SOURCE 1 CONTRACTOR 1414 DATE RECEIVED 070676

DATE OF INSPECTION INSPECTOR K.R

REMARKS:

P

WI

MINISTRY OF THE ENVIRONMENT COPY

FORM 7 MOE 07-091

Ministry of the Environment
Ontario S.P.M.

The Ontario Water Resources Act

316/6W

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 5602067 MUNICIP. 56004 CON. CON 04

COUNTY OR DISTRICT RUSSEL	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE RUSSEL	CON., BLOCK, TRACT, SURVEY, ETC. CON # 4	LOT 25-27 ~~PT~~ 023

[redacted] Russell Ont.

DATE COMPLETED 48-53 DAY 30 MO 08 YR. 77

018850 RC. 5 ELEVATION 0280 RC 5 BASIN CODE 26

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
RED	HARDPAW			0	22
RED	SHALE			22	70
GREY	SANDSTONE			70	78

31 0022714 0070717 0078218

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0075	1 ☑ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
06 &	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	1.88	0	0022
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

MATERIAL AND TYPE
DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☐ PUMP 2 ☑ BAILER
PUMPING RATE: 0003 GPM
DURATION OF PUMPING: 01 HOURS 10 MINS
STATIC LEVEL: 030 FEET
WATER LEVEL END OF PUMPING: 070 FEET
WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY
15 MINUTES: 048 FEET
30 MINUTES: 052 FEET
45 MINUTES: 065 FEET
60 MINUTES: 070 FEET
IF FLOWING, GIVE RATE: GPM
PUMP INTAKE SET AT: 70 FEET
WATER AT END OF TEST: 1 ☐ CLEAR 2 ☑ CLOUDY
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☑ DEEP
RECOMMENDED PUMP SETTING: 070 FEET
RECOMMENDED PUMPING RATE: 0003 GPM

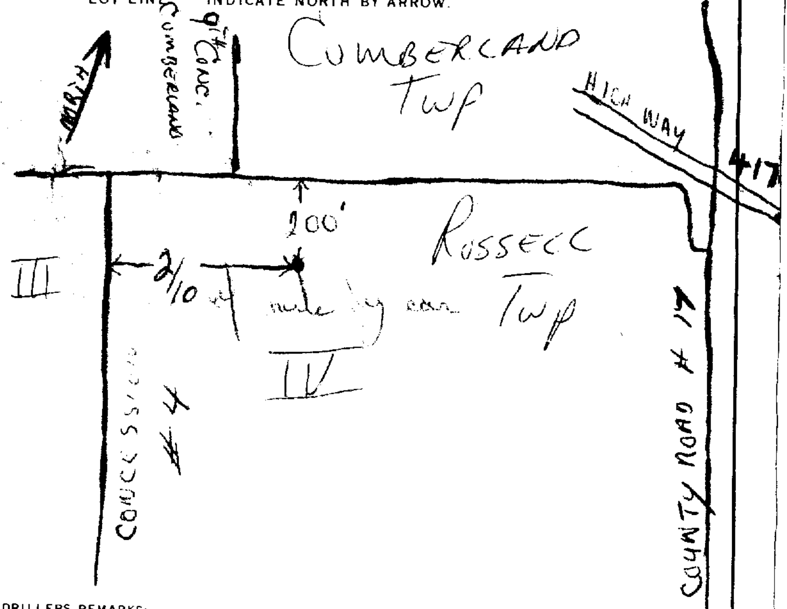
FINAL STATUS OF WELL 1
1 ☑ WATER SUPPLY
2 ☐ OBSERVATION WELL
3 ☐ TEST HOLE
4 ☐ RECHARGE WELL
5 ☐ ABANDONED, INSUFFICIENT SUPPLY
6 ☐ ABANDONED, POOR QUALITY
7 ☐ UNFINISHED

WATER USE 01
1 ☑ DOMESTIC
2 ☐ STOCK
3 ☐ IRRIGATION
4 ☐ INDUSTRIAL
☐ OTHER
5 ☐ COMMERCIAL
6 ☐ MUNICIPAL
7 ☐ PUBLIC SUPPLY
8 ☐ COOLING OR AIR CONDITIONING
9 ☐ NOT USED

METHOD OF DRILLING 1
1 ☑ CABLE TOOL
2 ☐ ROTARY (CONVENTIONAL)
3 ☐ ROTARY (REVERSE)
4 ☐ ROTARY (AIR)
5 ☐ AIR PERCUSSION
6 ☐ BORING
7 ☐ DIAMOND
8 ☐ JETTING
9 ☐ DRIVING

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS:

CONTRACTOR
NAME OF WELL CONTRACTOR: CAYER WELL DRILLER
LICENCE NUMBER: 1517
ADDRESS: SELMAN ONT.
NAME OF DRILLER OR BORER: Cayer
LICENCE NUMBER:
SIGNATURE OF CONTRACTOR: Maurice Cayer
SUBMISSION DATE DAY ____ MO. ____ YR. ____

OFFICE USE ONLY
DATA SOURCE: 1
CONTRACTOR: 1517
DATE RECEIVED: 241077
DATE OF INSPECTION: 29/3/79
INSPECTOR:
REMARKS:
P
WI

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506-4-77

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

316/Gd

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

(11) 5602324 MUNICIP. 56004 CON. CON 03

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC	LOT
Russell	Russell	3	024

OWNER (SURNAME FIRST)	ADDRESS	DATE COMPLETED
~~Chantal Development Inc.~~ DEVT.	Russell, Ontario	DAY 21 MO ~~June~~ 06 YR. 79

(21) WELL #18 ZONE 3 EASTING 470 99 NORTHING 5018499 RC. 5 ELEVATION 0275 RC. 5 BASIN CODE 26

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Brown	Sand		Fine	0	10
Brown	Sand	Clay	Hard packed	10	20
Grey	Limestone	Rock	Hard	20	220

(31) 0010608 0020628 0573 02202151273

32

(41) WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0210	1 ☒ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL

(51) CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
06	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	.188	0	0025
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET

(61) PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

(71) PUMPING TEST

PUMPING TEST METHOD: 1 ☒ PUMP 2 ☐ BAILER

PUMPING RATE: 0003 GPM

DURATION OF PUMPING: 02 HOURS 00 MINS

STATIC LEVEL: 016 FEET

WATER LEVEL END OF PUMPING: 175 FEET

WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY

15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
175 FEET	175	175 FEET	175

IF FLOWING, GIVE RATE: GPM

PUMP INTAKE SET AT: FEET

WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP

RECOMMENDED PUMP SETTING: 200 FEET

RECOMMENDED PUMPING RATE: 0003 GPM

FINAL STATUS OF WELL 1

1 ☒ WATER SUPPLY
2 ☐ OBSERVATION WELL
3 ☐ TEST HOLE
4 ☐ RECHARGE WELL
5 ☐ ABANDONED, INSUFFICIENT SUPPLY
6 ☐ ABANDONED, POOR QUALITY
7 ☐ UNFINISHED

WATER USE 01

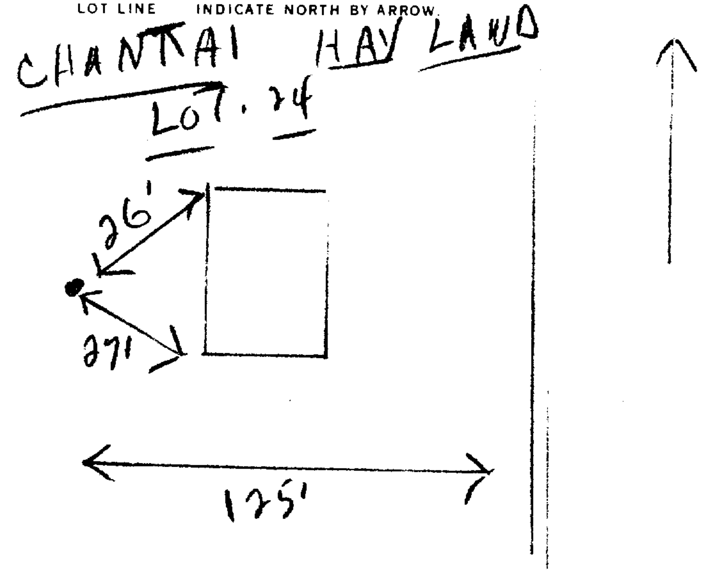
1 ☒ DOMESTIC
2 ☐ STOCK
3 ☐ IRRIGATION
4 ☐ INDUSTRIAL
☐ OTHER
5 ☐ COMMERCIAL
6 ☐ MUNICIPAL
7 ☐ PUBLIC SUPPLY
8 ☐ COOLING OR AIR CONDITIONING
9 ☐ NOT USED

METHOD OF DRILLING 4

1 ☐ CABLE TOOL
2 ☐ ROTARY (CONVENTIONAL)
3 ☐ ROTARY (REVERSE)
4 ☒ ROTARY (AIR)
5 ☐ AIR PERCUSSION
6 ☐ BORING
7 ☐ DIAMOND
8 ☐ JETTING
9 ☐ DRIVING

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS

CONTRACTOR

NAME OF WELL CONTRACTOR: Ramon H. Casselman
LICENCE NUMBER: 1505
ADDRESS: Williamsburg, Ontario
NAME OF DRILLER OR BORER: Dalton Gow.
LICENCE NUMBER:
SIGNATURE OF CONTRACTOR: Ramon Casselman
SUBMISSION DATE: DAY 21 MO. June YR. 79

OFFICE USE ONLY

DATA SOURCE: 1
CONTRACTOR: 1505
DATE RECEIVED: 061179
DATE OF INSPECTION:
INSPECTOR:
REMARKS:

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506—4—77

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 5602926 MUNICIP. CON.

UNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
Russell	Russell	4	21

WNER (SURNAME FIRST) [redacted]

ADDRESS Russell Ont.

DATE COMPLETED DAY 3 MO ~~[illegible]~~ July YR 84

RC. ELEVATION RC BASIN CODE II III IV

RDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

ENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	TO
red	hardpan	clay stone		0	21
red	shale			21	23
red	shale	rock hard		23	55

31
32

41 WATER RECORD

ATER FOUND AT - FEET	KIND OF WATER
52	1 ☑ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	TO
6 1/4	1 ☑ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	.188	0	23
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)
DIAMETER INCHES
LENGTH FEET
MATERIAL AND TYPE
DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD 1 ☐ PUMP 2 ☑ BAILER

PUMPING RATE 2 GPM

DURATION OF PUMPING HOURS 45 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING 1 ☐ PUMPING 2 ☐ RECOVERY 15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
26 FEET	45 FEET	35 FEET	40 FEET	45 FEET	45 FEET

IF FLOWING, GIVE RATE GPM

PUMP INTAKE SET AT 55 FEET

WATER AT END OF TEST 1 ☐ CLEAR 2 ☑ CLOUDY

RECOMMENDED PUMP TYPE ☐ SHALLOW ☑ DEEP

RECOMMENDED PUMP SETTING 50 FEET

RECOMMENDED PUMPING RATE 2 GPM

FINAL STATUS OF WELL

1 ☑ WATER SUPPLY
2 ☐ OBSERVATION WELL
3 ☐ TEST HOLE
4 ☐ RECHARGE WELL
5 ☐ ABANDONED, INSUFFICIENT SUPPLY
6 ☐ ABANDONED, POOR QUALITY
7 ☐ UNFINISHED

WATER USE

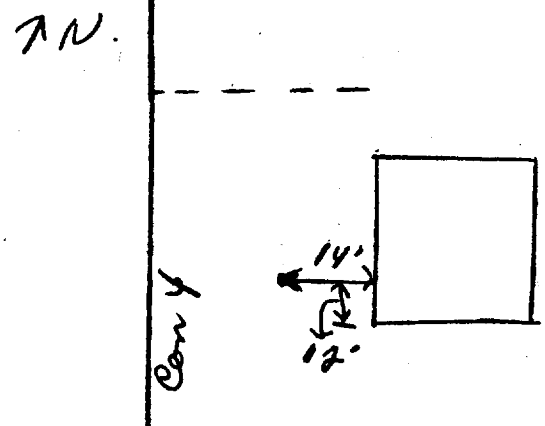
1 ☑ DOMESTIC
2 ☐ STOCK
3 ☐ IRRIGATION
4 ☐ INDUSTRIAL
☐ OTHER
5 ☐ COMMERCIAL
6 ☐ MUNICIPAL
7 ☐ PUBLIC SUPPLY
8 ☐ COOLING OR AIR CONDITIONING
9 ☐ NOT USED

METHOD OF DRILLING

1 ☑ CABLE TOOL
2 ☐ ROTARY (CONVENTIONAL)
3 ☐ ROTARY (REVERSE)
4 ☐ ROTARY (AIR)
5 ☐ AIR PERCUSSION
6 ☐ BORING
7 ☐ DIAMOND
8 ☐ JETTING
9 ☐ DRIVING

~~3582~~ LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS

CONTRACTOR

NAME OF WELL CONTRACTOR Maurice Cayer Ltd.
LICENCE NUMBER 1517
ADDRESS Casselman Ont.
NAME OF DRILLER OR BORER
LICENCE NUMBER
SIGNATURE OF CONTRACTOR Maurice Cayer
SUBMISSION DATE DAY MO. YR.

OFFICE USE ONLY

DATA SOURCE
CONTRACTOR
DATE RECEIVED 07 08 84
DATE OF INSPECTION
INSPECTOR
REMARKS

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FORM NO. 0506—4—77 FORM 7

[redacted]

Ministry of the Environment
Ontario

31G6W

The Ontario Water Resources Act

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 5602926 MUNICIP 56004 CON. CON 04

COUNTY OR DISTRICT: Russell
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Russell
CON., BLOCK, TRACT, SURVEY, ETC: 4
LOT: 021

[redacted]

Russell Ont.

DATE COMPLETED: DAY 03 MO 07 ~~July~~ YR 89

017999 RC 5 ELEVATION 0270 RC 5 BASIN CODE 26

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	TO
red	hardpan	clay stone		0	21
red	shale			21	23
red	shale	rock hard		23	55

NOV 18 1986

31 0021714 0512 0023717 0055717 1273

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0052	☑ FRESH ☐ SULPHUR ☐ SALTY ☐ MINERAL
	☐ FRESH ☐ SULPHUR ☐ SALTY ☐ MINERAL
	☐ FRESH ☐ SULPHUR ☐ SALTY ☐ MINERAL
	☐ FRESH ☐ SULPHUR ☐ SALTY ☐ MINERAL
	☐ FRESH ☐ SULPHUR ☐ SALTY ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	TO
~~6 1/4~~ 06	☑ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE	188	0	0023
	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE			
	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.):
DIAMETER: INCHES
LENGTH: FEET
MATERIAL AND TYPE:
DEPTH TO TOP OF SCREEN: FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD: ☐ PUMP ☑ BAILER
PUMPING RATE: 0002 GPM
DURATION OF PUMPING: ~~1~~ 00 HOURS 45 MINS
WATER LEVELS DURING: ☒ PUMPING ☐ RECOVERY

STATIC LEVEL	WATER LEVEL END OF PUMPING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
026 FEET	045 FEET	035 FEET	040 FEET	045 FEET	045 FEET

IF FLOWING, GIVE RATE: GPM
PUMP INTAKE SET AT: 55 FEET
WATER AT END OF TEST: ☐ CLEAR ☑ CLOUDY
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☑ DEEP
RECOMMENDED PUMP SETTING: 050 FEET
RECOMMENDED PUMPING RATE: 0001 GPM

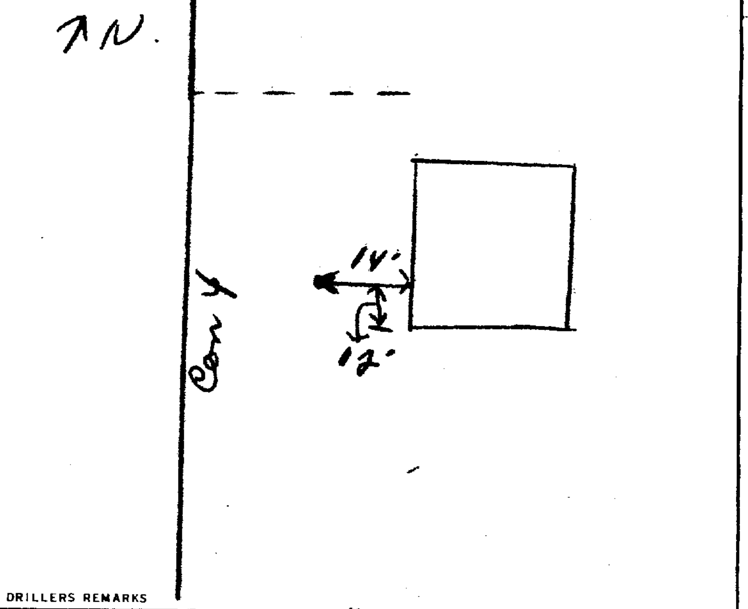
FINAL STATUS OF WELL 1
☑ WATER SUPPLY ☐ OBSERVATION WELL ☐ TEST HOLE ☐ RECHARGE WELL ☐ ABANDONED, INSUFFICIENT SUPPLY ☐ ABANDONED, POOR QUALITY ☐ UNFINISHED

WATER USE 01
☑ DOMESTIC ☐ STOCK ☐ IRRIGATION ☐ INDUSTRIAL ☐ OTHER ☐ COMMERCIAL ☐ MUNICIPAL ☐ PUBLIC SUPPLY ☐ COOLING OR AIR CONDITIONING ☐ NOT USED

METHOD OF DRILLING 1
☑ CABLE TOOL ☐ ROTARY (CONVENTIONAL) ☐ ROTARY (REVERSE) ☐ ROTARY (AIR) ☐ AIR PERCUSSION ☐ BORING ☐ DIAMOND ☐ JETTING ☐ DRIVING

~~3582~~ LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE INDICATE NORTH BY ARROW.



DRILLERS REMARKS

CONTRACTOR

NAME OF WELL CONTRACTOR: Maurice Cayer Ltd.
LICENCE NUMBER: 1517
ADDRESS: Casselman Ont.
NAME OF DRILLER OR BORER:
LICENCE NUMBER:
SIGNATURE OF CONTRACTOR: Maurice Cayer
SUBMISSION DATE: DAY ____ MO. ____ YR. ____

OFFICE USE ONLY

DATA SOURCE: 1
CONTRACTOR: 1517
DATE RECEIVED: 070884
DATE OF INSPECTION:
INSPECTOR:
REMARKS:

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506—4—77 FORM 7

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

5603492

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11

MUNICIP

CON.

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC	LOT
[redacted]	Russell	4	22 1/2

[redacted] Russell Ont. RR 2

DATE COMPLETED DAY 22 MO oct YR. 87

RC ELEVATION RC BASIN CODE

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
red	top soil			0	2
red	hard pan	clay		2	8
red	shale			8	60

31

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
58	1 ☑ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6 1/4	1 ☑ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	188	0	25
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
4	25	cement grout

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☐ PUMP 2 ☑ BAILER

PUMPING RATE: 15 GPM

DURATION OF PUMPING: 1 HOURS MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
FEET	35 ~~20~~ FEET	30 FEET	35 FEET	35 FEET	35 FEET

WATER LEVELS DURING: 1 ☐ PUMPING 2 ☐ RECOVERY

IF FLOWING, GIVE RATE: GPM

PUMP INTAKE SET AT: FEET

WATER AT END OF TEST: 1 ☐ CLEAR 2 ☑ CLOUDY

RECOMMENDED PUMP TYPE: ☐ SHALLOW ☑ DEEP

RECOMMENDED PUMP SETTING: 50 FEET

RECOMMENDED PUMPING RATE: 10 GPM

FINAL STATUS OF WELL

1 ☑ WATER SUPPLY
2 ☐ OBSERVATION WELL
3 ☐ TEST HOLE
4 ☐ RECHARGE WELL
5 ☐ ABANDONED, INSUFFICIENT SUPPLY
6 ☐ ABANDONED, POOR QUALITY
7 ☐ UNFINISHED
9 ☐ DEWATERING

WATER USE

1 ☑ DOMESTIC
2 ☐ STOCK
3 ☐ IRRIGATION
4 ☐ INDUSTRIAL
☐ OTHER
5 ☐ COMMERCIAL
6 ☐ MUNICIPAL
7 ☐ PUBLIC SUPPLY
8 ☐ COOLING OR AIR CONDITIONING
9 ☐ NOT USED

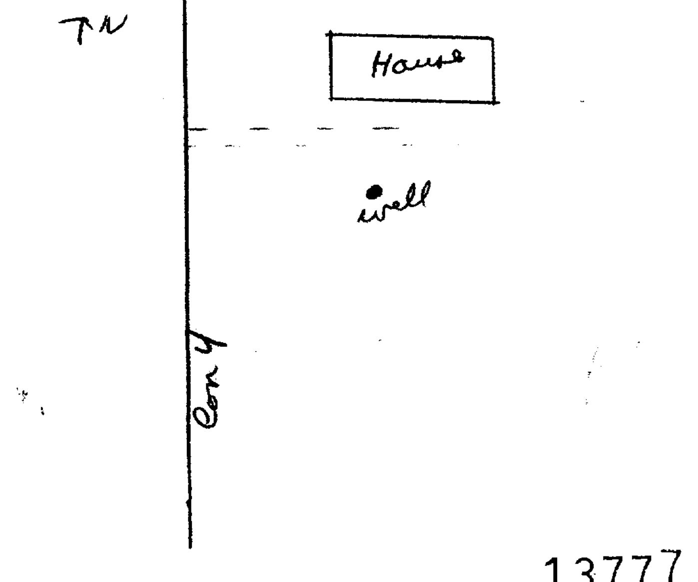
METHOD OF CONSTRUCTION

1 ☑ CABLE TOOL
2 ☐ ROTARY (CONVENTIONAL)
3 ☐ ROTARY (REVERSE)
4 ☐ ROTARY (AIR)
5 ☐ AIR PERCUSSION
6 ☐ BORING
7 ☐ DIAMOND
8 ☐ JETTING
9 ☐ DRIVING
☐ DIGGING
☐ OTHER

1517

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



13777

DRILLERS REMARKS

CONTRACTOR

NAME OF WELL CONTRACTOR: Maurice Cayer Ltd

WELL CONTRACTOR'S LICENCE NUMBER: 1517

ADDRESS: Casselman Ont.

NAME OF WELL TECHNICIAN:

WELL TECHNICIAN'S LICENCE NUMBER:

SIGNATURE OF TECHNICIAN/CONTRACTOR: Maurice Cayer

SUBMISSION DATE DAY ____ MO. ____ YR. ____

OFFICE USE ONLY

DATA SOURCE

CONTRACTOR

DATE RECEIVED DEC 01 1987

DATE OF INSPECTION

INSPECTOR

REMARKS

FORM NO. 0506 (11/86) FORM 9

MINISTRY OF THE ENVIRONMENT COPY

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 5603895 MUNICIP. 56004 CON. CON 04

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC	LOT 25-27
[redacted]	Russell	9	22

[redacted] ussell Eadie Rd. Ont.

DATE COMPLETED 48-53 DAY 24 MO 5 YR. 90

RC. ELEVATION RC. BASIN CODE II III IV

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Brown red	hard pan	stone		0	9
red	limestone	soft		9	85

31

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
83	1 ☑ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6 1/4	1 ☑ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	188	0	22
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)
DIAMETER INCHES
LENGTH FEET
MATERIAL AND TYPE
DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
2	22	grout

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☐ PUMP 2 ☑ BAILER
PUMPING RATE: 10 GPM
DURATION OF PUMPING: 1 HOURS ____ MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
20 FEET	75 FEET	45 FEET	60 FEET	65 FEET	75 FEET

WATER LEVELS DURING: 1 ☐ PUMPING 2 ☐ RECOVERY
IF FLOWING, GIVE RATE: ____ GPM
PUMP INTAKE SET AT: 85 FEET
WATER AT END OF TEST: 1 ☐ CLEAR 2 ☑ CLOUDY
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☑ DEEP
RECOMMENDED PUMP SETTING: 80 FEET
RECOMMENDED PUMPING RATE: 8 GPM

FINAL STATUS OF WELL

1 ☑ WATER SUPPLY
2 ☐ OBSERVATION WELL
3 ☐ TEST HOLE
4 ☐ RECHARGE WELL
5 ☐ ABANDONED, INSUFFICIENT SUPPLY
6 ☐ ABANDONED, POOR QUALITY
7 ☐ UNFINISHED
☐ DEWATERING

WATER USE

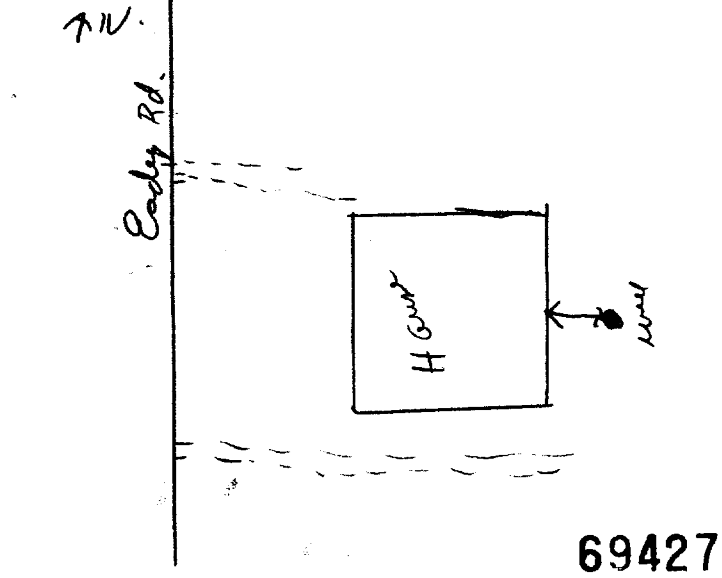
1 ☑ DOMESTIC
2 ☐ STOCK
3 ☐ IRRIGATION
4 ☐ INDUSTRIAL
☐ OTHER
5 ☐ COMMERCIAL
6 ☐ MUNICIPAL
7 ☐ PUBLIC SUPPLY
8 ☐ COOLING OR AIR CONDITIONING
9 ☐ NOT USED

METHOD OF CONSTRUCTION

1 ☑ CABLE TOOL
2 ☐ ROTARY (CONVENTIONAL)
3 ☐ ROTARY (REVERSE)
4 ☑ ROTARY (AIR)
5 ☐ AIR PERCUSSION
6 ☐ BORING
7 ☐ DIAMOND
8 ☐ JETTING
9 ☐ DRIVING
☐ DIGGING
☐ OTHER

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



69427

DRILLERS REMARKS

CONTRACTOR

NAME OF WELL CONTRACTOR: MAURICE Cayer Ltd
WELL CONTRACTOR'S LICENCE NUMBER: 1517
ADDRESS: Casselman Ont.
NAME OF WELL TECHNICIAN:
WELL TECHNICIAN'S LICENCE NUMBER:
SIGNATURE OF TECHNICIAN/CONTRACTOR: Maurice Cayer
SUBMISSION DATE: DAY ____ MO. ____ YR. ____

OFFICE USE ONLY

DATA SOURCE:
CONTRACTOR: 1517
DATE RECEIVED: JUN 21 1990
DATE OF INSPECTION:
INSPECTOR:
REMARKS:

FORM NO. 0506 (11/86) FORM 9

MINISTRY OF THE ENVIRONMENT COPY

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 5604087 MUNICIP. 56004 CON. CON 04

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY ETC	LOT 25-27
[redacted]	ssell	4	22

ussell Ontario

DATE COMPLETED 48-53 DAY 8 MO May YR 91

21 RC. ELEVATION RC BASIN CODE II III IV

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
red	clay	gravel shale		0	9
red	shale			9	15
red	limestone		soft	15	80

31

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
10-13 78	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS 14
15-18	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS 19
20-23	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS 24
25-28	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS 29
30-33	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS 34

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
10-11 6 1/4	1 ☑ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC 12	188	0	13-16 22
17-18	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC 19			20-23
24-25	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC 26			27-30

SCREEN

SIZE(S) OF OPENING (SLOT NO.) 31-33	DIAMETER 34-38 INCHES	LENGTH 39-40 FEET
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN 41-44 FEET	30

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)
10-13 2	14-17 22	grout
18-21	22-25	
26-29	30-33	80

71 PUMPING TEST

PUMPING TEST METHOD 10: 1 ☐ PUMP 2 ☑ BAILER

PUMPING RATE 11-14: 15 GPM

DURATION OF PUMPING: 1 15-16 HOURS 17-18 MINS

STATIC LEVEL 19-21	WATER LEVEL END OF PUMPING 22-24	15 MINUTES 26-28	30 MINUTES 29-31	45 MINUTES 32-34	60 MINUTES 35-37
10 FEET	50 FEET	20 FEET	35 FEET	50 FEET	50 FEET

25 WATER LEVELS DURING 1 ☑ PUMPING 2 ☐ RECOVERY

IF FLOWING, GIVE RATE 38-41 GPM

PUMP INTAKE SET AT 80 FEET

WATER AT END OF TEST 42: 1 ☐ CLEAR 2 ☑ CLOUDY

RECOMMENDED PUMP TYPE: ☐ SHALLOW ☑ DEEP

RECOMMENDED PUMP SETTING 43-45: 70 FEET

RECOMMENDED PUMPING RATE 46-49: 10 GPM

50-53

FINAL STATUS OF WELL 54

- 1 ☑ WATER SUPPLY
- 2 ☐ OBSERVATION WELL
- 3 ☐ TEST HOLE
- 4 ☐ RECHARGE WELL
- 5 ☐ ABANDONED, INSUFFICIENT SUPPLY
- 6 ☐ ABANDONED POOR QUALITY
- 7 ☐ UNFINISHED
- ☐ DEWATERING

WATER USE 55-56

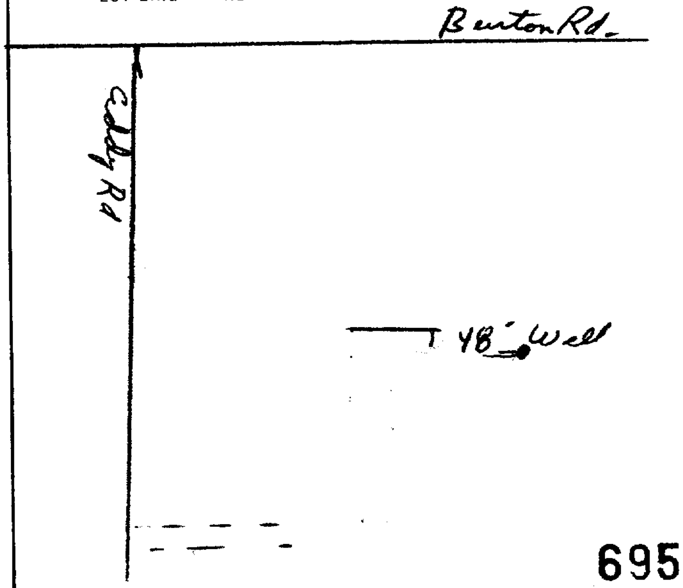
- 1 ☑ DOMESTIC
- 2 ☐ STOCK
- 3 ☐ IRRIGATION
- 4 ☐ INDUSTRIAL
- ☐ OTHER
- 5 ☐ COMMERCIAL
- 6 ☐ MUNICIPAL
- 7 ☐ PUBLIC SUPPLY
- 8 ☐ COOLING OR AIR CONDITIONING
- 9 ☐ NOT USED

METHOD OF CONSTRUCTION 57

- 1 ☑ CABLE TOOL
- 2 ☐ ROTARY (CONVENTIONAL)
- 3 ☐ ROTARY (REVERSE)
- 4 ☑ ROTARY (AIR)
- 5 ☐ AIR PERCUSSION
- 6 ☐ BORING
- 7 ☐ DIAMOND
- 8 ☐ JETTING
- 9 ☐ DRIVING
- ☐ DIGGING
- ☐ OTHER

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE INDICATE NORTH BY ARROW.



69561

DRILLERS REMARKS

CONTRACTOR

NAME OF WELL CONTRACTOR: Maurice Cayer Ltd

WELL CONTRACTOR'S LICENCE NUMBER: 1517

ADDRESS: Casselman Ont

NAME OF WELL TECHNICIAN:

WELL TECHNICIAN'S LICENCE NUMBER:

SIGNATURE OF TECHNICIAN/CONTRACTOR: Maurice Cayer

SUBMISSION DATE DAY ____ MO. ____ YR. ____

OFFICE USE ONLY

DATA SOURCE 58	CONTRACTOR 59-62	DATE RECEIVED 63-68	80
	1517	JUL 22 1991	

DATE OF INSPECTION

INSPECTOR

REMARKS

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506 (11/86) FORM 9

Ontario Ministry of the Environment

Well Tag Number (place sticker below)
A 021433
A021433

Well Record

Regulation 903 Ontario Water Resources Act

page ___ of ___

Instructions for Completing Form

- For use in the **Province of Ontario** only. This document is a permanent **legal** document. Please retain for future reference.
- All Sections **must** be completed in full to avoid delays in processing. Further instructions and explanations are available on the back of this form.
- Questions regarding completing this application can be directed to the Water Well Management Coordinator at 416-235-6203.
- **All metre measurements shall be reported to 1/10th of a metre.**
- Please print clearly in blue or black ink only.

Ministry Use Only
MUN ☐ CON ☐ LOT ☐

Well Owner's Information and Location of Well Information

[redacted]

RR#/Street Number/Name: 219 Eadie Rd
City/Town/Village: Russell
Site/Compartment/Block/Tract etc.: Plansor -9088

GPS Reading: NAD 83 Zone 18 Easting 420609 Northing 5018335
Unit Make/Model: Magellan
Mode of Operation: UTM ☐ Undifferentiated ☑ Averaged ☐ Differentiated, specify

Log of Overburden and Bedrock Materials (see instructions)

General Colour	Most common material	Other Materials	General Description	Depth Metres From	Depth Metres To
Red	Shale Rock		layered	0	2377

Hole Diameter

Depth Metres From	Depth Metres To	Diameter Centimetres
0	6.09	21.23
6.09	2377	15.55

Water Record

Water found at Metres	Kind of Water
22 m	☐ Gas ☑ Fresh ☐ Sulphur ☐ Salty ☐ Minerals ☐ Other:
___ m	☐ Gas ☐ Fresh ☐ Sulphur ☐ Salty ☐ Minerals ☐ Other:
___ m	☐ Gas ☐ Fresh ☐ Sulphur ☐ Salty ☐ Minerals ☐ Other:

After test of well yield, water was
☐ Clear and sediment free
☐ Other, specify

Chlorinated ☑ Yes ☐ No

Construction Record

Inside diam centimetres	Material	Wall thickness centimetres	Depth Metres From	Depth Metres To
Casing				
15.55	☑ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	0.48	+ 0.60	6.09
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
Screen				
Outside diam	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	Slot No.		
No Casing or Screen				
	☑ Open hole		6.09	2377

Test of Well Yield

Pumping test method: 3/4 H.P. Sub	Draw Down Time min	Draw Down Water Level Metres	Recovery Time min	Recovery Water Level Metres
Pump intake set at - (metres) 15	Static Level	7.50		10.25
Pumping rate - (litres/min) 20	1	8.15	1	9.60
Duration of pumping 1 hrs + 0 min	2	8.45	2	9.45
Final water level end of pumping 10.25 metres	3	8.58	3	9.30
Recommended pump type. ☐ Shallow ☑ Deep	4	8.69	4	9.10
Recommended pump depth. 15 metres	5	8.77	5	9.00
Recommended pump rate. 20 (litres/min)	10	9.20	10	8.75
	15	9.40	15	8.53
If flowing give rate - (litres/min)	20	9.65	20	8.45
	25	9.78	25	
If pumping discontinued, give reason.	30	9.88	30	
	40	10.00	40	
	50	10.15	50	
	60	10.25	60	

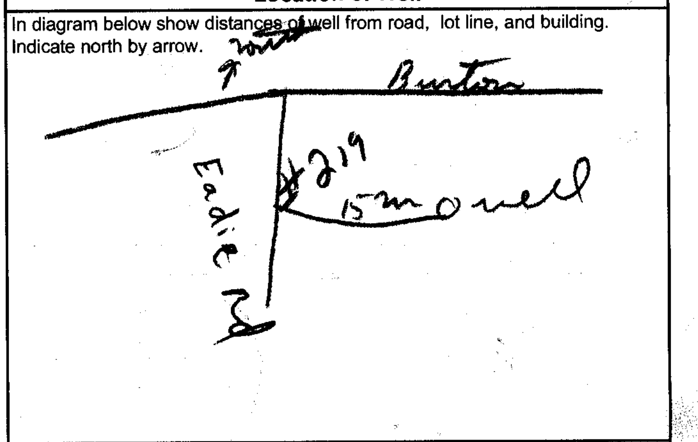
Plugging and Sealing Record

☑ Annular space ☐ Abandonment

Depth set at - Metres From	Depth set at - Metres To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
0	6.09	cement Grout	4 bag

Location of Well

In diagram below show distances of well from road, lot line, and building. Indicate north by arrow.



Method of Construction

☐ Cable Tool ☑ Rotary (air) ☐ Diamond ☐ Digging
☐ Rotary (conventional) ☐ Air percussion ☐ Jetting ☐ Other
☐ Rotary (reverse) ☐ Boring ☐ Driving

Water Use

☑ Domestic ☐ Industrial ☐ Public Supply ☐ Other
☐ Stock ☐ Commercial ☐ Not used
☐ Irrigation ☐ Municipal ☐ Cooling & air conditioning

Final Status of Well

☑ Water Supply ☐ Recharge well ☐ Unfinished ☐ Abandoned, (Other)
☐ Observation well ☐ Abandoned, insufficient supply ☐ Dewatering
☐ Test Hole ☐ Abandoned, poor quality ☐ Replacement well

Audit No. Z 27954
Date Well Completed: YYYY 05 MM 08 DD 16
Was the well owner's information package delivered? ☐ Yes ☑ No
Date Delivered: YYYY MM DD

Well Contractor/Technician Information

Name of Well Contractor: Gilles Bourgeois
Well Contractor's Licence No.: 1414
Business Address (street name, number, city etc.): St Albert ont
Name of Well Technician (last name, first name): Same
Well Technician's Licence No.: 0-193
Signature of Technician/Contractor: x Gilles Bourgeois
Date Submitted: YYYY 05 MM 08 DD 16

Ministry Use Only

Data Source
Contractor: 1414
Date Received: SEP 01 2005
Date of Inspection: YYYY MM DD
Remarks
Well Record Number

0506E (09/03) Contractor's Copy ☐ Ministry's Copy ☐ Well Owner's Copy ☐ *Cette formule est disponible en français*

Ontario Ministry of the Environment

The Ontario Water Resources Act

WATER WELL RECORD

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

11 **5605467** Municipality 56004 Con. CON 03

County or District Russell	Township/Borough/City/Town/Village Russell	Con block tract survey, etc. 3	Lot 23
[redacted]	Address Russell		Date completed 12 day Spt month 2000 year

21 UTM ✓ Northing RC Elevation RC Basin Code ii iii iv

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
Red	till	boulders	Hard	0	12
Red	Shale		Porous	12	60
Blue	Shale		Porous	60	105

31

32

41 WATER RECORD

Water found at - feet	Kind of water
100	☑ Fresh ☐ Salty ☐ Sulphur ☐ Minerals ☐ Gas
	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals ☐ Gas
	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals ☐ Gas
	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals ☐ Gas
	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals ☐ Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet From	Depth - feet To
8 3/4	☐ Steel ☐ Galvanized ☑ Concrete ☐ Open hole ☐ Plastic		0	22
6 1/4	☑ Steel ☐ Galvanized ☐ Concrete ☐ Open hole ☐ Plastic	1.88	+2	25
6 1/8	☐ Steel ☐ Galvanized ☐ Concrete ☑ Open hole ☐ Plastic		25	105

SCREEN

Sizes of opening (Slot No.)
Diameter inches
Length feet
Material and type
Depth at top of screen feet

61 PLUGGING & SEALING RECORD

☑ Annular space ☐ Abandonment

Depth set at - feet From	To	Material and type (Cement grout, bentonite, etc.)
0	22	Cement Grout

71 PUMPING TEST

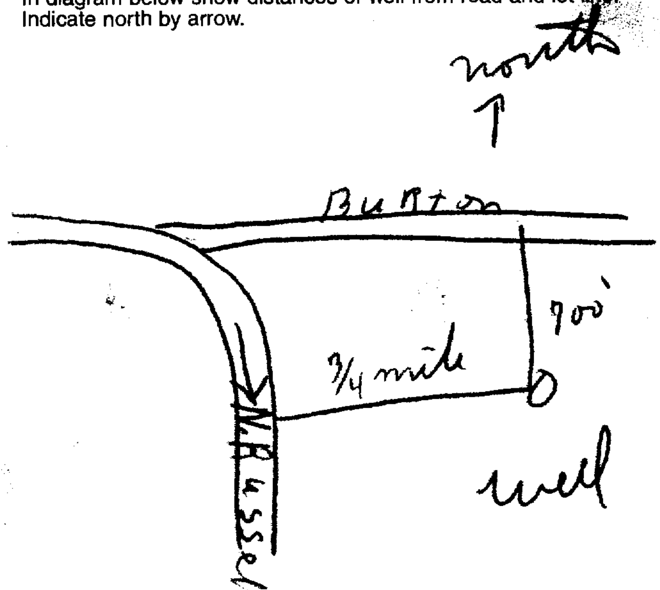
Pumping test method ☐ Pump ☑ Bailer
Pumping rate 2 1/2 GPM
Duration of pumping 1 Hours 0 Mins

Static level	Water level end of pumping	Water levels during ☐ Pumping ☑ Recovery 15 minutes	30 minutes	45 minutes	60 minutes
14 feet	100 feet	14 feet	14 feet	14 feet	14 feet

If flowing give rate GPM
Pump intake set at feet
Water at end of test ☐ Clear ☑ Cloudy
Recommended pump type ☐ Shallow ☑ Deep
Recommended pump setting 92 feet
Recommended pump rate 2 1/2 GPM

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



222425

FINAL STATUS OF WELL

☑ Water supply
☐ Observation well
☐ Test hole
☐ Recharge well
☐ Abandoned, insufficient supply
☐ Abandoned, poor quality
☐ Abandoned (Other)
☐ Dewatering
☐ Unfinished
☐ Replacement well

WATER USE

☑ Domestic
☐ Stock
☐ Irrigation
☐ Industrial
☐ Commercial
☐ Municipal
☐ Public supply
☐ Cooling & air conditioning
☐ Not use
☐ Other

METHOD OF CONSTRUCTION

☑ Cable tool
☐ Rotary (conventional)
☐ Rotary (reverse)
☐ Rotary (air)
☐ Air percussion
☐ Boring
☐ Diamond
☐ Jetting
☐ Driving
☐ Digging
☐ Other

Name of Well Contractor: Gilles Bourgeois
Well Contractor's Licence No.: 1414
Address: St Albert ont
Name of Well Technician: Same
Well Technician's Licence No.: 0-193
Signature of Technician/Contractor: Gilles Bourgeois
Submission date: 12 day Spt mo 2000 yr

MINISTRY USE ONLY

Data source
Contractor 1414
Date received SEP 18 2000
Date of inspection
Inspector
Remarks
CSS.ES0

0506 (11/98) Front Form 9

2 - MINISTRY OF THE ENVIRONMENT COPY

Ontario Ministry of the Environment

W Tag #: A170924 ...t Below)

A170924

Well Record

Regulation 903 Ontario Water Resources Act

leasurements recorded in: ☐ Metric ☐ Imperial

Page ____ of ____

Vell Owner's Information

irst Name / Last Name / Organization: Megha Holdings inc
E-mail Address:
☐ Well Constructed by Well Owner
lailing Address (Street Number/Name): 238 Corduroy
Municipality: Russell
Province: Ont
Postal Code:
Telephone No. *(inc. area code)*:

Vell Location

ddress of Well Location (Street Number/Name):
Township: Russell
Lot: 22
Concession: 5
ounty/District/Municipality: Prescott - Russell
City/Town/Village: Vars
Province: **Ontario**
Postal Code:
TM Coordinates: NAD 8 3 Zone 18 Easting 4 9 2 0 0 4 Northing 5 0 1 9 4 2 7
Municipal Plan and Sublot Number: 50R-10,104
Other:

verburden and Bedrock Materials/Abandonment Sealing Record *(see instructions on the back of this form)*

eneral Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	To
rown	clay			0	8
rey	clay			8	24
grey	gravel	sand,		24	32
grey	Rock			32	120

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used *(Material and Type)*	Volume Placed *(m³/ft³)*
2	20	ciment grout	4 Bags

Results of Well Yield Testing

After test of well yield, water was:
☑ Clear and sand free
☐ Other, *specify*
If pumping discontinued, give reason: ✓
Pump intake set at *(m/ft)*: 40
Pumping rate *(l/min / GPM)*: 10
Duration of pumping: 1 hrs + ____ min
Final water level end of pumping *(m/ft)*: 2.07
If flowing give rate *(l/min / GPM)*: ✓
Recommended pump depth *(m/ft)*: 95
Recommended pump rate *(l/min / GPM)*: 10
Well production *(l/min / GPM)*: 30
Disinfected? ☑ Yes ☐ No

Draw Down Time *(min)*	Water Level *(m/ft)*	Recovery Time *(min)*	Water Level *(m/ft)*
Static Level	1.02		2.07
1	1.47	1	1.64
2	1.53	2	1.55
3	1.57	3	1.52
4	1.60	4	1.47
5	1.64	5	1.45
10	1.73	10	1.37
15	1.79	15	1.33
20	1.81	20	1.28
25	1.87	25	1.26
30	1.91	30	1.23
40	2.00	40	1.20
50	2.05	50	1.18
60	2.07	60	1.17

Method of Construction

☐ Cable Tool
☐ Rotary (Conventional)
☐ Rotary (Reverse)
☐ Boring
☐ Air percussion
☐ Other, *specify*
☐ Diamond
☐ Jetting
☐ Driving
☐ Digging

Well Use

☐ Public
☐ Domestic
☐ Livestock
☐ Irrigation
☐ Industrial
☐ Other, *specify*
☑ Commercial
☐ Municipal
☐ Test Hole
☐ Cooling & Air Conditioning
☐ Not used
☐ Dewatering
☐ Monitoring

Construction Record - Casing

Inside Diameter *(cm/in)*	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness *(cm/in)*	Depth (m/ft) From	To
¼	steel	188	0	35

Status of Well

☑ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☐ Abandoned, other, *specify*
☐ Other, *specify*

Construction Record - Screen

Outside Diameter *(cm/in)*	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	To
			✓	

Water Details

/ater found at Depth 38 (m/ft) ☐ Gas | Kind of Water: ☐ Fresh ☑ Untested ☐ Other, *specify*
/ater found at Depth 05 (m/ft) ☐ Gas | Kind of Water: ☐ Fresh ☑ Untested ☐ Other, *specify*
/ater found at Depth (m/ft) ☐ Gas | Kind of Water: ☐ Fresh ☐ Untested ☐ Other, *specify*

Hole Diameter

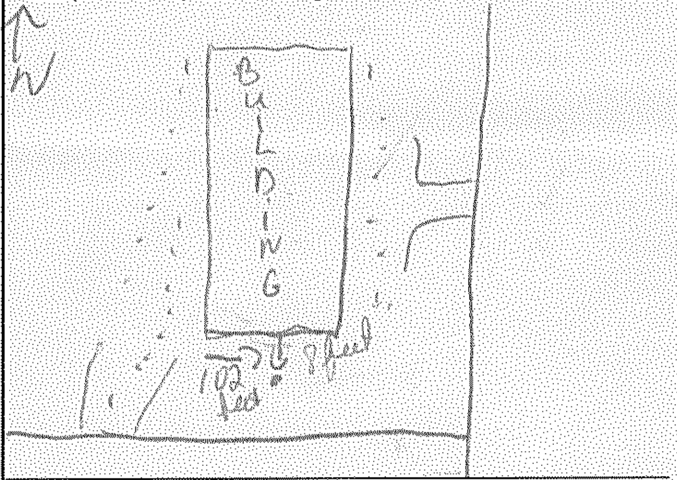
Depth (m/ft) From	To	Diameter *(cm/in)*
0	120	6 inch

Well Contractor and Well Technician Information

usiness Name of Well Contractor: laurice Cayer LTD
Well Contractor's Licence No.: 1 5 1 1 7
usiness Address (Street Number/Name): 69 RT 100 est Casselman
Municipality: Watien
rovince: Ont
Postal Code: K0A1M0
Business E-mail Address:
us.Telephone No. *(inc. area code)*: 91 7 764 2 1 3 2
Name of Well Technician (Last Name, First Name): Ryean Cayer
ell Technician's Licence No.: T 1 7 1 1 7
Signature of Technician and/or Contractor: Réjean Cayer
Date Submitted: 2015 08 04

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well owner's information package delivered ☑ Yes ☐ No
Date Package Delivered: 2015 08 04
Date Work Completed: 2015 08 04

Ministry Use Only

Audit No Z 195564

AUG 27 2015

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Contractor's Copy

Ontario Ministry of the Environment and Climate Change

Measurements recorded in: ☑ Metric ☐ Imperial

Well Tag No. **Tag#:A209576** A209576

Well Record

Regulation 903 Ontario Water Resources Act

Page 1 of 1

[redacted]

Address of Well Location (Street Number/Name): 9 Paquet, Street	Township: Russell	Lot: 22	Concession: 5
County/District/Municipality: Prescortt Russell	City/Town/Village: Vars	Province: **Ontario**	Postal Code: K0A3H0
UTM Coordinates Zone, Easting, Northing: NAD 83 / 18 / 471990 / 5019304	Municipal Plan and Sublot Number: 50R10398	Other: Part 2	

Overburden and Bedrock Materials/Abandonment Sealing Record *(see instructions on the back of this form)*

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	To
Grey	Gravel		Soft	0	0.90
Brown	Sand		Soft	0.90	1.81
Grey	Clay		Soft	1.81	5.45
Grey	Clay	Gravel-Sand	Soft	5.45	9.69
Grey	Limestone		Hard.	9.69	40.00

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	6.06	Quik Grouts	4 Bag.

Method of Construction

- ☑ Cable Tool
- ☐ Rotary (Conventional)
- ☑ Rotary (Reverse) AiR
- ☐ Boring
- ☐ Air percussion
- ☐ Other, specify
- ☐ Diamond
- ☐ Jetting
- ☐ Driving
- ☐ Digging

Well Use

- ☐ Public
- ☑ Domestic
- ☐ Livestock
- ☐ Irrigation
- ☐ Industrial
- ☐ Other, specify
- ☑ Commercial
- ☐ Municipal
- ☐ Test Hole
- ☐ Cooling & Air Conditioning
- ☐ Not used
- ☐ Dewatering
- ☐ Monitoring

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To
15.55	Steel	0.48	+0.60	9.69

Status of Well

- ☑ Water Supply
- ☐ Replacement Well
- ☐ Test Hole
- ☐ Recharge Well
- ☐ Dewatering Well
- ☐ Observation and/or Monitoring Hole
- ☐ Alteration (Construction)
- ☐ Abandoned, Insufficient Supply
- ☐ Abandoned, Poor Water Quality
- ☐ Abandoned, other, specify
- ☐ Other, specify

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	To

Water Details

Water found at Depth 9.69 (m/ft) ☐ Gas — Kind of Water: ☑ Fresh ☐ Untested ☐ Other, specify

Water found at Depth 39.39 (m/ft) ☐ Gas — Kind of Water: ☑ Fresh ☐ Untested ☐ Other, specify

Water found at Depth (m/ft) ☐ Gas — Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	6.06	25.40
0	40.00	15.55

Well Contractor and Well Technician Information

Business Name of Well Contractor: DAR-WATER-well-Drilling

Well Contractor's Licence No.: 7526

Business Address (Street Number/Name): 1763 - Route 300 west

Municipality: NAtion

Province: ON

Postal Code: K0A3C0

Business E-mail Address:

Bus.Telephone No. (inc. area code): 6139875598

Name of Well Technician (Last Name, First Name): Monette Karl

Well Technician's Licence No.: 3723

Signature of Technician and/or Contractor: Karl Monette

Date Submitted: 2018 02 25

Results of Well Yield Testing

After test of well yield, water was:
- ☑ Clear and sand free
- ☐ Other, specify

If pumping discontinued, give reason:

Pump intake set at (m/ft): 37.87

Pumping rate (l/min / GPM): 45:00

Duration of pumping: 1 hrs + 00 min

Final water level end of pumping (m/ft): 9.95

If flowing give rate (l/min / GPM):

Recommended pump depth (m/ft): 37.87

Recommended pump rate (l/min / GPM): 45:00

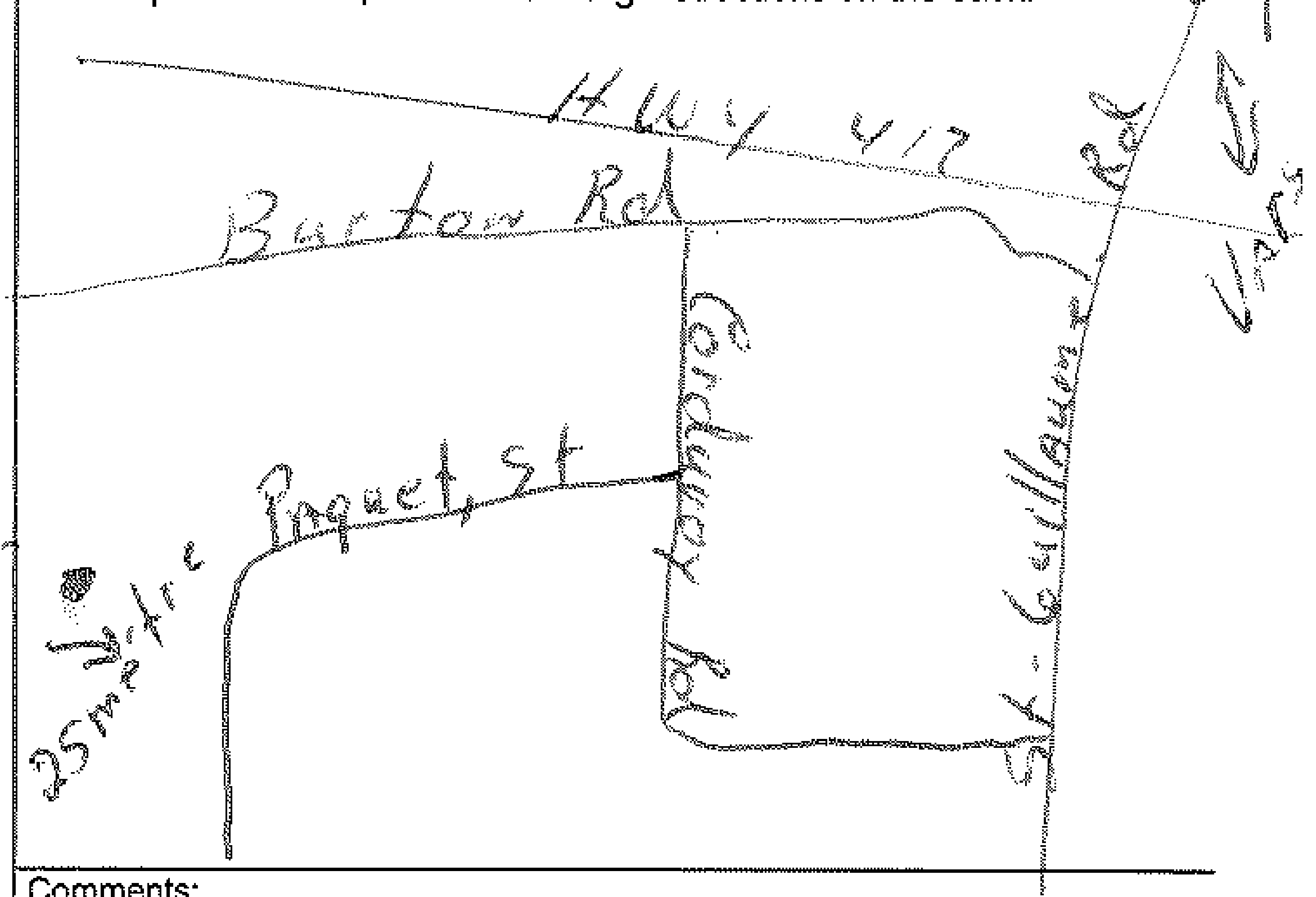
Well production (l/min / GPM): 20:00

Disinfected? ☑ Yes ☐ No

Draw Down Time (min)	Water Level (m/ft)	Recovery Time (min)	Water Level (m/ft)
Static Level	3.06		9.95
1	4.63	1	8.12
2	5.48	2	7.34
3	6.00	3	6.76
4	6.46	4	6.20
5	6.78	5	5.84
10	8.22	10	4.73
15	8.70	15	4.29
20	9.00	20	3.92
25	9.46	25	3.81
30	9.59	30	3.63
40	9.95	40	3.27
50	9.95	50	3.06
60	9.95	60	3.06

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well owner's information package delivered: ☑ Yes ☐ No

Date Package Delivered: 2018 02 15

Date Work Completed: 2018 02 09

Ministry Use Only

Audit No. Z280932

MAY 15 2018

Received

0506E (2014/11)

Ministry's Copy

Ontario Ministry of the Environment, Conservation and Parks

Tag#:A274434

Print Below: A274434

Well Record

Regulation 903 Ontario Water Resources Act

Measurements recorded in: ☐ Metric ☒ Imperial

Page ____ of ____

Well Owner's Information

First Name	Last Name/Organization	E-mail Address	☐ Well Constructed by Well Owner
	Swar Signs Inc.		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
2212 Gladwin Crescent Unit A9	Ottawa	ON	K1B 5N1	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
17 Paquet Street	Russell	22	5

County/District/Municipality	City/Town/Village	Province	Postal Code
[redacted] Ottawa Carleton	Vars	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	471902	5019270		

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
	Boulders	& Clay		0'	26'
Grey	Limestone			26'	83'
Grey & Black	Limestone			83'	254'
Grey + Black	Limestone			254'	300'

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³)
32'	22'	Neat cement	9.36
22'	0'	Bentonite slurry	6.4

Method of Construction

- ☐ Cable Tool
- ☐ Rotary (Conventional)
- ☐ Rotary (Reverse)
- ☐ Boring
- ☒ Air percussion
- ☐ Other, specify SUKGER
- ☐ Diamond
- ☐ Jetting
- ☐ Driving
- ☐ Digging

Well Use

- ☐ Public
- ☒ Domestic
- ☐ Livestock
- ☐ Irrigation
- ☐ Industrial
- ☐ Other, specify
- ☐ Commercial
- ☐ Municipal
- ☐ Test Hole
- ☐ Cooling & Air Conditioning
- ☐ Not used
- ☐ Dewatering
- ☐ Monitoring

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To
6 1/4"	Steel	.188"	+2'	32'
6 1/8"	Open Hole		32'	300'

Status of Well

- ☒ Water Supply
- ☐ Replacement Well
- ☐ Test Hole
- ☐ Recharge Well
- ☐ Dewatering Well
- ☐ Observation and/or Monitoring Hole
- ☐ Alteration (Construction)
- ☐ Abandoned, Insufficient Supply
- ☐ Abandoned, Poor Water Quality
- ☐ Abandoned, other, specify
- ☐ Other, specify

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	To

Water Details

Water found at Depth	Kind of Water
254 (m/ft) ☐ Gas	☐ Fresh ☒ Untested ☐ Other, specify
(m/ft) ☐ Gas	☐ Fresh ☐ Untested ☐ Other, specify
(m/ft) ☐ Gas	☐ Fresh ☐ Untested ☐ Other, specify

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0'	32'	9 3/4"
32'	300'	6 1/8"

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Air Rock Drilling Co. Ltd.	C7681

Business Address (Street Number/Name)	Municipality
6659 Franktown Road	Richmond

Province	Postal Code	Business E-mail Address
ON	K0A 2Z0	air-rock@sympatico.ca

Bus.Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
6138382170	Hanna, Jeremy

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted (YYYY MM DD)
T3632		2020 10 30

Results of Well Yield Testing

After test of well yield, water was:
☐ Clear and sand free
☐ Other, specify **Not tested**

If pumping discontinued, give reason: X

Pump intake set at (m/ft): 200

Pumping rate (l/min / GPM): 8

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft): 24'7"

If flowing give rate (l/min/GPM): X

Recommended pump depth (m/ft): [redacted] 260'

Recommended pump rate (l/min/GPM): 8

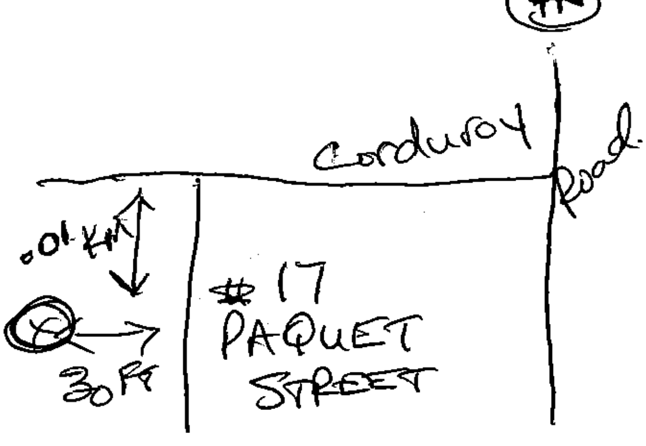
Well production (l/min/GPM): 8

Disinfected? ☒ Yes ☐ No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	5'1"		24'7"
1	10.3	1	20.5
2	12.7	2	17.2
3	14.6	3	14.9
4	16.2	4	12.1
5	16'9"	5	11'1"
10	17.5	10	9.8
15	21.2	15	5.1
20	23.4	20	5.1
25	24.2	25	5.1
30	24.5	30	5.1
40	24.6	40	5.1
50	24.6	50	5.1
60	24.7	60	5'1"

Map of Well Location

Please provide a map below following instructions on the back.



Comments:
1 [redacted] HP 10 GPM SET AT 260 FEET

Well owner's information package delivered	Date Package Delivered (YYYY MM DD)
☑ Yes ☐ No	2020 10 04
	Date Work Completed (YYYY MM DD): 2020 09 28

Ministry Use Only

Audit No. Z343947

Received NOV 09 2020

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Ministry's Copy

Map: Well records

This map allows you to search and view well record information from reported wells in Ontario.

Full dataset is available in the Open Data catalogue (https://data.ontario.ca/dataset/well-records) .

Go Back to Map

Well ID

Well ID Number: 7385814
Well Audit Number: *Z340897*
Well Tag Number: *A307335*
This table contains information from the original well record and any subsequent updates.

Well Location

Address of Well Location	BEHIND 9 PAQUET STREET
Township	RUSSELL TOWNSHIP
Lot	022

Concession	CON 04
County/District/Municipality	RUSSELL
City/Town/Village	VARS
Province	ON
Postal Code	n/a
UTM Coordinates	NAD83 — Zone 18 Easting: 471612.00 Northing: 5019164.00
Municipal Plan and Sublot Number	
Other	

Overburden and Bedrock Materials Interval

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To
	SILT			0	
	CLAY				

	TILL				

Annular Space/Abandonment Sealing Record

Depth From	Depth To	Type of Sealant Used (Material and Type)	Volume Placed
0 m	3.6 m	BENTONITE	

Method of Construction & Well Use

Method of Construction	Well Use
Other Method	
	Monitoring

Status of Well

Observation Wells

Construction Record - Casing

Inside Diameter	Open Hole or material	Depth From	Depth To

5.08 cm	PLASTIC	0 m	4.57 m

Construction Record - Screen

Outside Diameter	Material	Depth From	Depth To
5.88 cm	PLASTIC	4.57 m	6.09 m

Well Contractor and Well Technician Information

Well Contractor's Licence Number: 1844

Results of Well Yield Testing

After test of well yield, water was	
If pumping discontinued, give reason	
Pump intake set at	
Pumping Rate	
Duration of Pumping	

Final water level	
If flowing give rate	
Recommended pump depth	
Recommended pump rate	
Well Production	
Disinfected?	

Draw Down & Recovery

Draw Down Time(min)	**Draw Down Water level**	**Recovery Time(min)**	**Recovery Water level**
SWL			
1		1	
2		2	
3		3	
4		4	
5		5	

10		10	
15		15	
20		20	
25		25	
30		30	
40		40	
45		45	
50		50	
60		60	

Water Details

Water Found at Depth	Kind
6.45 m	

Hole Diameter

Depth From	Depth To	Diameter
0 m	6.45 m	16.51 cm

Audit Number: Z340897

Date Well Completed: January 26, 2021

Date Well Record Received by MOE: April 27, 2021

Related

How to use a Ministry of the Environment map (https://www.ontario.ca/page/how-use-ministry-environment-map#wells)

Technical documentation: Metadata record (https://data.ontario.ca/dataset/well-records/resource/3031344e-e3f2-48d5-888c-c1deadfd2f77)

Updated: January 10, 2024
Published: March 20, 2014

Map: Well records

This map allows you to search and view well record information from reported wells in Ontario.

Full dataset is available in the Open Data catalogue (https://data.ontario.ca/dataset/well-records) .

Go Back to Map

Well ID

Well ID Number: 7411241
Well Audit Number: *Z360159*
Well Tag Number: *A321642*
This table contains information from the original well record and any subsequent updates.

Well Location

Address of Well Location	
Township	RUSSELL TOWNSHIP
Lot	

Concession	
County/District/Municipality	RUSSELL
City/Town/Village	
Province	ON
Postal Code	n/a
UTM Coordinates	NAD83 — Zone 18 Easting: 471935.00 Northing: 5019422.00
Municipal Plan and Sublot Number	
Other	

Overburden and Bedrock Materials Interval

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To

Annular Space/Abandonment Sealing Record

Depth From	Depth To	Type of Sealant Used (Material and Type)	Volume Placed

Method of Construction & Well Use

Method of Construction	Well Use

Status of Well

Construction Record - Casing

Inside Diameter	Open Hole or material	Depth From	Depth To

Construction Record - Screen

Outside Diameter	Material	Depth From	Depth To

Well Contractor and Well Technician Information

Well Contractor's Licence Number: 1517

Results of Well Yield Testing

After test of well yield, water was	
If pumping discontinued, give reason	
Pump intake set at	
Pumping Rate	
Duration of Pumping	
Final water level	
If flowing give rate	
Recommended pump depth	

Recommended pump rate	
Well Production	
Disinfected?	

Draw Down & Recovery

Draw Down Time(min)	**Draw Down Water level**	**Recovery Time(min)**	**Recovery Water level**
SWL			
1		1	
2		2	
3		3	
4		4	
5		5	
10		10	
15		15	
20		20	

25		25	
30		30	
40		40	
45		45	
50		50	
60		60	

Water Details

Water Found at Depth	Kind

Hole Diameter

Depth From	Depth To	Diameter

Audit Number: Z360159

Date Well Completed: January 27, 2022

Date Well Record Received by MOE: February 18, 2022

Related

How to use a Ministry of the Environment map (https://www.ontario.ca/page/how-use-ministry-environment-map#wells)

Technical documentation: Metadata record (https://data.ontario.ca/dataset/well-records/resource/3031344e-e3f2-48d5-888c-c1deadfd2f77)

Updated: January 10, 2024
Published: March 20, 2014

Map: Well records

This map allows you to search and view well record information from reported wells in Ontario.

Full dataset is available in the Open Data catalogue (https://data.ontario.ca/dataset/well-records) .

Go Back to Map

Well ID

Well ID Number: 7422318
Well Audit Number: *Z388838*
Well Tag Number: *A352648*
This table contains information from the original well record and any subsequent updates.

Well Location

Address of Well Location	
Township	RUSSELL TOWNSHIP
Lot	

Concession	
County/District/Municipality	RUSSELL
City/Town/Village	
Province	ON
Postal Code	n/a
UTM Coordinates	NAD83 — Zone 18 Easting: 471872.00 Northing: 5019550.00
Municipal Plan and Sublot Number	
Other	

Overburden and Bedrock Materials Interval

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To

Annular Space/Abandonment Sealing Record

Depth From	Depth To	Type of Sealant Used (Material and Type)	Volume Placed

Method of Construction & Well Use

Method of Construction	Well Use

Status of Well

Construction Record - Casing

Inside Diameter	Open Hole or material	Depth From	Depth To

Construction Record - Screen

Outside Diameter	Material	Depth From	Depth To

Well Contractor and Well Technician Information

Well Contractor's Licence Number: 1517

Results of Well Yield Testing

After test of well yield, water was	
If pumping discontinued, give reason	
Pump intake set at	
Pumping Rate	
Duration of Pumping	
Final water level	
If flowing give rate	
Recommended pump depth	

Recommended pump rate	
Well Production	
Disinfected?	

Draw Down & Recovery

Draw Down Time(min)	**Draw Down Water level**	**Recovery Time(min)**	**Recovery Water level**
SWL			
1		1	
2		2	
3		3	
4		4	
5		5	
10		10	
15		15	
20		20	

25		25	
30		30	
40		40	
45		45	
50		50	
60		60	

Water Details

Water Found at Depth	Kind

Hole Diameter

Depth From	Depth To	Diameter

Audit Number: Z388838

Date Well Completed: June 11, 2022

Date Well Record Received by MOE: July 12, 2022

Related

How to use a Ministry of the Environment map (https://www.ontario.ca/page/how-use-ministry-environment-map#wells)

Technical documentation: Metadata record (https://data.ontario.ca/dataset/well-records/resource/3031344e-e3f2-48d5-888c-c1deadfd2f77)

Updated: January 10, 2024
Published: March 20, 2014

Map: Well records

This map allows you to search and view well record information from reported wells in Ontario.

Full dataset is available in the Open Data catalogue (https://data.ontario.ca/dataset/well-records) .

Go Back to Map

Well ID

Well ID Number: 7432535
Well Audit Number: *Z364958*
Well Tag Number: *A321660*
This table contains information from the original well record and any subsequent updates.

Well Location

Address of Well Location	
Township	RUSSELL TOWNSHIP
Lot	022

Concession	CON 05
County/District/Municipality	RUSSELL
City/Town/Village	
Province	ON
Postal Code	n/a
UTM Coordinates	NAD83 — Zone 18 Easting: 471807.00 Northing: 5019381.00
Municipal Plan and Sublot Number	
Other	

Overburden and Bedrock Materials Interval

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To

Annular Space/Abandonment Sealing Record

Depth From	Depth To	Type of Sealant Used (Material and Type)	Volume Placed

Method of Construction & Well Use

Method of Construction	Well Use

Status of Well

Construction Record - Casing

Inside Diameter	Open Hole or material	Depth From	Depth To

Construction Record - Screen

Outside Diameter	Material	Depth From	Depth To

Well Contractor and Well Technician Information

Well Contractor's Licence Number: 1517

Results of Well Yield Testing

After test of well yield, water was	
If pumping discontinued, give reason	
Pump intake set at	
Pumping Rate	
Duration of Pumping	
Final water level	
If flowing give rate	
Recommended pump depth	

Recommended pump rate	
Well Production	
Disinfected?	

Draw Down & Recovery

Draw Down Time(min)	**Draw Down Water level**	**Recovery Time(min)**	**Recovery Water level**
SWL			
1		1	
2		2	
3		3	
4		4	
5		5	
10		10	
15		15	
20		20	

25		25	
30		30	
40		40	
45		45	
50		50	
60		60	

Water Details

Water Found at Depth	Kind

Hole Diameter

Depth From	Depth To	Diameter

Audit Number: Z364958

Date Well Completed: June 02, 2022

Date Well Record Received by MOE: July 16, 2022

Related

How to use a Ministry of the Environment map (https://www.ontario.ca/page/how-use-ministry-environment-map#wells)

Technical documentation: Metadata record (https://data.ontario.ca/dataset/well-records/resource/3031344e-e3f2-48d5-888c-c1deadfd2f77)

Updated: January 10, 2024
Published: March 20, 2014

Map: Well records

This map allows you to search and view well record information from reported wells in Ontario.

Full dataset is available in the Open Data catalogue (https://data.ontario.ca/dataset/well-records) .

Go Back to Map

Well ID

Well ID Number: 7446938
Well Audit Number: *Z394718*
Well Tag Number: *A361089*
This table contains information from the original well record and any subsequent updates.

Well Location

Address of Well Location	
Township	RUSSELL TOWNSHIP
Lot	021

Concession	CON 04
County/District/Municipality	RUSSELL
City/Town/Village	
Province	ON
Postal Code	n/a
UTM Coordinates	NAD83 — Zone 18 Easting: 471364.00 Northing: 5018576.00
Municipal Plan and Sublot Number	
Other	

Overburden and Bedrock Materials Interval

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To

Annular Space/Abandonment Sealing Record

Depth From	Depth To	Type of Sealant Used (Material and Type)	Volume Placed

Method of Construction & Well Use

Method of Construction	Well Use

Status of Well

Construction Record - Casing

Inside Diameter	Open Hole or material	Depth From	Depth To

Construction Record - Screen

Outside Diameter	Material	Depth From	Depth To

Well Contractor and Well Technician Information

Well Contractor's Licence Number: 7681

Results of Well Yield Testing

After test of well yield, water was	
If pumping discontinued, give reason	
Pump intake set at	
Pumping Rate	
Duration of Pumping	
Final water level	
If flowing give rate	
Recommended pump depth	

Recommended pump rate	
Well Production	
Disinfected?	

Draw Down & Recovery

Draw Down Time(min)	**Draw Down Water level**	**Recovery Time(min)**	**Recovery Water level**
SWL			
1		1	
2		2	
3		3	
4		4	
5		5	
10		10	
15		15	
20		20	

25		25	
30		30	
40		40	
45		45	
50		50	
60		60	

Water Details

Water Found at Depth	Kind

Hole Diameter

Depth From	Depth To	Diameter

Audit Number: Z394718

Date Well Completed: December 05, 2022

Date Well Record Received by MOE: March 22, 2023

Related

How to use a Ministry of the Environment map (https://www.ontario.ca/page/how-use-ministry-environment-map#wells)

Technical documentation: Metadata record (https://data.ontario.ca/dataset/well-records/resource/3031344e-e3f2-48d5-888c-c1deadfd2f77)

Updated: January 10, 2024
Published: March 20, 2014

Map: Well records

This map allows you to search and view well record information from reported wells in Ontario.

Full dataset is available in the Open Data catalogue (https://data.ontario.ca/dataset/well-records) .

Go Back to Map

Well ID

Well ID Number: 7449812
Well Audit Number: *Z398982*
Well Tag Number: *A359642*
This table contains information from the original well record and any subsequent updates.

Well Location

Address of Well Location	
Township	RUSSELL TOWNSHIP
Lot	

Concession	
County/District/Municipality	RUSSELL
City/Town/Village	
Province	ON
Postal Code	n/a
UTM Coordinates	NAD83 — Zone 18 Easting: 471380.00 Northing: 5019077.00
Municipal Plan and Sublot Number	
Other	

Overburden and Bedrock Materials Interval

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To

Annular Space/Abandonment Sealing Record

Depth From	Depth To	Type of Sealant Used (Material and Type)	Volume Placed

Method of Construction & Well Use

Method of Construction	Well Use

Status of Well

Construction Record - Casing

Inside Diameter	Open Hole or material	Depth From	Depth To

Construction Record - Screen

Outside Diameter	Material	Depth From	Depth To

Well Contractor and Well Technician Information

Well Contractor's Licence Number: 7417

Results of Well Yield Testing

After test of well yield, water was	
If pumping discontinued, give reason	
Pump intake set at	
Pumping Rate	
Duration of Pumping	
Final water level	
If flowing give rate	
Recommended pump depth	

Recommended pump rate	
Well Production	
Disinfected?	

Draw Down & Recovery

Draw Down Time(min)	**Draw Down Water level**	**Recovery Time(min)**	**Recovery Water level**
SWL			
1		1	
2		2	
3		3	
4		4	
5		5	
10		10	
15		15	
20		20	

25		25	
30		30	
40		40	
45		45	
50		50	
60		60	

Water Details

Water Found at Depth	Kind

Hole Diameter

Depth From	Depth To	Diameter

Audit Number: Z398982

Date Well Completed: March 21, 2023

Date Well Record Received by MOE: April 25, 2023

Related

How to use a Ministry of the Environment map (https://www.ontario.ca/page/how-use-ministry-environment-map#wells)

Technical documentation: Metadata record (https://data.ontario.ca/dataset/well-records/resource/3031344e-e3f2-48d5-888c-c1deadfd2f77)

Updated: January 10, 2024
Published: March 20, 2014

Map: Well records

This map allows you to search and view well record information from reported wells in Ontario.

Full dataset is available in the Open Data catalogue (https://data.ontario.ca/dataset/well-records) .

Go Back to Map

Well ID

Well ID Number: 7449813
Well Audit Number: *Z398981*
Well Tag Number: *A359635*
This table contains information from the original well record and any subsequent updates.

Well Location

Address of Well Location	
Township	RUSSELL TOWNSHIP
Lot	

Concession	
County/District/Municipality	RUSSELL
City/Town/Village	
Province	ON
Postal Code	n/a
UTM Coordinates	NAD83 — Zone 18 Easting: 471314.00 Northing: 5018991.00
Municipal Plan and Sublot Number	
Other	

Overburden and Bedrock Materials Interval

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To

Annular Space/Abandonment Sealing Record

Depth From	Depth To	Type of Sealant Used (Material and Type)	Volume Placed

Method of Construction & Well Use

Method of Construction	Well Use

Status of Well

Construction Record - Casing

Inside Diameter	Open Hole or material	Depth From	Depth To

Construction Record - Screen

Outside Diameter	Material	Depth From	Depth To

Well Contractor and Well Technician Information

Well Contractor's Licence Number: 7417

Results of Well Yield Testing

After test of well yield, water was	
If pumping discontinued, give reason	
Pump intake set at	
Pumping Rate	
Duration of Pumping	
Final water level	
If flowing give rate	
Recommended pump depth	

Recommended pump rate	
Well Production	
Disinfected?	

Draw Down & Recovery

Draw Down Time(min)	**Draw Down Water level**	**Recovery Time(min)**	**Recovery Water level**
SWL			
1		1	
2		2	
3		3	
4		4	
5		5	
10		10	
15		15	
20		20	

25		25	
30		30	
40		40	
45		45	
50		50	
60		60	

Water Details

Water Found at Depth	Kind

Hole Diameter

Depth From	Depth To	Diameter

Audit Number: Z398981

Date Well Completed: March 21, 2023

Date Well Record Received by MOE: April 25, 2023

Related

How to use a Ministry of the Environment map (https://www.ontario.ca/page/how-use-ministry-environment-map#wells)

Technical documentation: Metadata record (https://data.ontario.ca/dataset/well-records/resource/3031344e-e3f2-48d5-888c-c1deadfd2f77)

Updated: January 10, 2024
Published: March 20, 2014

APPENDIX E

ECOLOG ERIS REPORT

ERIS

DATABASE
REPORT

Project Property:	*230216 - Phase I* *Lot 22 Concession 4* *Vars ON*
Project No:	*230216*
Report Type:	*Quote - Custom-Build Your Own Report*
Order No:	*24073000468*
Requested by:	*LRL Associates Ltd.*
Date Completed:	*July 31, 2024*

Environmental Risk Information Services
A division of Glacier Media Inc.
1.866.517.5204 | info@erisinfo.com | erisinfo.com

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Reliance on information in Report: This report DOES NOT replace a full Phase I Environmental Site Assessment but is solely intended to be used as a database review of environmental records.

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Executive Summary

Property Information:

Project Property:	*230216 - Phase I* *Lot 22 Concession 4 Vars ON*
Project No:	*230216*

Order Information:

Order No:	*24073000468*
Date Requested:	*July 30, 2024*
Requested by:	*LRL Associates Ltd.*
Report Type:	*Quote - Custom-Build Your Own Report*

Historical/Products:

Aerial Photographs	*Aerials - National Collection*
City Directory Search	*Smart CD Search*
ERIS Xplorer	*ERIS Xplorer*
Insurance Products	*Fire Insurance Maps/Inspection Reports/Site Plans*
Land Title Search	*Current Land Title Search*
Topographic Map	*Ontario Base Map (OBM)*

Executive Summary: Report Summary

Database	Name	Searched	Project Property	Boundary to 0.25km	Total
AAGR	***Abandoned Aggregate Inventory***	N	-	-	-
AGR	***Aggregate Inventory***	N	-	-	-
AMIS	***Abandoned Mine Information System***	N	-	-	-
ANDR	***Anderson's Waste Disposal Sites***	N	-	-	-
AST	***Aboveground Storage Tanks***	N	-	-	-
AUWR	***Automobile Wrecking & Supplies***	N	-	-	-
BORE	***Borehole***	N	-	-	-
CA	***Certificates of Approval***	Y	0	0	0
CDRY	***Dry Cleaning Facilities***	N	-	-	-
CFOT	***Commercial Fuel Oil Tanks***	N	-	-	-
CHEM	***Chemical Manufacturers and Distributors***	N	-	-	-
CHM	***Chemical Register***	N	-	-	-
CNG	***Compressed Natural Gas Stations***	N	-	-	-
COAL	***Inventory of Coal Gasification Plants and Coal Tar Sites***	N	-	-	-
CONV	***Compliance and Convictions***	N	-	-	-
CPU	***Certificates of Property Use***	N	-	-	-
DRL	***Drill Hole Database***	N	-	-	-
DTNK	***Delisted Fuel Tanks***	N	-	-	-
EASR	***Environmental Activity and Sector Registry***	N	-	-	-
EBR	***Environmental Registry***	Y	0	3	3
ECA	***Environmental Compliance Approval***	N	-	-	-
EEM	***Environmental Effects Monitoring***	N	-	-	-
EHS	***ERIS Historical Searches***	N	-	-	-
EIIS	***Environmental Issues Inventory System***	N	-	-	-
EMHE	***Emergency Management Historical Event***	N	-	-	-
EPAR	***Environmental Penalty Annual Report***	N	-	-	-
EXP	***List of Expired Fuels Safety Facilities***	N	-	-	-
FCON	***Federal Convictions***	N	-	-	-
FCS	***Contaminated Sites on Federal Land***	N	-	-	-
FOFT	***Fisheries & Oceans Fuel Tanks***	N	-	-	-
FRST	***Federal Identification Registry for Storage Tank Systems (FIRSTS)***	N	-	-	-
FST	***Fuel Storage Tank***	N	-	-	-
FSTH	***Fuel Storage Tank - Historic***	N	-	-	-
GEN	***Ontario Regulation 347 Waste Generators Summary***	Y	0	2	2
GHG	***Greenhouse Gas Emissions from Large Facilities***	N	-	-	-
HINC	***TSSA Historic Incidents***	N	-	-	-

Database	Name	Searched	Project Property	Boundary to 0.25km	Total
IAFT	***Indian & Northern Affairs Fuel Tanks***	*N*	-	-	-
INC	***Fuel Oil Spills and Leaks***	*N*	-	-	-
LIMO	***Landfill Inventory Management Ontario***	*N*	-	-	-
MINE	***Canadian Mine Locations***	*N*	-	-	-
MNR	***Mineral Occurrences***	*N*	-	-	-
NATE	***National Analysis of Trends in Emergencies System (NATES)***	*N*	-	-	-
NCPL	***Non-Compliance Reports***	*N*	-	-	-
NDFT	***National Defense & Canadian Forces Fuel Tanks***	*N*	-	-	-
NDSP	***National Defense & Canadian Forces Spills***	*N*	-	-	-
NDWD	***National Defence & Canadian Forces Waste Disposal Sites***	*N*	-	-	-
NEBI	***National Energy Board Pipeline Incidents***	*N*	-	-	-
NEBP	***National Energy Board Wells***	*N*	-	-	-
NEES	***National Environmental Emergencies System (NEES)***	*N*	-	-	-
NPCB	***National PCB Inventory***	*N*	-	-	-
NPR2	***National Pollutant Release Inventory 1993-2020***	*Y*	*0*	*0*	*0*
NPRI	***National Pollutant Release Inventory - Historic***	*N*	-	-	-
OGWE	***Oil and Gas Wells***	*N*	-	-	-
OOGW	***Ontario Oil and Gas Wells***	*N*	-	-	-
OPCB	***Inventory of PCB Storage Sites***	*Y*	*0*	*0*	*0*
ORD	***Orders***	*N*	-	-	-
PAP	***Canadian Pulp and Paper***	*N*	-	-	-
PCFT	***Parks Canada Fuel Storage Tanks***	*N*	-	-	-
PES	***Pesticide Register***	*N*	-	-	-
PFCH	***NPRI Reporters - PFAS Substances***	*N*	-	-	-
PFHA	***Potential PFAS Handlers from NPRI***	*N*	-	-	-
PINC	***Pipeline Incidents***	*N*	-	-	-
PRT	***Private and Retail Fuel Storage Tanks***	*Y*	*0*	*0*	*0*
PTTW	***Permit to Take Water***	*N*	-	-	-
REC	***Ontario Regulation 347 Waste Receivers Summary***	*N*	-	-	-
RSC	***Record of Site Condition***	*N*	-	-	-
RST	***Retail Fuel Storage Tanks***	*N*	-	-	-
SCT	***Scott's Manufacturing Directory***	*Y*	*0*	*0*	*0*
SPL	***Ontario Spills***	*Y*	*0*	*2*	*2*
SRDS	***Wastewater Discharger Registration Database***	*N*	-	-	-
TANK	***Anderson's Storage Tanks***	*N*	-	-	-
TCFT	***Transport Canada Fuel Storage Tanks***	*N*	-	-	-
VAR	***Variances for Abandonment of Underground Storage Tanks***	*N*	-	-	-
WDS	***Waste Disposal Sites - MOE CA Inventory***	*N*	-	-	-
WDSH	***Waste Disposal Sites - MOE 1991 Historical Approval Inventory***	*N*	-	-	-
WWIS	***Water Well Information System***	*N*	-	-	-

Database	*Name*	*Searched*	*Project Property*	*Boundary to 0.25km*	*Total*
		Total:	*0*	*7*	*7*

Executive Summary: Site Report Summary - Project Property

Map Key	*DB*	*Company/Site Name*	*Address*	*Dir/Dist (m)*	*Elev diff (m)*	*Page Number*

No records found in the selected databases for the project property.

Executive Summary: Site Report Summary - Surrounding Properties

Map Key	*DB*	*Company/Site Name*	*Address*	*Dir/Dist (m)*	*Elev Diff (m)*	*Page Number*
1	EBR	Belko Auto Body (1994) Ltd.	Parts of Lot 21 & 22, Concession 4 Russell, ON Canada ON	ESE/65.6	-3.31	14
2	EBR	Swar Signs Inc.	17 Paquet Street Township of Russell, ON K1B 5N1 Canada ON	ENE/114.7	-8.31	14
3	SPL		270 Corduroy Rd., Vars RUSSELL ON	ENE/172.0	-8.31	15
4	EBR	2806204 Ontario Ltd.	Part of Lot of 22, Concession 4 Russell, ON Canada ON	E/191.6	-7.31	15
5	SPL	Enbridge Gas Distribution Inc.	238 Corduroy Rd, Vars Ottawa ON	ENE/227.0	-8.31	16
5	GEN	Veritiv Canada Inc.	238 Corduroy Road Vars ON K0H 3H0	ENE/227.0	-8.31	17
5	GEN	Veritiv Canada Inc.	238 Corduroy Road Vars ON K0H 3H0	ENE/227.0	-8.31	17

Executive Summary: Summary By Data Source

EBR - Environmental Registry

A search of the EBR database, dated 1994 - Jun 30, 2024 has found that there are 3 EBR site(s) within approximately 0.25 kilometers of the project property.

Site	Address	Distance (m)	Map Key
Belko Auto Body (1994) Ltd.	Parts of Lot 21 & 22, Concession 4 Russell, ON Canada ON	65.6	1
Swar Signs Inc.	17 Paquet Street Township of Russell, ON K1B 5N1 Canada ON	114.7	2
2806204 Ontario Ltd.	Part of Lot of 22, Concession 4 Russell, ON Canada ON	191.6	4

GEN - Ontario Regulation 347 Waste Generators Summary

A search of the GEN database, dated 1986-Oct 31, 2022 has found that there are 2 GEN site(s) within approximately 0.25 kilometers of the project property.

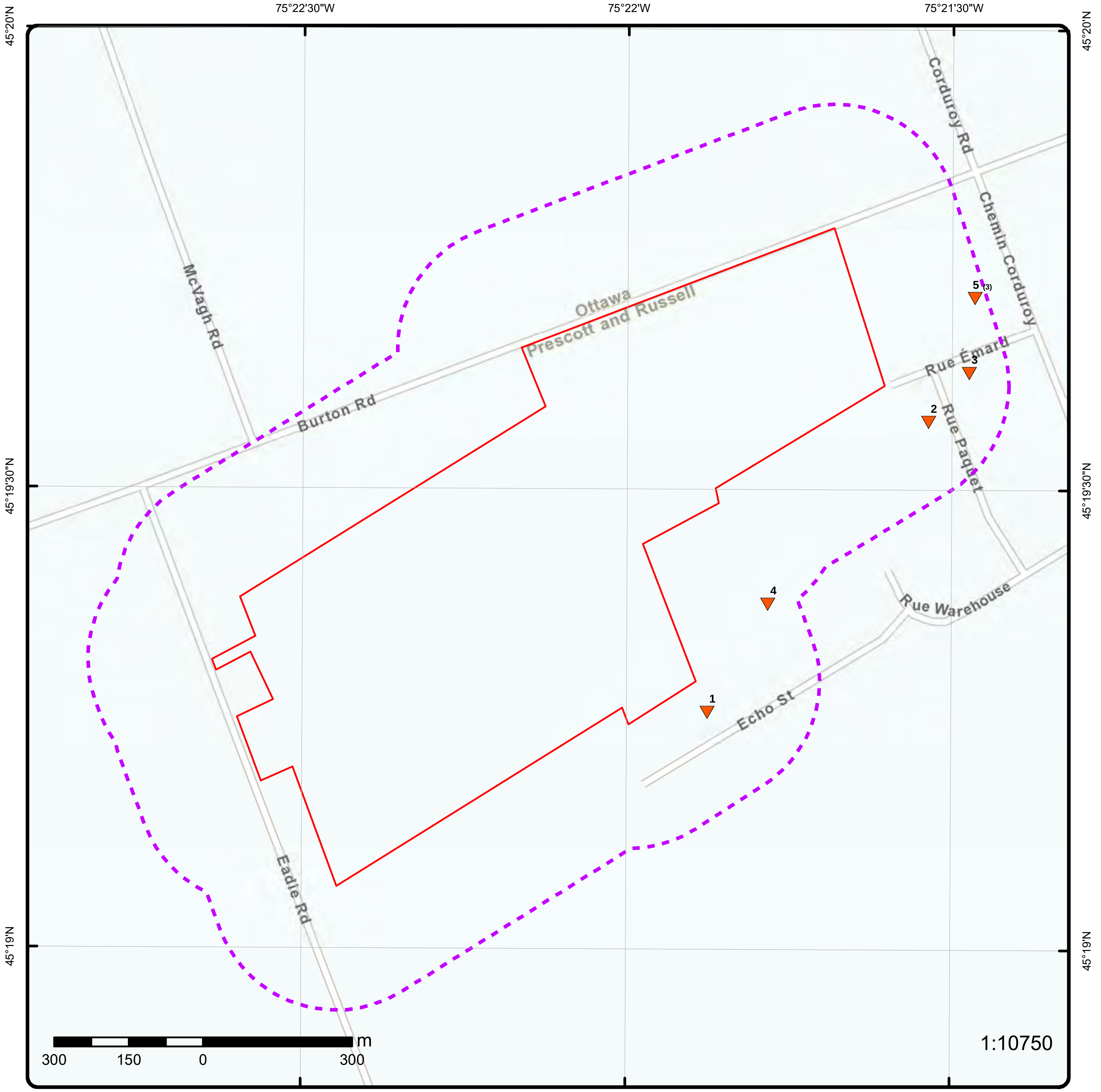
Site	Address	Distance (m)	Map Key
Veritiv Canada Inc.	238 Corduroy Road Vars ON K0H 3H0	227.0	5
Veritiv Canada Inc.	238 Corduroy Road Vars ON K0H 3H0	227.0	5

SPL - Ontario Spills

A search of the SPL database, dated 1988-Jan 2023; see description has found that there are 2 SPL site(s) within approximately 0.25 kilometers of the project property.

Site	Address	Distance (m)	Map Key
	270 Corduroy Rd., Vars RUSSELL ON	172.0	3

Site	Address	Distance (m)	Map Key
Enbridge Gas Distribution Inc.	238 Corduroy Rd, Vars Ottawa ON	227.0	5



Map: 0.25 Kilometer Radius

Order Number: 24073000468
Address: Lot 22 Concession 4, Vars, ON

▭ Project Property
⬚ Buffer Outline
△ Eris Sites with Higher Element
🟧 Eris Sites with Same Elevation
▼ Eris Sites with Lower Elevation
○ Eris Sites with Unknown Elevation

▬ Freeways; Highways
▬ Traffic Circle; Ramp
▬ Major Arterial; Minor Arterial
▭ Local Road
═ Service Road; Traffic Circle; Ramp
┼┼ Rail

▨ Beach
▨ Airport
▨ Industrial Area
▨ Military Base
▨ Aircraft Roads
▨ Native Reservation
▨ Hospital

▨ Shopping & Sports Area
▨ University/College
▨ Cemetery; Golf Course
▨ Parkt (National)
▨ Park (City/County)

Source: © 2021 ESRI StreetMap Premium.

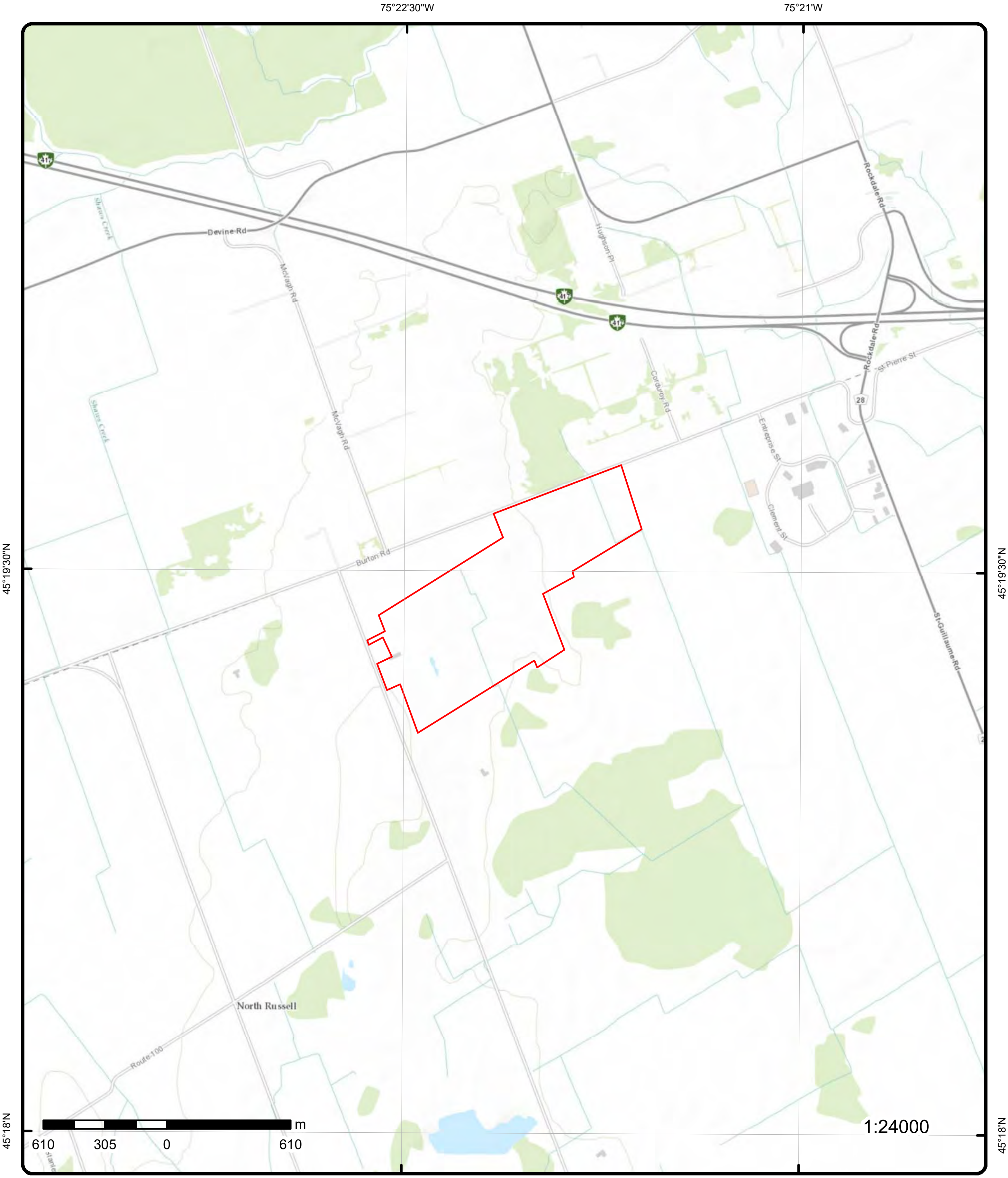
Aerial

Year: 2023

Order Number: 24073000468

Address: Lot 22 Concession 4, Vars, ON

Source: ESRI World Imagery



Topographic Map

Order Number: 24073000468

Address: Lot 22 Concession 4, ON

Source: ESRI World Topographic Map

Detail Report

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
1	1 of 1	ESE/65.6	79.9 / -3.31	***Belko Auto Body (1994) Ltd.*** ***Parts of Lot 21 & 22, Concession 4 Russell, ON Canada*** ***ON***	EBR

EBR Registry No:	019-3777	***Decision Posted:***	September 17, 2021
Ministry Ref No:	0490-BXXT8M	***Exception Posted:***	
Notice Type:	Instrument	***Section:***	Part II.1 (20.3 or 20.5)
Notice Stage:	Decision	***Act 1:***	Environmental Protection Act, R.S.O. 1990
Notice Date:		***Act 2:***	Environmental Protection Act
Proposal Date:	June 3, 2021	***Site Location Map:***	45.32095,-75.36459
Year:	2021		

Instrument Type:	Environmental Compliance Approval (sewage)
Off Instrument Name:	Environmental Compliance Approval (sewage) (OWRA s.53)
Posted By:	Ministry of the Environment, Conservation and Parks
Company Name:	
Site Address:	Parts of Lot 21 & 22, Concession 4 Russell, ON Canada
Location Other:	
Proponent Name:	Belko Auto Body (1994) Ltd.
Proponent Address:	Belko Auto Body (1994) Ltd. 1090 Cummings Avenue Ottawa, ON K1J 7R8 Canada
Comment Period:	June 3, 2021 - July 18, 2021 (45 days) Closed
URL:	https://ero.ontario.ca/notice/019-3777

Site Location Details:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
2	1 of 1	ENE/114.7	74.9 / -8.31	***Swar Signs Inc.*** ***17 Paquet Street Township of Russell, ON K1B 5N1 Canada*** ***ON***	EBR

EBR Registry No:	019-0898	***Decision Posted:***	April 7, 2020
Ministry Ref No:	5361-BGKLLM	***Exception Posted:***	
Notice Type:	Instrument	***Section:***	
Notice Stage:	Decision	***Act 1:***	Environmental Protection Act, R.S.O. 1990
Notice Date:		***Act 2:***	
Proposal Date:	November 22, 2019	***Site Location Map:***	45.326869,-75.358641
Year:	2019		

Instrument Type:	Environmental Compliance Approval (multiple media)
Off Instrument Name:	
Posted By:	Ministry of the Environment, Conservation and Parks
Company Name:	
Site Address:	17 Paquet Street Township of Russell, ON K1B 5N1 Canada
Location Other:	
Proponent Name:	Swar Signs Inc.
Proponent Address:	2212 Gladwin Crescent Unit A9 Ottawa, ON K1B 5N1 Canada
Comment Period:	November 22, 2019 - January 6, 2020 (45 days) Closed
URL:	https://ero.ontario.ca/notice/019-0898

Site Location Details:

Concession 5, Lot 22

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
3	1 of 1	ENE/172.0	74.9 / -8.31	270 Corduroy Rd., Vars RUSSELL ON	SPL

Ref No: 1-1O3GGM
Year:
Incident Dt: 3/10/2022 1:00:00 PM
Dt MOE Arvl on Scn:
MOE Reported Dt: 3/10/2022 2:58:06 PM
Dt Document Closed:
Site No:
MOE Response: Desktop Response
Site County/District:
Site Geo Ref Meth:
Site District Office: Cornwall Area Office
Nearest Watercourse:
Site Name:
Site Address: 270 Corduroy Rd., Vars
Site Region: UNITED COUNTIES OF PRESCOTT AND RUSSELL
Site Municipality: RUSSELL
Site Lot:
Site Conc:
Site Geo Ref Accu:
Site Map Datum:
Northing:
Easting:
Incident Cause:
Incident Preceding Spill: Leak/Break
Environment Impact: 1 Minor Impact
Health Env Consequence:
Nature of Impact:
Contaminant Qty: 60 litre (L)
System Facility Address:
Client Name: JACK LARABIE DISTRIBUTION INC.
Client Type: Private Business
Source Type: Truck - Transport/Hauling
Contaminant Code:
Contaminant Name: ENGINE OIL
Contaminant Limit 1:
Contam Limit Freq 1:
Contaminant UN No 1:
Receiving Medium: Land
Incident Reason:
Incident Summary: Russell Township: 50-60L oil from truck to ground; cleaning
Activity Preceding Spill: Loading and Unloading
Property 2nd Watershed: Lower Ottawa
Property Tertiary Watershed: 02LA - Rideau
Sector Type: GENERAL FREIGHT TRUCKING, LOCAL
SAC Action Class:
Call Report Locatn Geodata: {"integration_ids":["PR00003794084"],"wkts":["POINT (-75.3563017000 45.3272953000)"],"creation_date":"2022-03-10"}

Municipality No:
Nature of Damage:
Discharger Report:
Material Group:
Impact to Health: 0 No Impact
Agency Involved:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
4	1 of 1	E/191.6	75.9 / -7.31	2806204 Ontario Ltd. Part of Lot of 22, Concession 4 Russell, ON Canada ON	EBR

EBR Registry No: 019-4503
Ministry Ref No: 7406-C7BKTG
Notice Type: Instrument
Notice Stage: Decision
Notice Date:
Proposal Date: October 18, 2021
Year: 2021

Decision Posted: August 15, 2022
Exception Posted:
Section: Part II.1 (20.3 or 20.5)
Act 1: Environmental Protection Act, R.S.O. 1990
Act 2: Environmental Protection Act
Site Location Map: 45.32292,-75.36304

Instrument Type: Environmental Compliance Approval (sewage)
Off Instrument Name: Environmental Compliance Approval (sewage) (OWRA s.53)
Posted By: Ministry of the Environment, Conservation and Parks
Company Name:
Site Address:

Part of Lot of 22, Concession 4
Russell,
ON
Canada

Location Other:
Proponent Name: 2806204 Ontario Ltd.
Proponent Address:

2806204 Ontario Ltd.
2320 Stevenage Drive
Ottawa,
ON
K1G 3W3
Canada

Comment Period: October 18, 2021 - December 2, 2021 (45 days) Closed
URL: https://ero.ontario.ca/notice/019-4503

Site Location Details:

5	***1 of 3***	***ENE/227.0***	***74.9 / -8.31***	***Enbridge Gas Distribution Inc. 238 Corduroy Rd, Vars Ottawa ON***	***SPL***

Ref No: 5022-A2ML7K
Year:
Incident Dt: 9/23/2015
Dt MOE Arvl on Scn:
MOE Reported Dt: 9/23/2015
Dt Document Closed: 11/27/2015
Site No: NA
MOE Response: No
Site County/District:
Site Geo Ref Meth:
Site District Office:
Nearest Watercourse:
Site Name: Enbridge - 1 " gasline<UNOFFICIAL>
Site Address: 238 Corduroy Rd, Vars
Site Region:
Site Municipality: Ottawa
Site Lot:
Site Conc:
Site Geo Ref Accu:
Site Map Datum:
Northing:
Easting:
Incident Cause:
Incident Preceding Spill:
Environment Impact:
Health Env Consequence:
Nature of Impact:
Contaminant Qty: 0 other - see incident description
System Facility Address:
Client Name: Enbridge Gas Distribution Inc.
Client Type:
Source Type:
Contaminant Code: 35
Contaminant Name: NATURAL GAS (METHANE)
Contaminant Limit 1:
Contam Limit Freq 1:
Contaminant UN No 1:
Receiving Medium:

Municipality No:
Nature of Damage:
Discharger Report:
Material Group:
Impact to Health:
Agency Involved:

Incident Reason: Operator/Human Error
Incident Summary: TSSA/Enbridge: 1 " IP gasline damage
Activity Preceding Spill:
Property 2nd Watershed:
Property Tertiary Watershed:
Sector Type: Unknown / N/A
SAC Action Class: TSSA - Fuel Safety Branch - Hydrocarbon Fuel Release/Spill
Call Report Locatn Geodata:

5	***2 of 3***	***ENE/227.0***	***74.9 / -8.31***	***Veritiv Canada Inc. 238 Corduroy Road Vars ON K0H 3H0***	***GEN***

Generator No: ON4640256
SIC Code:
SIC Description:
Approval Years: As of Jul 2020
PO Box No:
Country: Canada
Status: Registered
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 145 L
Waste Class Name: Wastes from the use of pigments, coatings and paints

Waste Class: 135 C
Waste Class Name: Wastes containing other reactive anions

Waste Class: 263 C
Waste Class Name: Misc. waste organic chemicals

Waste Class: 114 C
Waste Class Name: Other inorganic acid wastes

Waste Class: 148 C
Waste Class Name: Misc. wastes and inorganic chemicals

Waste Class: 331 I
Waste Class Name: Waste compressed gases including cylinders

Waste Class: 262 L
Waste Class Name: Detergents and soaps

5	***3 of 3***	***ENE/227.0***	***74.9 / -8.31***	***Veritiv Canada Inc. 238 Corduroy Road Vars ON K0H 3H0***	***GEN***

Generator No: ON4640256
SIC Code:
SIC Description:
Approval Years: As of Nov 2021
PO Box No:
Country: Canada
Status: Registered
Co Admin:
Choice of Contact:

Phone No Admin:
Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class: 148 C
Waste Class Name: Misc. wastes and inorganic chemicals

Waste Class: 145 L
Waste Class Name: Wastes from the use of pigments, coatings and paints

Waste Class: 262 L
Waste Class Name: Detergents and soaps

Waste Class: 114 C
Waste Class Name: Other inorganic acid wastes

Waste Class: 263 C
Waste Class Name: Misc. waste organic chemicals

Waste Class: 135 C
Waste Class Name: Wastes containing other reactive anions

Waste Class: 263 L
Waste Class Name: Misc. waste organic chemicals

Waste Class: 262 C
Waste Class Name: Detergents and soaps

Waste Class: 331 I
Waste Class Name: Waste compressed gases including cylinders

Unplottable Summary

Total: 3 Unplottable sites

DB	Company Name/Site Name	Address	City	Postal
PRT		LOT 22 CON V	RUSSELL TWP ON	
SPL	ONTARIO HYDRO	LOT 22,CONC 5. TRANSFORMER	RUSSELL TOWNSHIP ON	
SPL	GFL Environmental Inc.	Corduroy Rd Lot 22 Concession 5 Parts 1 and 2 of Reference Plan 50R-10055	Russell ON	K0A 3H0

Unplottable Report

Site: **Database:** **PRT**

LOT 22 CON V   RUSSELL TWP ON

Location ID:	12591
Type:	retail
Expiry Date:	
Capacity (L):	
Licence #:	

Site: **ONTARIO HYDRO** **Database:** **SPL**

LOT 22,CONC 5. TRANSFORMER RUSSELL TOWNSHIP ON

Ref No:	102903	**Municipality No:**	67611
Year:		**Nature of Damage:**	
Incident Dt:	7/18/1994	**Discharger Report:**	
Dt MOE Arvl on Scn:		**Material Group:**	
MOE Reported Dt:	7/18/1994	**Impact to Health:**	
Dt Document Closed:		**Agency Involved:**	

Site No:	
MOE Response:	
Site County/District:	
Site Geo Ref Meth:	
Site District Office:	
Nearest Watercourse:	
Site Name:	
Site Address:	
Site Region:	
Site Municipality:	RUSSELL TOWNSHIP
Site Lot:	
Site Conc:	
Site Geo Ref Accu:	
Site Map Datum:	
Northing:	
Easting:	
Incident Cause:	COOLING SYSTEM LEAK
Incident Preceding Spill:	
Environment Impact:	NOT ANTICIPATED
Health Env Consequence:	
Nature of Impact:	
Contaminant Qty:	
System Facility Address:	
Client Name:	
Client Type:	
Source Type:	
Contaminant Code:	
Contaminant Name:	
Contaminant Limit 1:	
Contam Limit Freq 1:	
Contaminant UN No 1:	
Receiving Medium:	LAND
Incident Reason:	OTHER
Incident Summary:	ONTARIO HYDRO-10 L NON- PCB TRANSFORMER OIL TO GROUND,CLEANED-UP.
Activity Preceding Spill:	
Property 2nd Watershed:	
Property Tertiary Watershed:	
Sector Type:	
SAC Action Class:	
Call Report Locatn Geodata:	

Site: ***GFL Environmental Inc.***
Corduroy Rd Lot 22 Concession 5 Parts 1 and 2 of Reference Plan 50R-10055 Russell ON K0A 3H0

Database: **SPL**

Ref No: 8651-AY7JLU
Year:
Incident Dt: 2018/04/25
Dt MOE Arvl on Scn:
MOE Reported Dt: 2018/04/26
Dt Document Closed:

Municipality No:
Nature of Damage:
Discharger Report:
Material Group:
Impact to Health: 4 - Medium Environment
Agency Involved:

Site No: 4095-97RJSF
MOE Response: No
Site County/District: United Counties of Prescott and Russell
Site Geo Ref Meth: NA
Site District Office: Cornwall
Nearest Watercourse:
Site Name: Russell 417 Industrial Park Waste Transfer and Processing Site
Site Address: Corduroy Rd Lot 22 Concession 5 Parts 1 and 2 of Reference Plan 50R-10055
Site Region: Eastern
Site Municipality: Russell
Site Lot:
Site Conc: NA
Site Geo Ref Accu: NA
Site Map Datum: NA
Northing: NA
Easting: NA
Incident Cause:
Incident Preceding Spill: Fire/Explosion
Environment Impact:
Health Env Consequence:
Nature of Impact:
Contaminant Qty: 0 other - see incident description
System Facility Address:
Client Name: GFL Environmental Inc.
Client Type: Corporation
Source Type: Waste Disposal Site
Contaminant Code: 46
Contaminant Name: DOUSE WATER (PARTICULATE CONTAMINANT)
Contaminant Limit 1:
Contam Limit Freq 1:
Contaminant UN No 1: n/a
Receiving Medium: Air; Land
Incident Reason: Unknown / N/A
Incident Summary: GFL: fire, delayed reporting
Activity Preceding Spill:
Property 2nd Watershed:
Property Tertiary Watershed:
Sector Type: Miscellaneous Industrial
SAC Action Class: Air Spills - Fires
Call Report Locatn Geodata:

Appendix: Database Descriptions

Environmental Risk Information Services (ERIS) can search the following databases. The extent of historical information varies with each database and current information is determined by what is publicly available to ERIS at the time of update. ***Note:*** *Databases denoted with " * " indicates that the database will no longer be updated. See the individual database description for more information.*

Abandoned Aggregate Inventory: Provincial AAGR

The MAAP Program maintains a database of abandoned pits and quarries. Please note that the database is only referenced by lot and concession and city/town location. The database provides information regarding the location, type, size, land use, status and general comments.*

Government Publication Date: Sept 2002*

Aggregate Inventory: Provincial AGR

This database of licensed and permitted pits and quarries is maintained by the Ontario Ministry of Natural Resources and Forestry (MNRF), as regulated under the Aggregate Resources Act, R.S.O. 1990. Aggregate site data has been divided into active and inactive sites. Active sites may be further subdivided into partial surrenders. In partial surrenders, defined areas of a site are inactive while the rest of the site remains active.

Government Publication Date: Up to Nov 2023

Abandoned Mine Information System: Provincial AMIS

The Abandoned Mines Information System contains data on known abandoned and inactive mines located on both Crown and privately held lands. The information was provided by the Ministry of Northern Development and Mines (MNDM), with the following disclaimer: "the database provided has been compiled from various sources, and the Ministry of Northern Development and Mines makes no representation and takes no responsibility that such information is accurate, current or complete". Reported information includes official mine name, status, background information, mine start/end date, primary commodity, mine features, hazards and remediation.

Government Publication Date: 1800-Apr 2024

Anderson's Waste Disposal Sites: Private ANDR

The information provided in this database was collected by examining various historical documents which aimed to characterize the likely position of former waste disposal sites from 1860 to present. The research initiative behind the creation of this database was to identify those sites that are missing from the Ontario MOE Waste Disposal Site Inventory, as well as to provide revisions and corrections to the positions and descriptions of sites currently listed in the MOE inventory. In addition to historic waste disposal facilities, the database also identifies certain auto wreckers and scrap yards that have been extrapolated from documentary sources. Please note that the data is not warranted to be complete, exhaustive or authoritative. The information was collected for research purposes only.

Government Publication Date: 1860s-Present

Aboveground Storage Tanks: Provincial AST

Historical listing of aboveground storage tanks made available by the Department of Natural Resources and Forestry. Includes tanks used to hold water or petroleum. This dataset has been retired as of September 25, 2014 and will no longer be updated.

Government Publication Date: May 31, 2014

Automobile Wrecking & Supplies: Private AUWR

This database provides an inventory of known locations that are involved in the scrap metal, automobile wrecking/recycling, and automobile parts & supplies industry. Information is provided on the company name, location and business type.

Government Publication Date: 1999-Apr 30, 2024

Borehole: Provincial BORE

A borehole is the generalized term for any narrow shaft drilled in the ground, either vertically or horizontally. The information here includes geotechnical investigations or environmental site assessments, mineral exploration, or as a pilot hole for installing piers or underground utilities. Information is from many sources such as the Ministry of Transportation (MTO) boreholes from engineering reports and projects from the 1950 to 1990's in Southern Ontario. Boreholes from the Ontario Geological Survey (OGS) including The Urban Geology Analysis Information System (UGAIS) and the York Peel Durham Toronto (YPDT) database of the Conservation Authority Moraine Coalition. This database will include fields such as location, stratigraphy, depth, elevation, year drilled, etc. For all water well data or oil and gas well data for Ontario please refer to WWIS and OOGW.

Government Publication Date: 1875-Jul 2018

Certificates of Approval: Provincial CA

This database contains the following types of approvals: Air & Noise, Industrial Sewage, Municipal & Private Sewage, Waste Management Systems and Renewable Energy Approvals. The MOE in Ontario states that any facility that releases emissions to the atmosphere, discharges contaminants to ground or surface water, provides potable water supplies, or stores, transports or disposes of waste, must have a Certificate of Approval before it can operate lawfully. Fields include approval number, business name, address, approval date, approval type and status. This database will no longer be updated, as CofA's have been replaced by either Environmental Activity and Sector Registry (EASR) or Environmental Compliance Approval (ECA). Please refer to those individual databases for any information after Oct.31, 2011.

Government Publication Date: 1985-Oct 30, 2011*

Dry Cleaning Facilities: Federal CDRY

List of dry cleaning facilities made available by Environment and Climate Change Canada. Environment and Climate Change Canada's Tetrachloroethylene (Use in Dry Cleaning and Reporting Requirements) Regulations (SOR/2003-79) are intended to reduce releases of tetrachloroethylene to the environment from dry cleaning facilities.

Government Publication Date: Jan 2004-Dec 2022

Commercial Fuel Oil Tanks: Provincial CFOT

Locations of commercial underground fuel oil tanks. This is not a comprehensive or complete inventory of commercial fuel tanks in the province; this listing is a copy of records of registered commercial underground fuel oil tanks obtained under Access to Public Information.
Note that the following types of tanks do not require registration: waste oil tanks in apartments, office buildings, residences, etc.; aboveground gas or diesel tanks. Records are not verified for accuracy or completeness.

Government Publication Date: Oct 2023

Chemical Manufacturers and Distributors: Private CHEM

This database includes information from both a one time study conducted in 1992 and private source and is a listing of facilities that manufacture or distribute chemicals. The production of these chemical substances may involve one or more chemical reactions and/or chemical separation processes (i.e. fractionation, solvent extraction, crystallization, etc.).

Government Publication Date: 1999-Jan 31, 2020

Chemical Register: Private CHM

This database includes a listing of locations of facilities within the Province or Territory that either manufacture and/or distributes chemicals.

Government Publication Date: 1999-Apr 30, 2024

Compressed Natural Gas Stations: Private CNG

Canada has a network of public access compressed natural gas (CNG) refuelling stations. These stations dispense natural gas in compressed form at 3,000 pounds per square inch (psi), the pressure which is allowed within the current Canadian codes and standards. The majority of natural gas refuelling is located at existing retail gasoline that have a separate refuelling island for natural gas. This list of stations is made available by the Canadian Natural Gas Vehicle Alliance.

Government Publication Date: Dec 2012 -May 2024

Inventory of Coal Gasification Plants and Coal Tar Sites: Provincial COAL

This inventory includes both the "Inventory of Coal Gasification Plant Waste Sites in Ontario-April 1987" and the Inventory of Industrial Sites Producing or Using Coal Tar and Related Tars in Ontario-November 1988) collected by the MOE. It identifies industrial sites that produced and continue to produce or use coal tar and other related tars. Detailed information is available and includes: facility type, size, land use, information on adjoining properties, soil condition, site operators/occupants, site description, potential environmental impacts and historic maps available. This was a one-time inventory.*

Government Publication Date: Apr 1987 and Nov 1988*

Compliance and Convictions: Provincial CONV

This database summarizes the fines and convictions handed down by the Ontario courts beginning in 1989. Companies and individuals named here have been found guilty of environmental offenses in Ontario courts of law.

Government Publication Date: 1989-May 2024

Certificates of Property Use: Provincial CPU

This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include CPU's on the registry such as (EPA s. 168.6) - Certificate of Property Use.

Government Publication Date: 1994 - Jun 30, 2024

Drill Hole Database: Provincial DRL

The Ontario Drill Hole Database contains information on more than 113,000 percussion, overburden, sonic and diamond drill holes from assessment files on record with the department of Mines and Minerals. Please note that limited data is available for southern Ontario, as it was the last area to be completed. The database was created when surveys submitted to the Ministry were converted in the Assessment File Research Image Database (AFRI) project. However, the degree of accuracy (coordinates) as to the exact location of drill holes is dependent upon the source document submitted to the MNDM. Levels of accuracy used to locate holes are: centering on the mining claim; a sketch of the mining claim; a 1:50,000 map; a detailed company map; or from submitted a "Report of Work".

Government Publication Date: 1886 - Aug 2023

Delisted Fuel Tanks: Provincial DTNK

List of fuel storage tank sites that were once found in - and have since been removed from - the list of fuel storage tanks made available by the regulatory agency under Access to Public Information.

Government Publication Date: Oct 2023

Environmental Activity and Sector Registry: Provincial EASR

On October 31, 2011, a smarter, faster environmental approvals system came into effect in Ontario. The EASR allows businesses to register certain activities with the ministry, rather than apply for an approval. The registry is available for common systems and processes, to which preset rules of operation can be applied. The EASR is currently available for: heating systems, standby power systems and automotive refinishing. Businesses whose activities aren't subject to the EASR may apply for an ECA (Environmental Compliance Approval), Please see our ECA database.

Government Publication Date: Oct 2011-Apr 30, 2024

Environmental Registry: Provincial EBR

The Environmental Registry lists proposals, decisions and exceptions regarding policies, Acts, instruments, or regulations that could significantly affect the environment. Through the Registry, thirteen provincial ministries notify the public of upcoming proposals and invite their comments. For example, if a local business is requesting a permit, license, or certificate of approval to release substances into the air or water; these are notified on the registry. Data includes: Approval for discharge into the natural environment other than water (i.e. Air) - EPA s. 9, Approval for sewage works - OWRA s. 53(1), and EPA s. 27 - Approval for a waste disposal site. For information regarding Permit to Take Water (PTTW), Certificate of Property Use (CPU) and (ORD) Orders please refer to those individual databases.

Government Publication Date: 1994 - Jun 30, 2024

Environmental Compliance Approval: Provincial ECA

On October 31, 2011, a smarter, faster environmental approvals system came into effect in Ontario. In the past, a business had to apply for multiple approvals (known as certificates of approval) for individual processes and pieces of equipment. Today, a business either registers itself, or applies for a single approval, depending on the types of activities it conducts. Businesses whose activities aren't subject to the EASR may apply for an ECA. A single ECA addresses all of a business's emissions, discharges and wastes. Separate approvals for air, noise and waste are no longer required. This database will also include Renewable Energy Approvals. For certificates of approval prior to Nov 1st, 2011, please refer to the CA database. For all Waste Disposal Sites please refer to the WDS database.

Government Publication Date: Oct 2011-Apr 30, 2024

Environmental Effects Monitoring: Federal EEM

The Environmental Effects Monitoring program assesses the effects of effluent from industrial or other sources on fish, fish habitat and human usage of fisheries resources. Since 1992, pulp and paper mills have been required to conduct EEM studies under the Pulp and Paper Effluent Regulations. This database provides information on the mill name, geographical location and sub-lethal toxicity data.

Government Publication Date: 1992-2007*

ERIS Historical Searches: Private EHS

ERIS has compiled a database of all environmental risk reports completed since March 1999. Available fields for this database include: site location, date of report, type of report, and search radius. As per all other databases, the ERIS database can be referenced on both the map and "Statistical Profile" page.

Government Publication Date: 1999-Mar 31, 2024

Environmental Issues Inventory System: Federal EIIS

The Environmental Issues Inventory System was developed through the implementation of the Environmental Issues and Remediation Plan. This plan was established to determine the location and severity of contaminated sites on inhabited First Nation reserves, and where necessary, to remediate those that posed a risk to health and safety; and to prevent future environmental problems. The EIIS provides information on the reserve under investigation, inventory number, name of site, environmental issue, site action (Remediation, Site Assessment), and date investigation completed.

Government Publication Date: 1992-2001*

Emergency Management Historical Event:

Provincial EMHE

List of locations of historical occurrences of emergency events, including those assigned to the Ministry of Natural Resources by Order-In-Council (OIC) under the Emergency Management and Civil Protection Act, as well as events where MNR provided requested emergency response assistance. Many of these events will have involved community evacuations, significant structural loss, and/or involvement of MNR emergency response staff. These events fall into one of ten (10) type categories: Dam Failure; Drought / Low Water; Erosion; Flood; Forest Fire; Soil and Bedrock Instability; Petroleum Resource Center Event, EMO Requested Assistance, Continuity of Operations Event, Other Requested Assistance. EMHE record details are reproduced by ERIS under License with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2017.

Government Publication Date: Apr 30, 2022

Environmental Penalty Annual Report:

Provincial EPAR

This database contains data from Ontario's annual environmental penalty report published by the Ministry of the Environment and Climate Change. These reports provide information on environmental penalties for land or water violations issued to companies in one of the nine industrial sectors covered by the Municipal Industrial Strategy for Abatement (MISA) regulations.

Government Publication Date: Jan 1, 2011 - Dec 31, 2023

List of Expired Fuels Safety Facilities:

Provincial EXP

List of facilities and tanks for which there was once a fuel registration. This is not a comprehensive or complete inventory of expired tanks/tank facilities in the province; this listing is a copy of previously registered tanks and facilities obtained under Access to Public Information. Includes private fuel outlets, bulk plants, fuel oil tanks, gasoline stations, marinas, propane filling stations, liquid fuel tanks, piping systems, etc; includes tanks which have been removed from the ground.
Notes: registration was not required for private fuel underground/aboveground storage tanks prior to January 1990, nor for furnace oil tanks prior to May 1, 2002; registration is not required for waste oil tanks in apartments, office buildings, residences, etc., or aboveground gas or diesel tanks. Records are not verified for accuracy or completeness.

Government Publication Date: Oct 2023

Federal Convictions:

Federal FCON

Environment Canada maintains a database referred to as the "Environmental Registry" that details prosecutions under the Canadian Environmental Protection Act (CEPA) and the Fisheries Act (FA). Information is provided on the company name, location, charge date, offence and penalty.

Government Publication Date: 1988-Jun 2007*

Contaminated Sites on Federal Land:

Federal FCS

The Federal Contaminated Sites Inventory includes information on known federal contaminated sites under the custodianship of departments, agencies and consolidated Crown corporations as well as those that are being or have been investigated to determine whether they have contamination arising from past use that could pose a risk to human health or the environment. The inventory also includes non-federal contaminated sites for which the Government of Canada has accepted some or all financial responsibility. It does not include sites where contamination has been caused by, and which are under the control of, enterprise Crown corporations, private individuals, firms or other levels of government. Includes fire training sites and sites at which Per- and Polyfluoroalkyl Substances (PFAS) are a concern.

Government Publication Date: Jun 2000-Jun 2024

Fisheries & Oceans Fuel Tanks:

Federal FOFT

Fisheries & Oceans Canada maintains an inventory of aboveground & underground fuel storage tanks located on Fisheries & Oceans property or controlled by DFO. Our inventory provides information on the site name, location, tank owner, tank operator, facility type, storage tank location, tank contents & capacity, and date of tank installation.

Government Publication Date: 1964-Sep 2019

Federal Identification Registry for Storage Tank Systems (FIRSTS):

Federal FRST

A list of federally regulated Storage tanks from the Federal Identification Registry for Storage Tank Systems (FIRSTS). FIRSTS is Environment and Climate Change Canada's database of storage tank systems subject to the Storage Tank for Petroleum Products and Allied Petroleum Products Regulations. The main objective of the Regulations is to prevent soil and groundwater contamination from storage tank systems located on federal and aboriginal lands. Storage tank systems that do not have a valid identification number displayed in a readily visible location on or near the storage tank system may be refused product delivery.

Government Publication Date: Oct 31, 2021

Fuel Storage Tank:

Provincial FST

List of registered private and retail fuel storage tanks. This is not a comprehensive or complete inventory of private and retail fuel storage tanks in the province; this listing is a copy of registered private and retail fuel storage tanks, obtained under Access to Public Information.
Notes: registration was not required for private fuel underground/aboveground storage tanks prior to January 1990, nor for furnace oil tanks prior to May 1, 2002; registration is not required for waste oil tanks in apartments, office buildings, residences, etc., or aboveground gas or diesel tanks. Records are not verified for accuracy or completeness.

Government Publication Date: Oct 2023

Fuel Storage Tank - Historic:

Provincial FSTH

The Fuels Safety Branch of the Ontario Ministry of Consumer and Commercial Relations maintained a database of all registered private fuel storage tanks. Public records of private fuel storage tanks are only available since the registration became effective in September 1989. This information is now collected by the Technical Standards and Safety Authority.

Government Publication Date: Pre-Jan 2010*

Ontario Regulation 347 Waste Generators Summary:

Provincial GEN

Regulation 347 of the Ontario EPA defines a waste generation site as any site, equipment and/or operation involved in the production, collection, handling and/or storage of regulated wastes. A generator of regulated waste is required to register the waste generation site and each waste produced, collected, handled, or stored at the site. This database contains the registration number, company name and address of registered generators including the types of hazardous wastes generated. It includes data on waste generating facilities such as: drycleaners, waste treatment and disposal facilities, machine shops, electric power distribution etc. This information is a summary of all years from 1986 including the most currently available data. Some records may contain, within the company name, the phrase "See & Use..." followed by a series of letters and numbers. This occurs when one company is amalgamated with or taken over by another registered company. The number listed as "See & Use", refers to the new ownership and the other identification number refers to the original ownership. This phrase serves as a link between the 2 companies until operations have been fully transferred.

Government Publication Date: 1986-Oct 31, 2022

Greenhouse Gas Emissions from Large Facilities:

Federal GHG

List of greenhouse gas emissions from large facilities made available by Environment Canada. Greenhouse gas emissions in kilotonnes of carbon dioxide equivalents (kt CO2 eq).

Government Publication Date: 2013-Dec 2022

TSSA Historic Incidents:

Provincial HINC

List of historic incidences of spills and leaks of diesel, fuel oil, gasoline, natural gas, propane, and hydrogen recorded by the TSSA in their previous incident tracking system. The TSSA's Fuels Safety Program administers the Technical Standards & Safety Act 2000, providing fuel-related safety services associated with the safe transportation, storage, handling and use of fuels such as gasoline, diesel, propane, natural gas and hydrogen. Under this Act, the TSSA regulates fuel suppliers, storage facilities, transport trucks, pipelines, contractors and equipment or appliances that use fuels. Records are not verified for accuracy or completeness. This is not a comprehensive or complete inventory of historical fuel spills and leaks in the province. This listing is a copy of the data captured at one moment in time and is hence limited by the record date provided here.

Government Publication Date: 2006-June 2009*

Indian & Northern Affairs Fuel Tanks:

Federal IAFT

The Department of Indian & Northern Affairs Canada (INAC) maintains an inventory of aboveground & underground fuel storage tanks located on both federal and crown land. Our inventory provides information on the reserve name, location, facility type, site/facility name, tank type, material & ID number, tank contents & capacity, and date of tank installation.

Government Publication Date: 1950-Aug 2003*

Fuel Oil Spills and Leaks:

Provincial INC

Listing of spills and leaks of diesel, fuel oil, gasoline, natural gas, propane, and hydrogen reported to the Spills Action Centre (SAC). This is not a comprehensive or complete inventory of fuel-related leaks, spills, and incidents in the province; this listing in a copy of incidents reported to the SAC, obtained under Access to Public Information. Includes incidents from fuel-related hazards such as spills, fires, and explosions. Records are not verified for accuracy or completeness.

Government Publication Date: 31 Oct, 2023

Landfill Inventory Management Ontario:

Provincial LIMO

The Landfill Inventory Management Ontario (LIMO) database is updated every year, as the Ministry of the Environment, Conservation and Parks compiles new and updated information. Includes small and large landfills currently operating as well as those which are closed and historic. Operators of larger landfills provide landfill information for the previous operating year to the ministry for LIMO including: estimated amount of total waste received, landfill capacity, estimated total remaining landfill capacity, fill rates, engineering designs, reporting and monitoring details, size of location, service area, approved waste types, leachate of site treatment, contaminant attenuation zone and more. The small landfills include information such as site owner, site location and certificate of approval # and status.

Government Publication Date: Mar 31, 2022

Canadian Mine Locations:

Private MINE

This information is collected from the Canadian & American Mines Handbook. The Mines database is a national database that provides over 290 listings on mines (listed as public companies) dealing primarily with precious metals and hard rocks. Listed are mines that are currently in operation, closed, suspended, or are still being developed (advanced projects). Their locations are provided as geographic coordinates (x, y and/or longitude, latitude). As of 2002, data pertaining to Canadian smelters and refineries has been appended to this database.

Government Publication Date: 1998-2009*

Mineral Occurrences:

Provincial MNR

In the early 70's, the Ministry of Northern Development and Mines created an inventory of approximately 19,000 mineral occurrences in Ontario, in regard to metallic and industrial minerals, as well as some information on building stones and aggregate deposits. Please note that the "Horizontal Positional Accuracy" is approximately +/- 200 m. Many reference elements for each record were derived from field sketches using pace or chain/tape measurements against claim posts or topographic features in the area. The primary limiting factor for the level of positional accuracy is the scale of the source material. The testing of horizontal accuracy of the source materials was accomplished by comparing the plan metric (X and Y) coordinates of that point with the coordinates of the same point as defined from a source of higher accuracy.

Government Publication Date: 1846-Feb 2024

National Analysis of Trends in Emergencies System (NATES):

Federal NATE

In 1974 Environment Canada established the National Analysis of Trends in Emergencies System (NATES) database, for the voluntary reporting of significant spill incidents. The data was to be used to assist in directing the work of the emergencies program. NATES ran from 1974 to 1994. Extensive information is available within this database including company names, place where the spill occurred, date of spill, cause, reason and source of spill, damage incurred, and amount, concentration, and volume of materials released.

Government Publication Date: 1974-1994*

Non-Compliance Reports:

Provincial NCPL

The Ministry of the Environment provides information about non-compliant discharges of contaminants to air and water that exceed legal allowable limits, from regulated industrial and municipal facilities. A reported non-compliance failure may be in regard to a Control Order, Certificate of Approval, Sectoral Regulation or specific regulation/act.

Government Publication Date: Dec 31, 2022

National Defense & Canadian Forces Fuel Tanks:

Federal NDFT

The Department of National Defense and the Canadian Forces maintains an inventory of all aboveground & underground fuel storage tanks located on DND lands. Our inventory provides information on the base name, location, tank type & capacity, tank contents, tank class, date of tank installation, date tank last used, and status of tank as of May 2001. This database will no longer be updated due to the new National Security protocols which have prohibited any release of this database.

Government Publication Date: Up to May 2001*

National Defense & Canadian Forces Spills:

Federal NDSP

The Department of National Defense and the Canadian Forces maintains an inventory of spills to land and water. All spill sites have been classified under the "Transportation of Dangerous Goods Act - 1992". Our inventory provides information on the facility name, location, spill ID #, spill date, type of spill, as well as the quantity of substance spilled & recovered.

Government Publication Date: Mar 1999-Nov 2023

National Defence & Canadian Forces Waste Disposal Sites:

Federal NDWD

The Department of National Defence and the Canadian Forces maintains an inventory of waste disposal sites located on DND lands. Where available, our inventory provides information on the base name, location, type of waste received, area of site, depth of site, year site opened/closed and status.

Government Publication Date: 2001-Apr 2007*

National Energy Board Pipeline Incidents:

Federal NEBI

Locations of pipeline incidents from 2008 to present, made available by the Canada Energy Regulator (CER) - previously the National Energy Board (NEB). Includes incidents reported under the Onshore Pipeline Regulations and the Processing Plant Regulations related to pipelines under federal jurisdiction, does not include incident data related to pipelines under provincial or territorial jurisdiction.

Government Publication Date: 2008-Jun 30, 2021

National Energy Board Wells:

Federal NEBP

The NEBW database contains information on onshore & offshore oil and gas wells that are outside provincial jurisdiction(s) and are thereby regulated by the National Energy Board. Data is provided regarding the operator, well name, well ID No./UWI, status, classification, well depth, spud and release date.

Government Publication Date: 1920-Feb 2003*

National Environmental Emergencies System (NEES): Federal NEES

In 2000, the Emergencies program implemented NEES, a reporting system for spills of hazardous substances. For the most part, this system only captured data from the Atlantic Provinces, some from Quebec and Ontario and a portion from British Columbia. Data for Alberta, Saskatchewan, Manitoba and the Territories was not captured. However, NEES is also a repository for previous Environment Canada spill datasets. NEES is composed of the historic datasets ' or Trends ' which dates from approximately 1974 to present. NEES Trends is a compilation of historic databases, which were merged and includes data from NATES (National Analysis of Trends in Emergencies System), ARTS (Atlantic Regional Trends System), and NEES. In 2001, the Emergencies Program determined that variations in reporting regimes and requirements between federal and provincial agencies made national spill reporting and trend analysis difficult to achieve. As a consequence, the department has focused efforts on capturing data on spills of substances which fall under its legislative authority only (CEPA and FA). As such, the NEES database will be decommissioned in December 2004.

Government Publication Date: 1974-2003*

National PCB Inventory: Federal NPCB

Environment Canada's National PCB inventory includes information on in-use PCB containing equipment in Canada including federal, provincial and private facilities. Federal out-of-service PCB containing equipment and PCB waste owned by the federal government or by federally regulated industries such as airlines, railway companies, broadcasting companies, telephone and telecommunications companies, pipeline companies, etc. are also listed. Although it is not Environment Canada's mandate to collect data on non-federal PCB waste, the National PCB inventory includes some information on provincial and private PCB waste and storage sites. Some addresses provided may be Head Office addresses and are not necessarily the location of where the waste is being used or stored.

Government Publication Date: 1988-2008*

National Pollutant Release Inventory 1993-2020: Federal NPR2

The National Pollutant Release Inventory (NPRI) is Canada's public inventory of pollutant releases (to air, water and land), disposals, and transfers for recycling. The inventory, managed by Environment and Climate Change Canada, tracks over 300 substances. Under the authority of the Canadian Environmental Protection Act (CEPA), owners or operators of facilities that meet published reporting requirements are required to report to the NPRI.

Government Publication Date: Sep 2020

National Pollutant Release Inventory - Historic: Federal NPRI

Environment Canada has defined the National Pollutant Release Inventory ("NPRI") as a federal government initiative designed to collect comprehensive national data regarding releases to air, water, or land, and waste transfers for recycling for more than 300 listed substances. This data holds historic records; current records are found in NPR2.

Government Publication Date: 1993-May 2017

Oil and Gas Wells: Private OGWE

The Nickle's Energy Group (publisher of the Daily Oil Bulletin) collects information on drilling activity including operator and well statistics. The well information database includes name, location, class, status and depth. The main Nickle's database is updated on a daily basis, however, this database is updated on a monthly basis. More information is available at www.nickles.com.

Government Publication Date: 1988-May 31, 2024

Ontario Oil and Gas Wells: Provincial OOGW

In 1998, the MNR handed over to the Ontario Oil, Gas and Salt Resources Corporation, the responsibility of maintaining a database of oil and gas wells drilled in Ontario. The OGSR Library has over 20,000+ wells in their database. Information available for all wells in the ERIS database include well owner/operator, location, permit issue date, and well cap date, license No., status, depth and the primary target (rock unit) of the well being drilled. All geology/stratigraphy table information, plus all water table information is also provide for each well record.

Government Publication Date: 1800-Aug 2023

Inventory of PCB Storage Sites: Provincial OPCB

The Ontario Ministry of Environment, Waste Management Branch, maintains an inventory of PCB storage sites within the province. Ontario Regulation 11/82 (Waste Management - PCB) and Regulation 347 (Generator Waste Management) under the Ontario EPA requires the registration of inactive PCB storage equipment and/or disposal sites of PCB waste with the Ontario Ministry of Environment. This database contains information on: 1) waste quantities; 2) major and minor sites storing liquid or solid waste; and 3) a waste storage inventory.

Government Publication Date: 1987-Oct 2004; 2012-Dec 2013

Orders: Provincial ORD

This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include Orders on the registry such as (EPA s. 17) - Order for remedial work, (EPA s. 18) - Order for preventative measures, (EPA s. 43) - Order for removal of waste and restoration of site, (EPA s. 44) - Order for conformity with Act for waste disposal sites, (EPA s. 136) - Order for performance of environmental measures.

Government Publication Date: 1994 - Jun 30, 2024

Canadian Pulp and Paper: Private PAP

This information is part of the Pulp and Paper Canada Directory. The Directory provides a comprehensive listing of the locations of pulp and paper mills and the products that they produce.

Government Publication Date: 1999, 2002, 2004, 2005, 2009-2014

Parks Canada Fuel Storage Tanks: Federal PCFT

Canadian Heritage maintains an inventory of known fuel storage tanks operated by Parks Canada, in both National Parks and at National Historic Sites. The database details information on site name, location, tank install/removal date, capacity, fuel type, facility type, tank design and owner/operator.

Government Publication Date: 1920-Jan 2005*

Pesticide Register: Provincial PES

The Ontario Ministry of the Environment and Climate Change maintains a database of licensed operators and vendors of registered pesticides.

Government Publication Date: Oct 2011-Apr 30, 2024

NPRI Reporters - PFAS Substances: Federal PFCH

The National Pollutant Release Inventory (NPRI) is Canada's public inventory of releases, disposals, and transfers, tracking over 320 pollutants. Per - and polyfluoroalkyl substances (PFAS) are a group of over 4,700 human-made substances for which adverse environmental and health effects have been observed. This listing of PFAS substance reporters includes those NPRI facilities that reported substances that are found in either: a) the Comprehensive Global Database of PFASs compiled by the Organisation for Economic Co-operation and Development (OECD), b) the US Environmental Protection Agency (US EPA) Master List of PFAS Substances, c) the US EPA list of PFAS chemicals without explicit structures, or d) the US EPA list of PFAS structures (encompassing the largest set of structures having sufficient levels of fluorination to potentially impart PFAS-type properties).

Government Publication Date: Sep 2020

Potential PFAS Handlers from NPRI: Federal PFHA

The National Pollutant Release Inventory (NPRI) is Canada's public inventory of releases, disposals, and transfers, tracking over 320 pollutants. Per - and polyfluoroalkyl substances (PFAS) are a group of over 4,700 human-made substances for which adverse environmental and health effects have been observed. This list of potential PFAS handlers includes those NPRI facilities that reported business activity (NAICS code) included in the US Environmental Protection Agency (US EPA) list of Potential PFAS-Handling Industry Sectors, further described as operating in industry sectors where literature reviews indicate that PFAS may be handled and/or released. Inclusion of a facility in this listing does not indicate that PFAS are being manufactured, processed, used, or released by the facility - these are facilities that potentially handle PFAS based on their industrial profile.

Government Publication Date: Sep 2020

Pipeline Incidents: Provincial PINC

List of pipeline incidents (strikes, leaks, spills). This is not a comprehensive or complete inventory of pipeline incidents in the province; this listing in an historical copy of records previously obtained under Access to Public Information. Records are not verified for accuracy or completeness.

Government Publication Date: Feb 28, 2021

Private and Retail Fuel Storage Tanks: Provincial PRT

The Fuels Safety Branch of the Ontario Ministry of Consumer and Commercial Relations maintained a database of all registered private fuel storage tanks and licensed retail fuel outlets. This database includes an inventory of locations that have gasoline, oil, waste oil, natural gas and/or propane storage tanks on their property. The MCCR no longer collects this information. This information is now collected by the Technical Standards and Safety Authority (TSSA).

Government Publication Date: 1989-1996*

Permit to Take Water: Provincial PTTW

This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include PTTW's on the registry such as OWRA s. 34 - Permit to take water.

Government Publication Date: 1994 - Jun 30, 2024

Ontario Regulation 347 Waste Receivers Summary: Provincial REC

Part V of the Ontario Environmental Protection Act ("EPA") regulates the disposal of regulated waste through an operating waste management system or a waste disposal site operated or used pursuant to the terms and conditions of a Certificate of Approval or a Provisional Certificate of Approval. Regulation 347 of the Ontario EPA defines a waste receiving site as any site or facility to which waste is transferred by a waste carrier. A receiver of regulated waste is required to register the waste receiving facility. This database represents registered receivers of regulated wastes, identified by registration number, company name and address, and includes receivers of waste such as: landfills, incinerators, transfer stations, PCB storage sites, sludge farms and water pollution control plants. This information is a summary of all years from 1986 including the most currently available data.

Government Publication Date: 1986-1990, 1992-2021

Record of Site Condition:

Provincial RSC

The Record of Site Condition (RSC) is part of the Ministry of the Environment's Brownfields Environmental Site Registry. Protection from environmental cleanup orders for property owners is contingent upon documentation known as a record of site condition (RSC) being filed in the Environmental Site Registry. In order to file an RSC, the property must have been properly assessed and shown to meet the soil, sediment and groundwater standards appropriate for the use (such as residential) proposed to take place on the property. The Record of Site Condition Regulation (O. Reg. 153/04) details requirements related to site assessment and clean up. RSCs filed after July 1, 2011 will also be included as part of the new (O.Reg. 511/09). The Government of Ontario states that it is not responsible for the accuracy of the information in this Registry.

Government Publication Date: 1997-Sept 2001, Oct 2004-Jun 2024

Retail Fuel Storage Tanks:

Private RST

This database includes an inventory of retail fuel outlet locations (including marinas) that have on their property gasoline, oil, waste oil, natural gas and / or propane storage tanks.

Government Publication Date: 1999-Apr 30, 2024

Scott's Manufacturing Directory:

Private SCT

Scott's Directories is a data bank containing information on over 200,000 manufacturers across Canada. Even though Scott's listings are voluntary, it is the most comprehensive database of Canadian manufacturers available. Information concerning a company's address, plant size, and main products are included in this database.

Government Publication Date: 1992-Mar 2011*

Ontario Spills:

Provincial SPL

List of spills and incidents made available by the Ministry of the Environment, Conservation and Parks. This database identifies information such as location (approximate), type and quantity of contaminant, date of spill, environmental impact, cause, nature of impact, etc. Information from 1988-2002 was part of the ORIS (Occurrence Reporting Information System). The SAC (Spills Action Centre) handles all spills reported in Ontario. Regulations for spills in Ontario are part of the MOE's Environmental Protection Act, Part X. The Ministry of the Environment, Conservation and Parks cites the coronavirus pandemic as an explanation for delays in releasing data pursuant to requests. This database includes spill incidents that occurred in Mar 2023-Mar 2024, May 2024 in addition to those listed in the Government Publication Date.

Government Publication Date: 1988-Jan 2023; see description

Wastewater Discharger Registration Database:

Provincial SRDS

Facilities that report either municipal treated wastewater effluent or industrial wastewater discharges under the Effluent Monitoring and Effluent Limits (EMEL) and Municipal/Industrial Strategy for Abatement Regulations. The Municipal/Industrial Strategy for Abatement (MISA) division of the Ontario Ministry of Environment keeps record of direct dischargers of toxic pollutants within nine sectors including: Electric Power Generation, Mining, Petroleum Refining, Organic Chemicals, Inorganic Chemicals, Pulp & Paper, Metal Casting, Iron & Steel, and Quarries.

Government Publication Date: 1990-Dec 31, 2021

Anderson's Storage Tanks:

Private TANK

The information provided in this database was collected by examining various historical documents, which identified the location of former storage tanks, containing substances such as fuel, water, gas, oil, and other various types of miscellaneous products. Information is available in regard to business operating at tank site, tank location, permit year, permit & installation type, no. of tanks installed & configuration and tank capacity. Data contained within this database pertains only to the city of Toronto and is not warranted to be complete, exhaustive or authoritative. The information was collected for research purposes only.

Government Publication Date: 1915-1953*

Transport Canada Fuel Storage Tanks:

Federal TCFT

List of fuel storage tanks currently or previously owned or operated by Transport Canada. This inventory also includes tanks on The Pickering Lands, which refers to 7,530 hectares (18,600 acres) of land in Pickering, Markham, and Uxbridge owned by the Government of Canada since 1972; properties on this land has been leased by the government since 1975, and falls under the Site Management Policy of Transport Canada, but is administered by Public Works and Government Services Canada. This inventory provides information on the site name, location, tank age, capacity and fuel type.

Government Publication Date: 1970 - Apr 2023

Variances for Abandonment of Underground Storage Tanks:

Provincial VAR

Listing of variances granted for storage tank abandonment. This is not a comprehensive or complete inventory of tank abandonment variances in the province; this listing is a copy of tank abandonment variance records previously obtained under Access to Public Information. In Ontario, registered underground storage tanks must be removed within two years of disuse; if removal of a tank is not feasible, an application may be sought for a variance from this code requirement.

Records are not verified for accuracy or completeness.

Government Publication Date: Feb 28, 2022

Waste Disposal Sites - MOE CA Inventory: Provincial WDS

The Ontario Ministry of Environment, Waste Management Branch, maintains an inventory of known open (active or inactive) and closed disposal sites in the Province of Ontario. Active sites maintain a Certificate of Approval, are approved to receive and are receiving waste. Inactive sites maintain Certificate(s) of Approval but are not receiving waste. Closed sites are not receiving waste. The data contained within this database was compiled from the MOE's Certificate of Approval database. Locations of these sites may be cross-referenced to the Anderson database described under ERIS's Private Source Database section, by the CA number. All new Environmental Compliance Approvals handed out after Oct 31, 2011 for Waste Disposal Sites will still be found in this database.

Government Publication Date: Oct 2011-Apr 30, 2024

Waste Disposal Sites - MOE 1991 Historical Approval Inventory: Provincial WDSH

In June 1991, the Ontario Ministry of Environment, Waste Management Branch, published the "June 1991 Waste Disposal Site Inventory", of all known active and closed waste disposal sites as of October 30st, 1990. For each "active" site as of October 31st 1990, information is provided on site location, site/CA number, waste type, site status and site classification. For each "closed" site as of October 31st 1990, information is provided on site location, site/CA number, closure date and site classification. Locations of these sites may be cross-referenced to the Anderson database described under ERIS's Private Source Database section, by the CA number.

Government Publication Date: Up to Oct 1990*

Water Well Information System: Provincial WWIS

This database describes locations and characteristics of water wells found within Ontario in accordance with Regulation 903. It includes such information as coordinates, construction date, well depth, primary and secondary use, pump rate, static water level, well status, etc. Also included are detailed stratigraphy information, approximate depth to bedrock and the approximate depth to the water table.

Government Publication Date: Dec 31 2023

Definitions

Database Descriptions: This section provides a detailed explanation for each database including: source, information available, time coverage, and acronyms used. They are listed in alphabetic order.

Detail Report: This is the section of the report which provides the most detail for each individual record. Records are summarized by location, starting with the project property followed by records in closest proximity.

Distance: The distance value is the distance between plotted points, not necessarily the distance between the sites' boundaries. All values are an approximation.

Direction: The direction value is the compass direction of the site in respect to the project property and/or center point of the report.

Elevation: The elevation value is taken from the location at which the records for the site address have been plotted. All values are an approximation. Source: Google Elevation API.

Executive Summary: This portion of the report is divided into 3 sections:

'Report Summary'- Displays a chart indicating how many records fall on the project property and, within the report search radii.

'Site Report Summary'-Project Property'- This section lists all the records which fall on the project property. For more details, see the 'Detail Report' section.

'Site Report Summary-Surrounding Properties'- This section summarizes all records on adjacent properties, listing them in order of proximity from the project property. For more details, see the 'Detail Report' section.

Map Key: The map key number is assigned according to closest proximity from the project property. Map Key numbers always start at #1. The project property will always have a map key of '1' if records are available. If there is a number in brackets beside the main number, this will indicate the number of records on that specific property. If there is no number in brackets, there is only one record for that property.

The symbol and colour used indicates 'elevation': the red inverted triangle will dictate 'ERIS Sites with Lower Elevation', the yellow triangle will dictate 'ERIS Sites with Higher Elevation' and the orange square will dictate 'ERIS Sites with Same Elevation.'

Unplottables: These are records that could not be mapped due to various reasons, including limited geographic information. These records may or may not be in your study area, and are included as reference.

APPENDIX F

AERIAL PHOTOGRAPHS

LRL

ENGINEERING | INGENIERIE

5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

PROJECT

PHASE I ENVIRONMENTAL SITE ASSESSMENT
417 VARS INDUSTRIAL PARK - PHASE 3
TOWNSHIP OF RUSSELL, ONTARIO

DRAWING TITLE

AERIAL PHOTOGRAPH 1946
SOURCE: NATIONAL AIR PHOTO LIBRARY
(NOT TO SCALE)

CLIENT

RUSSELL TOWNSHIP

DATE

AUGUST 2024

PROJECT

230216

AP1

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ENGINEERING | INGENIERIE
5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

PROJECT

PHASE I ENVIRONMENTAL SITE ASSESSMENT
417 VARS INDUSTRIAL PARK - PHASE 3
TOWNSHIP OF RUSSELL, ONTARIO

DRAWING TITLE

AERIAL PHOTOGRAPH 1955
SOURCE: NATIONAL AIR PHOTO LIBRARY
(NOT TO SCALE)

CLIENT

RUSSELL TOWNSHIP

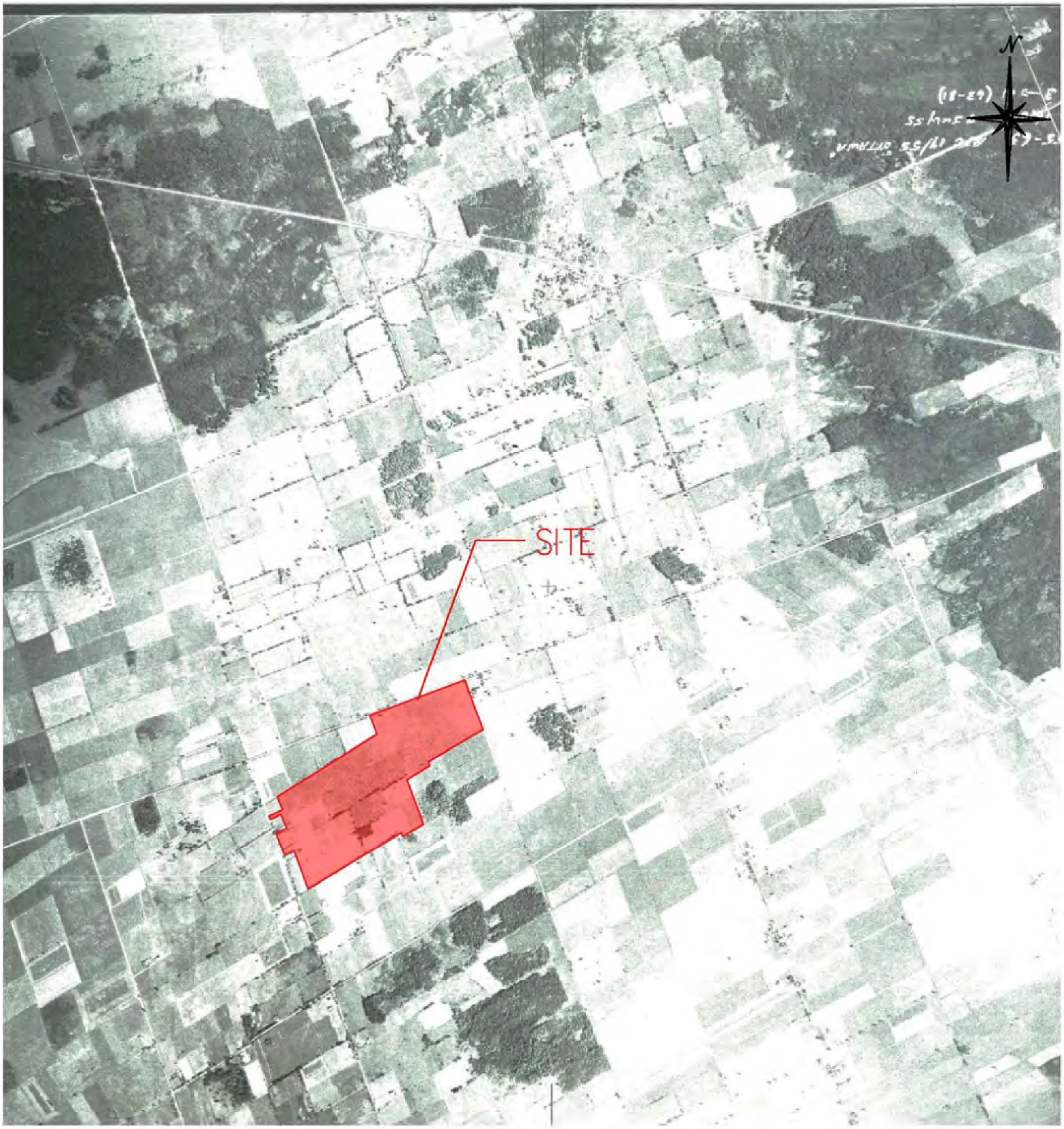
DATE

AUGUST 2024

PROJECT

230216

AP2



LRL

ENGINEERING | INGENIERIE

5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

PROJECT

PHASE I ENVIRONMENTAL SITE ASSESSMENT
417 VARS INDUSTRIAL PARK - PHASE 3
TOWNSHIP OF RUSSELL, ONTARIO

DRAWING TITLE

AERIAL PHOTOGRAPH 1966
SOURCE: NATIONAL AIR PHOTO LIBRARY
(NOT TO SCALE)

CLIENT	DATE	PROJECT	
RUSSELL TOWNSHIP	AUGUST 2024	230216	AP3

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ENGINEERING | INGENIERIE
5430 Canotek Road | Ottawa, ON, K1J 9G2
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PROJECT

PHASE I ENVIRONMENTAL SITE ASSESSMENT
417 VARS INDUSTRIAL PARK - PHASE 3
TOWNSHIP OF RUSSELL, ONTARIO

DRAWING TITLE

AERIAL PHOTOGRAPH 1976
SOURCE: GEOOTTAWA
(NOT TO SCALE)

CLIENT

RUSSELL TOWNSHIP

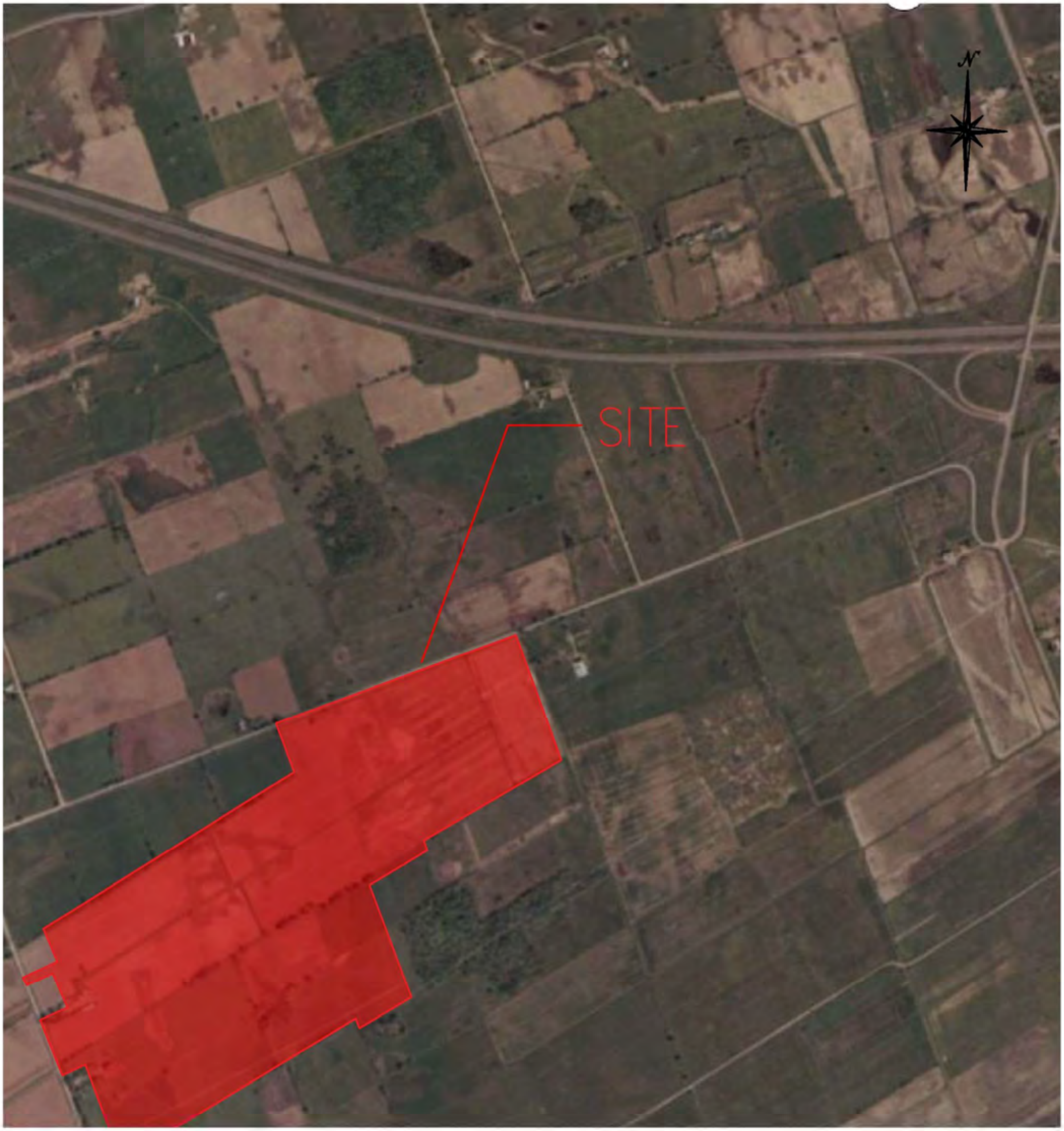
DATE

AUGUST 2024

PROJECT

230216

AP4



LRL

ENGINEERING | INGENIERIE

5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

PROJECT

PHASE I ENVIRONMENTAL SITE ASSESSMENT
417 VARS INDUSTRIAL PARK - PHASE 3
TOWNSHIP OF RUSSELL, ONTARIO

DRAWING TITLE

AERIAL PHOTOGRAPH 1983
SOURCE: NATIONAL AIR PHOTO LIBRARY
(NOT TO SCALE)

CLIENT	DATE	PROJECT	
RUSSELL TOWNSHIP	AUGUST 2024	230216	AP5

ENGINEERING | INGENIERIE

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PROJECT

PHASE I ENVIRONMENTAL SITE ASSESSMENT
417 VARS INDUSTRIAL PARK - PHASE 3
TOWNSHIP OF RUSSELL, ONTARIO

DRAWING TITLE

AERIAL PHOTOGRAPH 1999
SOURCE: GEOOTTAWA
(NOT TO SCALE)

CLIENT

RUSSELL TOWNSHIP

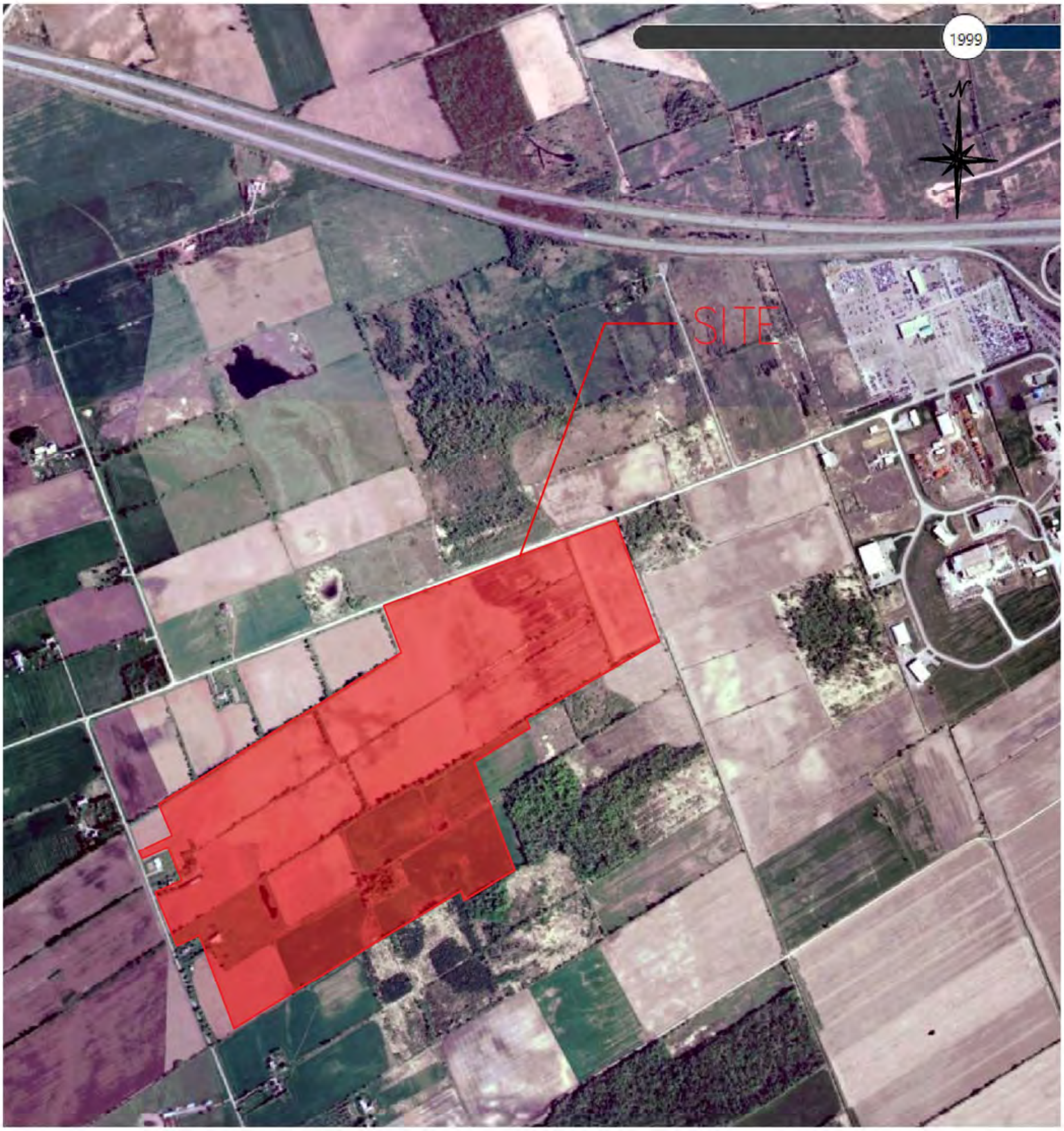
DATE

AUGUST 2024

PROJECT

230216

AP6



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www.lrl.ca | (613) 842-3434

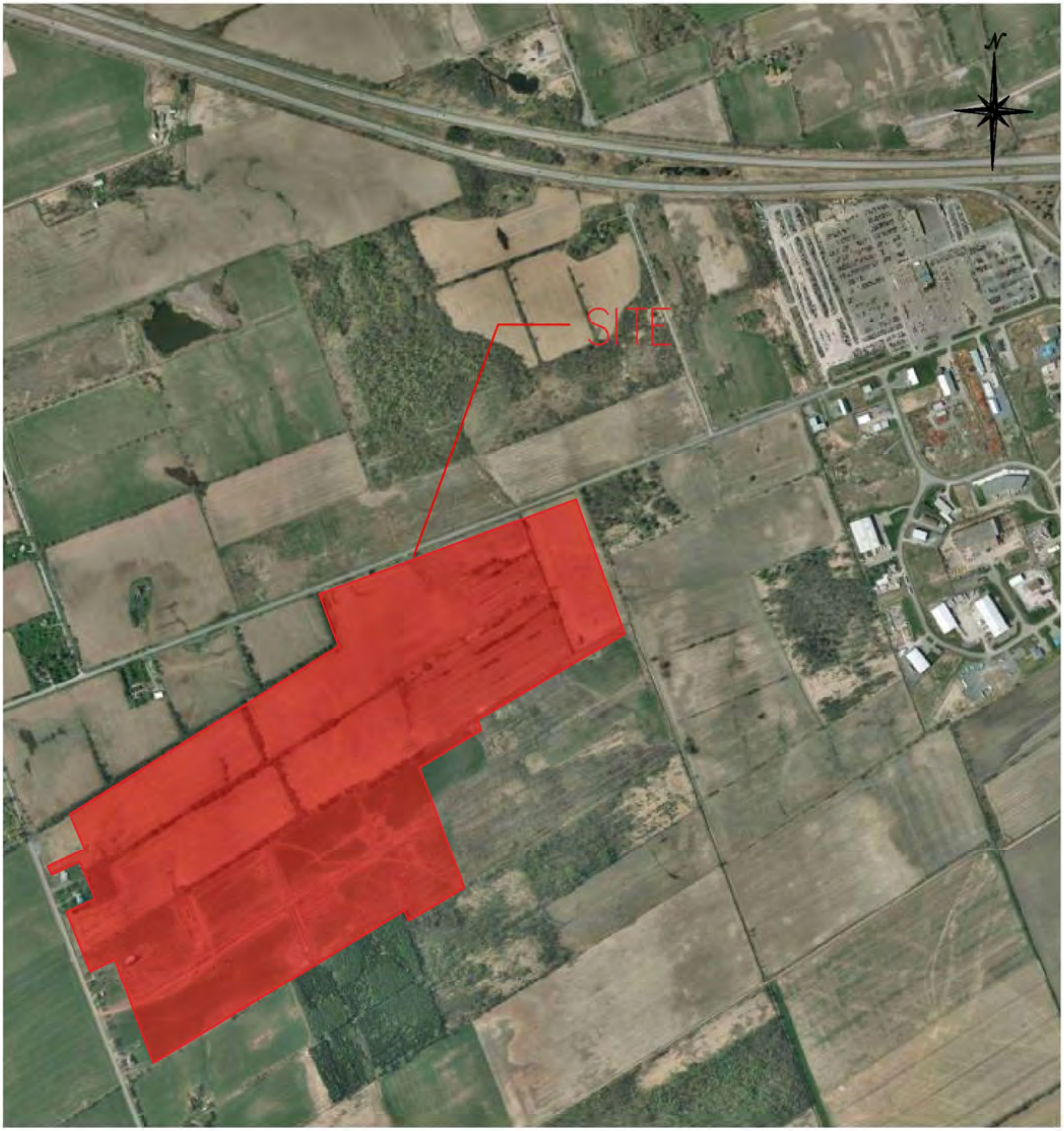
PROJECT

PHASE I ENVIRONMENTAL SITE ASSESSMENT
417 VARS INDUSTRIAL PARK - PHASE 3
TOWNSHIP OF RUSSELL, ONTARIO

DRAWING TITLE

AERIAL PHOTOGRAPH 2011
SOURCE: GEOOTTAWA
(NOT TO SCALE)

CLIENT	DATE	PROJECT	
RUSSELL TOWNSHIP	AUGUST 2024	230216	AP7



LRL
ENGINEERING | INGENIERIE
5430 Canotek Road | Ottawa, ON, K1J 9G2
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PROJECT

PHASE I ENVIRONMENTAL SITE ASSESSMENT
417 VARS INDUSTRIAL PARK - PHASE 3
TOWNSHIP OF RUSSELL, ONTARIO

DRAWING TITLE

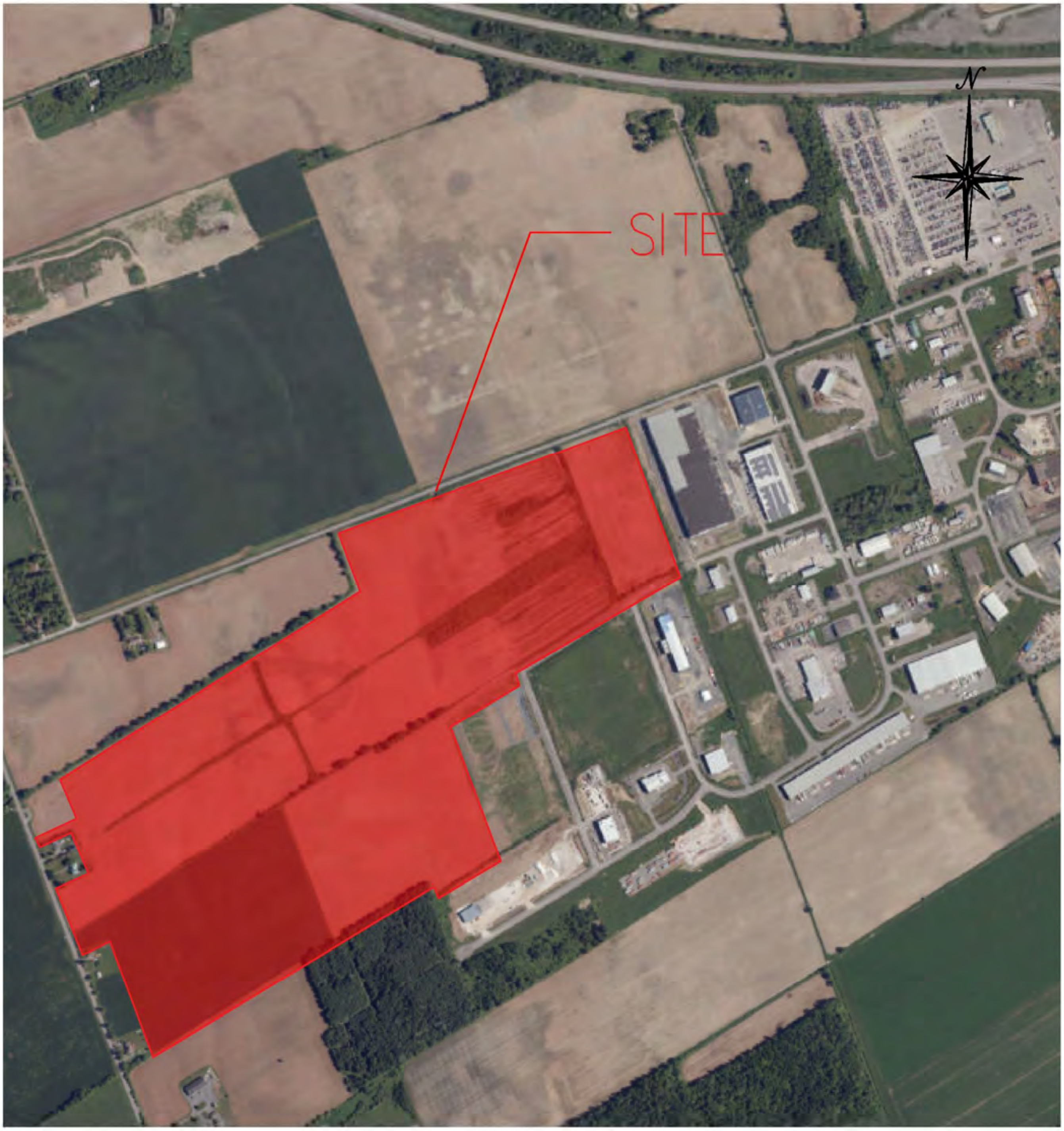
AERIAL PHOTOGRAPH 2022
SOURCE: GEOOTTAWA
(NOT TO SCALE)

CLIENT: RUSSELL TOWNSHIP

DATE: AUGUST 2024

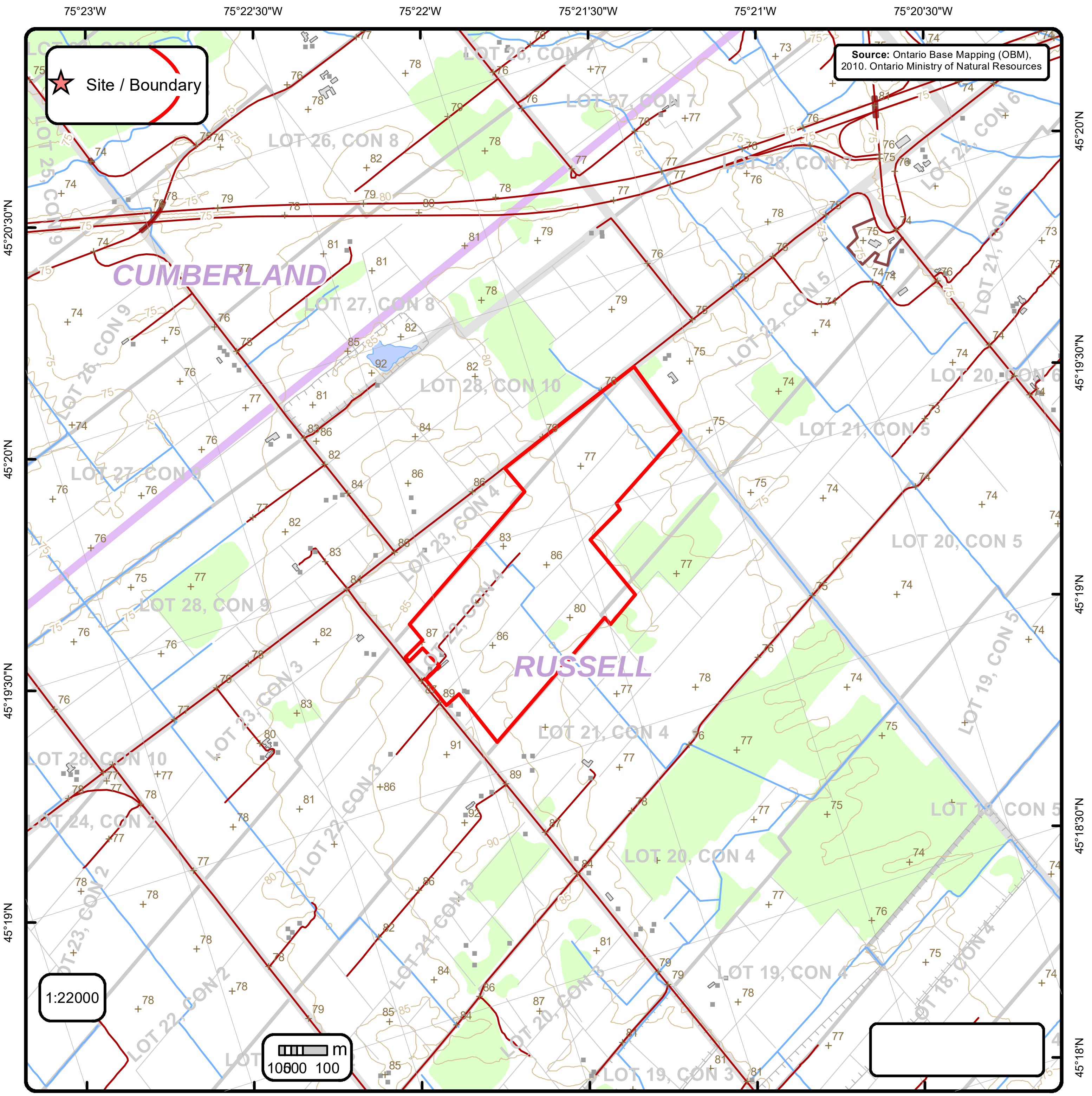
PROJECT: 230216

AP8



APPENDIX G

TOPOGRAPHIC MAP



Ontario Base Mapping (OBM) Data

Order No. 24073000468

- \+ Spot Height (metre)
- ▪ Building Point
- Towers
- ● Utility Site Point
- Misc. Line
- Railroads
- Roads
- Trail
- Transportation Structure
- Utility Line
- Water Structure
- Drainage Line Feature
- River or Stream
- ☐ Airports
- ■ Tanks
- ▨ Building to Scale
- Contour Line
- Pit or Quarry
- 🟦 Waterbody
- Wetlands
- Concession
- Lots
- Municipalitiy
- Land Ownership
- 🟩 Wooded Area
- Conservation Authority
- Conservation Area
- Municipal Park
- Provincial Park
- National Park
- Nature Reserve

APPENDIX H

SITE VISIT PHOTOGRAPHS

Photograph No. 1	
Date: 8/14/2024	
Description Western extent of the Site facing northeast towards the neighbouring property (159 Eadie Road).	

Photograph No. 2	
Date: 8/14/2024	
Description Western extent of the Site facing southeast.	

Photograph No. 3	
Date: 8/14/2024	
Description Southwestern corner of the Site facing North. Shows the hilly topography of the Site.	

Photograph No. 4	
Date: 8/14/2024	
Description Lower central portion of the Site facing the western extent.	

Photograph No. 5	
Date: 8/14/2024	
Description Southern central extent of the Site facing North along stream.	

Photograph No. 6	
Date: 8/14/2024	
Description Frog habitat identified along the southern portion of the stream.	

<table>
<tr><td>Photograph No. 7</td><td rowspan="3"></td></tr>
<tr><td>Date: 8/14/2024</td></tr>
<tr><td>Description

Southeastern extent of the Site facing east along the neighbouring property (560 Echo Street).</td></tr>
</table>

<table>
<tr><td>Photograph No. 8</td><td rowspan="3"></td></tr>
<tr><td>Date: 8/14/2024</td></tr>
<tr><td>Description

Southeastern extent of the Site facing north at the central portion of the Site, towards the on-going construction for the Emard Street extension.</td></tr>
</table>

Photograph No. 9	
Date: 8/14/2024	
Description Southern extent of the Site facing the lower eastern extent of the Site to the neighbouring property (224 Robot Street).	

Photograph No. 10	
Date: 6/11/2024	
Description Emard Street and Robot Street intersection facing the west towards the on-going extension of the road into the central portion of the Site.	

Photograph No. 11	
Date: 8/14/2024	
Description Emard Street extent of the Site facing the eastern extent of the Site towards the neighbouring property (812 Burton Road).	

Photograph No. 12	
Date: 8/14/2024	
Description Northeastern extent of the Site facing the south towards the on-going swear construction along the eastern portion of the Site.	

Photograph No. 13

Date: 8/14/2024

Description

Northern extent of the Site facing the south towards the overgrown field, Emard Street and the neighbouring properties are seen in the back

Photograph No. 14

Date: 8/14/2024

Description

Northern extent of the property facing southwest towards overgrown field then the neighbouring property (652 Burton Road).

APPENDIX I

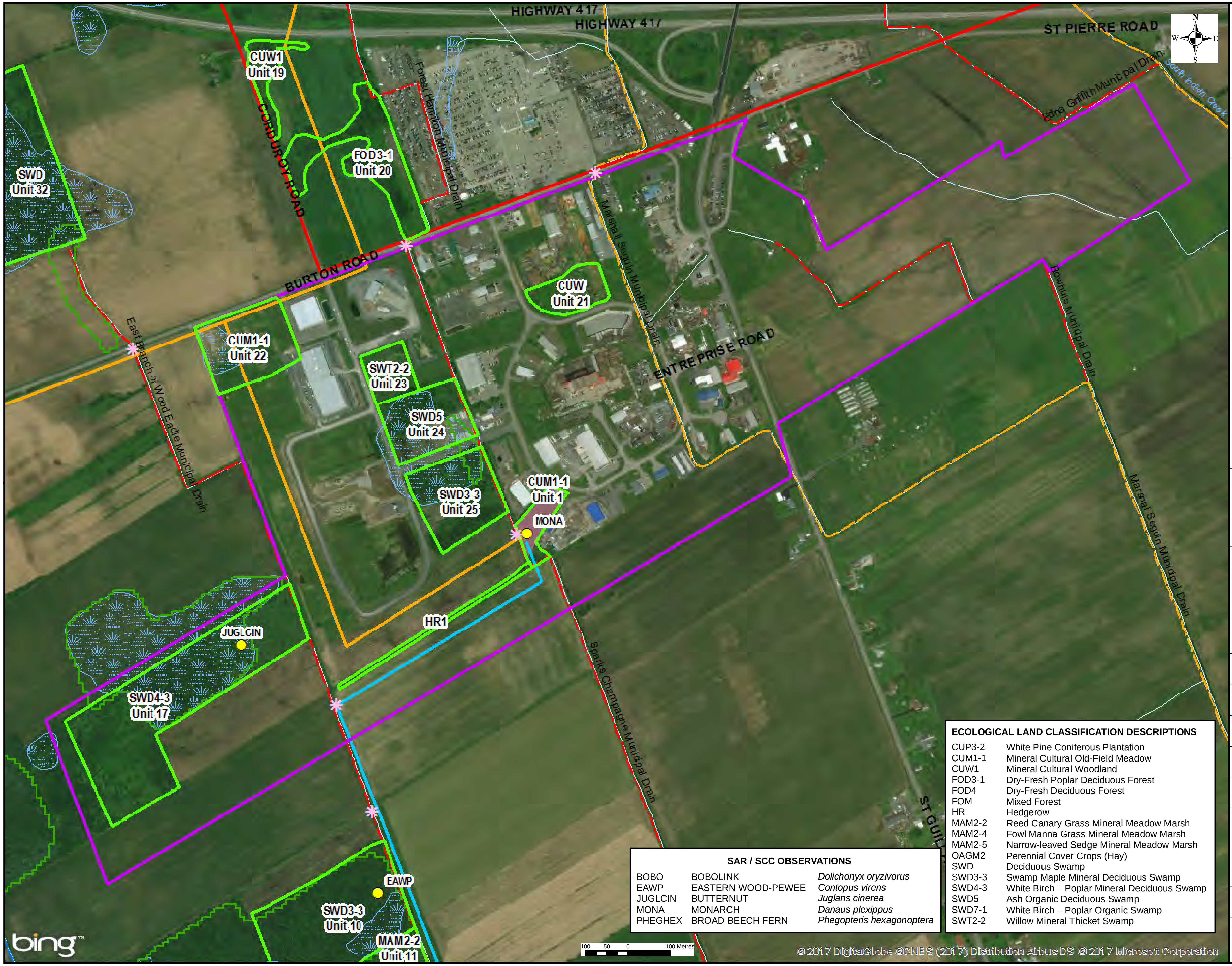
TABLE 2 OF SCHEDULE D OF O. REG. 153/04

Ontario Regulation 153/04 – Schedule D
Summary of Potentially Contaminating Activities & Areas of Potential Environmental Concern

- Acid and Alkali Manufacturing, Processing and Bulk Storage
- Adhesives and Resins Manufacturing, Processing and Bulk Storage
- Airstrips and Hangars Operation
- Antifreeze and De-icing Manufacturing and Bulk Storage
- Asphalt and Bitumen Manufacturing
- Battery Manufacturing, Recycling and Bulk Storage
- Boat Manufacturing
- Chemical Manufacturing, Processing and Bulk Storage
- Coal Gasification
- Commercial Autobody Shops
- Commercial Trucking and Container Terminals
- Concrete, Cement and Lime Manufacturing
- Cosmetics Manufacturing, Processing and Bulk Storage
- Crude Oil Refining, Processing and Bulk Storage
- Discharge of Brine related to oil and gas production
- Drum and Barrel and Tank Reconditioning and Recycling
- Dye Manufacturing, Processing and Bulk Storage
- Electricity Generation, Transformation and Power Stations
- Electronic and Computer Equipment Manufacturing
- Explosives and Ammunition Manufacturing, Production and Bulk Storage
- Explosives and Firing Range
- Fertilizer Manufacturing, Processing and Bulk Storage
- Fire Retardant Manufacturing, Processing and Bulk Storage
- Fire Training
- Flocculants Manufacturing, Processing and Bulk Storage
- Foam and Expanded Foam Manufacturing and Processing
- Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles
- Gasoline and Associated Products Storage in Fixed Tanks
- Glass Manufacturing
- Importation of Fill Material of Unknown Quality
- Ink Manufacturing, Processing and Bulk Storage
- Iron and Steel Manufacturing and Processing
- Metal Treatment, Coating, Plating and Finishing
- Metal Fabrication
- Mining, Smelting and Refining; Ore Processing; Tailings Storage
- Oil Production
- Operation of Dry Cleaning Equipment (where chemicals are used)
- Ordnance Use
- Paints Manufacturing, Processing and Bulk Storage
- Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications
- Petroleum-derived Gas Refining, Manufacturing, Processing and Bulk Storage
- Pharmaceutical Manufacturing and Processing
- Plastics (including Fibreglass) Manufacturing and Processing
- Port Activities, including Operation and Maintenance of Wharves and Docks
- Pulp, Paper and Paperboard Manufacturing and Processing
- Rail Yards, Tracks and Spurs
- Rubber Manufacturing and Processing
- Salt Manufacturing, Processing and Bulk Storage
- Salvage Yard, including automobile wrecking
- Soap and Detergent Manufacturing, Processing and Bulk Storage
- Solvent Manufacturing, Processing and Bulk Storage
- Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems
- Tannery
- Textile Manufacturing and Processing
- Transformer Manufacturing, Processing and Use
- Treatment of Sewage equal to or greater than 10,000 litres per day
- Vehicles and Associated Parts Manufacturing
- Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners
- Wood Treating and Preservative Facility and Bulk Storage of Treated and Preserved Wood Products

APPENDIX H

Natural Heritage Features Map



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SAR / SCC OBSERVATIONS

BOBO	BOBOLINK	*Dolichonyx oryzivorus*
EAWP	EASTERN WOOD-PEWEE	*Contopus virens*
JUGLCIN	BUTTERNUT	*Juglans cinerea*
MONA	MONARCH	*Danaus plexippus*
PHEGHEX	BROAD BEECH FERN	*Phegopteris hexagonoptera*

ECOLOGICAL LAND CLASSIFICATION DESCRIPTIONS

CUP3-2	White Pine Coniferous Plantation
CUM1-1	Mineral Cultural Old-Field Meadow
CUW1	Mineral Cultural Woodland
FOD3-1	Dry-Fresh Poplar Deciduous Forest
FOD4	Dry-Fresh Deciduous Forest
FOM	Mixed Forest
HR	Hedgerow
MAM2-2	Reed Canary Grass Mineral Meadow Marsh
MAM2-4	Fowl Manna Grass Mineral Meadow Marsh
MAM2-5	Narrow-leaved Sedge Mineral Meadow Marsh
OAGM2	Perennial Cover Crops (Hay)
SWD	Deciduous Swamp
SWD3-3	Swamp Maple Mineral Deciduous Swamp
SWD4-3	White Birch – Poplar Mineral Deciduous Swamp
SWD5	Ash Organic Deciduous Swamp
SWD7-1	White Birch – Poplar Organic Swamp
SWT2-2	Willow Mineral Thicket Swamp

wsp
126 DON HILLOCK DRIVE, UNIT 2
AURORA, ONTARIO CANADA L4G 0G9
TEL.: 905-750-3080 | FAX: 905-727-0463 | WWW.WSP.COM

LEGEND

▭	TOWNSHIP OF RUSSELL STUDY AREA
▭	CITY OF OTTAWA STUDY AREA
■	PROPOSED WATER AND WASTEWATER FACILITIES
—	PROPOSED WATER LINEAR INFRASTRUCTURE
—	PROPOSED WATER & WASTEWATER LINEAR INFRASTRUCTURE
~	WATERCOURSE
◯	SIGNIFICANT WOODLAND
◯	UNEVALUATED WETLANDS
◯	PROVINCIALLY SIGNIFICANT WETLANDS
◯	WATERBODIES
◯	ECOLOGICAL LAND CLASSIFICATION

MUNICIPAL DRAINS - DFO CLASS

– –	C
– –	E
– –	F
– –	NR
●	SAR / SCC OBSERVATIONS
✱	DETAILED AQUATIC ASSESSMENTS

Data Source: Ministry of Natural Resources, Ontario Base Mapping, October 2016.

CLIENT:
-

PROJECT:
MUNICIPAL CLASS ENVIRONMENTAL
ASSESSMENT STUDY
HIGHWAY 417 INDUSTRIAL PARK
WATER AND SANITARY SERVICING

PROJECT NO: 161-08735-00
DATE: OCTOBER 2017
DESIGNED BY: -
DRAWN BY: T.P.
CHECKED BY: -
FIGURE NO: 3
SCALE: 1:9,000

TITLE:
NATURAL HERITAGE FEATURES - TOWNSHIP OF RUSSELL STUDY AREA

DISCIPLINE:
ENVIRONMENT

ISSUE: -
REV.: -

Document Path: T:\161-08735-00\2017\161-08735-00 NHF Figure 3.mxd

ECOLOGICAL LAND CLASSIFICATION DESCRIPTIONS

CUP3-2	White Pine Coniferous Plantation
CUM1-1	Mineral Cultural Old-Field Meadow
CUW1	Mineral Cultural Woodland
FOD3-1	Dry-Fresh Poplar Deciduous Forest
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EAWP	EASTERN WOOD-PEWEE	*Contopus virens*
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LEGEND

▭	TOWNSHIP OF RUSSELL STUDY AREA
▭	CITY OF OTTAWA STUDY AREA
■	PROPOSED WATER AND WASTEWATER FACILITIES
—	PROPOSED WATER LINEAR INFRASTRUCTURE
—	PROPOSED WATER & WASTEWATER LINEAR INFRASTRUCTURE
~	WATERCOURSE
▢	SIGNIFICANT WOODLAND
▢	UNEVALUATED WETLANDS
▢	PROVINCIALLY SIGNIFICANT WETLANDS
▢	WATERBODIES
▢	ECOLOGICAL LAND CLASSIFICATION

MUNICIPAL DRAINS - DFO CLASS

– –	C
– –	E
– –	F
– –	NR
●	SAR / SCC OBSERVATIONS
✳	DETAILED AQUATIC ASSESSMENTS

Data Source: Ministry of Natural Resources, Ontario Base Mapping, October 2016.

CLIENT:
-

PROJECT:

MUNICIPAL CLASS ENVIRONMENTAL
ASSESSMENT STUDY
HIGHWAY 417 INDUSTRIAL PARK
WATER AND SANITARY SERVICING

PROJECT NO: 161-08735-00	DATE: OCTOBER 2017

DESIGNED BY:
-

DRAWN BY:
T.P.

CHECKED BY:
-

FIGURE NO: 4	SCALE: 1:8,000

TITLE:

NATURAL HERITAGE FEATURES -
PROPOSED WATER LINEAR
INFRASTRUCURE ALIGNMENT

DISCIPLINE:
ENVIRONMENT

ISSUE: -	REV.: -

Document Path: T:\161-08735-00\2017\161-08735-00 NHF Figure 4.mxd

APPENDIX I

PIC and Public Update Feedback Summary

Ministry of Citizenship and Multiculturalism

Heritage Planning Unit
Heritage Branch
Citizenship, Inclusion and Heritage Division
5th Flr, 400 University Ave
Tel.: 416-305-0757

Ministère des Affaires civiques et du Multiculturalisme

Unité de la planification relative au patrimoine
Direction du patrimoine
Division des affaires civiques, de l'inclusion et du patrimoine
Tél.: 416-305-0757

April 17, 2024 EMAIL ONLY

François Landry
Project Manager
Township of Russell
francoislandry@russell.ca

MCM File	:	**0021194**
Proponent	:	**Township of Russell**
Subject	:	**Municipal Class Environmental Assessment – Schedule B – Notice of Study Commencement**
Project	:	**Road Network Expansion, Vars Industrial Park**
Location	:	**Township of Russell, United Counties of Prescott and Russell**

Dear François Landry:

Thank you for providing the Ministry of Citizenship and Multiculturalism (MCM) with the Notice of Study Commencement for the above-referenced project.

MCM's interest in this project relates to its mandate of conserving Ontario's cultural heritage, which includes:

- archaeological resources, including land and marine;
- built heritage resources, including bridges and monuments; and
- cultural heritage landscapes.

Under the Environmental Assessment (EA) process, the proponent is required to determine a project's potential impact on known (previously recognized) and potential cultural heritage resources.

Project Summary

The Corporation of the Township of Russell is initiating a Schedule B Class EA to review and study the proposed expansion of the road network within the Vars Industrial Park. The road network expansion intends to provide access to subject lands, optimize new lot configuration and improve transportation efficiency to and within the park, all while considering existing conditions and constraints.

The Schedule B Class EA process aims to thoroughly review the expansion of the roadway infrastructure within the industrial park. The expansions would involve the construction of new road ROWs (Right of Way), and implementing associated drainage infrastructure, to expand the current road network and to assess potential connections to Burton Road and Eadie Road.

Identifying Cultural Heritage Resources

While some cultural heritage resources may have already been formally identified, others may be identified through screening and evaluation.

Archaeological Resources

Our records indicate that a Stage 1 archaeological assessment (AA, under Project Information Form (PIF) number P365-0117-2017) has been undertaken for what appears to be portions of the study area. The report has been entered into the Ontario Public Register of Archaeological Reports.

If any lands within the study area, including any temporary roads, detours or work areas associated with the project, has not been previously screened or assessed, the Ministry's *Criteria for Evaluating Archaeological Potential* can assist you to determine if an archaeological assessment is needed. If it is determined that the project area exhibits archaeological potential, then an AA will be undertaken during the planning phase. If further AA(s) are recommended, then MCM recommends that further stages of AA be completed as early as possible during the detailed design phase and prior to any ground disturbing activities.

AAs are required to be undertaken by an archaeologist licenced under the *Ontario Heritage Act*, who is responsible for submitting the report directly to MCM for review.

The results of the AA will be summarized in the EA report, i.e. the Executive Summary of each AA report provides a brief summary of the work completed and the recommendations for next steps, whether for further archaeological assessment, in which case the report will include a map that identifies those areas, or for no further assessment. The EA report must also include clear commitments to undertake any further AA stages recommended and a timeline for their completion.

Built Heritage Resources and Cultural Heritage Landscapes

The Ministry's *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes* should be completed to help determine whether this EA project may impact known or potential built heritage resources and/or cultural heritage landscapes.

If any municipal bridges may be impacted by this project, the Municipal Heritage Bridges: Criteria for Evaluating Potential for Cultural Heritage Resources (checklist and background information) should be completed. The checklist was developed by the Municipal Engineers Association in consultation with MCM.

If there is potential for built heritage resources and/or cultural heritage landscapes on the property or within the project area, a Cultural Heritage Evaluation Report (CHER) should be undertaken by a qualified person to determine the cultural heritage value or interest of the property (or project area). If the property (or project area) is determined to be of cultural heritage value or interest and alterations or development is proposed, MCM recommends that a Heritage Impact Assessment (HIA), prepared by a qualified consultant, be completed to assess potential project impacts. Please send the HIA to MCM for review and comment and make it available to local organizations or individuals who have expressed interest in review.

Community input should be sought to identify locally recognized and potential cultural heritage resources. Sources include, but are not limited to, municipal heritage committees, historical societies and other local heritage organizations.

Cultural heritage resources are often of critical importance to Indigenous communities. Indigenous communities may have knowledge that can contribute to the identification of cultural heritage resources, and we suggest that any engagement with Indigenous communities includes a discussion about known or potential cultural heritage resources that are of value to them.

Environmental Assessment Reporting

All technical cultural heritage studies and their recommendations are to be addressed and incorporated into EA projects. Please advise MCM whether any technical cultural heritage studies will be completed for this EA project and provide them to MCM before issuing a Notice of Completion or commencing any work on the site. If screening has identified no known or potential cultural heritage resources, or no impacts to these resources, please include the completed checklists and supporting documentation in the EA report or file.

Please note that the responsibility for administration of the *Ontario Heritage Act* and matters related to cultural heritage have been transferred from the Ministry of Tourism, Culture and Sport (MTCS) to the Ministry of Citizenship and Multiculturalism (MCM). Individual staff roles and contact information remain unchanged. Please continue to send any notices, report and/or documentation **via email only** to both Karla Barboza and myself.

- Karla Barboza, Team Lead - Heritage | Heritage Planning Unit (Citizenship and Multiculturalism) | 416-660-1027 | karla.barboza@ontario.ca
- Erika Leclerc, Heritage Planner | Heritage Planning Unit (Citizenship and Multiculturalism) | 416-305-0757 | erika.leclerc@ontario.ca

Thank you for consulting MCM on this project and please continue to do so throughout the EA process. If you have any questions or require clarification, please do not hesitate to contact me.

Sincerely,

Erika Leclerc
Heritage Planner
Erika.leclerc@ontario.ca

Copied to: Kyle Herold, Civil Engineer Designer, LRL Engineering
Karla Barboza, Team Lead – Heritage Planning Unit, MCM

It is the sole responsibility of proponents to ensure that any information and documentation submitted as part of their EA report or file is accurate. The Ministry of Citizenship and Multiculturalism (MCM) makes no representation or warranty as to the completeness, accuracy or quality of the any checklists, reports or supporting documentation submitted as part of the EA process, and in no way shall MCM be liable for any harm, damages, costs, expenses, losses, claims or actions that may result if any checklists, reports or supporting documents are discovered to be inaccurate, incomplete, misleading or fraudulent.

Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48(1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out an archaeological assessment, in compliance with Section 48(1) of the *Ontario Heritage Act*.

The *Funeral, Burial and Cremation Services Act, 2002, S.O. 2002, c.33* requires that any person discovering human remains must cease all activities immediately and notify the police or coroner. If the coroner does not suspect foul play in the disposition of the remains, in accordance with *Ontario Regulation 30/11* the coroner shall notify the Registrar, Ontario Ministry of Public and Business Service Delivery, which administers provisions of that Act related to burial sites. In situations where human remains are associated with archaeological resources, the Ministry of Citizenship and Multiculturalism should also be notified (at archaeology@ontario.ca) to ensure that the archaeological site is not subject to unlicensed alterations which would be a contravention of the *Ontario Heritage Act*.

417 Industrial Park Road Network Expansion PIC Public Feedback (Transcribed)

Date: May 30th, 2024

	Name	Comments (Verbiage Transcribed from resident form submissions)
1	Resident #1	1. Respect must be given to the Eadie Road residents- there should be about 500 ft between the homes & the industries developnment- plus berm and trees etc. 2. No Road should go to Eadie Road- all exists should force the traffic to the 417 @ Embrun to go South. Trucks can take 417 to 416. 3. The light in the night sky is always issue for the residents, for nature- the light could impact the birds & animals. 4. If you need an option, prefer 4 or 5, but no exit to Eadie. 5. I fail to understand the need for industrial park extension considering the 2 warehouses that have yet to be leased after 4-5 years.
2	Resident # 2	Preferred option No. 2
3	Resident # 3	If you are going ahead with this project, I prefer option 4 or 5; 6 will also do. This keeps traffic away from Eadie Road. Also, why are we selling property within the industrial park @ cost? If there is a waiting list we should be making a profit to lessen costs on the tax payer. We do not need to grow as fast as we are. Please show it down.
4	Resident # 4	1. 136 Eadie is not Vacant, it's a farm. 2. Flood lights already visible from our home & getting brighter. 3. Traffic flow on Eadie already dangerous. 4. Definitely no Emard Extension. Disagree with Option to 1 & 2. 5. Option 4 or 5 could be possible 6. Extension to Emard does not improve safety.
5	Resident # 5	Don't extend Emard to Eadie. Consider utilising unopened road allowance between concessions 4 & 5 south to unopened route 100 east to St. Guillaume. In favour of Option 3. Light study to be required during lot development. Need hydrogeological studies for wells at lot level to ascertain impact on water aquifer.
6	Resident # 6	I have been told no analysis of the marketability of various lot sites has been done. How does one plan a road network without knowing what size and quantity of lots can be sold? This study seems premature without such a study.
7	Resident # 7	I am against the expansion of the park at this time. Choice #4 is better than the others. Choice #1 is the worst. Will impact the most people. Any road from the park on to Eadie will impact current and future commuters from Russell including the new people coming into the new constructions further up on Eadie.
8	Resident # 8	What price is being charged for the industrial lots? Per acre? How much did township pay for the acres? Will there be a profit? Will the expansion of the industrial park when there are lots available? Will there be a "quiet" barrier for residents next to industrial lots? Personally I am not happy with any of the proposal that want to use Eadie Road.

Hydro One Networks Inc.

483 Bay Street
8th Floor South Tower
Toronto, Ontario M5G 2P5

HydroOne.com

November 20, 2024

Re: Road Network Expansion; 417 Industrial Park

Attention:
Francois Landry
Project Manager
Russell Township

Thank you for sending us notification regarding Road Network Expansion; 417 Industrial Park. In our preliminary assessment, we confirm there are no existing Hydro One Transmission assets in the subject area. Please be advised that this is only a preliminary assessment based on current information.

If plans for the undertaking change or the study area expands beyond that shown, please contact Hydro One to assess impacts of existing or future planned electricity infrastructure.

Any future communications are sent to Secondarylanduse@hydroone.com.

Be advised that any changes to lot grading and/or drainage within proximity to Hydro One transmission corridor lands must be controlled and directed away from the transmission corridor.

Sent on behalf of,

Secondary Land Use
Asset Optimization
Strategy & Integrated Planning
Hydro One Networks Inc.

Minutes from (virtual) Meeting Russell OP August 30/2024

Attended:
Christian Boudreau (UCPR Paramedics)
Brian McBain (Russell Fire Dept)
Jonathan Bourgon (Russell Infra)
Sylvain Boudreault (Russell Planning)

Absent: Shaun Cameron (OPP), Millie Bourdeau (Russell By-law)

Intro:
As our villages undergo transformation, it becomes imperative to assess how street and urban design affect emergency response capabilities.

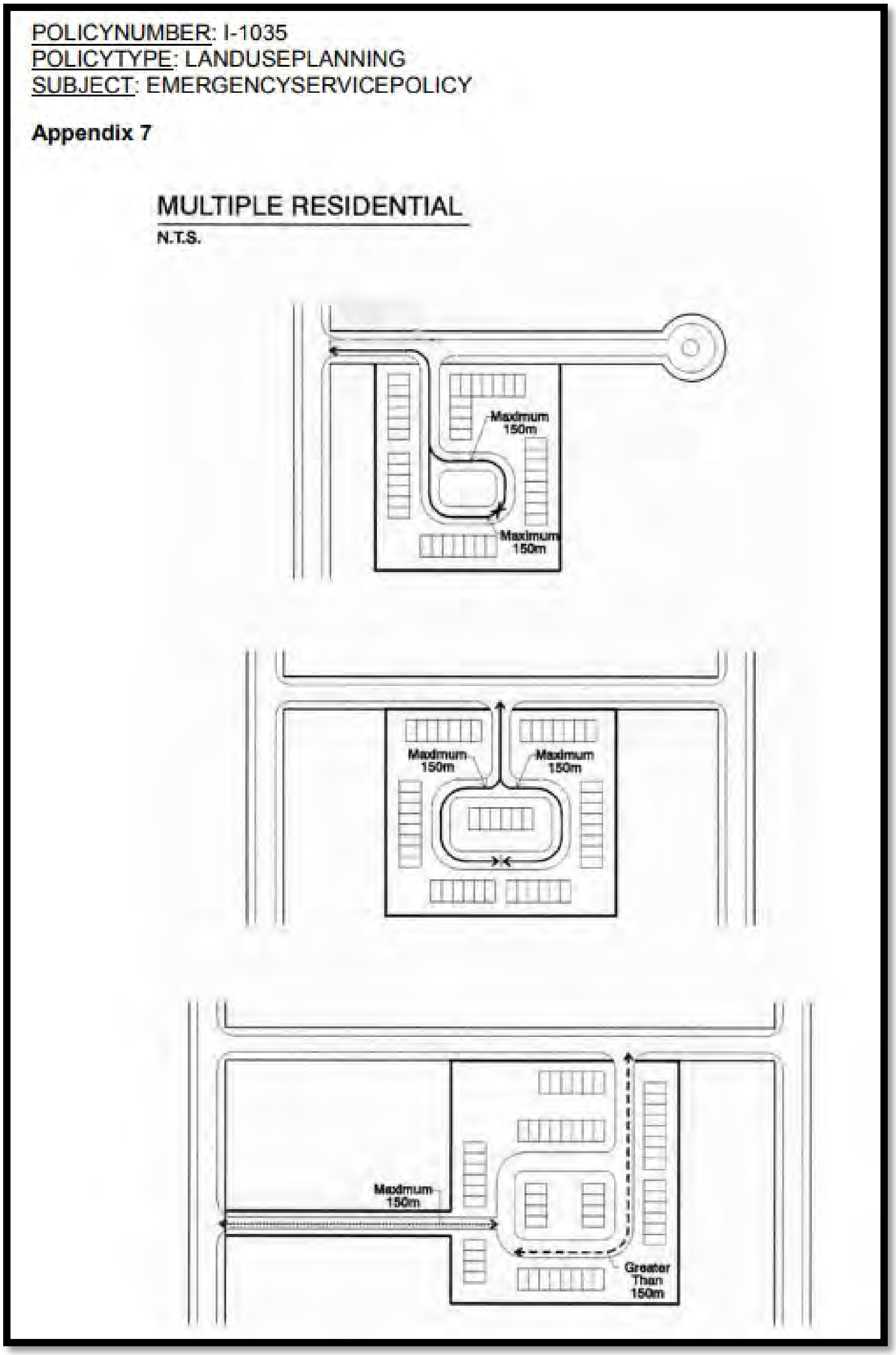
Our goal is to obtain your input and recommendation to help us develop new policies in our Official Plan related to transportation to ultimately maintain and/or enhance emergency response times.

Open discussion on the streets design of **cul-de-sac, private streets and one way streets**.

1- **Cul-de sac:** would recommend minimum turning radius for emergency vehicle (fire truck)
NFP standards recommends:
Planning wise: max. 150 m and/or max. 300 m with emergency access route
Ex: City of Kitchener - Emergency Service Policy

2- Private Street: further investigation for width and identify no parking within fire route when required. Fire truck ladder requires min. 14.2 feet of clearance.

3. Minimum number of entrance/exit per development: NFP standards
Ex: City of Kitchener - Emergency Service Policy



POLICYNUMBER: I-1035
POLICYTYPE: LANDUSEPLANNING
SUBJECT: EMERGENCYSERVICEPOLICY

Appendix 7

MULTIPLE RESIDENTIAL
N.T.S.

3- **One way Streets:** waiting recommendation from consultant with relation to the Transportation Master Plan

4- **Existing problem street in Russell Twp:** no specific street was identified at this time.