# Development Application for Zoning By-law Amendment

## Complete Application

The application must be completed by the owner or authorized agent. If the application is being submitted by an agent, the owner's written authorization is required. If the lands subject to this application are owned by more than one owner, the authorization of all owners is required. Submission of this application constitutes consent for authorized municipal staff to inspect the subject lands.

It is the responsibility of the applicant to research and evaluate the site and the proposal to ensure that the development will conform to the interests of the health, safety and welfare of future residents. Sufficient studies for the completion of the application should be carried out prior to submission and should be reflected in the application form.

## Online Application Process

All applications must be submitted online via the County's CityView Portal. The portal can be accessed here: Welcome - CityView Portal. The applicant will submit the materials required as part of a complete application. Once the County confirms receipt of a complete submission, the applicant will be contacted and provided further directions for payment options.

## Pre-Consultation Meeting:

Pre-Consultation is highly recommended for Zoning By-law Amendment applications. The purpose of a Pre-Consultation meeting is to provide the applicant with an opportunity to present the proposed development, discuss potential issues, and for the Norfolk County and external agencies to identify the application requirements. The requirements, as detailed in the Pre-Consultation meeting comments, are valid for one year after the meeting date.

## User Fees:

The planning application fee will be determined when the application can be deemed complete according to Norfolk County Community Planning user fees: User Fees | Norfolk County

Additional agency plan review fees may apply. Please see below for more information and forward fees directly to the applicable agency, as required:

**Grand River Conservation Authority**
Plan Review fees | Grand River Conservation Authority
**Long Point Region Conservation Authority**
Planning Fees - Long Point Region Conservation Authority

Cash, debit, credit or cheque payable to Norfolk County in the amount set out in the User Fees By-Law that will be accepted and deposited once the application has been deemed complete.

**Development Application Process**

Norfolk County staff will circulate the complete application to adjacent landowners, public agencies, and internal departments. Planning Act decision timeframes will apply in accordance with the provisions of Section 34 of the Planning Act Norfolk County collects personal information submitted through this form under the authority of the Municipal Freedom of Information and Protection Act. Norfolk County will use this information for the purposes indicated by this form. Questions about collecting personal information can be directed to Norfolk GIS Services at NorfolkGIS@norfolkcounty.ca.

Additional studies required for a complete application along with peer reviews may be required and shall be provided at the applicant's sole expense. In these cases, Norfolk County staff will select the company to complete the peer review.

Norfolk County will refund the original fee if applicants withdraw their applications before circulation. If Norfolk County must recirculate your drawings, there will be an additional fee. If Norfolk County must do more than three reviews of engineering drawings due to revisions by the owner or failure to revise engineering drawings as requested, Norfolk County will charge an additional fee.

**Contact Us**

For additional information or assistance completing this application, please contact a Planner at 519-426-5870 or planning@norfolkcounty.ca.

**Notification Sign Requirements**

For public notification, Norfolk County will provide you with a sign to indicate the intent and purpose of the development application. It is your responsibility to:

1. Post one sign per frontage in a conspicuous location on the subject lands.
2. Ensure one sign is posted at the front of the subject lands at least three feet above ground level and not on a tree.
3. Notify the Planner when the sign is in place.
4. Maintain the sign until the development application is finalized and, after that, remove it.

**For Office Use Only**:

| | | | |
|---|---|---|---|
| File Number | | Public Notice Sign | |
| Related File Number | | Application Fee | |
| Pre-consultation Meeting | | Conservation Authority Fee | |
| Application Submitted | | Well & Septic Info Provided | |
| Complete Application | | Planner | |

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**Check the type of planning application(s) you are submitting.**

☐ Zoning By-Law Amendment – Regular

☐ Zoning By-Law Amendment - Major

☐ Zoning By-Law Amendment - Minor

☐ Temporary Use By-law

**Property Assessment Roll Number:** _____

## A. Applicant Information

*Note: It is the responsibility of the owner to notify the Planner of any changes in ownership or authorized applicant within 30 days of such a change*

**Name of Owner** _____

Address _____

Town and Postal Code _____

Phone Number _____

Cell Number _____

Email _____

**Name of Authorized Applicant** _____

Address _____

Town and Postal Code _____

Phone Number _____

Cell Number _____

Email _____

**Name of Authorized Agent** _____

Address _____

Town and Postal Code _____

Phone Number _____

Cell Number _____

Email _____

Unless otherwise directed, Norfolk County will forward all correspondence and notices regarding this application to both owner and agent noted above.

☐ Owner ☐ Agent ☐ Applicant

Names and addresses of any holder of any mortgagees, charges or other encumbrances on the subject lands:

N/A

## B. Location, Legal Description and Property Information

1. Legal Description (include Geographic Township, Concession Number, Lot Number, Block Number and Urban Area or Hamlet):

   _____

   _____

   Municipal Civic Address: _____

   Land acquisition date (if known): 2011

   Present Official Plan Designation(s): _____

   Present Zoning: _____

2. Is there a site-specific provision on the subject lands?

   Yes ☐ No If yes, please specify the corresponding number:

   _____

3. Present use of the subject lands:

   _____
   _____

4. Please describe **all existing** buildings or structures on the subject lands and whether they will be retained, demolished or removed.

   _____
   _____
   _____

5. If an addition to an existing building is being proposed, please explain the proposed use.

   _____
   _____
   _____

6. Please describe **all proposed** buildings or structures/additions on the subject lands.

   _____
   _____

7. Are any existing buildings on the subject lands designated under the *Ontario Heritage Act* as being of cultural heritage value or interest?

   ☐ Yes ☐ No

   If yes, identify and provide details:

   _____
   _____

8. If known, the length of time the existing uses have continued on the subject lands:

   _____

9. Existing use of abutting properties:

   _____

10. Are there any easements or restrictive covenants affecting the subject lands?

    ☐ Yes ☐ No

    If yes, describe the easement or restrictive covenant and its effect:

    _____

## C. Purpose of Development Application

**Note: Please complete all that apply.**

1. Please describe the proposed development on the subject lands:

   _____
   _____
   _____

2. Please explain why it is not possible to comply with the provisions of the Zoning By-law :

   _____
   _____
   _____

3. Have the subject land or lands within 120 metres ever been and/or currently are the subject of a Planning Act application:
   - Plan of Subdivision ☐ Yes ☐ No
   - Official Plan Amendment ☐ Yes ☐ No
   - Zoning Bylaw, or Zoning Order Amendment ☐ Yes ☐ No
   - Site Plan ☐ Yes ☐ No
   - Consent/Minor Variance ☐ Yes ☐ No

   If yes, indicate the application file number and the status of the application_____
   _____

## D. Previous Use of the Property

1. Has there been an industrial or commercial use on the subject lands or adjacent lands?

   ☐ Yes ☐ No ☐ Unknown

If yes, specify the uses (for example: gas station or petroleum storage):

_____
_____

2. Is there reason to believe the subject lands may have been contaminated by former

uses on the site or adjacent sites?

☐ Yes ☐ No ☐ Unknown

3. Provide the information you used to determine the answers to the above questions:

_____

_____

4. If you answered yes to any of the above questions in Section D, a previous land use inventory showing all known former uses of the subject lands, and/or when applicable, the adjacent lands, is required.

   Is the land use inventory of former land uses attached? ☐ Yes ☐ No

**E. Provincial Planning Statement**

1. Is the requested amendment consistent with the Provincial Planning Statement issued under subsection 3(1) of the *Planning Act, R.S.O. 1990, c. P. 13*?

   ☐ Yes ☐ No

   If no, please explain:

   _____

   _____

   _____

2. It is owner's responsibility to be aware of and comply with all relevant federal or provincial legislation, municipal by-laws or other agency approvals, including the Endangered Species Act, 2007. Have the subject lands been screened to ensure that development or site alteration will not have any impact on the habitat for endangered or threatened species further to the Provincial Planning Statement?

   ☐ Yes ☐ No

   If no, please explain:

   _____

   _____

   _____

3. Have the subject lands been screened to ensure that development or site alteration will not have any impact on source water protection?

   ☐ Yes ☐ No

   If no, please explain:

   _____

   _____

*Note: If in an area of source water Wellhead Protection Area (WHPA) A, B or C, Intake Protection Zone (IP-Z), Issue Contributing Area (ICA), please attach relevant information and approved mitigation measures from the Risk Management Official.*

4. Are any of the following uses or features on the subject lands or within 500 metres of the subject lands, unless otherwise specified? Please check boxes, if applicable.

**Livestock facility or stockyard**

☐ On the subject lands or ☐ within 500 meters – distance _____

**Significant Woodland**

☐ On the subject lands or ☐ within 500 meters – distance _____

**Municipal Landfill**

☐ On the subject lands or ☐ within 500 meters – distance _____

**Sewage treatment plant or waste stabilization plant**

☐ On the subject lands or ☐ within 500 meters – distance _____

**Provincially significant wetland or other environmental feature**

☐ On the subject lands or ☐ within 500 meters – distance _____

**Floodplain**

☐ On the subject lands or ☐ within 500 meters – distance _____

**Rehabilitated mine site**

☐ On the subject lands or ☐ within 500 meters – distance _____

**Non-operating mine site within one kilometre**

☐ On the subject lands or ☐ within 500 meters – distance _____

**Active mine site within one kilometre**

☐ On the subject lands or ☐ within 500 meters – distance _____

**Industrial or commercial use (specify the use(s))**

☐ On the subject lands or ☐ within 500 meters – distance _____

**Active railway line**

☐ On the subject lands or ☐ within 500 meters – distance _____

**Seasonal wetness of lands**

☐ On the subject lands or ☐ within 500 meters – distance _____

**Erosion**

☐ On the subject lands or ☐ within 500 meters – distance _____

**Abandoned gas wells**

☐ On the subject lands or ☐ within 500 meters – distance _____

## F. Servicing and Access

1. Indicate what services are available or proposed:

| **Water Supply** | | **Storm Drain** | |
|---|---|---|---|
| Municipal piped water | ☐ | Storm sewers | ☐ |
| Individual wells | ☐ | Open ditches | ☐ |
| Communal wells | ☐ | Other (describe below): _____ | ☐ |
| Other (describe below): _____ | ☐ | | |

| **Sewage Treatment** | | **Existing or proposed access to subject lands** | |
|---|---|---|---|
| Municipal sewers | ☐ | Municipal road | ☐ |
| Communal system | ☐ | Provincial highway | ☐ |
| Septic tank and tile bed in good working order | ☐ | Unopened road | ☐ |
| Other (describe below): _____ | ☐ | Name of road/street:_____ | |
| | | Other (describe below): _____ | ☐ |

2. Does the application require development on privately owned and operated individual or communal septic systems, and more than 4500 litres of effluent produced per day as a result of the development being completed?

   ☐ Yes ☐ No

   If yes, provide (i) Servicing Options Report and (ii) hydrogeological report with submission.

## G. Other Information

1. Does the application involve a local business?

   ☐ Yes ☐ No If yes, how many people are employed on the subject lands?

_____

2. Indicate below or on a separate attachment, the applicant's proposed strategy for consulting with the public on the request for a zoning by-law amendment.

_____
_____

3. Is there any other information that you think may be useful in the review of this application? If so, explain below or attach on a separate page.

_____
_____
_____

## H. Supporting Material to be submitted by Applicant

In order for your application to be considered complete, folded hard copies and an electronic version of the site plan drawings, additional plans, studies and reports will be required in addition to a sketch plan in accordance with Ontario Regulation 545/06.

A sketch showing, in metric units:

a) the boundaries and dimensions of the subject land;

b) the location, size and type of all existing and proposed buildings and structures on the subject land, indicating their distance from the front lot line, rear lot line and side lot lines;

c) the approximate location of all natural and artificial features (*for example, buildings, railways, roads, watercourses, drainage ditches, banks of rivers or streams, wetlands, wooded areas, wells and septic tanks*) that,

   i. are located on the subject land and on land that is adjacent to it, and

   ii. in the applicant's opinion, may affect the application;

d) the current uses of land that is adjacent to the subject land;

e) the location, width and name of any roads within or abutting the subject land, indicating whether it is an unopened road allowance, a public travelled road, a private road or a right of way;

f) if access to the subject land will be by water only, the location of the parking and docking facilities to be used; and

g) the location and nature of any easement affecting the subject land

The following additional plans, studies and reports, including but not limited to, **may** be required as part of a complete application submission:

- ☐ On-Site Sewage Disposal System Evaluation Form (to verify location and condition)
- ☐ Cut and Fill Plan
- ☐ Erosion and Sediment Control Plan
- ☐ Grading and Drainage Control Plan (around perimeter and within site) (existing and proposed)
- ☐ Plan and Profile Drawings
- ☐ Site Servicing Plan
- ☐ Storm water Management Plan
- ☐ Street Sign and Traffic Plan
- ☐ Street Tree Planting Plan
- ☐ Tree Preservation Plan
- ☐ Archaeological Assessment
- ☐ Environmental Impact Study
- ☐ Functional Servicing Report
- ☐ Agricultural Impact Assessment
- ☐ Geotechnical Study / Hydrogeological Review
- ☐ Minimum Distance Separation Calculations
- ☐ Noise or Vibration Study
- ☐ Record of Site Condition
- ☐ Stormwater Management Report
- ☐ Traffic Impact Study

The approval of the proposed development might be subject to additional federal or provincial legislation, municipal by-laws or other agency approvals.

Norfolk COUNTY

## I. Transfers, Easements and Postponement of Interest

The owner acknowledges and agrees that if required, it is their solicitor's responsibility on behalf of the owner to disclose the registration of all transfer(s) of land and/or easement in favour of the County and/or utilities. Also, the owner further acknowledges and agrees that it is their solicitor's responsibility on behalf of the owner to undertake the registration of postponements of any charges in favour of the County.

## J. Permission to Enter Subject Lands

Permission is hereby granted to Norfolk County officers, employees or agents, to enter the premises subject to this application for the purpose of making inspections associated with this application, during normal and reasonable working hours.

## K. Freedom of Information

For the purposes of the *Municipal Freedom of Information and Protection of Privacy Act*, I authorize and consent to the use by or the disclosure to any person or public body any information that is collected under the authority of the *Planning Act, R.S.O. 1990, c. P. 13* for the purpose of processing this application.

March 3, 2026

Owner/Authorized Applicant Signature — Date

## L. Owner's Authorization

If the authorized applicant/agent is not the registered owner of the lands that is the subject of this application, the owner(s) must complete the authorization set out below.

I/We Westwood Developments Inc. am/are the registered and authorized owner(s) of the lands that is the subject of this application.

I/We authorize Carmen Jandu, Agent to make this application on my/our behalf and to provide any of my/our personal information necessary for the processing of this application. Moreover, this shall be your good and sufficient authorization for so doing.

Owner C/S — Date March 10/26

per DAVID PRESIDENT.
I HAVE AUTHORITY TO BIND THE CORPORATION

Owner — Date

**M. Declaration**

I, Carmen Jandu of The Town of Oakville, Region of Halton

solemnly declare that:

all of the above statements and the statements contained in all of the exhibits transmitted herewith are true and I make this solemn declaration conscientiously believing it to be true and knowing that it is of the same force and effect as if made under oath and by virtue of *The Canada Evidence Act*.

Declared before me at:
City of Hamilton

Owner/Authorized Applicant Signature

In City of Hamilton

This 11th day of May

A.D., 2026

Jared Vail Marcus, a Commissioner, etc
Province of Ontario,
for Arcadis Professional Services( Canada) Inc.
Expires June 16, 2026

# Development Application for Draft Plan of Subdivision / Vacant Plan of Condominium

## Complete Application

The application must be completed by the owner or authorized agent. Where the application is being submitted by an agent, the owner's written authorization is required. If the lands subject to this application are owned by more than one owner, the authorization of all owners is required. Submission of this application constitutes consent for authorized municipal staff to inspect the subject lands.

It is the responsibility of the applicant to research and evaluate the site and the proposal to ensure that the development will protect and preserve the health, safety and welfare of future residents. Sufficient studies for the completion of the application should be carried out prior to submission and should be reflected in the application form.

The requested information in this application form must be provided by the applicant and will be used to process the application pursuant to the requirements of Section 51 of the Planning Act, Ontario Regulation 544/06, and the Condominium Act.

A pre-submission meeting may be requested by staff or arranged at the request of the applicant. A pre-submission review is not required prior to submission of this application but can be provided upon request.

## Online Application Process

All applications must be submitted online via the County's CityView Portal. The portal can be accessed here: Welcome - CityView Portal. The applicant will submit the materials required as part of a complete application. Once the County confirms receipt of a complete submission, the applicant will be contacted and provided further direction for payment options.

## Pre-Consultation Meeting:

Pre-consultation is highly recommended for Draft Plan of Subdivision or Vacant Plan of Condominium applications. The purpose of a pre-consultation meeting is to provide the applicant with an opportunity to present the proposed development, discuss opportunities and constraints, and for the County and Agency staff to identify the submission requirements. The requirements, as detailed in the pre-consultation meeting notes, are valid for one year after the meeting date.

If the application for draft plan of subdivision/condominium is being submitted in conjunction with an application for a Zoning By-law Amendment and/or application for an Official Plan Amendment, all applications must be completed and submitted together.

**User Fees:**

The planning application fee will be determined when the application can be deemed complete according to Norfolk County Community Planning user fees: User Fees | Norfolk County
Cash, debit, credit or cheque payable to Norfolk County in the amount set out in the user fees By-Law that will be accepted and deposited once the application has been deemed complete.

An additional agency plan review fee may apply. Please see below for more information and forward fees directly to the applicable agency, as required:

**Grand River Conservation Authority**
Plan Review fees | Grand River Conservation Authority

**Long Point Region Conservation Authority**
Planning Fees - Long Point Region Conservation Authority

**Development Application Process**

Additional studies required for a complete application shall be at the applicant's sole expense. Peer reviews may be necessary to review particular studies at the applicant's expense. In these cases, Norfolk County staff will select the company to complete the peer review.

The County will refund the original fee if applicants withdraw their applications before circulation. If your drawings are recirculated, there will be an additional fee. If more than three reviews of engineering drawings are requested due to revisions by the owner or failure to revise engineering drawings as requested, the County will charge an additional fee.

**Contact Us**

For additional information or assistance completing this application, please contact a Planner at 519-426-5870 or planning@norfolkcounty.ca.

The information submitted on this form is collected under the authority of the Freedom of Information and Protection of Privacy Act (FIPPA) and Municipal Freedom of Information and Protection of Privacy Act (MFIPPA) for Norfolk County employees to use for the purpose of preparing and registering a development agreement.

Questions about the collection of personal information through this form may be directed to the Agreement and Development Coordinator or Information and Privacy Coordinator, Corporation of Norfolk County, 50 Colborne Street South, Simcoe ON

**For Office Use Only**:

| | | | |
|---|---|---|---|
| File Number | _____ | Public Notice Sign | _____ |
| Related File Number | _____ | Application Fee | _____ |
| Pre-Consultation Meeting | _____ | Conservation Authority Fee | _____ |
| Application Submitted | _____ | Well & Septic Info Provided | _____ |
| Complete Application | _____ | Planner | _____ |

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**Check the type of planning application(s) you are submitting.**

☐ Draft Plan of Subdivision
☐ Vacant Plan of Condominium
☐ Condominium Exemption

Please describe the proposed development

_____
_____
_____

**Property Assessment Roll Number:** _____

## A. Applicant Information

*Note: It is the responsibility of the owner to notify the Planner of any changes in ownership or authorized applicant within 30 days of such a change*

### Registered Owner(s)

Company Name: _____ Phone number: _____

Contact Name: _____ E-mail: _____

Address: _____ Date property was acquired: _____

Municipality/Postal Code: _____

### Authorized Applicant (if different than registered owner)

Company Name: _____ Municipality/Postal Code: _____

Contact Name: _____ Phone number: _____

Address: _____ E-mail: _____

### Authorized Agent

Company Name: _____ Address: _____

Contact Name: _____ Municipality/Postal Code: _____

Phone number: _____ E-mail: _____

**Name of Surveyor**

Company Name: _____ Municipality/Postal Code: _____

Contact Name: _____ Phone number: _____

Address: _____ E-mail: _____

**Name of Solicitor**

Company Name: _____ Municipality/Postal code: _____

Contact Name: _____ Phone number: _____

Address: _____ E-mail: _____

Please specify to whom all communications should be sent. Unless otherwise directed, all correspondence and notices in respect of this application will be forwarded to the owner and agent noted above.

☐ Owner ☐ Applicant ☐ Agent

Names and addresses of any holder of any mortgagees, charges or other encumbrances on the subject lands:

_____

## B. Location, Legal Description and Property Description

1. Legal description (include Geographic Township, Concession Number, Lot Number, Block Number and Urban Area or Hamlet):

_____

Municipal address:

0 West Street

Present Official Designation(s):

_____

_____

Present zoning:

_____

_____

Date of acquisition of the subject property (if known): _____

2. Is the property encumbered by any easements (existing or proposed)? If so, please describe:

_____

3. Please complete the description of proposed uses:

| Proposed Land Uses | Number of Residential Units | Number of Lots/ Blocks | Area in Hectares | Density Proposed (Units Per Hectare) | Parking Provided |
|---|---|---|---|---|---|
| Single Detached Dwellings | | | | | |
| Semi-Detached Dwellings | | | | | |
| Townhouse Dwellings (street, stacked, group) | | | | | |
| Apartments Residential | | | | | |
| Additional Residential Units | | | | | |
| Other residential (Specify) | | | | | |
| Commercial | | | | | |
| Office | | | | | |
| Industrial | | | | | |
| Institutional | | | | | |
| Open Space (i.e. parks) | | | | | |
| Agricultural | | | | | |
| Roads | | | | | |
| Other (specify) | SWM: 1.00 ha<br>SANITARY P. STATION: 0.09 ha<br>ROAD WIDENING: 0.16 ha | | | | |
| **TOTAL** | | | | | |

4. Additional information for Vacant Plan of Condominium applications only:

   i. Describe the condominium details:

   _____

   _____

   ii. Has the site plan been approved? ☐ Yes ☐ No

   Site plan file number: _____

   iii. Has a site plan agreement been registered? ☐ Yes ☐ No

iv. Has a building permit been issued? ☐ Yes ☐ No

v. Is the proposed development under construction? ☐ Yes ☐ No

vi. Is this a conversion of an existing building containing rental residential units?

☐ Yes ☐ No

If yes, indicate the number of units to be converted: _____

vii. Does the development include affordable housing units? ☐ Yes ☐ No

If yes, indicate the number of units to be converted: _____

**C. Existing Land Uses for the Site and Surrounding Area**

1. Describe the existing use and if known the length of time the existing uses have continued on the subject lands:

_____
_____
_____

2. Are any existing buildings on the subject lands designated under the Ontario Heritage Act as being of significant heritage value or interest?

☐ Yes ☐ No

If yes, identify and provide details of the building:

_____

3. Indicate land use of abutting properties

_____
_____

4. Is the proposal part of a phased development? If so, provide the name of the phased development and associated file number of the previous phases:

_____

5. Has the subject property ever been or currently is the subject of a Planning Act application?

- Plan of Subdivision ☐ Yes ☐ No
- Official Plan Amendment ☐ Yes ☐ No
- Zoning Bylaw, or Zoning Order Amendment ☐ Yes ☐ No

- Site Plan ☐ Yes ☐ No
- Consent/Minor Variance ☐ Yes ☐ No

  If yes, please indicate the application file number and the status of the application_____

6. Is the subject property covered by a Minister's zoning order?

   ☐ Yes ☐ No

   If yes, indicate the Ontario Regulation Number:_____

7. Is the water, sewage, or road works associated with the proposed development subject to the provisions of the Environmental Assessment Act?

   ☐ Yes ☐ No

8. Related Planning Applications – List all existing and proposed development applications affecting lands within 120 metres of the subject property:

| Type of Planning Act application | File No. | Address |
|---|---|---|
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |

**D. Previous Use of Lands:**

1. Has there been industrial or commercial use on the subject lands or adjacent lands? ☐ Yes ☐ No ☐ Unknown

   If yes, specify the uses (for example: gas station or petroleum storage):

   _____

2. Is there reason to believe the subject lands may have been contaminated by former uses on the site or adjacent sites?

   ☐ Yes ☐ No ☐ Unknown

   Provide the information you used to determine the answers to the above questions:

   _____

3. If you answered yes to any of the above questions in Section D, a land uses inventory listing all known former land uses of the subject lands, and/or when applicable, the adjacent lands, is required.

   Is the land use inventory of former land uses attached? ☐ Yes ☐ No

## E. Provincial Policy

1. Complete the following Environmental Features, Infrastructure and Development Context table as required:

| Environmental Features, Infrastructure and Development Context | On-site | Within 500 metres |
|---|---|---|
| Class I Industrial Use[1] | ☐ | ☐ |
| Class II Industrial Use[1] | ☐ | ☐ |
| Class 3 Industrial Use[1] | ☐ | ☐ |
| Landfill site | ☐ | ☐ |
| Sewage treatment plant and waste stabilization plant | ☐ | ☐ |
| Significant wetlands | ☐ | ☐ |
| Significant habitat of endangered and threatened species | ☐ | ☐ |
| Significant fish habitat, valley lands, areas of natural and scientific interest, wildlife habitat | ☐ | ☐ |
| Sensitive groundwater recharge areas, headwaters and aquifers | ☐ | ☐ |
| Erosion hazards | ☐ | ☐ |
| Floodplains | ☐ | ☐ |
| Active railway line | ☐ | ☐ |
| Existing and/or planned controlled access highways or freeways | ☐ | ☐ |
| High voltage electric transmission line | ☐ | ☐ |
| Agricultural operations | ☐ | ☐ |
| Mineral aggregate resource area | ☐ | ☐ |
| Mineral aggregate operations | ☐ | ☐ |
| Existing pits and quarries | ☐ | ☐ |
| Significant archaeological resources | ☐ | ☐ |
| Hazardous sites[2] | ☐ | ☐ |
| Source water protection (Wellhead Protection Area (WHPA) A, B or C; Issue Contributing Area; Intake Protection Zone | ☐ | ☐ |

[1] *Class 1, 2,3 Industrial Use – Refer to D-6-1 Industrial Categorization Criteria of the Ministry of the Environment Conservation and Parks*

[2] *Hazardous sites - means property or lands that could be unsafe for development and site alteration due to naturally occurring hazards.*

2. For each feature or development circumstance of potential concern identified in Section E.1. explain how regard was had to the Provincial Planning Statement.

_____

_____

_____

3. It is owner's responsibility to be aware of and comply with all relevant federal or provincial legislation, municipal by-laws or other agency approvals, including the Endangered Species Act, 2007. Have the subject lands been screened to ensure that development or site alteration will not have any impact on the habitat for endangered or threatened species further to the Provincial Planning Statement?

☐ Yes ☐ No

If no, please explain: _____

**F. Servicing and Access**

1. Indicate what services are available or proposed:

| **Water Supply** | | **Storm Drain** | |
|---|---|---|---|
| Municipal piped water | ☐ | Storm sewers | ☐ |
| Individual wells | ☐ | Open ditches | ☐ |
| Communal wells | ☐ | Other (describe below): | ☐ |
| Other (describe below): | ☐ | | |

| **Sewage Treatment** | | **Existing or proposed access to subject lands** | |
|---|---|---|---|
| Municipal sewers | ☐ | Municipal road | ☐ |
| Communal system | ☐ | Provincial highway | ☐ |

| | | | |
|---|---|---|---|
| Septic tank and tile bed in good working order | ☐ | Unopened road | ☐ |
| Other (describe below): | ☐ | Name of road/street:_____ | |
| | | Other (describe below): | ☐ |

2. Is the property located within a designated municipal drain boundary?

_____

**G. Other Information**

1. Does the application involve a local business? ☐ Yes ☐ No

   If yes, how many jobs are provided on the subject lands?

   _____

2. Is there any other information that you think may be useful in the review of this application? If so, explain below or attach on a separate page.

   _____
   _____
   _____

The following additional plans, studies and reports, including but not limited to, **may** also be required as part of the complete application submission:

- ☐ Zoning Deficiency Form
- ☐ On-Site Sewage Disposal System Evaluation Form (to verify location and condition)
- ☐ Architectural Plan
- ☐ Buildings Elevation Plan
- ☐ Cut and Fill Plan
- ☐ Erosion and Sediment Control Plan
- ☐ Grading and Drainage Control Plan (around perimeter and within site) (existing and proposed)
- ☐ Landscape Plan
- ☐ Photometric (Lighting) Plan

- ☐ Plan and Profile Drawings
- ☐ Site Servicing Plan
- ☐ Storm water Management Plan
- ☐ Street Sign and Traffic Plan
- ☐ Street Tree Planting Plan
- ☐ Tree Preservation Plan
- ☐ Archaeological Assessment
- ☐ Heritage Impact Assessment
- ☐ Environmental Impact Study
- ☐ Agricultural Impact Assessment
- ☐ Functional Servicing Report
- ☐ Geotechnical Study / Hydrogeological Review
- ☐ Minimum Distance Separation Schedule
- ☐ Noise or Vibration Study
- ☐ Record of Site Condition
- ☐ Stormwater Management Report
- ☐ Traffic Impact Study – please contact the Planner to verify the scope required

All other requirements as per the pre-consultation meeting will apply. All final plans must include the owner's signature as well as the engineer's signature and seal. The statement of acknowledgement must be signed in this regard.

"I confirm that the required drawings have been completed and submitted as specified in the general requirements along with the requirements outlined in the Pre-consultation notes. I understand that the application may not be deemed complete until planning staff are satisfied with the content and format of the required drawings."

Authorized Applicant/Agent Signature _____ Date _____

## H. Development Agreements

A development agreement will be required as part of the subdivision and condominium applications. You should contact the Agreement Administrator for further details of the requirements, including but not limited to insurance coverage, professional liability for the engineer(s), additional fees and performance securities.

## I. Transfers, Easements and Postponement of Interest

The owner acknowledges and agrees that if required, it is their solicitor's responsibility on behalf of the owner to disclose the registration of all transfer(s) of land and/or easement in favour of the County and/or utilities. Also, the owner further acknowledges and agrees that it is their solicitor's responsibility on behalf of the owner for the registration of postponements of any charges in favour of the County.

## J. Permission to Enter Subject Lands

Permission is hereby granted to Norfolk County officers, employees or agents, to enter the premises subject to this application for the purpose of making inspections associated with this application, during normal and reasonable working hours.

## K. Freedom of Information

For the purposes of the *Municipal Freedom of Information and Protection of Privacy Act*, I authorize and consent to the use by or the disclosure to any person or public body any information that is collected under the authority of the *Planning Act, R.S.O. 1990, c. P. 13* for the purposes of processing this application.

Owner/ Authorized Applicant Signature Date

Norfolk COUNTY

## L. Owner's Authorization

If the applicant/agent is not the registered owner of the lands that is the subject of this application, the owner(s) must complete the authorization set out below.

I/We Westwood Trails Developments Inc. am/are the registered owner(s) of the lands that is the subject of this application.

I/We authorize Carmen Jandu, Agent to make this application on my/our behalf and to provide any of my/our personal information necessary for the processing of this application. Moreover, this shall be your good and sufficient authorization for so doing.

c/s 3/5/26

Owner Date

PER PRESIDENT, DAVE POND
I HAVE AUTHORITY TO BIND THE CORPORATION

~~Owner~~ ~~Date~~

## M. Declaration

I, Carmen Jandu of the Town of Oakville, Region of Halton

solemnly declare that:

all of the above statements and the statements contained in all of the exhibits transmitted herewith are true and I make this solemn declaration conscientiously believing it to be true and knowing that it is of the same force and effect as if made under oath and by virtue of *The Canada Evidence Act*.

Declared before me at:
City of Hamilton

Owner/Authorized Applicant Signature

In City of Hamilton

This 11th day of May

A.D., 2026

A Commissioner, etc.

Jared Vail Marcus, a Commissioner, etc
Province of Ontario,
for Arcadis Professional Services( Canada) Inc.
Expires June 16, 2026

# Development Application for Official Plan Amendment

## Complete Application

The application must be completed by the owner or authorized agent. If the application is being submitted by an agent, the owner's written authorization is required. If the lands subject to this application are owned by more than one owner, the authorization of all owners is required. Submission of this application constitutes consent for authorized municipal staff to inspect the subject lands.

It is the responsibility of the applicant to research and evaluate the site and the proposal to ensure that the development will conform to the interests of the health, safety and welfare of future residents. Sufficient studies for the completion of the application should be carried out prior to submission and should be reflected in the application form.

## Online Application Process

All applications must be submitted online via the County's CityView Portal. The portal can be accessed here: Welcome - CityView Portal. The applicant will submit the materials required as part of a complete application. Once the County confirms receipt of a complete submission, the applicant will be contacted and provided further directions for payment options.

## Pre-Consultation Meeting:

Pre-Consultation is highly recommended for Official Plan Amendment applications. The purpose of a Pre-Consultation meeting is to provide the applicant with an opportunity to present the proposed development, discuss potential issues, and for the Norfolk County and external agencies to identify the application requirements. The requirements, as detailed in the Pre-Consultation meeting comments, are valid for one year after the meeting date.

## User Fees:

The planning application fee will be determined when the application can be deemed complete according to Norfolk County Community Planning user fees: User Fees | Norfolk County

Additional agency plan review fees may apply. Please see below for more information and forward fees directly to the applicable agency, as required:

**Grand River Conservation Authority**
Plan Review fees | Grand River Conservation Authority
**Long Point Region Conservation Authority**
Planning Fees - Long Point Region Conservation Authority

Cash, debit, credit or cheque payable to Norfolk County in the amount set out in the User Fees By-Law that will be accepted and deposited once the application has been deemed complete.

**Development Application Process**

Norfolk County staff will circulate the complete application to adjacent landowners, public agencies, and internal departments for comment. Planning Act decision timeframes will apply in accordance with the provisions of Section 17 of the Act.

Norfolk County collects personal information submitted through this form under the authority of the Municipal Freedom of Information and Protection Act. Norfolk County will use this information for the purposes indicated by this form.

Additional studies required for a complete application and any required peer reviews that may be necessary shall be provided at the applicant's sole expense. In these cases, Norfolk County staff will select the company to complete the peer review.

Norfolk County will refund the original fee if applicants withdraw their applications before circulation. If Norfolk County must recirculate your drawings, there will be an additional fee. If Norfolk County must do more than three reviews of engineering drawings due to revisions by the owner or failure to revise engineering drawings as requested, Norfolk County will charge an additional fee.

**Contact Us**

For additional information or assistance completing this application, please contact a Planner at 519-426-5870 or planning@norfolkcounty.ca.

**Notification Sign Requirements**

For public notification, Norfolk County will provide you with a sign to indicate the intent and purpose of the development application. It is your responsibility to:

1. Post one sign per frontage in a conspicuous location on the subject lands.
2. Ensure one sign is posted at the front of the subject lands at least three feet above ground level and not on a tree.
3. Notify the Planner when the sign is in place.
4. Maintain the sign until the development application is finalized and, after that, remove it.

**For Office Use Only**:

| | | | |
|---|---|---|---|
| File Number | | Public Notice Sign | |
| Related File Number | | Application Fee | |
| Pre-consultation Meeting | | Conservation Authority Fee | |
| Application Submitted | | Well & Septic Info Provided | |
| Complete Application | | Planner | |

**Check the type of planning application(s) you are submitting.**

☐ Official Plan Amendment - Regular

☐ Official Plan Amendment - Major

**Property Assessment Roll Number:** _____

## A. Applicant Information

*Note: It is the responsibility of the owner to notify the Planner of any changes in ownership or authorized applicant within 30 days of such a change*

**Name of Owner** _____

Address _____

Town and Postal Code _____

Phone Number _____

Cell Number _____

Email _____

**Name of Authorized Applicant** _____

Address _____

Town and Postal Code _____

Phone Number _____

Cell Number _____

Email _____

**Name of Authorized Agent** _____

Address _____

Town and Postal Code _____

Phone Number _____

Cell Number _____

Email _____

Unless otherwise directed, Norfolk County will forward all correspondence and notices regarding this application to both owner and agent noted above.

☐ Owner ☐ Agent ☐ Applicant

Names and addresses of any holder of any mortgagees, charges or other encumbrances on the subject lands:

N/A

_____

**B. Location, Legal Description and Property Information**

1. Legal Description (include Geographic Township, Concession Number, Lot Number, Block Number and Urban Area or Hamlet):

_____

_____

Municipal Civic Address: _____

Land acquisition date (if known): 2011

Present Official Plan Designation(s): _____

Present Zoning: Agriculture

2. Is there a site-specific provision on the subject lands?

☐ Yes ☐ No

If yes, please specify the corresponding number:

_____

3. Present use of the subject lands:

_____

_____

4. Please describe **all existing** buildings or structures on the subject lands and whether they will be retained, demolished or removed.

_____
_____
_____

5. If an addition to an existing building is being proposed, please explain the proposed use.

_____
_____

6. Please describe **all proposed** buildings or structures/additions on the subject lands.

_____
_____

7. Are any existing buildings on the subject lands designated under the *Ontario Heritage Act* as being of cultural heritage value or interest?

☐Yes No ☐

If yes, identify and provide details:

_____
_____

8. If known, the length of time the existing uses have continued on the subject lands:

_____

9. Existing use of abutting properties:

_____
_____

10. Are there any easements or restrictive covenants affecting the subject lands?

Yes ☐ No ☐

If yes, describe the easement or restrictive covenant and its effect:

_____

**C. Purpose of Development Application**

**Note: Please complete all that apply.**

1. Please describe the proposed development on the subject lands:

_____
_____
_____

2. Please explain why it is not possible to conform to the policies of the Official Plan:

_____
_____

3. What land uses would the requested official plan amendment authorize?

_____
_____

4. Are any Official Plan schedules or maps proposed to be changed or replaced

☐ Yes ☐ No

If yes, please provide a proposed key land use schedule map.

5. Have the subject land or lands within 120 metres ever been and/or currently are the subject of a Planning Act application:
   - Plan of Subdivision ☐ Yes ☐ No
   - Official Plan Amendment ☐ Yes ☐ No
   - Zoning Bylaw, or Zoning Order Amendment ☐ Yes ☐ No
   - Site Plan ☐ Yes ☐ No
   - Consent/Minor Variance ☐ Yes ☐ No

   If yes, indicate the application file number and the status of the application_____

6. Does the requested amendment alter all or any part of the boundary of an area of settlement in the municipality or establish a new area of settlement in the municipality?

☐Yes ☐No

If yes, describe its effect:

_____
_____

7. Does the requested amendment remove the subject land from an area of employment?

☐Yes ☐No

If yes, describe its effect:

_____

8. Does the requested amendment alter, replace, or delete a policy of the Official Plan?

☐Yes ☐ No

If yes, identify the policy, and also include a proposed text of the policy amendment (if additional space is required, please attach a separate sheet):

_____

_____

## D. Previous Use of the Property

1. Has there been an industrial or commercial use on the subject lands or adjacent lands?

☐ Yes ☐ No ☐ Unknown

If yes, specify the uses (for example: gas station or petroleum storage):

_____

_____

2. Is there reason to believe the subject lands may have been contaminated by former uses on the site or adjacent sites?

☐ Yes ☐ No ☐ Unknown

3. Provide the information you used to determine the answers to the above questions:

_____

_____

4. If you answered yes to any of the above questions in Section D, a previous land use inventory showing all known former uses of the subject lands, and/or when applicable, the adjacent lands, is required.

Is the land use inventory of former land uses attached? ☐ Yes ☐ No

## E. Provincial Planning Statement

1. Is the requested amendment consistent with the Provincial Planning Statement issued under subsection 3(1) of the *Planning Act, R.S.O. 1990, c. P. 13*?

☐ Yes ☐No

If no, please explain:

_____

_____

2. It is the owner's responsibility to be aware of and comply with all relevant federal or provincial legislation, municipal by-laws or other agency approvals, including

the Endangered Species Act, 2007. Have the subject lands been screened to ensure that development or site alteration will not have any impact on the habitat for endangered or threatened species further to the Provincial Planning Statement?

☐ Yes ☐ No

If no, please explain:

_____

_____

3. Have the subject lands been screened to ensure that development or site alteration will not have any impact on source water protection?

☐ Yes ☐ No

If no, please explain:

_____

_____

*Note: If in an area of source water Wellhead Protection Area (WHPA) A, B or C, Intake Protection Zone (IP-Z), Issue Contributing Area (ICA), please attach relevant information and approved mitigation measures from the Risk Management Official.*

4. Are any of the following uses or features on the subject lands or within 500 metres of the subject lands, unless otherwise specified? Please check boxes, if applicable.

**Livestock facility or stockyard**

☐ On the subject lands or ☐ within 500 meters – distance _____

**Significant Woodland**

☐ On the subject lands or ☐ within 500 meters – distance _____

**Municipal Landfill**

☐ On the subject lands or ☐ within 500 meters – distance _____

**Sewage treatment plant or waste stabilization plant**

☐ On the subject lands or ☐ within 500 meters – distance _____

**Provincially significant wetland or other environmental feature**

☐ On the subject lands or ☐ within 500 meters – distance _____

**Floodplain**

☐ On the subject lands or ☐ within 500 meters – distance _____

**Rehabilitated mine site**

☐ On the subject lands or ☐ within 500 meters – distance _____

**Non-operating mine site within one kilometre**

☐ On the subject lands or ☐ within 500 meters – distance _____

**Active mine site within one kilometre**
☐ On the subject lands or ☐ within 500 meters – distance _____

**Industrial or commercial use (specify the use(s))**
☐ On the subject lands or ☐ within 500 meters – distance _____

**Active railway line**
☐ On the subject lands or ☐ within 500 meters – distance _____

**Seasonal wetness of lands**
☐ On the subject lands or ☐ within 500 meters – distance _____

**Erosion**
☐ On the subject lands or ☐ within 500 meters – distance _____

**Abandoned gas wells**
☐ On the subject lands or ☐ within 500 meters – distance _____

## F. Servicing and Access

1. Indicate what services are available or proposed:

| **Water Supply** | | **Storm Drain** | |
|---|---|---|---|
| Municipal piped water | ☐ | Storm sewers | ☐ |
| Individual wells | ☐ | Open ditches | ☐ |
| Communal wells | ☐ | Other (describe below): _____ | ☐ |
| Other (describe below): _____ | ☐ | | |
| **Sewage Treatment** | | **Existing or proposed access to subject lands** | |
| Municipal sewers | ☐ | Municipal road | ☐ |
| Communal system | ☐ | Provincial highway | ☐ |
| Septic tank and tile bed in good working order | ☐ | Unopened road | ☐ |
| Other (describe below): _____ | ☐ | Name of road/street:_____ | |
| | | Other (describe below): _____ | ☐ |

2. Does the application require development on privately owned and operated individual or communal septic systems, and more than 4500 litres of effluent produced per day as a result of the development being completed?

☐ Yes ☐ No

If yes, provide (i) Servicing Options Report and (ii) Hydrogeological Report with the submission.

## G. Other Information

1. Does the application involve a local business? ☐ Yes ☐ No

   If yes, how many people are employed on the subject lands?

   _____

2. Please provide a proposed strategy for consulting with the public with respect to this application:

   _____

   _____

   _____

## H. Supporting Material to be submitted by Applicant

### i. Concept sketch

A sketch drawn to scale showing in metric units, the following;

1) the boundaries and dimensions of the subject lands and where applicable, total land holdings owned by the applicant and encompassing the lands for which the application is being made;

2) the distribution of the proposed land uses, including the location, size and use of all proposed building and structures, landscaping and parking areas on the subject land. In the case of a plan of subdivision, a lotting plan shall be submitted.

### ii. Additional plans, studies and reports

The following additional plans, studies and reports, including but not limited to, **may** also be required as part of the complete application submission:

☐ On-Site Sewage Disposal System Evaluation Form (to verify location and condition)

☐ Cut and Fill Plan

☐ Erosion and Sediment Control Plan

- ☐ Grading and Drainage Control Plan (around perimeter and within site) (existing and proposed)
- ☐ Plan and Profile Drawings
- ☐ Site Servicing Plan
- ☐ Storm water Management Plan
- ☐ Street Sign and Traffic Plan
- ☐ Street Tree Planting Plan
- ☐ Tree Preservation Plan
- ☐ Archaeological Assessment
- ☐ Environmental Impact Study
- ☐ Functional Servicing Report
- ☐ Agricultural Impact Assessment
- ☐ Geotechnical Study / Hydrogeological Review
- ☐ Minimum Distance Separation Calculations
- ☐ Noise or Vibration Study
- ☐ Record of Site Condition
- ☐ Stormwater Management Report
- ☐ Traffic Impact Study – please contact the Planner to verify the scope required

The approval of the proposed development might be subject to additional federal or provincial legislation, municipal by-laws or other agency approvals.

## I. Transfers, Easements and Postponement of Interest

The owner acknowledges and agrees that if required, it is their solicitor's responsibility on behalf of the owner to disclose the registration of all transfer(s) of land and/or easement in favour of the County and/or utilities. Also, the owner further acknowledges and agrees that it is their solicitor's responsibility on behalf of the owner to undertake the registration of postponements of any charges in favour of the County.

## J. Permission to Enter Subject Lands

Permission is hereby granted to Norfolk County officers, employees or agents, to enter the premises subject to this application for the purpose of making inspections associated with this application, during normal and reasonable working hours.

## K. Freedom of Information

For the purposes of the *Municipal Freedom of Information and Protection of Privacy Act*, I authorize and consent to the use by or the disclosure to any person or public body any information that is collected under the authority of the *Planning Act, R.S.O. 1990, c. P. 13* for the purpose of processing this application.

Owner/Authorized Applicant Signature — March 2, 2026 (Date)

## L. Owner's Authorization

If the authorized applicant/agent is not the registered owner of the lands that is the subject of this application, the owner(s) must complete the authorization set out below.

I/We Westwood Trail Developments Inc am/are the registered and authorized owner(s) of the lands that is the subject of this application.

I/We authorize Arcadis c/o Carmen Jandu to make this application on my/our behalf and to provide any of my/our personal information necessary for the processing of this application. Moreover, this shall be your good and sufficient authorization for so doing.

C/S — March 10/26 (Date)

PER PRESENT Owner DAVID POND I HAVE AUTHORITY TO BIND THE CORPORATION

~~Owner~~ — ~~Date~~

***Note:** If property is owned by an Ontario Ltd. Corporation, Articles of Incorporation are required to be attached to the application.**

**M. Declaration**

I, Carmen Jandu of The Town of Oakville, Region of Halton

solemnly declare that:

all of the above statements and the statements contained in all of the exhibits transmitted herewith are true and I make this solemn declaration conscientiously believing it to be true and knowing that it is of the same force and effect as if made under oath and by virtue of *The Canada Evidence Act*.

Declared before me at:
City of Hamilton

Owner/Authorized Applicant Signature

In City of Hamilton

This 11th day of May

A.D., 2026

Jared Vail Marcus, a Commissioner, etc
Province of Ontario,
for Arcadis Professional Services( Canada) Inc.
Expires June 16, 2026

Ms. Alisha Cull, BES, MCIP, RPP, Ec.D.
Manager, Planning Services
Norfolk County
50 Colborne Street South
Simcoe, Ontario N3Y 4H3
Canada

Arcadis Professional Services (Canada) Inc.
360 James Street North
Suite 200
Hamilton, Ontario L8L 1H5
Canada
Phone: 905 546 1010
www.arcadis.com

Date: May 29, 2026
Subject: **Applications for Official Plan Amendment, Zoning By-Law Amendment, and Draft Plan of Subdivision, for Westwood Trail Phase 3 in Norfolk County**

Dear Ms. Cull,

On behalf of the owner, Westwood Trail Developments Inc., Arcadis Professional Services (Canada) Inc. is pleased to submit the enclosed applications for Official Plan Amendment ("OPA"), Zoning By-law Amendment ("ZBLA"), Draft Plan of Subdivision ("DPS") for the lands located at Part of Lot 18, Concession Gore, former Township of Woodhouse, in Norfolk County ("County) in the Province of Ontario ("subject lands").

The owner is applying for a privately initiated OPA to propose a settlement boundary expansion permitted under Policy 6.4K of the Official Plan for Urban Boundary Expansion Special Policy Areas. The proposed development and addition to the Urban Area of Simcoe represents the third and final phase of the Westwood Trails Development located at the western boundary Simcoe.

The inclusion of the lands within the Simcoe Urban Area boundary is proposed to permit a residential development subdivision consisting of the following:

- 1 townhouse block located on a private road containing 101 units;
- 2 townhouse blocks located containing 12 units located on a proposed municipal road;
- 1 multi-residential (apartment) block;
- a stormwater management block; and,
- a municipal park block which is an extension to the existing Westwood Acres Park.

The proposed subdivision will deliver a mix of densities with a total of 293 units: 101 condominium townhouse units, 12 freehold townhouse units, and 180 apartment units. Based on an approximate site area of 8.9 hectares and a total of 293 units, an overall density of 33 units per hectare is proposed.

The Norfolk County Official Plan designates the subject lands as 'Agricultural'. The Norfolk County Zoning By-law 1-Z-2014 zones the subject lands as 'Agricultural (A)'. As confirmed by the County through the pre-consultation process, applications for OPA, ZBLA, DPS, and DPC are required to facilitate the proposed development.

Ms. Alisha Cull, BES, MCIP, RPP, Ec.D.
Norfolk County
May 29, 2026

In support of the proposed applications, please find enclosed the following:

- Application Forms:
  - OPA Form
  - ZBLA Form
  - DPS Form
- Prepared by Arcadis:
  - Planning Justification Report
  - Draft OPA and Schedule
  - Draft ZBLA and Schedule
  - DPS
- Prepared by Apex Archaeology Inc.:
  - Stage 1 Archaeological Background Study dated February 26, 2026
- Prepared by DBH Soil Services Inc.:
  - Agricultural Impact Assessment dated December 12, 2025
- Prepared by Natural Resource Solutions Inc.:
  - Environmental Impact Study dated May 2026
- Prepared by MTE Consultants Inc.:
  - Phase I Environmental Site Assessment dated February 28, 2014
  - Phase II Environmental Site Assessment dated June 19, 2014
  - Geotechnical Investigation Report dated March 18, 2026
  - Hydrogeological Assessment Report dated March 18, 2026
    - Letter of Acknowledgement from the County's Risk Management Officer, dated March 13, 2026
    - Restricted Land Use Notices, dated March 13, 2026
  - Functional Servicing Report dated March 18, 2026
  - Stormwater Management Report dated March 18, 2026
- Prepared by Paradigm Transportation Solutions Ltd.:
  - Transportation Impact Study dated December 2025
- Prepared by Natural Resource Solutions Inc.:
  - Environmental Impact Statement dated May 1, 2026

The following detailed materials related to the DPC and Site Plan Approval will be submitted in the future and are as follows:

- DPC Application Form
- Landscaping Plan
- Photometrics (Lighting) Plan
- Siltation and Erosion Control Plan
- Pavement Parking and Signage
- Streetlighting Plan
- On-street Parking Plan
- Composite Utility Plan
- Land Use Compatibility Study
- Construction Access and Management Plan

- Walkability and Transit Connectivity Assessment
- Streetlighting Design

Payment made payable to County will be provided under separate cover once fees have been confirmed by the County. We trust that the enclosed is in order. However, should you have any questions or require further information, please do not hesitate to contact the undersigned. We look forward to working with County on these applications.

Sincerely,
Arcadis Professional Services (Canada) Inc.

Carmen Jandu MCIP RPP
Senior Associate – Studio Manager, Planning

Email: carmen.jandu@arcadis.com
Direct Line: 905 546 1010 ext 63106

CC. Mike McArthur, Westwood Development Inc.
Dave Ponds, Westwood Development Inc.

Westwood Trail Developments Inc.

# Planning Justification Report

## Westwood Trail Phase III, Norfolk County

**Applications for Official Plan Amendment, Zoning By-law Amendment, and Draft Plan of Subdivision**

May 29, 2026

# Planning Justification Report

**Westwood Trail Phase III, Norfolk County**

May 29, 2026

**Prepared By:**
Arcadis Professional Services (Canada) Inc.
360 James Street North, Suite 200
Hamilton, Ontario L8L 1H5
Canada
Phone: 905 546 1010

**Prepared For:**
Westwood Trail Developments Inc.
222 Deer Ridge Drive
Kitchener, Ontario N2P 2M2
Canada

**Our Ref:**
124639

Carmen Jandu MCIP RPP
Senior Associate – Studio Manager, Planning

Isabelle Ilagan RPP MCIP
Planner

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# Version Control

| Issue | Revision No. | Date Issued | Page No. | Description | Reviewed By |
|---|---|---|---|---|---|
| 1 | N/A | May 29, 2026 | 66 | Planning Justification Report | Carmen Jandu |
| | | | | | |
| | | | | | |

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**Appendix B: Draft Zoning By-law Amendment and Schedule**

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# Acronyms and Abbreviations

| | |
|---|---|
| AAI | Apex Archaeology Inc. |
| AIA | Agricultural Impact Assessment |
| AODA | Accessibility for Ontarians with Disabilities Act |
| Arcadis | Arcadis Professional Services (Canada) Inc. |
| County | Norfolk County |
| DBH | DBH Soil Services Inc. |
| DPC | Draft Plan of Condominium |
| DPS | Draft Plan of Subdivision |
| EIS | Environmental Impact Study |
| ESA | Environmental Site Assessment |
| FSR | Functional Servicing Report |
| MDS1 | Minimum Distance Separation 1 |
| MMAH | Ministry of Municipal Affairs and Housing |
| MOF | Ministry of Finance |
| MTE | MTE Consultants |
| NRSI | Natural Resource Solutions Inc. |
| Official Plan | Norfolk County Official Plan |
| OPA | Official Plan Amendment |
| Owner | Westwood Trail Developments Inc. |
| Paradigm | Paradigm Transportation Solutions Limited |
| *Planning Act* | *Planning Act, R.S.O. 1990, c.P.13* |
| PJR | Planning Justification Report |
| PSA | Primary Study Area |
| PPS | Provincial Planning Statement |
| RMO | Risk Management Officer |
| RMP | Risk Management Plan |
| SAR | Species at Risk |
| SPA | Site Plan Approval |
| SSA | Secondary Study Area |

| | |
|---|---|
| Subject Lands | Part of Lot 18, Concession Gore, former Township of Woodhouse, Norfolk County (the “County”) in the Province of Ontario |
| SWH | Significant Wildlife Habitat |
| SWM | Stormwater Management |
| TIS | Transportation Impact Study |
| UPH | Units per Hectare |
| ZBLA | Zoning By-law Amendment |
| Zoning By-law | Norfolk County Zoning By-law 1-Z-2014 |

# Executive Summary

This Planning Justification Report has been prepared by Arcadis Professional Services (Canada) Inc. on behalf of Westwood Trail Developments Inc. to support the submission of planning applications for Official Plan Amendment, Zoning By-law Amendment, and Draft Plan of Subdivision to Norfolk County which would permit the development of a residential subdivision located at Part of Lot 18, Concession Gore, former Township of Woodhouse, in Norfolk County in the Province of Ontario.

On May 22, 2024, the County adopted OPA 163 pursuant to Sections 17 and 26 of the *Planning Act, R.S.O. 1990, c.P.13* by By-Law 2024-48. The adopted OPA 163 represents the first phase of the County's official plan update, setting out a long-term growth management strategy for the urban communities in the County by amending urban area boundaries, land use designations, and adding site-specific policies. Through OPA 163, the County has adopted the inclusion of several parcels of land, including the subject lands, into the Urban Area of Simcoe as Part 1 lands. The Part 1 lands subject to this application are located at the western boundary of the existing urban area, south of West Street and comprise of the lands subject to this application and an existing stormwater management facility approved outside of the urban area boundary through Amendment No. 13 to the Official Plan.

On September 5, 2025, the Ministry of Municipal Affairs and Housing approved OPA 163 with modifications. Modifications 4 and Part B (7) respectively, both approved the inclusion of the Part 1 lands into the Simcoe Urban Area Boundary subject to Site Specific Policy 6.4.k) then withheld their decision pending further information. Site Specific Policy 6.4.k) provides Urban Area Boundary Expansion Policies which detail the required studies and plans to justify requests for boundary inclusion and are permitted though privately initiated site-specific amendments.

In response, the applicant has prepared the enclosed submission in keeping with Site Specific Policy 6.4.k) iii) and requests a private site-specific amendment for their lands that will provide additional information to finalize the decision for the inclusions of the lands as adopted within OPA 163. The subject lands represent the last phase of the Westwood Trails subdivision which is located to the immediate west of the existing Westwood Trails Phases I and II.

The subject lands are approximately 8.9 hectares in size and are currently vacant, containing a woodlot and open area. As outlined above, the applicant is requesting the expansion of the Simcoe Urban Area Boundary to include the subject lands and permit the development of Phase III of the Westwood Trails subdivision with a mixed density residential subdivision. The proposed development consists of a carriage-style municipal road fronted by townhome blocks and an apartment building. Proposed tenure for the dwellings includes common element condominium, standard condominium, and freehold units. In addition to the residential blocks, the proposed development includes a large wooded park block and a stormwater management block.

Overall, the proposed development will help to create a livable and attractive development, support the achievement of complete communities, and contribute to housing and residential growth targets of the County and Province.

Reference should be made to the supporting studies, reports, and materials included in this submission.

# 1 Introduction

Westwood Trail Developments Inc. (the “Owner”) is the owner of an approximately 8.9-hectare parcel of land known as Part of Lot 18, Concession Gore, former Township of Woodhouse, Norfolk County (the “County”) in the Province of Ontario (herein referred to as the “subject lands”). They are also referred to as Westwood Trails Phase III. The subject lands are currently vacant, containing a woodlot and open area, with mature trees and unmaintained meadows.

Prior to 2008, approximately 2.56 hectares of the subject lands were originally located within the Simcoe Urban Area Boundary. However, as part of Official Plan Amendment (“OPA”) No. 22, these lands were removed from the urban area in exchange for lands that now form Phase II of the Westwood Trails subdivision. This land exchange was considered a logical adjustment, at the time, due to the subject lands being situated at the terminus of the Thomson Road cul-de-sac, had existing servicing availability, and are located adjacent to established community uses, including Westwood Acres Park.

Currently, the subject lands lie outside of the Simcoe Urban Area Boundary adjacent to its western limit. The Owner is applying for a privately initiated OPA to propose the expansion of the Simcoe Urban Area Boundary to include the subject lands which will accommodate the proposed development known as Westwood Trails Phase III.

The inclusion of the lands within the Urban Area Boundary will permit the proposed residential development, consisting of a carriage-style municipal road and 3 blocks for condominium townhouses, 1 block for an apartment building, a stormwater management (“SWM”) block, and a park block envisioned as an extension to the existing Westwood Acres Park created in earlier phases of the Westwood Trails subdivision. Currently a mix of unit types and densities are proposed: 101 townhouse units, 12 bungalow-townhouse units, and 180 apartment units. Based on an approximate site area of 8.9 hectares and a total of 293 units, an overall density of 33 units per hectare (“UPH”) is proposed. The Norfolk County Official Plan (the “Official Plan”) provides a population forecast to 2051, in which Simcoe is forecast to support a population of 34,299 persons, 14,291 households, and 11,594 of employment.

The Official Plan designates the subject lands as ‘Agricultural’. The Norfolk County Zoning By-law 1-Z-2014 (the “Zoning By-law”) zones the subject lands as ‘Agricultural (A)’. As confirmed by the County through the pre-consultation process, applications for OPA, Zoning By-law Amendment (“ZBLA”), Draft Plan of Subdivision (“DPS”), and Draft Plan of Condominium (“DPC”) are required to facilitate the proposed development.

Arcadis Professional Services (Canada) Inc. (“Arcadis”) has been retained by the Owner to provide professional planning advice and assistance on the development of the subject lands. The authors of this report have come to an independent professional planning opinion which supports the applications as they are reflective of good planning and are in the public interest. This Planning Justification Report (“PJR”) provides a thorough discussion and analysis of current and applicable Provincial legislation and plans, local planning documents, supporting studies, technical works, and other relevant matters in the context of the proposed development.

# 2 Subject Lands and Surrounding Context

The following subsections provide a review of the context, existing uses, and conditions for the subject lands and surrounding area. These elements frame the discussion on the planning policy justification for the proposed OPA, ZBLA, and DPS.

## 2.1 Subject Lands

The subject lands are known as Part of Lot 18, Concession Gore, former Township of Woodhouse, Norfolk County in the Province of Ontario. They are irregular in shape, approximately 8.9 hectares in size, and have an approximate frontage of 183 metres along West Street. The subject lands are vacant, containing a woodlot and open area, with mature trees and unmaintained meadows. There are no buildings or structures on the subject lands, however, there is an existing driveway from Westwood into the subject lands. Please refer to **Figure 2-1** for an aerial image of the subject lands.

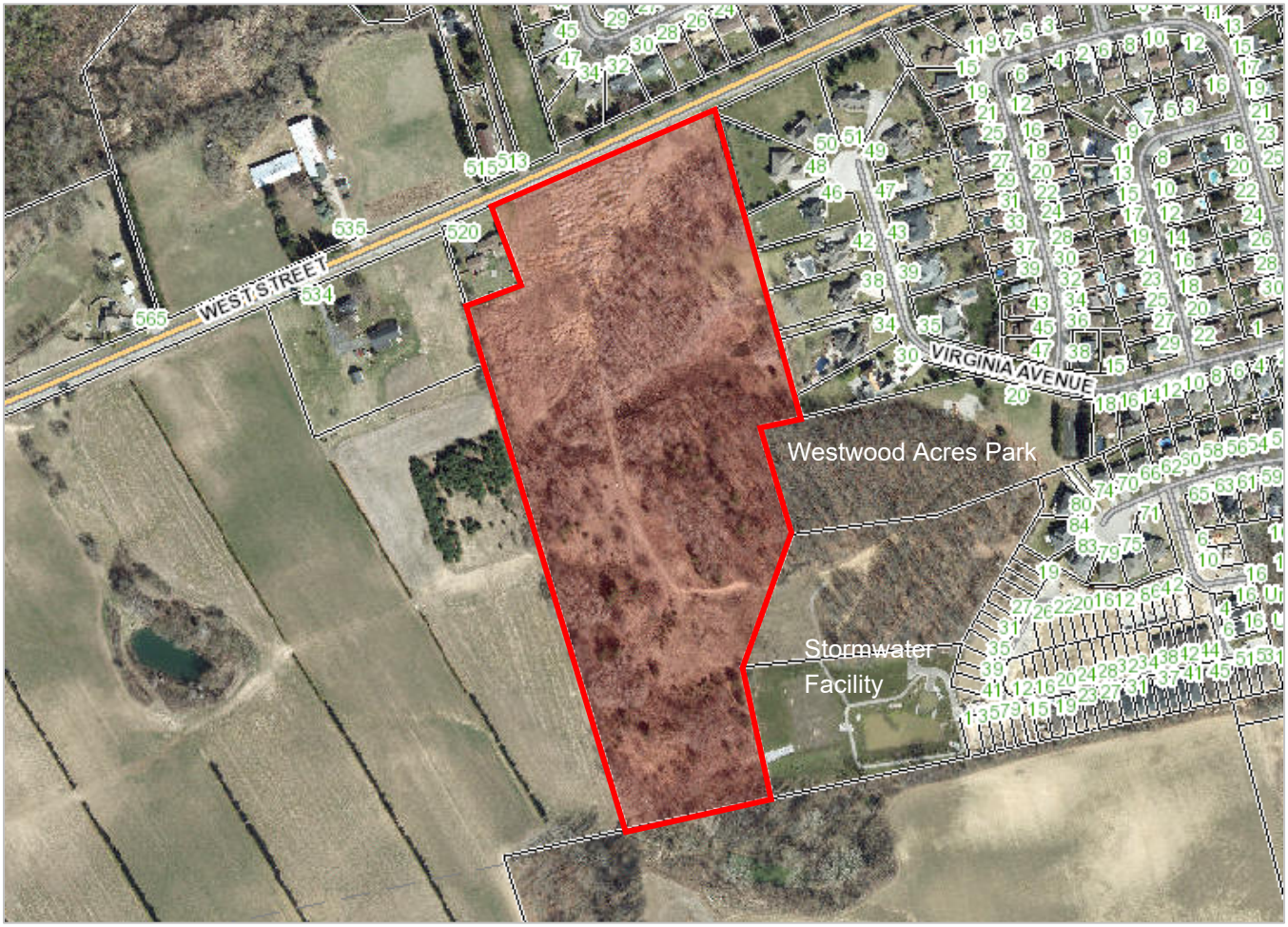



*Figure 2-1: Aerial image of the subject lands, retrieved from Norfolk County Community Web Map*

## 2.2 Surrounding Context

The subject lands are generally located within the east central portion of the County and is west of the boundary for the Simcoe Urban Area. They are south of West Street (Regional Road No. 1), and generally north of Evergreen Hill Road, west of Virginia Avenue, and east of Hillcrest Road. There are residential dwellings located north of West Street and to the east, agricultural farmland is located west with a woodlot located to the south and agricultural lands beyond. The Westwood Acres Park and Westwood Trails SWM facility is located at the southeast portion of

the subject lands. Simcoe contains predominantly low-density residential uses and a number of institutional uses including but not limited to the Simcoe Recreation Centre, churches such as the Immanuel Christian Reformed Church and Evergreen Heights Christian Fellowship, and a number of schools such as Elgin Avenue Public School and Holy Trinity Catholic High School. Simcoe also offers a variety of amenities and services including stores, medical offices, and restaurants.

Please refer to **Figure 2-2** for an aerial image of the surrounding context.

*Figure 2-2: Surrounding context of the subject lands, retrieved from Google Earth*

# 3 Proposed Development

The Simcoe Urban Area is recognized within the Official Plan as one of the County's primary settlement areas intended to accommodate long-term residential, commercial, institutional, and employment growth. As the largest and most urbanized community, Simcoe plays an important role in the County's growth management strategy and community structure. The Official Plan for the County includes policies to promote Simcoe's function of a major service centre and that continued development of Simcoe should reflect a complete, balanced, and sustainable

urban community through an efficient pattern of development and the inclusion of a mix of low, medium, and higher density housing forms to meet diverse needs.

The subject lands represent the third and final phase of the Westwood Trails Development located at the western edge of the Simcoe. Concluded in OPA 163, their inclusion into the Simcoe Urban Area Boundary for residential purposes supports an efficient pattern of development and a logical extension of community, reinforcing Simcoe's continued role as the primary settlement area and optimizes existing municipal services available on West Street and Virgina Drive.

The recent Housing Needs Assessment identified that the average age of population of Norfolk continues to increase with an anticipated demand for higher density housing and a need for other forms of housing geared to older adults.[1] The inclusion of these lands within the Urban Area Boundary would facilitate a mixed density residential subdivision that would assist with meeting future demand for smaller housing forms. The proposed housing program includes a variety of built forms including freehold townhomes, condominium tenure street townhomes, condominium tenure rear lane townhomes, and a low-rise apartment building. A Concept Plan has been prepared to support a proposed DPS which will create the residential blocks. The Concept Plan illustrates the potential development layout and associated population yield and can be found below as **Figure 3-1**.

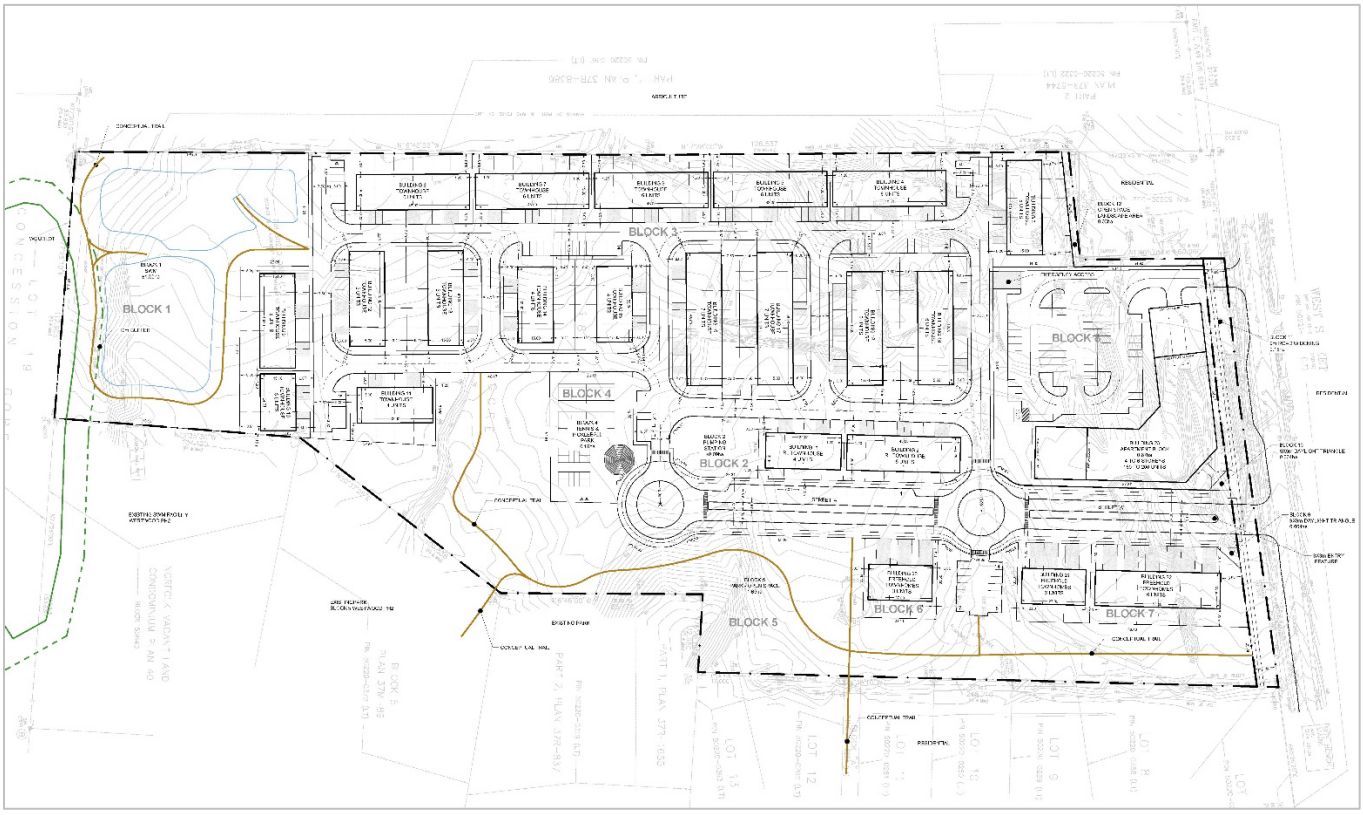



*Figure 3-1: Concept Plan prepared by Arcadis*

The proposed DPS introduces the construction of Street "A", a municipal right-of-way designed as a carriage-style road with sidewalks located on both sides and lay-by parking. As seen on **Figure 3-1**, Street "A" runs in a north-

[1] Norfolk County Housing Needs Assessment, June 2025, pg.57

south direction road and incorporates twin turning circles, improving vehicular circulation throughout the development.

Street "A" terminates at a 1.65-hectare park block envisioned as an expansion of the existing Westwood Acres Park located on Virgina Avenue. The proposed park block has also been shown with a conceptual trail, which – if constructed – would contribute to the broader trail network within Simcoe and provide connectivity between communities, existing parks, and trails located to the east. A municipal parking lot has been proposed on the east side of Street "A" to serve both residents and future park visitors.

A 4- to 6-storey apartment building is proposed at the northern portion of the subject lands, oriented to front onto West Street. Access is proposed to be provided through a private driveway from West Street, leading to a central surface parking area accommodating both residents and visitors. The building is conceptually shown with building step backs proposed at the fourth storey to support massing transition from adjacent residential areas.

The majority of the remaining lands are planned for condominium townhomes, with two driveway connections onto Street "A". The proposed townhome forms include rear loaded townhomes which front on to Street "A" and row townhomes accessed via a 7.5-metre-wide common element private road. A proposed common element outdoor amenity space is situated adjacent to the park block and is envisioned to include amenities such as tennis and pickleball courts for use by the residents of the development. There are fifty-one (51) visitor parking spaces distributed throughout the condominium block to support resident and visitor needs.

A proposed SWM facility is located at the southern boundary, located within the natural low point of the subject lands. Access to the SWM block is proposed through the condominium lands and a service easement in favor of the County would be provided as part of the development approval. The proposed development will be serviced with municipal water and sanitary sewers and a privately owned sewage pumping station located in a block within the development.

The proposed development is projected to deliver approximately 293 residential units across a variety of housing forms to the Simcoe Urban Area, providing an overall density calculation of 33 UPH and 63 people per hectare which exceeds the people target density of 45 residents and jobs per hectare recommended for the overall County during the Grow Norfolk Study.[2] Although no employment uses are proposed, it is assumed that a percentage of the proposed dwellings will generate "at home" employment. Development statistics demonstrated on the Concept Plan are summarized in **Table 3-1** below.

The proposed development supports the creation of a livable, complete, and well-connected neighbourhood, while supporting housing and residential growth targets of the County and Province.

*Table 3-1: Development statistics prepared by Arcadis*

| Blocks | Description | Area (ha) | # Units | Population* |
|---|---|---|---|---|
| Block 1 | Storm Water Management Facility | 1.0 | | |
| Block 2 | Private Sanitary Pumping Station Block | 0.09 | | |
| Block 3 | Townhouses (street and group towns) | 3.77 | 101 | 242 |

[2] GROW Norfolk Study (Municipal Comprehensive Review), Volume 5: Land Evaluation and Area Review & Volume 6: Preferred Directions and Recommendations CD 23-098

| Blocks | Description | Area (ha) | # Units | Population* |
|---|---|---|---|---|
| Block 4 | Open Space Amenity | 0.19 | | |
| Block 5 | Parkland (woodlot) | 1.65 | | |
| Block 6 & 7 | Bungalow Street Townhomes | 0.42 | 12 | 29 |
| Block 8 | Apartment Building | 0.87 | 180 | 288 |
| Block 9 & 10 | Sight Triangles | 0.01 | | |
| Block 11 | Road Widening | 0.16 | | |
| Block 12 | Open Space (landscaped area) | 0.03 | | |
| Street “A” | Public Right-of-Way | 0.67 | | |
| **Total** | | **8.85** | **293** | **559** |

** Residential population is calculated using a Persons Per Unit count taken from "Norfolk County Design Criteria" (County of Norfolk, February 2019)*

# 4 Pre-Consultation Meeting

On July 9, 2025, a pre-consultation meeting was held by the County to provide feedback on the proposed development and outline the requirements for a complete application. It was determined that applications for OPA, ZBLA, DPS, and DPC would be required to facilitate the proposed development. The County has identified the following forms, plans, design sheets, studies, and reports as required for a complete application. At this time, only applications for OPA, ZBLA, and DPS are enclosed, therefore, more detailed submission materials related to a future DPC have been shown in bold in **Table 4-1** below and do not form part of the current submission.

The pre-consultation record also requests the submission of a Land Use Compatibility Study. The subject lands are located outside of the Typical Influence Area criteria of 1000 metres for a Class 3 Industry under D-6 series guideline established by the Ministry of Environment. The subject lands lie over 1000 metres in a straight line, from industrial uses located north of Queensway West, and is separated by the Kent River Valley. A Phase I Environmental Site Assessment (“ESA”), a Hydrogeological Study, Agricultural Impact Assessment (“AIA”), and an Environmental Impact Study (“EIS”) have been included in the submission to ensure that the condition of the subject lands is appropriate for residential uses, and that the inclusion of residential uses will not negatively impact the environmental, hydrological, and agriculture of the lands and its surroundings. Therefore, a Land Use Compatibility Study is not included in this submission.

*Table 4-1: Required materials for a complete application for OPA, ZBLA, DPS, and DPC*

| Type | Requirements |
|---|---|
| Plans and Design Sheets | • OPA Application Form<br>• ZBLA Application Form |

| Type | Requirements |
|---|---|
| | • DPS Application Form<br>• **DPC Application Form**<br>• Concept Plan<br>• DPS<br>• **Landscaping Plan**<br>• Minimum Distance Separation Schedule<br>• **Photometrics (Lighting) Plan**<br>• Site Plan and Site Plan Details<br>• Survey/Legal Plan<br>• Topographical Survey<br>• Draft OPA<br>• Draft ZBLA<br>• Parking Plan<br>• Area Grading Plan<br>• Lot Grading Plan<br>• **Siltation and Erosion Control Plan**<br>• General Plan of Services<br>• Plan and Profile Drawings<br>• Storm Drainage Plan<br>• Sanitary Drainage Plan and Design Sheets<br>• **Pavement Marking and Signage**<br>• **Streetlighting Plan**<br>• **On-street Parking Plan**<br>• **Composite Utility Plan** |
| Studies and Reports | • AIA<br>• Archaeological Assessment<br>• EIS<br>• **Land Use Compatibility Study**<br>• Source Water Protection Area Assessment<br>  ○ * Contained within Hydrogeological Assessment Report<br>• PJR<br>• SWM Report<br>• Functional Servicing Report<br>• Drainage Act Assessment<br>• Geotechnical Study<br>• ESA<br>• Traffic Impact Assessment/Study<br>• **Construction Access and Management Plan**<br>• **Walkability and Transit Connectivity Assessment** |

| Type | Requirements |
|---|---|
| | • **Streetlighting Design** |

# 5 Supporting Studies, Reports, and Materials

The County's pre-consultation process outlined the information and materials required to be submitted as part of a complete application. In accordance with this PJR, and in the interest of good planning, professional studies and reports were completed which will be included separately. An overview of these studies and reports is provided below.

## 5.1 Agricultural Impact Assessment

An AIA was prepared by DBH Soil Services Inc. ("DBH") on December 12, 2025. The purpose of the AIA was to identify and assess agricultural impacts based on roadside reconnaissance surveys and review of online resources and provide avoidance or mitigative measures as necessary to offset or lessen any impacts. Given the geographical location of the Primary Study Area ("PSA") lands, the AIA concluded that the proposed future development of the PSA would have minimal impact on the surrounding agricultural activities within the Secondary Study Area ("SSA").

### 5.1.1 Minimum Distance Separation

Minimum Distance Separation 1 ("MDS1") calculations were completed for the AIA as a best practice to protect lands for agricultural use as long as possible during the development phases. The MDSI identified three pole barns north of the subject lands used for horses. DBH stated that there is one MDS1 arc impinging on the north and northeast portion of the PSA, which impacts the proposed roadway into the proposed development however, the MDS guidelines permit reduced setbacks in situations where there are four or more non agricultural uses or residential dwellings in closer proximity to the livestock facilities and as a result recommends a 156-metre setback. The recommended setback of 156 metres falls almost completely outside of the limits of the subject lands. DBH concluded that the MDSI is consistent with the PPS 2024 Section 2.3.2 I e). Please refer to the AIA prepared by DBH for a detailed discussion.

## 5.2 Environmental Impact Study

An EIS was prepared by Natural Resource Solutions Inc. ("NRSI") on May 1, 2026. The purpose of the EIS was to demonstrate that the proposed development will not negatively impact the County-defined Provincially Significant Features and Natural Heritage Features, and their ecological functions. It provides a characterization of the existing natural features and species habitats and assesses their significance and sensitivity to inform the design of the proposed development. Potential impacts to the natural features and functions were assessed based on development details provided by the Project Team.

Recommendations were provided within the EIS that relate to the following:

- Woodland compensation and wildlife habitat replacement;
- Construction timing for tree clearing and site alteration;
- Recommendations for trail development, if applicable;

- Recommendations for the protection of Natural Heritage Features during construction;
- Proposed monitoring; and,
- Recommendations for subdivision design and community awareness.

The recommendations aim to mitigate and offset impacts of the Natural Heritage Features and to restore and/or enhance the features and their ecological functions after construction. NRSI has concluded that impacts due to the proposed development can be mitigated including direct, indirect, and induced impacts that may arise during construction and human use of the proposed development.

Please refer to the EIS for additional details regarding each recommendation.

## 5.3 Functional Servicing and Stormwater Management Report

### 5.3.1 Functional Servicing Report

A Functional Servicing Report ("FSR") was prepared by MTE Consultants ("MTE") on March 18, 2026. The purpose of the FSR was to prepare a functional servicing strategy for the subdivision which reflects the DPS and outlines how the subject sands can be developed on full municipal services, including sanitary sewage, domestic water, storm drainage, and utilities.

The following conclusions were provided:

1. The proposed subdivision grading strategy will meet Norfolk County standards, provides major overland flow routes to the end-of-pipe SWMF, and respects environmental buffers wherever possible.
2. The proposed sanitary sewer network will service the required wastewater flows onsite and will outlet to the proposed private sanitary pumping station.
3. The proposed sanitary pumping station and forcemain will provide a sanitary sewer outlet connecting to the existing maintenance hole located at Holden Avenue; and will meet the MECP Design Guidelines.
4. The proposed watermain distribution network will provide water servicing to the Subject Lands and will meet fire flow demands for all proposed land uses. This water distribution network will connect to the existing watermains along West Street and Virginia Avenue.
5. The proposed storm sewer network will direct minor flow events to the end-of-pipe SWMF and will meet Norfolk County standards.
6. Stormwater management for the Subject Lands can be accommodated by directing the stormwater runoff to the proposed SWM facility for treatment prior to being infiltrated, as highlighted in Section 5.4 of this report.
7. The Subject Lands can be adequately serviced through the extension of existing utilities including hydro, gas, cable TV, and telephone.

### 5.3.2 Stormwater Management Report

A SWM Report was prepared by MTE on March 18, 2026. The purpose of the SWM Report was to develop a comprehensive SWM strategy for the development proposal for the subject lands in accordance with the DPS, that is acceptable to the County, the Long Point Regional Conservation Authority, and the Ministry of the Environment, Conservation and Parks.

The following conclusions were provided:

1. The stormwater management strategy outlined herein will provide the Subject Lands with appropriate levels of quality, quantity, erosion, and water balance.
2. 'Enhanced' water quality control will be provided through the proposed end-of-pipe SWMF. Furthermore, the capture and infiltration of rainfall sitewide will help recharge groundwater and reduce peak flow and erosion considerations downstream.
3. Quantity control targets for post-development peak flows can be achieved in the proposed stormwater management facility for the 2-year through the 100-year storm events.
4. Adequate storage and release rate control has been provided to meet the extended detention storage and drawdown requirements for the 25mm storm event.
5. Implementing erosion and sediment controls during construction will minimize any negative impacts of construction activities on the adjacent properties and the receiving watercourse.
6. Water Balance targets can be satisfactorily met through the end-of-pipe infiltration measures as described within this report. This includes a net gain in total infiltration of 30,949m3/year.

Based on the conclusions, following recommendations were provided:

1. That the quality/quantity control stormwater management facility be constructed to provide control of stormwater as described in Section 5 of this report.
2. That the Water Balance, as calculated in this report, be reviewed and re-confirmed during final design.
3. That during the site grading operations, soils be selectively excavated and placed, under the supervision of a geotechnical engineer, in order to maximize the post-development areas for infiltration.
4. That erosion and sediment controls during construction as described in Section 7 of this report be implemented.
5. That the conceptual design and modeling of the future stormwater management facility contained within the subdivision be reviewed and re-confirmed at the time of final design.
6. Salt Management Plans be prepared for all blocks subject to site plan approval and/or a plan of condominium approval.

## 5.4 Geotechnical Investigation Report

A Geotechnical Investigation Report was completed by MTE on March 18, 2026. The purpose of the investigation was to determine the soil and groundwater conditions in the area of the proposed development. The investigation contains geotechnical recommendations pertaining to development of the subject lands; including, site grading, site servicing, foundations, pavement design, and construction inspection and testing.

## 5.5 Hydrogeological Assessment Report

A Hydrogeological Assessment Report was completed by MTE on March 18, 2026. The purpose of the report was to discuss the potential impacts the development may have on wetlands/woodlots and municipal/private water users. The following conclusions were provided:

- The Subject Lands are located within a WHPA B for the Cedar Street well field and WHPA C for the Cedar Street and Chapel Street well fields.
- The Subject Lands are rated as high vulnerability.

- The Subject Lands are located within a mapped Significant Groundwater Recharge Area.
- The Subject Lands are located within an ICA for $NO^{3-}$-N.
- Overburden deposits beneath the Subject Lands are comprised of silt material overlying sand material, interpreted to be the Surficial Sand Aquifer/Intermediate Aquifer.
- Geological cross-section A-A' depicts fine grained material overlying the underlying sand material, except at the Cedar Street well field where the Surficial Sand Aquifer/Intermediate Aquifer is present at surface.
- Geological cross-section B-B' depicts the Surficial Sand Aquifer/Intermediate Aquifer is present at surface between 500 m and 900 m of the cross-section.
- Groundwater beneath the Subject Lands is interpreted to flow north toward Kent Creek.
- The water table is interpreted to exist at ~ 10.8 mBGS to 15.2 mBGS (~215.9 mAMSL to 217.4 mAMSL) beneath the Subject Lands.
- The measured geometric mean K for the silt material beneath the Subject Lands based on SWRT was 1.5x10-7 m/sec.
- The geometric mean K for the saturated sand material beneath the Subject Lands based on SWRT and empirical estimates was 4.3x10-4 m/sec.
- Groundwater velocity in the Surficial Sand Aquifer/Intermediate Aquifer beneath the Subject Lands was estimated to be 163 m/yr.
- Groundwater quality analytical results indicate the sampled wells met the ODWQS MAC except MW202-25 for NO3--N (10.6 mg/L).
- Groundwater quality analytical results indicate that the sampled wells met the ODWS AO and OG except for MW201-25 for Mn (0.0603 mg/L). MTE interprets this result to be reflective of background concentrations.
- No significant drinking water threats were identified for the Subject Lands.
- The proposed residential development is not considered to be a generator of nitrate, therefore it is MTE's opinion that the ICA is not significant.
- The proposed development may continue under a RMP that can be negotiated with the RMO to set conditions for reducing the risks associated with the application and/or storage of road salt and on-site snow storage.
- As part of a RMP, MTE would propose a monitoring program whereby road salt parameters (e.g. chlorides and sodium) would be monitored and reported at a frequency agreeable to the RMO.
- Based on a review of the Source Protection Technical Rules, the Subject Lands should not be prohibited from development based on hydrological or related environmental considerations.

Based on the conclusions, following recommendations were provided:

- Continuation of the pre-construction groundwater monitoring program and implementation of a during and post-construction groundwater monitoring program as described in Section 8.0.
- Any monitoring wells requiring decommissioning to allow for construction activities to take place shall be decommissioned in accordance with Ontario Regulation 903 (as amended).
- Complete a door-to-door private well survey of properties within the Study Area.
- Compare inverts of municipal services (including pumping station) to groundwater elevations to determine whether a Water Taking and Discharge Plan to support an EASR submittal would be required for construction.
- Compare the seasonal high groundwater level (i.e. MW101A-25 and MW201-25) to the base of the infiltration gallery to confirm adequate separation exists.

## 5.6 Phase I and II Environmental Site Assessment

A Phase I ESA was completed by MTE on February 28, 2014. A Phase II ESA was prepared by MTE on June 19, 2014. The purpose of the Phase I ESA was to identify actual or potential contamination on the site, based on the evaluation of information collected through records review, site visits, and interviews. The Phase 1 ESA recommended the completion of a Phase II ESA. The purpose of the Phase II ESA was to investigate potential impacts in soil and groundwater, related to potential on-Site and off-Site environmental concerns, as a due diligence measure. MTE confirmed that no further investigation is required or warranted at this time and recommended that the wells should be maintained in accordance with Ontario Regulation 903 and no further soil or groundwater testing is required or recommended at this time.

## 5.7 Stage 1 Archaeological Background Study

A Stage 1 Archaeological Background Study was completed by Apex Archaeology Inc. ("AAI") on February 26, 2026. The purpose of the study was to identify areas for potential archaeological resources.

The following recommendations were provided:

1. Portions of the study area exhibit potential for archaeological resources, and a Stage 2 Archaeological Assessment is recommended (see Map 7).
2. The areas that exhibit potential for archaeological resources should be subject to test pit survey at 5m intervals (see Map 7).
3. A Property Inspection must be conducted concurrently with the Stage 2 Archaeological Assessment to confirm the current conditions within the study area.
4. No soil disturbances or removal of vegetation shall take place within the study area prior to the MCM acceptance of a report into the Provincial Registry of Archaeological Reports that recommends all archaeological concerns for the proposed undertaking have been addressed and no further archaeological investigations are required.

## 5.8 Transportation Impact Study

A Transportation Impact Study ("TIS") was prepared by Paradigm Transportation Solutions Limited ("Paradigm") in December of 2025. The purpose of the TIS is to estimate the net impact(s) of the development-related traffic on the surrounding road network, and to identify any remedial measures, if necessary, to support the development from a transportation perspective. The TIS concluded that the proposed development is not forecast to significantly impact traffic operations at West Street and Hillcrest Road or West Street and Holden Avenue. Further, westbound left-turn lanes are not warranted at either Street "A" or the proposed West Street driveway connection to the apartment driveway. Paradigm recommended that the site be considered for approval with no requirement for off-site transportation network improvement.

# 6 Planning Policy Review

## 6.1 *Planning Act, R.S.O. 1990, c. P.13*

The *Planning Act, R.S.O. 1990, c.P.13* (the "*Planning Act*") is the central piece of legislation governing land use planning in the Province. The purpose of the *Planning Act* is to provide planning processes that are fair, promote sustainable economic development, provide for a land use planning system, integrate matters of provincial interest into provincial and municipal planning decisions, encourage co-operation and coordination among interests, and to recognize the decision-making authority and accountability of municipal councils on planning.

The *Planning Act* sets out the role of the municipality to make local planning decisions that will determine the future of communities, as well to prepare planning documents such as Official Plans, and Zoning By-laws. The *Planning Act* recognizes upper-tier municipalities, such as counties and regions by allotting them and planning boards to deal with broad land use planning issues that concern more than one local municipality through Official Plans and gives them power to approve local Official Plans on behalf of the Minister of Municipal Affairs and Housing.

For the purposes of this PJR, the version of the *Planning Act* utilized was the online version found here: https://www.ontario.ca/laws/statute/90p13.

### 6.1.1 Section 2 of the Planning Act: Provincial Interest

Section 2 of the *Planning Act* refers to matters of provincial interest that the Minister, the council of a municipality, a local board, a planning board and the Ontario Land Tribunal, must have regard to, among other matters, in order to carry out their responsibilities under the *Planning Act*. The proposed development is subject to Section 16 and 34 of the *Planning Act*, as amendments to the municipal Official Plan/Secondary Plan and the Zoning By-law are required, which will be submitted concurrently. The applications will be processed in accordance with those sections of the *Planning Act*.

Applicable matters listed in Section 2 which pertain to the proposed applications include:

a) *the protection of ecological systems, including natural areas, features and functions;*
b) *the protection of the agricultural resources of the Province;*
c) *the conservation and management of natural resources and the mineral resource base;*
d) *the conservation of features of significant architectural, cultural, historical, archaeological or scientific interest;*

**Planning Comment:**

Supporting technical studies to address the protection of existing ecological systems and their functions, the protection of agricultural resources, and the conservation of archaeological features have been submitted as part of this development proposal and have informed the proposed residential development. The subject lands are largely wooded and have not historically been used for agricultural production. An AIA and MDS1 calculations to address the impact of the proposed greater agricultural area have been submitted and support the proposed development. With respect to the ecological condition of the subject lands, an EIS has been prepared to identify significant natural features and establish appropriate developable limits. A Stage 1 Archaeological Background Study has also been prepared and has identified an area that meets the criteria to proceed to a Stage 2

Investigation. Recommendations of the Stage 2 Archaeological Assessment findings will be followed as per Ministry guidelines. The preparation of the above technical reports meets the policy direction above.

*e) the supply, efficient use and conservation of energy and water;*
*f) the adequate provision and efficient use of communication, transportation, sewage and water services and waste management systems;*
*g) the minimization of waste;*
*h) the orderly development of safe and healthy communities;*
*h.1) the accessibility for persons with disabilities to all facilities, services and matters to which this Act applies;*
*i) the adequate provision and distribution of educational, health, social, cultural and recreational facilities;*

**Planning Comment:**

The subject lands are proposed to be included within the expansion of the Simcoe Urban Area Boundary. The County identifies this Urban Area as the largest one in the County, in which the County shall support and promote the continued development of Simcoe as a complete, balanced, and sustainable urban community containing an efficient pattern of development. The subject lands' strategic location is within proximity to a variety and range of complementary land uses, such as commercial, health, open space, institutional, and recreational facilities. This strategic location establishes accessibility to future residents between the proposed development and complementary land uses.

The Province and County emphasize the importance of sustainable and efficient development, in which growth and development should be directed to lands which result in the protection of environmental resources and the utilization of existing infrastructure, services, and amenities. Supporting technical studies have been prepared to demonstrate that the proposed development makes an efficient use of lands, infrastructure, and services as well as to support the proposed development, including the FSR and SWM Report prepared by MTE and the TIS prepared by Paradigm.

Furthermore, the proposed development will be designed to be compliant with Accessibility for Ontarians with Disabilities Act ("AODA") Standards to ensure that there is adequate accessibility for persons with disabilities and for those looking for greater accessibility. In addition, capacity at institutional uses will be confirmed through the comments circulated to the Grand Erie District School Board which will provide guidance on future educational needs resulting from proposed development.

*j) the adequate provision of a full range of housing, including affordable housing;*
*k) the adequate provision of employment opportunities;*
*l) the protection of the financial and economic well-being of the Province and its municipalities;*
*m) the co-ordination of planning activities of public bodies;*
*~~n)~~ the resolution of planning conflicts involving public and private interests;*
*o) the protection of public health and safety;*
*p) the appropriate location of growth and development;*
*q) the promotion of development that is designed to be sustainable, to support public transit and to be oriented to pedestrians;*
*r) the promotion of built form that,*
    *i. is well-designed,*
    *ii. encourages a sense of place, and*
    *iii. provides for public spaces that are of high quality, safe, accessible, attractive and vibrant;*

s) *the mitigation of greenhouse gas emissions and adaptation to a changing climate. 1994, c. 23, s. 5; 1996, c. 4, s. 2; 2001, c. 32, s. 31 (1); 2006, c. 23, s. 3; 2011, c. 6, Sched. 2, s. 1; 2015, c. 26, s. 12; 2017, c. 10, Sched. 4, s. 11 (1); 2017, c. 23, Sched. 5, s. 80.*

**Planning Comment:**

The subject lands are proposed to be included within the Simcoe Urban Area Boundary, where development is supported and promoted in accordance with local planning policy direction. As the proposed development is located adjacent to the western boundary of the existing Simcoe Urban Area with frontage onto West Street, its inclusion into the urban boundary is a logical location for growth which will complete the final phase of the Westwood Trails community. The proposed development will increase the amount of wooded parkland in the area and propose a built form that is compatible with surrounding residential built forms. The proposed variety of housing options includes townhomes and apartment units which will assist with current shortages for smaller, more compact, and seniors-oriented accessible homes within the community. The proposed development could provide approximately 293 residential units and envisions connectivity to adjacent communities through active pedestrian trails and sidewalk connections. With direct frontage onto West Street, the new neighbourhood will be able to utilize existing routes located on West Street and could assist with increasing ridership and the overall transit system.

The additional residential units will help accommodate the anticipated growth within the Province and County while contributing to the County's land tax base. Development Charges collected for the development will contribute to funding new and upgraded infrastructure as well as improvements to transit and services.

### 6.1.2 Section 3 of the Planning Act: Policy Statements

Section 3 of the *Planning Act* states that the Minister may issue policy statements, that have been approved by the Lieutenant Governor in Council on matters relating to municipal planning that in the opinion of the Minister are of provincial interest. **Subsection 6.2** of this PJR outlines how the proposed development conforms with the Provincial Planning Statement, 2024.

### 6.1.3 *Planning Act* Conclusion

The proposed development and associated applications are subject to Section 16 and Section 34 of the *Planning Act*, as amendments are required to the Official Plan and Zoning By-law. The applications will be processed in accordance with these applicable sections. The proposed development **conforms with the *Planning Act*** as it will:

- Address the protection of existing ecological systems and their functions, the protection of agricultural resources, and the conservation of archaeological features, as demonstrated by the AIA, EIS, and future preparation of the Stage 2 Archaeological Assessment;
- Make an efficient use of lands, infrastructure, and services as well as to support the proposed development, as demonstrated by the FSR and SWM Report and TIS;
- Contribute to residential growth in an area within proximity to a variety of services and amenities (i.e. educational, health, social, cultural, and recreational facilities);
- Help accommodate a range of incomes and residents by providing a range and mix of dwelling types and housing options;
- Be compatible with the surrounding area and respect the existing residential character;
- Aid in the efficient use of energy and water through the extension of existing utilities including hydro, gas, cable TV, and telephone;

- Incorporate applicable standards of the AODA; and,
- Not have negative impact on public health and safety.

## 6.2 Provincial Planning Statement, 2024

The Provincial Planning Statement ("PPS"), 2024 is a streamlined province-wide land use planning policy framework that replaces both the Provincial Policy Statement, 2020 and A Place to Grow: Growth Plan for the Greater Golden Horseshoe, 2020. It builds upon housing-supportive policies from both documents and provides municipalities with the tools and flexibility they need to build more homes.

The PPS was approved by the Lieutenant Governor in Council, Order in Council No. 1099/2024 and was issued under Section 3 of the *Planning Act* and came into effect October 20, 2024. Section 3 of the *Planning Act* requires that all decisions affecting planning matters shall be consistent with the minimum standards set in the PPS. To comply with the *Planning Act* and to be consistent with the PPS, OPA 163 updates policies and land use designations. A decision was made on September 5, 2025, to approve, in part, OPA 163, with modifications, as adopted by By-law 2024-48. Council has adopted the inclusion of the Phase 1 lands into the Simcoe Urban Area Boundary.

For the purposes of this PJR, the version of the PPS utilized was the online version found here: https://www.ontario.ca/files/2024-10/mmah-provincial-planning-statement-en-2024-10-23.pdf.

The PPS is to be read in its entirety. With respect to the specific policies in the PPS, the following below are applicable to the subject lands, proposed development, and proposed planning applications.

### 6.2.1 Chapter 2: Building Homes, Sustaining Strong and Competitive Communities

#### Subsection 2.1: Planning for People and Homes

**Policy 2.1.1** *As informed by provincial guidance, planning authorities shall base population and employment growth forecasts on Ontario Population Projections published by the Ministry of Finance and may modify, as appropriate.*

**Policy 2.1.2** *Notwithstanding policy 2.1.1, municipalities may continue to forecast growth using population and employment forecasts previously issued by the Province for the purposes of land use planning.*

**Policy 2.1.3** *At the time of creating a new official plan and each official plan update, sufficient land shall be made available to accommodate an appropriate range and mix of land uses to meet projected needs for a time horizon of at least 20 years, but not more than 30 years, informed by provincial guidance. Planning for infrastructure, public service facilities, strategic growth areas and employment areas may extend beyond this time horizon. Where the Minister of Municipal Affairs and Housing has made a zoning order, the resulting development potential shall be in addition to projected needs over the planning horizon established in the official plan. At the time of the municipality's next official plan update, this additional growth shall be incorporated into the official plan and related infrastructure plans.*

**Policy 2.1.4** *To provide for an appropriate range and mix of housing options and densities required to meet projected requirements of current and future residents of the regional market area, planning authorities shall:*

a) *maintain at all times the ability to accommodate residential growth for a minimum of 15 years through lands which are designated and available for residential development; and*
b) *maintain at all times where new development is to occur, land with servicing capacity sufficient to provide at least a three-year supply of residential units available through lands suitably zoned, including units in draft approved or registered plans.*

**Policy 2.1.5** *Where planning is conducted by an upper-tier municipality, the land and unit supply maintained by the lower-tier municipality identified in policy 2.1.4 shall be based on and reflect the allocation of population and units by the upper-tier municipality.*

**Policy 2.1.6** *Planning authorities should support the achievement of complete communities by:*

a) *accommodating an appropriate range and mix of land uses, housing options, transportation options with multimodal access, employment, public service facilities and other institutional uses (including schools and associated child care facilities, long-term care facilities, places of worship and cemeteries), recreation, parks and open space, and other uses to meet long-term needs;*
b) *improving accessibility for people of all ages and abilities by addressing land use barriers which restrict their full participation in society; and*
c) *improving social equity and overall quality of life for people of all ages, abilities, and incomes, including equity-deserving groups.*

**Planning Comment:**

The PPS provides that population growth forecasts should be based on Ontario Population Projections published by the Ministry of Finance ("MOF"). The MOF's population projection to 2051 is 171,587 people for Haldimand-Norfolk. Policy 6.3 of the Official Plan outlines that by 2051, the population forecast for Norfolk County is 92,700 people. This population projection was identified during the Grow Norfolk Study and was used as the basis for OPA 163 adopted by Norfolk Council in May 2024 and later approved by the Ministry of Municipal Affairs and Housing ("MMAH") in September 2025.

The subject lands are identified as within Part 1 lands on Schedule A (Simcoe Urban Area) in OPA 163 and adopted by Council as being within the Urban Area Boundary. However, the MMAH provided two modifications for Simcoe, Modification 4 and Part B 7) respectively, that approved the inclusion of the Part 1 lands within the Urban Area subject to Special Policy 6.4.k) then withheld a decision pending further review/information. Modification 7 of the approved OPA endorses the population forecasts to 2051 and further noted that lands designated for development within the existing urban area on Schedule A – Community Structure, was adequate to meet demand for future development to 2048 rather than 2051. It is therefore anticipated that the additional urban area lands will be required to meet the forecasted population to 2051. Table 5 of OPA 163 identifies that by 2051, Simcoe is forecasted to grow to a population of 34,299 with 14,291 new households, and 11,594 new employments.

In response to the withheld decision by the MMAH, the Owner has submitted a privately initiated OPA under 6.4 k) iii) of the Plan to provide the necessary additional information and finalize the decision and lift the withheld

modification on the subject lands and include them into the Urban Area Boundary for residential purposes. Planning applications at hand include the submission of a proposed DPS and a ZBLA.

An FSR and SWM Report prepared by MTE confirm that the proposed development can be serviced by existing infrastructure with only a minor extension of infrastructure along West Street. The proposed development provides for appropriate range and mixes of housing options and densities within proximity to a variety of complementary land uses, amenities, and services (i.e. employment, public service facilities, institutional uses, recreation, and parks and open space), such as Norfolk General Hospital and the Simcoe Recreation Centre. Furthermore, the subject lands are located within proximity (i.e. approximate 10-minute walk) to an on-demand transit stop for Ride Norfolk, which provides service in Delhi, Port Dover, Port Rowan, Simcoe, Waterford, and other communities in the County, such as Renton, St. Williams, and Wilsonville.

The proposed development will support the achievement of complete communities as it will assist in the County meeting and/or exceeding planned intensification targets (i.e. by adding 293 residential units). In terms of accessibility, the proposed development will be designed to be compliant with AODA Standards to ensure that there is adequate accessibility for persons with disabilities. Detailed design elements will be provided through later project phases, such as at the Site Plan Approval ("SPA") stage.

## Subsection 2.2: Housing

**Policy 2.2.1** *Planning authorities shall provide for an appropriate range and mix of housing options and densities to meet projected needs of current and future residents of the regional market area by:*

- *a) establishing and implementing minimum targets for the provision of housing that is affordable to low and moderate income households, and coordinating land use planning and planning for housing with Service 4Managers to address the full range of housing options including affordable housing needs;*
- *b) permitting and facilitating:*
  1. *all housing options required to meet the social, health, economic and wellbeing requirements of current and future residents, including additional needs housing and needs arising from demographic changes and employment opportunities; and*
  2. *all types of residential intensification, including the development and redevelopment of underutilized commercial and institutional sites (e.g., shopping malls and plazas) for residential use, development and introduction of new housing options within previously developed areas, and redevelopment, which results in a net increase in residential units in accordance with policy 2.3.1.3;*
- *c) promoting densities for new housing which efficiently use land, resources, infrastructure and public service facilities, and support the use of active transportation; and*
- *d) requiring transit-supportive development and prioritizing intensification, including potential air rights development, in proximity to transit, including corridors and stations.*

## Subsection 2.3: Settlement Areas and Settlement Area Boundary Expansions

### Subsection 2.3.1 General Policies for Settlement Areas

**Policy 2.3.1.1** *Settlement areas shall be the focus of growth and development. Within settlement areas, growth should be focused in, where applicable, strategic growth areas, including major transit station areas.*

**Policy 2.3.1.2** *Land use patterns within settlement areas should be based on densities and a mix of land uses which:*

*a) efficiently use land and resources;*
*b) optimize existing and planned infrastructure and public service facilities;*
*c) support active transportation;*
*d) are transit-supportive, as appropriate; and*
*e) are freight-supportive.*

**Policy 2.3.1.3** *Planning authorities shall support general intensification and redevelopment to support the achievement of complete communities, including by planning for a range and mix of housing options and prioritizing planning and investment in the necessary infrastructure and public service facilities.*

**Policy 2.3.1.4** *Planning authorities shall establish and implement minimum targets for intensification and redevelopment within built-up areas, based on local conditions.*

**Policy 2.3.1.5** *Planning authorities are encouraged to establish density targets for designated growth areas, based on local conditions. Large and fast-growing municipalities are encouraged to plan for a target of 50 residents and jobs per gross hectare in designated growth areas.*

**Policy 2.3.1.6** *Planning authorities should establish and implement phasing policies, where appropriate, to ensure that development within designated growth areas is orderly and aligns with the timely provision of the infrastructure and public service facilities.*

### Subsection 2.3.2 New Settlement Areas and Settlement Area Boundary Expansions

**Policy 2.3.2.1** *In identifying a new settlement area or allowing a settlement area boundary expansion, planning authorities shall consider the following:*

*a) the need to designate and plan for additional land to accommodate an appropriate range and mix of land uses;*
*b) if there is sufficient capacity in existing or planned infrastructure and public service facilities;*
*c) whether the applicable lands comprise specialty crop areas;*
*d) the evaluation of alternative locations which avoid prime agricultural areas and, where avoidance is not possible, consider reasonable alternatives on lower priority agricultural lands in prime agricultural areas;*
*e) whether the new or expanded settlement area complies with the minimum distance separation formulae;*
*f) whether impacts on the agricultural system are avoided, or where avoidance is not possible, minimized and mitigated to the extent feasible as determined through an*

*agricultural impact assessment or equivalent analysis, based on provincial guidance; and*

g) *the new or expanded settlement area provides for the phased progression of urban development.*

**Policy 2.3.2.2** *Notwithstanding policy 2.3.2.1.b), planning authorities may identify a new settlement area only where it has been demonstrated that the infrastructure and public service facilities to support development are planned or available.*

**Planning Comment:**

Noted above, the subject lands are identified as Part 1 lands on Schedule A (Simcoe Urban Area) in OPA 163 and adopted by Council as being within the Urban Area. However, MMAH modifications withheld a final decision pending further information.

The County has prepared OPA 163 based on the results of a comprehensive visioning, strategic planning, and community engagement program as required under the *Planning Act*.[3] OPA 163 is based on a 25-year planning period and will be reviewed at a minimum of 5-year intervals to determine if amendments are required. Adopted in 2024, the next anticipated review period is 2029.

The proposed development, as a residential subdivision providing 293 residential units, will direct growth to the Urban Area, where development should be supported and promoted. The FSR and SWM Report prepared by MTE outlines that the subject lands can be developed on full municipal services, including sanitary sewage, domestic water, storm drainage, and utilities. The TIS prepared by Paradigm state that the proposed development is not forecast to significantly impact traffic operations at West Street and Hillcrest Road or West Street and Holden Avenue.

The proposed development will contribute to achieving the population forecast and an appropriate range and mix of housing options and densities within the Province and County. The residential intensification and increased density will be achieved through the development of a vacant site, which will increase the population in proximity to existing complementary land uses, amenities, and services.

### 6.2.2 Chapter 3: Infrastructure and Facilities

#### Subsection 3.2: Transportation Systems

**Policy 3.2.1** *Transportation systems should be provided which are safe, energy efficient, facilitate the movement of people and goods, are appropriate to address projected needs, and support the use of zero- and low- emission vehicles.*

**Policy 3.2.2** *Efficient use should be made of existing and planned infrastructure, including through the use of transportation demand management strategies, where feasible.*

**Policy 3.2.3** *As part of a multimodal transportation system, connectivity within and among transportation systems and modes should be planned for, maintained and, where possible, improved, including connections which cross jurisdictional boundaries.*

3 OPA 163- Basis for the Official a) to f) as modified

**Planning Comment:**

The proposed development contemplates vehicle access via a new north-south all-moves street connection to West Street, as well as an all moves driveway connection to West Street for the apartment block. The TIS prepared by Paradigm concluded that the proposed development is not forecast to significantly impact traffic operations at West Street and Hillcrest Road or West Street and Holden Avenue and recommended that the proposed development should be approved. Paradigm did not recommend a requirement for off-site transportation network improvements.

## Subsection 3.5: Land Use Compatibility

**Policy 3.5.1** *Major facilities and sensitive land uses shall be planned and developed to avoid, or if avoidance is not possible, minimize and mitigate any potential adverse effects from odour, noise and other contaminants, minimize risk to public health and safety, and to ensure the long-term operational and economic viability of major facilities in accordance with provincial guidelines, standards and procedures.*

**Policy 3.5.2** *Where avoidance is not possible in accordance with policy 3.5.1, planning authorities shall protect the long-term viability of existing or planned industrial, manufacturing or other major facilities that are vulnerable to encroachment by ensuring that the planning and development of proposed adjacent sensitive land uses is only permitted if potential adverse affects to the proposed sensitive land use are minimized and mitigated, and potential impacts to industrial, manufacturing or other major facilities are minimized and mitigated in accordance with provincial guidelines, standards and procedures.*

**Planning Comment:**

Several supporting technical studies have been prepared to confirm that the proposed development is not anticipated to result in compatibility issues. Studies include the AIA, EIS, Hydrogeological Assessment Report, and Phase I & II ESA. The Phase II ESA investigated the potential impacts in soil and groundwater, related to potential on-Site and off-Site environmental concerns, and recommended that no further investigation is required or warranted. Furthermore, recommendations of the Stage 2 Archaeological Assessment findings will be followed as per Ministry guidelines. Please refer to **Section 5** of this PJR for a summary of these studies.

## Subsection 3.6: Sewage, Water and Stormwater

**Policy 3.6.1** *Planning for sewage and water services shall:*

- *a) accommodate forecasted growth in a timely manner that promotes the efficient use and optimization of existing municipal sewage services and municipal water services and existing private communal sewage services and private communal water services;*
- *b) ensure that these services are provided in a manner that:*
    1. *can be sustained by the water resources upon which such services rely;*
    2. *is feasible and financially viable over their life cycle;*
    3. *protects human health and safety, and the natural environment, including the quality and quantity of water; and*
    4. *aligns with comprehensive municipal planning for these services, where applicable.*
- *c) promote water and energy conservation and efficiency;*

d) *integrate servicing and land use considerations at all stages of the planning process;*
e) *consider opportunities to allocate, and re-allocate if necessary, the unused system capacity of municipal water services and municipal sewage services to support efficient use of these services to meet current and projected needs for increased housing supply; and*
f) *be in accordance with the servicing options outlined through policies 3.6.2, 3.6.3, 3.6.4 and 3.6.5.*

**Policy 3.6.2** *Municipal sewage services and municipal water services are the preferred form of servicing for settlement areas to support protection of the environment and minimize potential risks to human health and safety. For clarity, municipal sewage services and municipal water services include both centralized servicing systems and decentralized servicing systems.*

**Planning Comment:**

The FSR prepared by MTE concluded that the subject lands can be developed on full municipal services, including sanitary sewage, domestic water, storm drainage, and utilities. They are proposed to be serviced by extending the existing sanitary sewer on West Street at the intersection of Holden Avenue to proposed Street "A". Domestic wastewater generated from the site will be collected by a network of 200mm diameter sewers within the proposed Street "A" municipal road. A private sanitary pumping station is proposed as a result of existing grade differences that makes gravity flow not feasible. The proposed sanitary pumpstation is located on Street "A" within a proposed residential block and will be maintained by the condominium corporation. In terms of water servicing, connection will be made to the existing 200mm diameter watermain on West Street, and the watermain will be extended along the proposed site frontage. MTE further states that SWM for the subject lands can be accommodated by directing the stormwater runoff to the proposed SWM facility (located in Block 1 on the westmost portion of the subject lands) for treatment prior to being infiltrated. Please refer to FSR and SWM Report for more details on the proposed servicing strategy.

## Subsection 3.9: Public Spaces, Recreation, Parks, Trails and Open Space

**Policy 3.9.1** *Healthy, active, and inclusive communities should be promoted by:*

a) *planning public streets, spaces and facilities to be safe, meet the needs of persons of all ages and abilities, including pedestrians, foster social interaction and facilitate active transportation and community connectivity;*
b) *planning and providing for the needs of persons of all ages and abilities in the distribution of a full range of publicly-accessible built and natural settings for recreation, including facilities, parklands, public spaces, open space areas, trails and linkages, and, where practical, water-based resources;*
c) *providing opportunities for public access to shorelines; and*
d) *recognizing provincial parks, conservation reserves, and other protected areas, and minimizing negative impacts on these areas*

**Planning Comment:**

The proposed development includes the development of approximately 1.6 hectares of additional public parkland that can be utilized by expanding the County's trail network. It is the intent of the proposed development that the

park block be dedicated to the County and combined with the adjacent Westwood Acres park to the east. In addition to the public park, outdoor amenity spaces providing active playing areas are proposed to service future residents to foster a healthy lifestyle. The proposed parks, trail connections, and outdoor amenity spaces meet the policy direction found in Section 3.9.1 of the PPS.

### 6.2.3 Chapter 4: Wise Use and Management of Resources

#### 4.1 Natural Heritage

**Policy 4.1.1** *Natural features and areas shall be protected for the long term.*

**Policy 4.1.2** *The diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of natural heritage systems, should be maintained, restored or, where possible, improved, recognizing linkages between and among natural heritage features and areas, surface water features and ground water features.*

**Policy 4.1.3** *Natural heritage systems shall be identified in Ecoregions 6E & 7E1, recognizing that natural heritage systems will vary in size and form in settlement areas, rural areas, and prime agricultural areas.*

**Policy 4.1.4** *Development and site alteration shall not be permitted in:*

*a) significant wetlands in Ecoregions 5E, 6E and 7E1; and*
*b) significant coastal wetlands.*

**Policy 4.1.5** *Development and site alteration shall not be permitted in:*

*a) significant wetlands in the Canadian Shield north of Ecoregions 5E, 6E and 7E1;*
*b) significant woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River)1;*
*c) significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River)1;*
*d) significant wildlife habitat;*
*e) significant areas of natural and scientific interest; and*
*f) coastal wetlands in Ecoregions 5E, 6E and 7E1 that are not subject to policy 4.1.4.b), unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.*

**Policy 4.1.6** *Development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements.*

**Policy 4.1.7** *Development and site alteration shall not be permitted in habitat of endangered species and threatened species, except in accordance with provincial and federal requirements.*

**Policy 4.1.8** *Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in policies 4.1.4, 4.1.5, and 4.1.6 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions*

**Policy 4.1.9** *Nothing in policy 4.1 is intended to limit the ability of agricultural uses to continue.*

**Planning Comment:**

The subject lands contain a portion of a significant woodland designated in the County's Official Plan which is discussed in **Subsection 6.3** of this PJR. The protection of natural features and areas is proposed through the implementation of buffers, the provision of compensation, and construction monitoring. The EIS prepared by NRSI recommends a 10-metre woodland buffer to the significant woodlot to ensure that existing root zones from woodland edge trees will be sufficiently protected while allowing room for future growth, to provide areas of natural woodland edge regeneration and active restoration to enhance the buffering capacity of the features, and to provide movement corridors for bats moving in and out of the woodland habitat as well as woodland edge foraging habitat. The EIS also recommends that the Significant Woodland impact be compensated through the establishment of woodland compensation plantings following an offsetting ratio of 2:1 in terms of area of woodland removed. Furthermore, to ensure that the adjacent woodland is not impacted throughout all stages of property development, pre-, during-, and post-construction monitoring is recommended. This includes sediment and erosion control measures such as silt fencing, the monitoring of fencing measures, and the inspection of the vegetative restoration zones and southern woodland buffer.

In regard to linkages, as the study area's natural features are relatively isolated on the local landscape, with wildlife species that are relatively tolerant of human-occupied landscapes only unitizing the narrow agricultural hedgerows which offer natural connectivity to adjacent wooded natural features, the proposed development will not interrupt a key ecological linkage or movement corridor for land-based wildlife movements within the study area vicinity.

## 4.3 Agriculture

**Policy 4.3.1** *Planning authorities are required to use an agricultural system approach, based on provincial guidance, to maintain and enhance a geographically continuous agricultural land base and support and foster the long-term economic prosperity and productive capacity of the agri-food network.*

**Planning Comment:**

The AIA prepared by DBH concluded that the proposed development of the PSA would have minimal impact on the surrounding agricultural activities within the SSA (the SSA is 1500 metres beyond the boundaries of the PSA). DBH also completed MDS1 calculations as part of the AIA and identified one MDS1 arc impinging on the north and northeast portion of the PSA. Given the location of existing non agricultural and residential uses, the MDSI recommended setback of 156 metres resulting with the subject lands falling almost completely outside of the arc. DBH concluded that the MDSI is consistent with the PPS 2024 Section 2.3.2 I e). Please refer to the AIA prepared by DBH for a detailed discussion.

## 4.6 Cultural Heritage and Archaeology

**Policy 4.6.2** *Planning authorities shall not permit development and site alteration on lands containing archaeological resources or areas of archaeological potential unless the significant archaeological resources have been conserved.*

**Planning Comment:**

A Stage 1 Archaeological Background Study prepared by AAI has identified an area that meets the criteria to proceed to a Stage 2 Archaeological Assessment. Recommendations for its findings will be followed as per Ministry guidelines.

### 6.2.4 PPS Conclusion

The proposed development is **consistent with the PPS** as it will:

- Encourage increased amounts of residential intensification within the Simcoe Urban Area Boundary;
- Be located at a logical expansion to the urban area and in a location appropriate for residential intensification due to the proximity to a variety of land uses, amenities, and services;
- Contribute to accommodating the forecasted and projected population growth through the provision of 293 residential units;
- Increase the range and mix of housing options and densities within an urban area, the Province, and the County;
- Support the existing and future variety of complementary land uses (i.e. employment, public service facilities, institutional uses, recreation, and parks and open space) through potential increased use and access from the added population;
- Be accessible to existing and planned transportation and transit options, supporting transit use and development;
- Be compliant with AODA Standards, as applicable;
- Can be developed with full municipal services, including sanitary sewage, domestic water, storm drainage, and utilities; and,
- Has assessed agricultural, environmental, and archaeological impacts through the preparation of an AIA, EIS, Phase I and II ESA, and Stage 1 Archaeological Background Study.

## 6.3 Norfolk County Official Plan

The Official Plan was adopted by Council on May 9, 2006 and approved by the MMAH on December 23, 2008. It was adopted by the Five-Year Review Council on January 31, 2018 and approved by the Five-Year Review MMAH on October 5, 2018. The Official Plan is the principal land-use planning tool used to manage growth and development within the County to the year 2036. The purpose of the Official Plan is to provide a policy framework to guide economic, environmental, and social decisions that have implications for the use of land.

OPA 163 was adopted by Norfolk Council as By-Law 2024-48 on May 22, 2024, and was granted final approval by the MMAH on September 5, 2025.

OPA 163 implements the recommendations resulting from the first phase of the County's Official Plan Review completed under the Grow Norfolk project umbrella and sets out a long-term growth management strategy for the County. OPA 163 implements a growth strategy for the urban communities in the County by amending urban area boundaries, amending land use designations, and by amending and adding site-specific policies.

For the purposes of this PJR, the version of the Official Plan utilized was the online version found here: https://www.norfolkcounty.ca/media/35xnhjc4/norfolk-county-official-plan.pdf as well as the approved OPA 163.

Prior to 2008, 2.56 hectares of the subject lands with frontage onto West Street was designated within the Simcoe Urban Area Boundary. The approval OPA No. 22 permitted a land trade for these lands for an identically sized parcel at the terminus of Thomson Road which at the time, represented a more immediate opportunity for urban residential uses as services were available at the terminus of the road and that the lands could be incorporated with another parcel to create one larger comprehensive development plan. As a result, the 2.56-hectare parcel of land

at West Street was redesignated from 'Urban Residential' to 'Agricultural' and the boundary of the settlement area was adjusted to exclude these lands.

**Table 6-1** below outlines the Official Plan designations of the subject lands:

*Table 6-1: Official Plan designations of the subject lands*

| Schedule | Designation |
|---|---|
| Schedule A-1 | Rural Area |
| Schedule B-15 Land Use | Agricultural<br>Amendment No. 22 |
| Schedule C-4 Natural Heritage | Significant Woodland |
| Schedule D-4 Source Water Protection | Wellhead Protection Area B<br>Vulnerability Score 10<br>Vulnerability Score 8<br>Issue Contributing Area (Nitrate) |
| Schedule E-2 Transportation | Arterial Road (West Street)<br>Collector Road (Hillcrest Road)<br>Local Road (Holden Avenue and Thomson Road) |
| Schedule I-2 Active Transportation | Additional Routes Being Considered (West Street) |

### 6.3.1 Section 3: Sustainable Natural Heritage

#### Subsection 3.3: Source Water Protection [7-OP-2020, Amendment 128]

**Subsection 3.3.2 Land Uses in Vulnerable Areas**

**Subsection 3.3.2.1: Prescribed Drinking Water Threats**

**Policy 3.3.2.1** *Land uses and activities which may pose a drinking water threat to municipal water supplies are defined by the Clean Water Act, 2006 as an activity or condition that adversely affects, or has the potential to adversely affect, the quality and quantity of any water that is or may be used as a source of drinking water. Drinking water threats are prescribed by Ontario Regulation 287/07 of the Clean Water Act, 2006, and include the following:*

- *Waste disposal sites within the meaning of Part V of the Environmental Protection Act.*
- *The establishment, operation or maintenance of a system that collects, stores, transmits, treats or disposes of sewage.*
- *The application of agricultural source material to land.*

- *The storage of agricultural source material.*
- *The management of agricultural source material.*
- *The application of non-agricultural source material to land.*
- *The handling and storage of non-agricultural source material.*
- *The application of commercial fertilizer to land.*
- *The handling and storage of commercial fertilizer.*
- *The application of pesticide to land.*
- *The handling and storage of pesticide.*
- *The application of road salt.*
- *The handling and storage of road salt.*
- *The storage of snow.*
- *The handling and storage of fuel.*
- *The handling and storage of a dense non-aqueous phase liquid (DNAPL).*
- *The handling and storage of an organic solvent.*
- *The management of runoff that contains chemicals used in the de-icing of aircraft.*
- *An activity that takes water from an aquifer or surface water body without returning the water to the same aquifer or surface water body.*
- *An activity that reduces the recharge of an aquifer.*
- *The use of land as livestock grazing or pasturing land, an outdoor confinement area or farm-animal yard.*

**Subsection 3.3.2.2: Land Use & Activity Prohibitions, Regulations and Restrictions within Vulnerable Areas**

**Policy 3.3.2.2** *Significant drinking water threats within vulnerable areas are either prohibited or regulated by the Long Point Region Source Protection Plan policies. The significance of a prescribed drinking water threat depends on the circumstances of the activity and where the activity is occurring within a vulnerable area.*

*Notwithstanding the land uses permitted by the underlying land use designation in this Official Plan:*

*a) Permitted land uses that involve a significant drinking water threat within a vulnerable area identified as a WHPA-A, WHPA-B, WHPA-C, IPZ-1 or ICA in Schedule "D" to this Plan may be either prohibited or regulated by the Long Point Region Source Protection Plan.*

*b) Any application for development, redevelopment, or site alteration for any land use, except solely residential uses, within a Wellhead Protection Area A, B or C; Intake Protection Zone 1; or Issue Contributing Area where a drinking water threat could be significant shall only be deemed complete under the Planning Act if submitted with a Section 59 Notice issued by the Risk Management Official, in accordance with the Clean Water Act, 2006, where applicable in accordance with the Long Point Region Source Protection Plan.*

*c) 3.3.2.2 b) shall also apply to the approval of any Building Permit application.*

*d) The County's Risk Management Official shall determine whether a new land use or activity is, or involves, a significant drinking water threat in accordance with the*

*Clean Water Act, 2006 and whether the use or activity is prohibited or regulated through a Risk Management Plan in accordance with the Long Point Region Source Protection Plan 3.3.2.2 b) and 3.3.2.2 c) shall not apply if the applicant can demonstrate, to the satisfaction of the Risk Management Official, as the case may be, that a significant drinking water threat activity will not be engaged in.*

e) *The Risk Management Official may provide guidance to assist the County in screening applications for development, redevelopment or site alteration.*

f) *When planning for growth and approving development that is to be serviced by an existing municipal well located within a WHPA-Q1 with a significant risk level, the County shall ensure that Planning Act decisions consider the long-term sustainability of the municipal drinking water system by:*
   i. *ensuring the development and any required expansion of the municipal drinking water system is consistent with the Integrated Sustainable Master Plan, including the water allocation threshold; and,*
   ii. *consulting with the Ministry of the Environment, Conservation and Parks to discuss any necessary amendments to the Permit to Take Water.*

g) *To ensure that any existing and future consumptive water taking within the WHPA-Q1 with a significant risk level ceases to be or never becomes a significant drinking water threat, additional water supply should be located outside of the WHPA-Q1 where practical.*

h) *To ensure that any existing and future consumptive water taking within the WHPA-Q1 with a significant risk level ceases to be or never becomes a significant drinking water threat, the County shall develop and implement an education and outreach program targeted toward property and business owners within the vulnerable area.*

i) *To ensure that any existing and future activity that reduces the recharge of an aquifer within the WHPA-Q2 with a significant risk level ceases to be or never becomes a significant drinking water threat, the County is encouraged to maintain pre-development recharge where appropriate. [7-OP-2020, Amendment 128]*

**Subsection 3.3.2.4: Abandoned Wells**

**Policy 3.3.2.4** *Prior to new development, proponents may be required to carry out an investigation for abandoned water, oil and gas wells within any WHPA-A, B, C or IPZ-1 and provide for the proper sealing or plugging of same, in accordance with relevant Provincial legislation and regulations, where this activity would a significant drinking water threat.*

**Planning Comment:**

As per Schedule D-4 Source Water Protection of the Official Plan, the subject lands are located within *Wellhead Protection Area B* and are given vulnerability scores of 8 and 10.

To assess whether the existing and future sources of drinking water are protected from incompatible land uses as a result of the proposed development, a Hydrogeological Assessment was prepared by MTE. The report assessed the impact of the SWM facility and proposed sanitary pumping station from a source water protection perspective. An impact assessment is contained within Section 7 of their report, as a result of their assessment MTE recommends the preparation of Salt Management Plans for all blocks subject to SPA and/or a plan of condominium approval and states that snow storage areas will be defined during the site plan application

process for the applicable blocks. MTE concludes that the proposed development may continue under a Risk Management Plan ("RMP") that would be negotiated with the County's Risk Management Officer ("RMO") which would address road salt application only. As per the Clean Water Act's Prescribed Table of Drinking Water Threats, only sewage systems within WHPA-A or -B areas with scores of 10 are considered significant threats. The pump station that is proposed within a WHPA-C is identified with a score of 8 and therefore is not considered a significant threat nor will it require an RMP.

The Hydrogeological Report concludes that based on the Review of the Source Protection Technical Rules there are no hydrological or related environmental considerations that would prohibit development. As required by Policy 3.3.2.2.b) above, a letter of Acknowledgement from the County's RMO has been received and is included with this submission. The screening done by the RMO similarly recommended the preparation of a RMP for the development to proceed while noting that the pump station will be reviewed/approved under a future Environmental Compliance Application approval from the Ministry of Environment.

## Subsection 3.5: Natural Heritage Systems

### Provincially Significant Features

**Policy 3.5.1** *The following shall be the policy of the County:*

a) *Development and site alteration shall not be permitted in a Provincially Significant Feature unless in accordance with provincial and federal requirements.*
b) *Development and site alteration shall not be permitted on lands adjacent to the natural heritage features and areas, unless the ecological function of the adjacent land has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions that cannot be adequately mitigated. The extent of adjacent land shall be defined as indicated in Table 1. An Environmental Impact Study (EIS) in accordance with Section 9.7.1 (Environmental Impact Study) of this Plan shall be required for all development proposals adjacent to or abutting areas identified as Provincially Significant Features.*

### Natural Heritage Features

**Policy 3.5.2** *The following shall be the policy of the County:*

a) *Natural Heritage Features identified on Schedule "C" and/or Table 2 to this Plan shall be subject to the policies of the underlying land use designation, as shown on Schedule "B", and the policies of this Section of the Plan.*
b) *Development or site alteration proposed in, or adjacent to, a Natural Heritage Feature(s), whether illustrated on Schedule "C" or only described in Table 2, shall be subject to the completion of an Environmental Impact Study, in accordance with Section 9.7.1 (Environmental Impact Study) of this Plan. Development or site alteration in, or adjacent to, such features shall not be permitted unless it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions that cannot be adequately mitigated. The extent of adjacent land shall be defined as indicated in Table 2.*

**Policy 3.5.2 Table 2**

***Habitat of endangered species and threatened species***

*EIS demonstrates that there will be no negative impacts on the habitat values upon which the species depend directly and indirectly, and any related ecological and hydrological functions.*

***Significant wildlife habitat***

*EIS demonstrates that there will be no negative impacts on wildlife of their habitat.*

***Significant Woodlands***

*EIS demonstrates there will be no negative impacts on the natural features of the woodlands and the ecological functions that sustain them.*

**Planning Comment:**

The subject lands do not contain Provincially significant features however Schedule C-4 of the Official Plan identifies portions of significant woodland extending into the subject lands from the south and east boundary limits. The proposed development would result in a portion of the significant woodlot being removed. An EIS prepared by NRSI assessed the impacts of the proposed development to the natural features and recommends that offset through the establishment of woodland compensation planting at an off-property location be considered to replace the removal of the natural features within the subject lands identified as portions of a Significant Woodland, potential species at risk ("SAR") habitat, and Candidate significant wildlife habitat ("SWH"). Significant Woodland removal is recommended to be compensated at a 2:1 area-based ratio, based on the area of removal required on the subject lands. Areas that are confirmed to represent SWH, or are otherwise considered Candidate SWH, should also be compensated at a 2:1 ratio. The total area of woodland compensation will be confirmed subject to the completion of future targeted surveys to assess the presence of SWH in the subject lands.

Although no SAR were identified within the subject lands based on the site investigations, there is the potential for SAR habitat. NRSI recommends that additional actions must be completed as required to ensure conformance with the Species Conservation Act and the Species at Risk Act.

The EIS also recommends additional targeted surveys to be completed to further assess the presence or absence of SAR and SWH functions within the subject lands.

## 6.3.2 Section 4.0 Ensuring Economic Vitality

### Subsection 4.4: Promoting Agriculture

**Policy 4.4**

*It is the policy of this Plan to promote the further development of Norfolk County's agricultural industry and to provide support to local farmers. To support this policy, the County may undertake the following measures:*

a) *Protect the agricultural land base and discourage or prohibit those uses that unnecessarily take agricultural land out of production or which may conflict with farm operations;*
b) *Prohibit the expansion of urban, hamlet and resort areas on to prime agricultural lands without a comprehensive review indicating the need for such expansion and demonstrating that lower quality lands are not available or practical for such*

*expansion; Facilitate the development of on-farm diversified businesses, in accordance with provincial guidelines, that provide the opportunity for farm operators to earn a supplementary income in a manner that minimizes the use of prime productive agricultural lands;*

**Planning Comment:**

The subject lands are currently designated 'Agricultural' within Schedule B-15 Land Use of the Official Plan, however, are not currently cultivated as the property is largely treed. As discussed in **Subsection 6.2.3** of this PJR, the AIA prepared by DBH concluded that the proposed development of the PSA would have minimal impact on the surrounding agricultural activities within the SSA (the SSA is 1500 metres beyond the boundaries of the PSA). DBH also completed MDS1 calculations as part of the AIA and identified one MDS1 arc impinging on the north and northeast portion of the PSA. Given the location of existing non-agricultural and residential uses, the MDSI recommended setback of 156 metres resulting with the subject lands falling almost completely outside of the arc. DBH concluded that the MDSI is consistent with the PPS 2024 Section 2.3.2 I e). Please refer to the AIA prepared by DBH for a detailed discussion.

### 6.3.3 Section 5.0 Maintaining Healthy Communities

#### Subsection 5.3: Housing

**Policy 5.3** *The following shall be the policy of the County:*

a) *At all times, the County shall maintain the ability to accommodate residential growth for a minimum of 10 years through land which is designated and available for residential development. Additionally, the County shall ensure that where new development is to occur, land with servicing capacity sufficient to provide at least a 3-year supply of residential units in draft approved and registered plans, or in cases of residential intensification and redevelopment, land appropriately zoned in the Zoning By-law and available for development or redevelopment.*

b) *The County shall ensure that a full range of housing types and densities are provided to meet the anticipated demand and demographic change. All forms of housing required to meet the social, health and well-being of current and future residents, including those with special needs shall be encouraged. The County shall target that 15 percent of all new housing built in Norfolk County be multi-residential dwellings and 15 percent be semi-detached and townhouse dwellings.*

**Planning Comment:**

The subject lands are proposed to be included into the Simcoe Urban Area Boundary, where growth and development are supported in accordance with local planning policy. As the lands are situated directly adjacent to the western edge of the existing Simcoe Urban Area, their inclusion represents a logical and appropriate location for expansion, completing the final phase of the Westwood Trails community.

The proposed built form is compatible with the surrounding residential area and introduces a mix of housing options, including townhouses and apartment units. This diversity will help address current shortages of smaller, more compact, and accessible homes that are well suited for seniors and other residents seeking alternative housing forms. The development is anticipated to deliver approximately 293 residential units and will establish strong connections to neighbouring communities through active transportation linkages, including pedestrian

trails, and sidewalk extensions. The additional residential units will assist in meeting projected population growth for both the Province and the County.

## Subsection 5.6: Recreation

### Subsection 5.6.2: Linked to Open Space and Natural Heritage System

**Policy 5.6.2** *As a component of the County initiative to undertake a Natural Heritage System Strategy, in accordance with Section 3.5.3 (Natural Heritage System Strategy), it is the County's intention to create a linked parks and open space system, where possible. In addition to those options for the acquisition of land outlined in Section 6.4.3 (Natural Heritage System Strategy), the County may create linked open space through the integration of:*

*a) Natural Heritage Features in public ownership, including land owned by the County, LPRCA, GRCA, Provincial and Federal Ministries and land trusts;*
*b) abandoned rail lines in public ownership;*
*c) existing rights-of-way;*
*d) established and proposed service and utility corridors;*
*e) existing parkland;*
*f) linkages provided through the draft plan of subdivision approval process and site plan control process;*
*g) agreements with private landowners;*
*h) retention or acquisition of access easements; and*
*i) land acquisition.*

**Planning Comment:**

The portion of the significant woodland is proposed to be retained within a public open space block that will be conveyed to the County for use as a public park. The public open space block will be contiguous with the existing County park (Westwood Acres Park) that is located to the immediate east of the subject lands and comprises the remaining off-property portions of the Significant Woodland which conforms to this policy direction.

## Subsection 5.7: Cultural Heritage

### Subsection 5.7.4 Archaeological Resources

**Policy 5.7.4** *The County recognizes that there are archaeological remains of prehistoric and historic habitation, or areas containing archaeological potential within the County. The following shall be the policy of the County:*

*a) Archaeological potential areas shall be determined through the use of Provincial screening criteria, or criteria developed based on the known archaeological record within the County by a licensed archaeologist as part of an archaeological management plan.*
*b) For a proposed development within an area of archaeological potential, an archaeological assessment shall be required prior to final planning approval, or as a condition of final planning approval. Archaeological assessment reports prepared by licensed archaeologists shall be in compliance with guidelines set out by the*

*Ministry of Tourism, Culture and Sport, as well as licensing requirements developed under the Ontario Heritage Act.*

c) *Where archaeological resources are identified, the County recognizes that there may be a need for Stage 4 archaeological mitigation by conservation in place or excavation as a result of proposed development or construction. The County may consider archaeological preservation on site, to ensure that the integrity of the resource is maintained. The County may also maintain the integrity of archaeological resources by enacting a Zoning By-law to prohibit incompatible land uses and/or the erection of buildings or structures on land which is a site of a significant archaeological resource.*

**Planning Comment:**

The Stage 1 Archaeological Background Study prepared by AAI has identified an area that meets the criteria to proceed to a Stage 2 Archaeological Assessment. Recommendations of its findings will be followed as per Ministry guidelines.

### 6.3.4 Section 6.0 Managing Growth (Subject to Official Plan Amendment 163)

On September 5, 2025, a decision was made by the MMAH, to approve, in part, OPA 163 as adopted by By-law 2024-48, subject to eleven (11) modifications to ensure consistency with the PPS, 2024. A decision on nine (9) matters has been withheld as they are inconsistent with the settlement area boundary expansion policies of the PPS, 2024.

OPA 163 sets out a long-term growth management strategy for the County and implements a growth strategy for the urban communities in the County by amending urban area boundaries, amending land use designations, and amending and adding site-specific policies.

On September 5, 2025, the MMAH approved OPA 163 with modifications. Modifications 4 and Part B 7) respectively, both approved the inclusion of Part 1 lands into the Simcoe Urban Area Boundary subject to Site Specific Policy 6.4.k) then withheld their decision pending further information. Site Specific Policy 6.4.k) provides Urban Area Boundary Expansion Policies which detail the required studies and plans to justify requests for boundary inclusion and permitted though privately initiated site-specific amendments.

#### Subsection 6.4: Specific Urban Areas

**Policy 6.4**

k) *Urban Area Boundary Expansion Special Policy Area*

i. *To manage growth forecasted over the long-term planning horizon and to guide development and land needs into the future, the County will ensure development growth is staged appropriately and occurs in an orderly manner.*

ii. *Further amendments to Schedule B: Land Use and other schedules and policies of this plan shall be facilitated through the completion of a County-led Community Plan and Master Servicing Strategy for each urban area subject to this Special Policy Area*

*iii. Notwithstanding Section 6.4 k) ii) and Section 9.5.1, the County may consider a private site specific amendment for a specific site or area within an urban area, provided that the proponent conduct studies and develop plans, which may include but are not limited to demonstration that:*

1. *the land use mix, densities of development and compatibility between different uses, conforms to the policies of this Plan;*
2. *adequate municipal water and wastewater services can be extended and upgraded to accommodate the proposed development with the costs to be borne by the developer to the satisfaction of the County;*
3. *there is sufficient reserve capacity in the water treatment and wastewater treatment services to accommodate the identified growth or that such capacity will be available to the lands within five years;*
4. *the stormwater management strategy meets the standards of the County (and the Conservation Authority, as applicable);*
5. *the proposed transportation system, including active transportation routes, meets the standards of the County and can be integrated into the existing transportation network;*
6. *an environmental analysis has been completed and any significant environmental features and appropriate buffer areas to protect those features have been identified;*
7. *a cultural heritage and archaeological assessment has been carried out in consultation with Provincial ministries and local Indigenous communities, and measures to conserve significant cultural heritage and archaeological resources and to mitigate the impact of development on these resources have been identified;*
8. *an Environmental Assessment, where required, has been completed which identifies, evaluates, and chooses optimal means of providing the necessary infrastructure;*
9. *the location of facilities supportive of the proposed development, including open space and parks, schools, places of worship, and commercial facilities are integrated into the proposed development in conformity to the policies of this Plan;*

10. *an agricultural impact analysis has been completed which conforms to the policies of this plan and is completed to the satisfaction of the County; and*
11. *any new development or redevelopment on lands adjacent to existing neighbourhoods shall consider the existing and planned uses of those neighbourhoods, compatibility, connectivity, and services as part of an appropriate mix of uses for Healthy and Complete Communities.*

**Planning Comment:**

Section 6.4 of the Official Plan provides policies related to Urban Areas. Through OPA 163, the above policy related to an Urban Area Boundary Expansion Special Policy Area has been adopted.

The proposed OPA, ZBLA, and DPS applications represent a private-site specific amendment for the subject lands that have been previously adopted by Council and approved by the MMAH with modifications to withhold a final decision for Part 1 lands identified in the Simcoe Urban Area pending further consideration/review. In keeping with the requirements of 6.4 k) the required technical studies have been completed and have informed the proposed DPS. This PJR further details and describes the compatibility of the proposed development to the adjacent neighbourhoods and proposes opportunities for enhanced connectivity, expansions to existing parkland, additions to the overall Simcoe trail network, and potential optimization of the existing transit network which meets the policy direction in OPA 163.

The objective of the private-site specific amendment is to also provide the necessary information to support the removal of the withheld decision on these lands and bring these lands into an Urban Area.

### 6.3.5 Section 7.0: Managing Land Use

#### Subsection 7.7: Urban Residential Designation

**Subsection 7.7.1: Permitted Uses**

**Policy 7.7.1** *Subject to the other policies of this Plan, the following policies shall apply in determining uses permitted on land designated Urban Residential on Schedule "B".*

a) *The predominant use of land shall be a variety of urban dwelling types, including single detached dwellings, semi-detached dwellings, duplex dwellings and similar low-profile residential buildings not exceeding 2 dwelling units per lot.*
b) *Medium density residential uses shall be permitted including triplex dwellings, fourplex dwellings, row or block townhouse dwellings, converted dwellings containing more than two dwelling units, walk-up apartments and similar medium profile residential buildings, subject to the policies of Section 7.7.2 (b) (Urban Residential Designation – Land Use Policies).*
c) *High density residential uses in development forms greater than those described in Subsections (a) and (b) shall be permitted subject to the policies of Section 7.7.2 (c) (Urban Residential Designation – Land Use Policies), save and except for in the Courtland Urban Area where high density residential uses shall not be permitted.*

**Subsection 7.7.2: Land Use Policies**

**Policy 7.7.2** *The following policies apply to land designated Urban Residential.*

a) *Single, semi-detached and duplex housing forms shall generally have an average net density of 15 units per hectare (uph), save and except for land designated Urban Residential in the Courtland Urban Area, where private servicing limitations shall determine the density of development.*

b) *Triplex, fourplex, townhouses, and other medium density housing forms, shall generally have a net density of between 15 and 30 uph, save and except for in the Courtland Urban Area where private servicing limitations shall determine the density of development. New medium density residential development and other uses that are similar in terms of profile, shall meet the following criteria:*

   i. *the density, height and character of the development shall have regard to adjacent uses;*
   ii. *the height and massing of the buildings at the edge of the medium density residential development shall have regard to the height and massing of the buildings in any adjacent low density residential area and may be subject to additional setbacks, or landscaping to provide an appropriate buffer;*
   iii. *the development will be encouraged to have direct access to an arterial or collector road, where possible and appropriate;*
   iv. *the watermains and sanitary sewers shall be capable of accommodating the development, or the proponent shall commit to extending services at no cost to the County, save and except for in the Courtland Urban Area, where private septic systems shall be permitted;*
   v. *the development is adequately serviced by parks and school facilities;*
   vi. *in developments incorporating walk-up apartments, block townhouse dwellings and medium-profile residential buildings, on-site recreational facilities or amenities such as playground equipment may be required;*
   vii. *the development shall be designed and landscaped, and buffering shall be provided to ensure that the visual impact of the development on adjacent uses is minimized;*
   viii. *except for a triplex dwelling, fourplex dwelling or other similar small-scale developments, a report on the adequacy of the road network to accommodate the expected traffic flows, and the adequacy of water and sewer services may be required from the proponent and approved by the County; and*
   ix. *triplexes, fourplexes, freehold street townhouses or other similar small-scale developments, may be subject to site plan control, in accordance with the policies of Section 9.6.5 (Site Plan Control) of this Plan.*

c) *High density residential uses, including apartment buildings and other forms of multiple housing of a similar density shall be carefully located. The following criteria shall be addressed in the consideration of such applications, especially in proximity to lower density residential development:*

   i. *the density, height and character of the development shall be compatible with adjacent uses;*

ii. *the ability of the site to accommodate necessary facilities and amenities, such as garbage storage, parking and landscaped areas;*
iii. *the height, form and density of the proposed development is such that no undue adverse impacts in terms of overshadowing, increased traffic or loss of amenity area are created for surrounding residential uses;*
iv. *the relationship of the site to nearby lower density residential uses, in view of the desire to provide a gradual transition in height and density wherever possible;*
v. *the degree to which the site has access to significant open space amenities such as valleylands or major parks;*
vi. *municipal watermains and sanitary sewers shall be required and shall be capable of accommodating the development, or the proponent shall commit to extending services at no cost to the County;*
vii. *the proximity of the site to arterial or collector roads, and/or pedestrian accessibility to a Downtown Area or, in the case of the Simcoe Urban Area, a Secondary Centre, or other locations of supporting services and facilities;*
viii. *the adequacy of local services including schools and other community services. It is recognized that accessibility to such facilities, including health care services, may be particularly important to residents with special needs; and*
ix. *the use shall be subject to site plan control, in accordance with the policies of Section 9.6.5 (Site Plan Control) of this Plan.*

**Planning Comment:**

An OPA is being requested to redesignate the subject lands from 'Agricultural' to 'Urban Residential'. As discussed above, the proposed development introduces a mix of housing options, including townhouses and apartment units. This diversity will help address current shortages of smaller, more compact, and accessible homes that are well suited for seniors and other residents seeking alternative housing forms. The development is anticipated to deliver approximately 293 residential units (101 townhouse units, 12 bungalow-townhouse units, and 180 apartment units). Based on an approximate site area of 8.9 hectares and a total of 293 units, an overall density of 33 UPH is proposed.

## 6.3.6 Section 8.0 Networks and Infrastructure

### Subsection 8.2: The Transportation Network

#### Subsection 8.2.2: Hierarchy and Classification of Roads

#### Subsection 8.2.2.3: Arterial Roads

*Arterial Roads identified on Schedule "E" are roads designed to carry high volumes of traffic from Provincial Highways and other interregional roads to the collector road system, and vice-versa. The following shall be the policy of the County:*

a) *Access from abutting properties to arterial roads shall be approved by the County.*

b) *Except as noted in Section 8.2.2(g) (Hierarchy and Classification of Roads) of this Plan, the minimum basic road right-of-way width for an arterial road shall be 36 metres. Setbacks from arterial roads shall be established in the Zoning Bylaw.*
c) *The flow of traffic on arterial roads shall take precedence over on-street parking, except in the Downtown Areas, where traffic and on-street parking needs shall be balanced.*
d) *In the Urban Areas, sidewalks shall generally be constructed on both sides of an arterial road.*

**Subsection: 8.2.2.4: Collector Roads**

*Collector roads are designed with the dual function of carrying moderate volumes of local traffic to arterial roads, and distributing arterial traffic to local roads, while providing access to abutting properties. The following shall be the policy of the County:*

a) *On-street parking may be permitted on collector roads in the Urban Areas, although location and time restrictions may be enforced in specific instances; for example, adjacent to schools or during peak periods of traffic demand.*
b) *Direct access to collector roads shall be permitted, subject to geometric design considerations.*
c) *Except as noted in Section 8.2.2(g) (Hierarchy and Classification of Roads) of this Plan, the minimum basic road right-of-way width for collector roads shall generally be 26 metres.*
d) *In the Urban Areas, sidewalks shall generally be constructed on both sides of collector roads.*

**Subsection 8.2.2.5: Local Roads**

**Policy 8.2.2.5** *The remainder of the streets in the County road system are classified as local roads. Local roads are intended to carry low volumes of traffic and to provide access to individual properties.*

*The following shall be the policy of the County:*

a) *Except as noted in Section 8.2.2(g) (Hierarchy and Classification of Roads) of this Plan, local roads shall generally be two traffic lane roads with a minimum road right-of-way width of 20 metres and be designed to carry local traffic and to provide land access to abutting properties. In instances where more than two lanes of traffic are to be accommodated, the minimum right-of-way width shall be 23 metres.*
b) *Local roads shall be designed to discourage high speed traffic through frequent stop signs or other appropriate design measures.*
c) *Sidewalks may generally be required on one side of local roads. In instances where local roads lead directly to a school, park, community facility or other facility which generates pedestrian traffic, or where safety of pedestrians is of particular concern, sidewalks may be required on both sides of the road.*
d) *Some local roads are only seasonally maintained. Nothing in this Plan shall be construed to imply specific seasonal road or maintenance improvement initiatives within the planning horizon of the Official Plan.*

**Planning Comment:**

The TIS prepared by Paradigm states that West Street (County Road 1) is classified as an east-west arterial road, Hillcrest Road is classified as a collector road south of West Street and an arterial road (County Road 41) north of West Street, and Holden Avenue and Thomson Road are classified as north-south local roads.

Vehicle access to the subject lands is proposed via a new north-south all-moves connection to West Street, and an all-moves driveway connection to West Street for the apartment block. An internal emergency access connection is also proposed between the apartment block and the internal road network west of Street A.

**Subsection 8.2.4 Public Transit**

**Policy 8.2.4** *Transit provides opportunities to enhance the mobility options for people who do not or cannot drive to access goods, services, amenities, and local attractions. The following shall be the policy of the County:*

*a) The County will explore opportunities to enhance transit services in partnership with community and/or government partners, including adjacent municipalities.*
*b) Development within Urban Areas shall, where appropriate, take into consideration the safe and convenient provision of transit services.*
*c) The continued need for transit services will be considered on an on-going basis.*

**Planning Comment:**

The subject lands are located within proximity (i.e. approximate 10-minute walk) to an on-demand transit stop for Ride Norfolk, which provides service in Delhi, Port Dover, Port Rowan, Simcoe, Waterford, and other communities in the County, such as Renton, St. Williams, and Wilsonville. As there is direct frontage onto West Street, the new neighbourhood will be able to utilize existing routes located on West Street and would assist with increasing ridership and the overall transit system.

## Subsection 8.9: Water and Wastewater Services

**Subsection 8.9.1: Services in Urban Areas**

**Policy 8.9.1** *The following shall be the policy of the County:*

*a) The County shall ensure that both municipal water supply and wastewater treatment systems perform within permitted operating standards. Limitations on the capacity or operating performance of these systems are recognized as a constraint to further development. The County shall continue to monitor treatment capacities and operational effectiveness of these municipal systems.*
*b) Development in proximity to any waste water treatment plant shall adhere to the minimum separation distances and standards of the appropriate Ministry of the Environment and Climate Change Guidelines. Prior to the approval of any development of a sensitive land use in proximity to a waste water treatment plant, the Ministry of the Environment and Climate Change shall be consulted, and its standards shall be satisfied. The County may, to deal with specific situations, require separation distances that are greater than the minimum standards set by the Ministry.*

c) *All development in the Urban Areas shall be fully serviced by municipal piped water supply and waste water treatment systems, save and except for circumstances outlined in Section 8.9.1 f) (Services in Urban Areas). Notwithstanding this, appropriate development shall be permitted in the Courtland Urban Area on the basis of a municipal water system and private waste water disposal systems.*

d) *In Urban Areas, priority shall be given to the development of land that is presently serviced by watermains and sanitary sewer systems, or those areas that can most easily be serviced, at minimal expense.*

e) *Infilling of vacant areas within the Urban Areas which are already provided with full municipal services is encouraged, and shall be a criterion when evaluating proposed plans of subdivision and consents, with respect to the extension of services, utilities or the associated construction.*

f) *In order to ensure the efficient use of land and municipal services in the Urban Areas, development on individual on-site servicing systems (water and/or waste water disposal) shall generally not be permitted. Exceptions will be considered in areas not serviced by municipal water and/or waste water sewer services on the basis of a site-specific amendment to the Zoning By-law, and satisfaction of the following criteria:*

   i. *the development shall be minor in nature, constituting one or two single detached residential lots;*

   ii. *the development shall be of an infilling nature in an area largely developed and presently serviced by individual on-site water and/or individual on-site waste water disposal systems; and*

   iii. *the development is proposed on land situated such that there are unique circumstances which would deter the rational, efficient, cost-effective and/or timely extension of services. Such unique circumstances would include topographic constraints and the absence of any feasible future users of municipal services, combined with excessive distances from existing services that would make future extension of services impractical. However, excessive distance from existing services alone shall not constitute a unique circumstance for the purposes of this Section.*

**Planning Comment:**

The FSR prepared by MTE concluded that the subject lands can be developed on full municipal services, including sanitary sewage, domestic water, storm drainage, and utilities. They are proposed to be serviced by connection to the existing sanitary sewer on West Street at the intersection of Holden Avenue. Connection will be made to the existing 200mm diameter watermain on West Street, and the watermain will be extended along the proposed site frontage. MTE further states that SWM for the subject lands can be accommodated by directing the stormwater runoff to the proposed SWM facility (located in Block 1 on the westmost portion of the subject lands) for treatment prior to being infiltrated. Please refer to FSR and SWM Report for more details on the proposed servicing strategy.

### 6.3.7 Official Plan Conclusion

The proposed development **conforms with the Official Plan, as proposed to be amended** as it will:

- Have no negative impact to the WHPA B area with the implementation of a RMP as recommended in the Hydrogeological Assessment Report;
- Maintain and protect the Natural Heritage Features and functions within a publicly owned block and would offset woodland compensation to a location within the County;
- Assist the Province and County in achieving their population and new housing supply target, by providing 293 residential units;
- Enhance the quality of life through the provision and extension of open space and trails;
- Address cultural heritage policies through the preparation of an Archaeological Assessment and meeting Ministry procedures;
- Represent the logical expansion of the Simcoe Urban Area as the last phase of the Westwood Trails subdivision which is located to the immediate west of the existing Westwood Trails Phases I and II;
- Ensure an appropriate transition to adjacent areas and respect the existing context and character;
- Be able to utilize existing municipal road infrastructure;
- Provide residential development that may increase ridership and the overall transit system; and,
- Be developed on full municipal services, including sanitary sewage, domestic water, storm drainage, and utilities with minimal extension of municipal infrastructure.

## 6.4 Norfolk County Zoning By-law 1-Z-2014

The Zoning By-law was approved by the County on July 14, 2014. The last consolidated version was February 1, 2026. The Zoning By-law regulates the use of lands, the frontage and depth of a parcel of land, the proportion of land occupied by a building or structure, the erection, use, height, bulk, size, floor area, spacing and location of building and structures, and the provision of parking facilities within the County. As seen in **Figure 6-4** below, the subject lands are zoned ‘Agricultural (A)’. To permit the proposed development, an application for ZBLA will be required which is detailed in **Subsection 7.2** of this PJR.

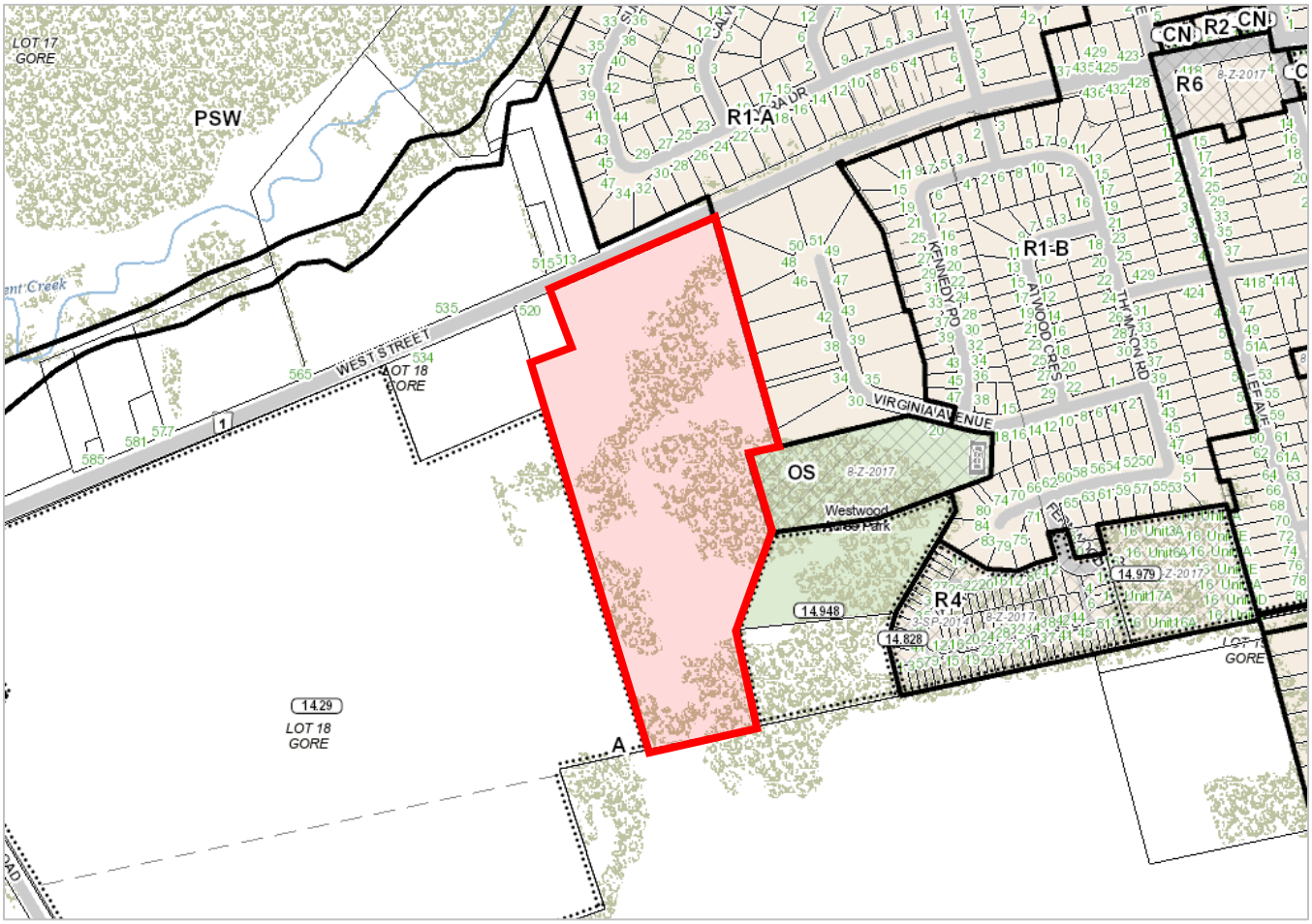



*Figure 6-1: Zoning of subject lands, retrieved from the County's online interactive maps*

# 7 Proposed Planning Instruments

To permit the proposed development, approval of several planning applications will be required, including an OPA, ZBLA, and DPS, and future DPC and SPA.

## 7.1 Official Plan Amendment

Schedule B-15 Land Use designates the subject lands as 'Agricultural'. This designation is intended to strengthen the agricultural community in the County and the policies are designed and intended to protect agriculture from the intrusion of incompatible uses and provide the opportunity for businesses that support agricultural operations to locate on farms or in close proximity to farms. The primary use of land for this designation shall be for the growing of crops, including biomass, nursery and horticultural crops, the raising of livestock, the raising of other animals for food, fur and fibre, including poultry and fish, aquaculture, apiaries and maple syrup production and agro-forestry. As such, the 'Agricultural' designation does not permit the proposed development.

In order to facilitate the proposed development, an application under Section 22 of the *Planning Act* is required to amend the Official Plan. The purpose of this OPA is to permit a site-specific amendment to expand the settlement area boundary of the Simcoe Urban Area by approximately 8.86 hectares which is to be designated 'Urban Residential' to permit urban residential development in the form of a Plan of Condominium and townhouse dwellings.

Amendments will be required to the following schedules to include the approximate 8.86 hectares within the settlement area boundary of the Simcoe Urban Area:

- Schedule A-1, Community Structure;
- Schedule B-15, Land Use;
- Schedule C-4, Natural Heritage;
- Schedule D-4, Water Resources;
- Schedule E-2, Transportation;
- Schedule I-2, Active Transportation; and,
- Schedule J-4, Natural Resources.

Please refer to **Appendix A** for the Draft OPA and Schedule.

## 7.2 Zoning By-law Amendment

A ZBLA will be required to provide the appropriate designations to 'Urban Residential' designated lands. To facilitate the proposed residential densities, the parent 'Residential Type 4 (R4)' and 'Residential Type 6 (R6)' zoning categories were used. Site specific amendments are required for the 'Residential Type 4' zone applied to for Block 2 which will recognize that the lots will be fronting onto a private road with proposed minor revisions to performance standards related to side yards and lot frontage to accommodate a more compact built form.

Park and amenity blocks are proposed in the 'Open Space' zoning category while the proposed SWM facility is proposed to remain in the 'Agricultural' zone, similar to the existing facility within Westwood Phase II. The amendment proposes a Holding Symbol (H) to be applied to each of the residential blocks which is proposed to be lifted with the approval of the DPS.

The proposed site-specific amendments are listed below:

*Table 7-1: Site-specific zoning amendments*

| Section | Required | Proposed | Modification Required |
|---|---|---|---|
| Subsection 14.0 Special Provision | NA | Site Specific Amendment:<br>A 'lot' shall be defined as a lot within a condominium plan | Yes |
| Residential Type 4 Zone Subsection 5.4.2 b) – Minimum Lot Frontage | 30m | Per unit<br>Interior Lot – 6.5m<br>Corner Lot – 9.0m | Yes |

| Section | Required | Proposed | Modification Required |
|---|---|---|---|
| Residential Type 4 Zone Subsection 5.4.2 e) – Min. Interior Side Yard | 1.2m | 1.2m | No |
| Residential Type 4 Zone Subsection 5.4.2 d) i) – Min. Exterior Side Yard | 6.0m | 1.6m | Yes |
| Residential Type 4 Zone Subsection 5.4.2 d) i) – Min. Rear Yard | With attached garage - 7.5m | With attached garage – 6.0m | Yes |
| Subsection 4.2.4 d) – General Provisions- Location of Parking on a Lot | b) for group townhouses and apartment dwellings, no parking lot shall be located closer than 3 metres from any dwelling on the lot or of any interior lot line abutting another residential Zone; | No parking lot shall be closer than 1.2m from a dwelling on the lot or any interior lot line abutting another residential Zone | Yes |
| Subsection 4.2.3 b) – Residential Parking Area for Urban Residential Type 1 to 4 Zones [R1 to R4] | b) not more than one (1) required parking space may be located within the required front yard or required exterior side yard [7-Z-2018]; | Shall not apply | Yes |

Under Section 34 of the *Planning Act*, a ZBLA may be used to amend any by-law passed under that section. The subject lands are zoned 'Agricultural (A)'. It is being requested that the subject lands be rezoned to the following zones:

- Urban Residential Type 4 Zone (R4) with a Holding (H) provision and a new special provision 14.XXX;
- Urban Residential Type 4 Zone (R4) with a Holding (H) provision and a new special provision 14.XXX;
- Urban Residential Type 6 (R6) Zone; and,

- Open Space (OS) Zone.

It is also being requested to further amend the 'Urban Residential Type 4 Zone (R4)' to recognize site specific provisions relating to lot frontage for corner lots, interior side yard, exterior site yard, location of parking on a lot, residential parking areas. These provisions will allow for the establishment of the size and scale of the residential dwellings. The site layout will be subject to SPA.

Please refer to **Appendix B** for the Draft ZBLA and Schedule.

## 7.3 Draft Plan of Subdivision

In order to facilitate the construction of the proposed development and the development of a new municipal road, a DPS will be required. The DPS proposes to subdivide the lands into eight (8) conveyable parcels and create a municipal road. The proposed blocks are as follows:

*Table 7-2: Proposed blocks of the DPS*

| Block | Land Use |
|---|---|
| Block 1 | SWM Facility |
| Block 2 | Private Sanitary Pumping Station |
| Block 3 | Townhomes (condominium tenure) – approximately 101 units – subject to future SPA |
| Block 4 | Common Element Outdoor Amenity Space – Tennis, pickleball courts |
| Block 5 | Public Park – Woodlot |
| Block 6 | Street Townhomes – subject to future Part Lot Control Exemption By-law |
| Block 7 | Street Townhomes – subject to future Part Lot Control Exemption By-law |
| Block 8 | Residential Apartment Building – approximately 180 units – subject to future SPA |
| Block 9-11 | Daylighting triangles and West Street road widening |
| Block 12 | Open space – landscaped area |

Please refer to **Appendix C** for the DPS.

## 7.4 Future Planning Applications

Following the registration of the Plan of Subdivision it is anticipated that separate plan of condominium applications would be required – a Standard Plan of Condominium for the proposed apartment building and common element condominium for the townhouse component of the proposed development. Street townhomes fronting onto Street "A" would be further divided through a Part Lot Control Exemption.

Applications for SPA will be required, which may be considered concurrently with the required Plan of Condominium Applications. The future SPA applications will provide detailed design, final unit yields, detailed development statistics, site elements, grading information, and mandatory notes. Further, it is expected that servicing and landscaping design will be refined and submitted during SPA stage.

# 8 Conclusion

Westwood Trail Developments Inc., the owner of an approximately 8.9-hectare parcel of land, is applying for a privately initiated OPA to propose the expansion of the Simcoe Urban Area Boundary to include the subject lands which will accommodate the proposed development known as Westwood Trails Phase III. Applications for OPA, ZBLA, and DPS are required to facilitate the proposed development.

Based on a review of the subject lands, the surrounding context, supporting studies and reports, and the applicable planning policy framework, the subject applications represent good planning and facilitate an appropriate form of development in the County.

The proposed development and subsequent planning applications:

- Are supported by the technical studies and reports prepared;
- Conform with and are consistent with all upper tier and provincial planning documents;
- Are compatible with the surrounding context and enhance the Simcoe Urban Area;
- Increase the number of residential units and contributes to the growth and density targets for the Province and County;
- Do not negatively impact significant Natural Heritage Features and functions;
- Enhance the quality of life through the provision of open space and trails; and,
- Represents good planning and is in the public interest.

# Appendix A

## Draft Official Plan Amendment and Schedule

Amendment No. XXX

Amendment Number 144 to the Norfolk Official Plan
Simcoe Urban Area, - Settlement area boundary expansion

## Part A: Preamble to the Amendment

The purpose of this Official Plan Amendment (OPA) is to permit a site-specific amendment to expand the Settlement Area Boundary of the Simcoe Urban Area by approximately 8.86 hectares which is to be designated “Urban Residential” to permit urban residential development in the form of a Plan of Condominium and townhouse dwellings.

The subject lands form part of the area identified as Part 1 lands on Schedule A (Simcoe Urban Area) in OPA 163 and adopted by Council on May 22, 2024 as an appropriate area for expansion of the Simcoe Urban Boundary Area.

On September 5th, 2025 the Ministry of Municipal Affairs approved OPA 163 with modifications. Modification 4 and Part B 7) respectively in the decision, approved the inclusion of all Part 1 lands identified in the OPA into the Simcoe Urban Area Boundary subject to Special Policy 6.4.k) and then withheld the final decision on both Part 1 and 7 lands pending further consideration and/or information.

This amendment satisfies the policy direction of OPA 163, providing the necessary technical studies and analysis under Site Specific Policy 6.4.k 7) to support the lands inclusion for an urban boundary expansion area. The amendment satisfies the policy direction of the Provincial Planning Statement 2024, Chapter 2: Building Homes, Sustaining Strong and Competitive Communities, Chapter 3: Infrastructure and Facilities and Chapter 4 Wise Use and Management of Resources. The amendment is consistent with the County’s comprehensive visioning and strategic planning conducted under the Grow Norfolk Project and promotes an efficient development and land use pattern to that accommodate an appropriate range residential densities that does not impact significant natural heritage features, cultural resources or impact the existing agricultural area.

The expansion implements the Growth Strategy adopted by Norfolk County by amending the Simcoe Urban Area Boundary and adding a land use designation. The additional lands to the settlement area will assist to accommodate forecasted population growth to the planning horizon of 2051, consistent with Official Plan Amendment 163 and the Provincial Planning Statement (PPS, 2024)

The amendment redesignates the subject lands from “Agricultural Area” to “Urban Residential,” enabling future mixed – density residential development through subsequent planning approvals.

**Location of the Lands Affected**

As shown on the attached Schedule “A”, the subject lands are approximately 8.86 hectares, and are located west of Virgina Steet, south of West Street, at the western limit of the Simcoe Urban Area Boundary and are legally described Part of Lot 18, Concession Gore, former Township of Woodhouse, in Norfolk County in the Province of Ontario.

**Basis of the Amendment**

It is the is the intent of this amendment to include the land identified on Schedule “A” into the Urban Area Boundary for Simcoe and apply an ‘Urban Residential’ designation which will permit the medium and high-density residential uses.

The size and scale of the residential dwellings will be established through a Zoning By-law and the site layout is subject to Site Plan Control.

**Part B: The Amendment**

That the Norfolk County Official Plan is hereby amended as follows:

**Map Schedule Amendment**

Schedule ‘A-1’, Community Structure, in the Norfolk Official Plan is amended by expanding the Simcoe Urban Area Boundary to include approximately 8.86ha and shown on Schedule ‘A’, attached hereto, with Special Policy Area 6.4.k).

That Schedule B-15, Land Use, in the Norfolk County Official Plan is amended by adding approximately 8.86ha shown on Schedule ‘A’, attached hereto, to within the Simcoe Urban Area Boundary with Special Policy Area 6.4.k).

That Schedule C-4, Natural Heritage, in the Norfolk County Official Plan is amended by adding the lands shown on Schedule ‘A’, attached hereto, to within the Simcoe Urban Area.

That Schedule D-4, Water Resources, in the Norfolk County Official Plan is amended by adding the lands shown on Schedule ‘A’, attached hereto, to within the Simcoe Urban Area.

That Schedule E-2, Transportation, in the Norfolk County Official Plan is amended by adding the lands shown as Schedule ‘A’, attached hereto, to within the Simcoe Urban Area.

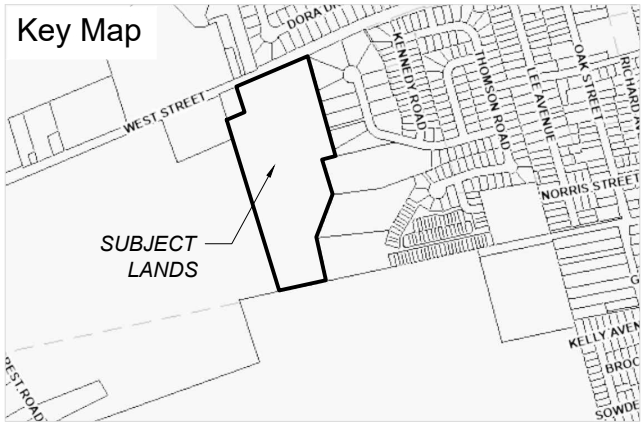
That Schedule I-2, Active Transportation, in the Norfolk County Official Plan is amended by adding the lands shown as Schedule ‘A’, attached hereto, to within the Simcoe Urban Area.

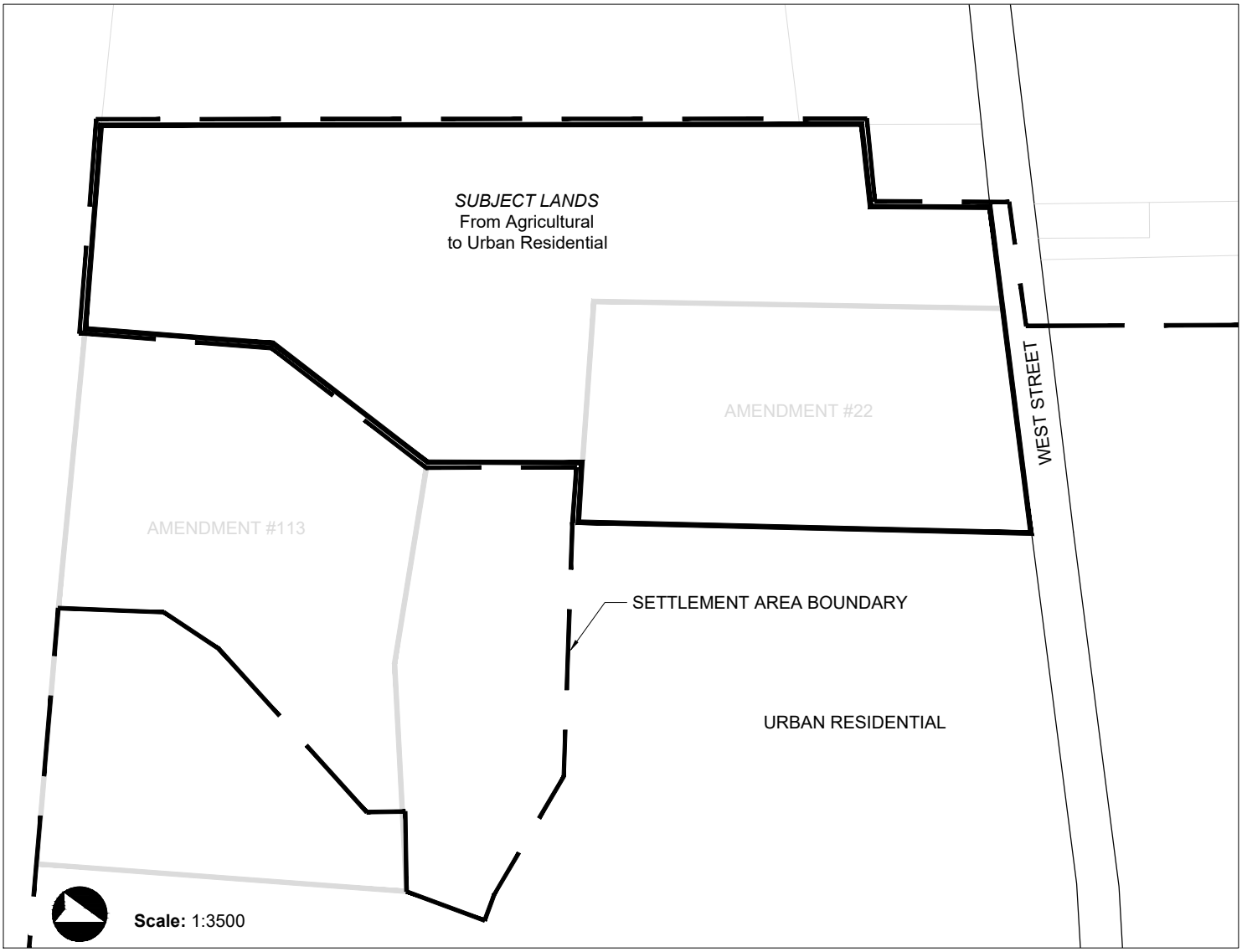
That Schedule J-4, Natural Resources, in the Norfolk County Official Plan is amended by

adding the lands shown as on Schedule ‘A’, attached hereto, to within the Simcoe Urban Area.

Amendment No. XXX

to the
OFFICIAL PLAN
for
NORFOLK COUNTY




# Schedule 'A'

# Appendix B

## Draft Zoning By-law Amendment and Schedule

# The Corporation of Norfolk County

## By-Law X-X-2026

Being a By-Law to Amend Zoning By-Law 1-Z-2014, as amended, for property described as Part of Lot 18, Concession Gore, former Township of Woodhouse, Town of Simcoe, Norfolk County, Urban Area of Simcoe, Norfolk County.

Whereas Norfolk Council is empowered to enact this By-Law, by virtue of the provisions of Section 34 and Section 36(1) of the *Planning Act, R.S.O. 1990, CHAPTER P.13*, as amended; and

Whereas this By-Law conforms to the Norfolk County Official Plan; and

Now therefore the Council of The Corporation of Norfolk County hereby enacts as follows:

1. That Schedule A of By-Law 1-Z-2014, as amended, is hereby further amended by changing the zoning of the subject lands identified as Part of Lot 18, Concession Gore, former Township of Woodhouse, Town of Simcoe, Norfolk County on Schedule A (attached to and forming part of this By-Law), in accordance with the following:

   From Agriculture to Urban Residential Type 4 Zone (R4) with a Holding (H) provision and a new special provision 14.XXX;

   From Agriculture to Urban Residential Type 4 Zone (R4) with a Holding (H) provision and a new special provision 14.XXX;

   From Agriculture to Urban Residential Type 6 (R6) Zone

   From Agriculture to Open Space (OS) Zone.

2. That Subsection 14.0 Special Provisions is hereby further amended by adding 14.XXX; in accordance with the following:

   14.XXX In the R4 Zone, a “lot” shall be defined as lots within the condominium plan. In lieu of the corresponding provisions in the R4 Zone, the following shall apply for the lands amended to Urban Residential Type 4 (R4-XX)(H) Zone:

   a) Minimum *Lot Frontage:*
      - *i) Interior lot – 6.5m*
      - *ii) Corner Lot* – 9 metres

   b) Minimum *interior side* yard – 1.2m

c) Minimum *exterior side yard* – 1.6m

d) Minimum rear yard

i) Attached garage 6.0m

In lieu of the parking provisions in Subsection 4.2.4 d) – Location of Parking on a *Lot* The following shall apply:

i) No parking lot shall be closer than 1.2m from a dwelling on the lot or any interior lot line abutting another residential Zone

3. That Subsection 14.0 Special Provisions is hereby further amended by adding 14.XXX; in accordance with the following:

14.XXX In lieu of the corresponding provisions in the R4 Zone, the following shall apply for the lands amended to Urban Residential Type 4 (R4-XX)(H) Zone:

a) THAT The parking provisions in Subsection 4.1.3 b) – *Residential Parking Area for Urban Residential Type 1 to 4 Zones [R1 to R4]* - Shall not apply

4. Holding Prefix

a) That the holding (H) provision of this by-law shall be removed upon the approval of a Draft Plan of Subdivision to the satisfaction of the General Manager of Community Development (or designate).

Enacted and passed this ___ day of _____, 2026.

_____

Mayor: A. Martin

_____

County Clerk: W. Tigert

# Schedule 'A'

**Legend**

TOTAL LANDS TO BE AMENDED

LANDS TO BE REZONED FROM AGRICULTURAL [A] ZONE TO URBAN RESIDENTIAL TYPE 4 [R4-XX] ZONE WITH A HOLDING [H], AND SPECIAL PROVISIONS

LANDS TO BE REZONED FROM AGRICULTURAL [A] ZONE TO URBAN RESIDENTIAL TYPE 4 [R4-XX] ZONE WITH A HOLDING [H], AND SPECIAL PROVISIONS

LANDS TO BE REZONED FROM AGRICULTURAL [A] ZONE TO URBAN RESIDENTIAL TYPE 6 [R6]

LANDS TO BE REZONED FROM AGRICULTURAL [A] ZONE TO OPEN SPACE [OS] ZONE

**Scale:** 1:3500

**File Number:**

This is Schedule 'A' to By-law No. ____- 2026
to amend Zoning Bylaw No. 1-Z-2014 Schedule 'A-25'

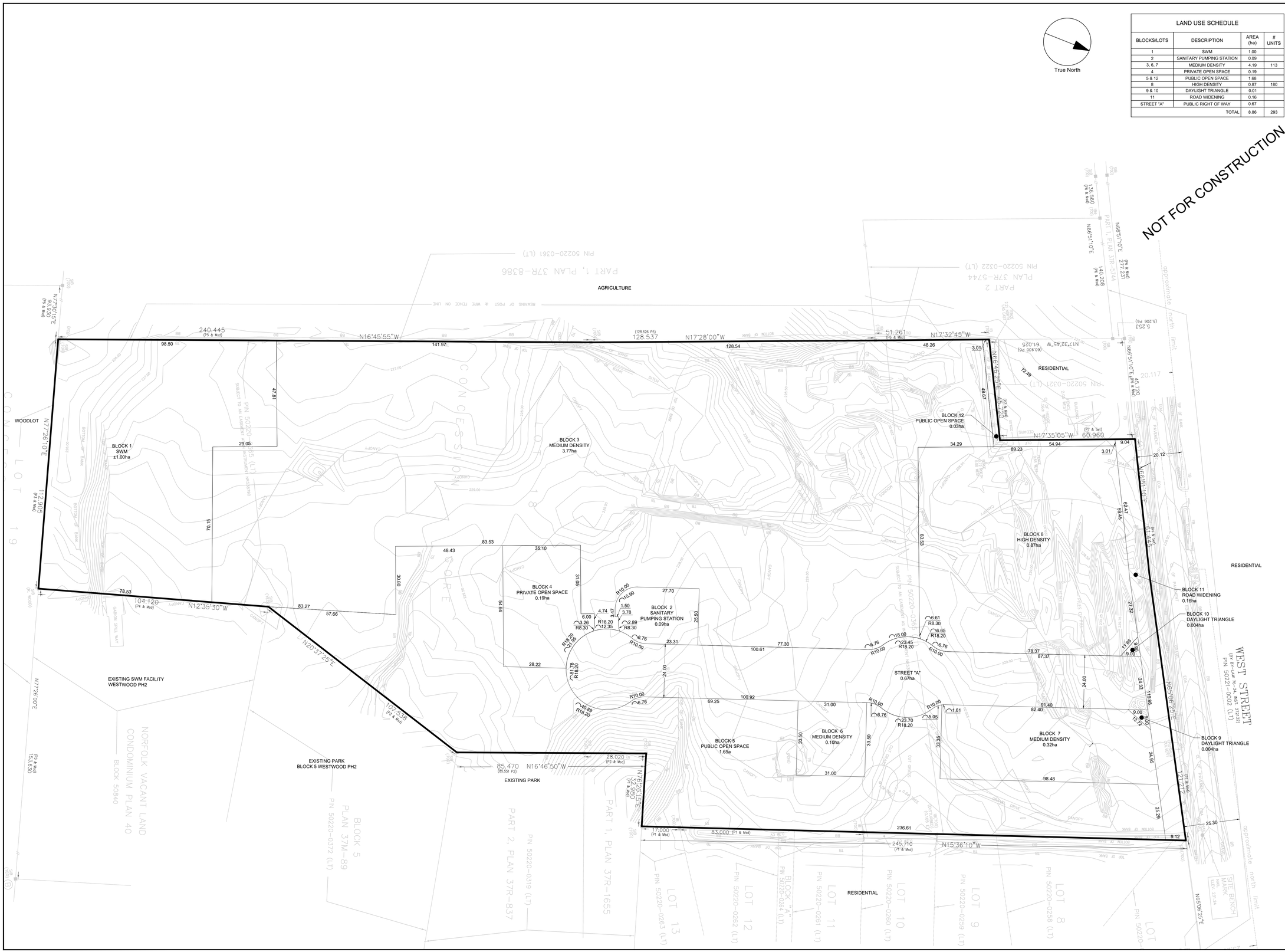
Passed the ____ day of _____, 2026.

_____
MAYOR

_____
CLERK

# Appendix C

## Draft Plan of Subdivision


True North
NOT FOR CONSTRUCTION
AGRICULTURE
PART 1, PLAN 37R-8386
PIN 50220-0361 (LT)
PART 2
PLAN 37R-5744
PIN 50220-0322 (LT)
PART 1 PLAN 37R-5744
PIN 50220-0321 (LT)
approximate north limit
WOODLOT
BLOCK 1
SWM
±1.00ha
BLOCK 3
MEDIUM DENSITY
3.77ha
BLOCK 12
PUBLIC OPEN SPACE
0.03ha
RESIDENTIAL
BLOCK 4
PRIVATE OPEN SPACE
0.19ha
BLOCK 2
SANITARY
PUMPING STATION
0.09ha
STREET "A"
0.67ha
BLOCK 8
HIGH DENSITY
0.87ha
BLOCK 11
ROAD WIDENING
0.16ha
BLOCK 10
DAYLIGHT TRIANGLE
0.004ha
BLOCK 9
DAYLIGHT TRIANGLE
0.004ha
BLOCK 5
PUBLIC OPEN SPACE
1.65a
BLOCK 6
MEDIUM DENSITY
0.10ha
BLOCK 7
MEDIUM DENSITY
0.32ha
EXISTING SWM FACILITY
WESTWOOD PH2
EXISTING PARK
BLOCK 5 WESTWOOD PH2
EXISTING PARK
NORFOLK VACANT LAND
CONDOMINIUM PLAN 40
BLOCK 50840
BLOCK 5
PLAN 37M-89
PIN 50220-0372 (LT)
PART 2, PLAN 37R-837
PIN 50220-0319 (LT)
PART 1, PLAN 37R-1655
LOT 13
PIN 50220-0263 (LT)
LOT 12
PIN 50220-0262 (LT)
LOT 11
PIN 50220-0261 (LT)
LOT 10
PIN 50220-0260 (LT)
LOT 9
PIN 50220-0259 (LT)
LOT 8
PIN 50220-0258 (LT)
BLOCK "A"
PIN 50220-0264 (LT)
WEST STREET
(BY-LAW 76-34, INST. 70133)
PIN 50221-0002 (LT)
SITE BENCH MARK
NAIL
ELEV. 233.34
SUBJECT TO AN EASEMENT AS IN INSTRUMENT NUMBER
REFERENCE POINT
REFLAINS OF POST & WIRE FENCE ON LINE
N77°26'10"E
112.200
(P3 & Msd)
N16°45'55"W
240.445
(P5 & Msd)
98.50
141.97
(128.626 P5)
128.537
N17°28'00"W
128.54
51.261
(P6 & Msd)
N17°32'45"W
48.26
3.01
N17°32'45"W
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(60.920 P6)
N65°46'25"E
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48.67
N65°51'10"E
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(P4 & Msd)
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(P4 & Msd)
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(P5 & Msd)
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(P7 & Set)
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89.23
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9.04
3.01
20.12
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47.81
70.15
N77°26'10"E
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(P4 & Msd)
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57.66
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35.10
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77.30
100.61
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25.30
9.12
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(85.551 P2)
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(P1 & Msd)
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15.630
(P3 & Msd)
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R8.30
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R18.00
R18.20
R10.00
R8.30
R10.00
R18.20
R10.00
R18.20
R10.00
R18.20

Arcadis Professional Services (Canada) Inc.
360 James Street North, Suite 200
Hamilton, Ontario L8L 1H5
Canada
Phone: 905 546 1010
www.arcadis.com

## LAND USE SCHEDULE

| BUILDING / BLOCK | DESCRIPTION | AREA (ha) | # UNITS |
|---|---|---|---|
| BLOCK 1 | SWM | 1.00 | |
| BLOCK 2 | SANITARY PUMPING STATION | 0.09 | |
| BLOCK 3 | BUILDINGS 1 & 2 REAR LOADED TOWNHOUSES | 3.77 | 10 |
| | BUILDINGS 3 TO 19 ROW TOWNHOUSES | | 91 |
| BLOCK 4 | OPEN SPACE - AMENITY AREA | 0.19 | |
| BLOCK 5 | PARK | 1.65 | |
| BLOCK 6 & 7 | BUILDINGS 20 TO 22 - BUNGALOWS | 0.42 | 12 |
| BLOCK 8 | BUILDING 23 RESIDENTIAL APARTMENT BUILDING | 0.87 | 180 |
| BLOCK 9 & 10 | DAYLIGHT TRIANGLE | 0.01 | |
| BLOCK 11 | ROAD WIDENING | 0.16 | |
| BLOCK 12 | OPEN SPACE [3M LANDSCAPE AREA] | 0.03 | |
| STREET "A" | PUBLIC RIGHT OF WAY | 0.67 | |
| | TOTAL | 8.86 | 293 |

True North

AGRICULTURE

CONCEPTUAL TRAIL

WOODLOT

BLOCK 1
SWM
±1.00ha

10m BUFFER

BLOCK 1

BUILDING 8
TOWNHOUSE
6 UNITS

BUILDING 7
TOWNHOUSE
6 UNITS

BUILDING 6
TOWNHOUSE
6 UNITS

BUILDING 5
TOWNHOUSE
6 UNITS

BUILDING 4
TOWNHOUSE
6 UNITS

BLOCK 3

BUILDING 3
TOWNHOUSE
4 UNITS

RESIDENTIAL

BLOCK 12
OPEN SPACE
LANDSCAPE AREA
0.03ha

EMERGENCY ACCESS

BUILDING 12
TOWNHOUSE
5 UNITS

BUILDING 13
TOWNHOUSE
5 UNITS

BUILDING 14
TOWNHOUSE
4 UNITS

BUILDING 15
TOWNHOUSE
4 UNITS

BUILDING 16
TOWNHOUSE
7 UNITS

BUILDING 17
TOWNHOUSE
7 UNITS

BUILDING 18
TOWNHOUSE
6 UNITS

BUILDING 19
TOWNHOUSE
6 UNITS

BLOCK 8

BUILDING 9
TOWNHOUSE
5 UNITS

BUILDING 10
TOWNHOUSE
3 UNITS

BUILDING 11
TOWNHOUSE
4 UNITS

BLOCK 4

BLOCK 4
TENNIS &
PICKLEBALL
PARK
0.19ha

BLOCK 2
PUMPING
STATION
±0.09ha

BUILDING 1
RL TOWNHOUSE
4 UNITS

BUILDING 2
RL TOWNHOUSE
6 UNITS

BLOCK 2

BLOCK 11
9m ROAD WIDENING
0.16ha

BLOCK 10
9X9m DAYLIGHT TRIANGLE
0.004ha

BUILDING 23
APARTMENT BLOCK
0.87ha
4 TO 6 STOREYS
180 TO 200 UNITS

RESIDENTIAL

STREET 'A'

BLOCK 9
9X9m DAYLIGHT TRIANGLE
0.004ha

3X3m ENTRY
FEATURE

BUILDING 20
FREEHOLD
TOWNHOMES
3 UNITS

BUILDING 21
FREEHOLD
TOWNHOMES
3 UNITS

BUILDING 22
FREEHOLD
TOWNHOMES
6 UNITS

BLOCK 6

BLOCK 7

BLOCK 5
PARK - OPEN SPACE
1.65ha

BLOCK 5

EXISTING SWM FACILITY
WESTWOOD PH2

EXISTINGPARK
BLOCK 5 WESTWOOD PH2

EXISTING PARK

CONCEPTUAL TRAIL

CONCEPTUAL TRAIL

CONCEPTUAL TRAIL

CONCEPTUAL TRAIL

RESIDENTIAL

NORFOLK VACANT LAND CONDOMINIUM PLAN 40
BLOCK 5084

PART 1, PLAN 37R-8386
PIN 50220-0361 (LT)

PART 2
PLAN 37R-5744
PIN 50220-0322 (LT)

PART 1, PLAN 37R-5744
PIN 50220-0321 (LT)

PART 2, PLAN 37R-837
PIN 50220-0319 (LT)

PART 1, PLAN 37R-1655
PIN 50220-0263 (LT)

PLAN 37M-89
BLOCK 5
PIN 50220-0372 (LT)

LOT 13
PIN 50220-0262 (LT)

LOT 12
PIN 50220-0261 (LT)

LOT 11
PIN 50220-0260 (LT)

LOT 10
PIN 50220-0259 (LT)

LOT 9
PIN 50220-0258 (LT)

LOT 8
PIN 50220-0257

LOT 7

CONCESSION 19 GORE

WEST S GORE

SITE BENCH MARK ELEV. 231.24

CLIENT

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ISSUES

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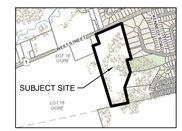
PRELIMINARY- SUBJECT TO REVISION

KEY PLAN

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Hamilton ON L8L 1H5 Canada
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www.arcadis.com

PROJECT
WESTWOOD TRAIL PHASE III

SCALE
10 5 0 10 20 30
1:750 (m)

PROJECT NO:
0000

| DRAWN BY: | CHECKED BY: |
|---|---|
| M. ROJAS | C. JANDU |
| PROJECT MGR: | APPROVED BY: |
| C. JANDU | C. JANDU |

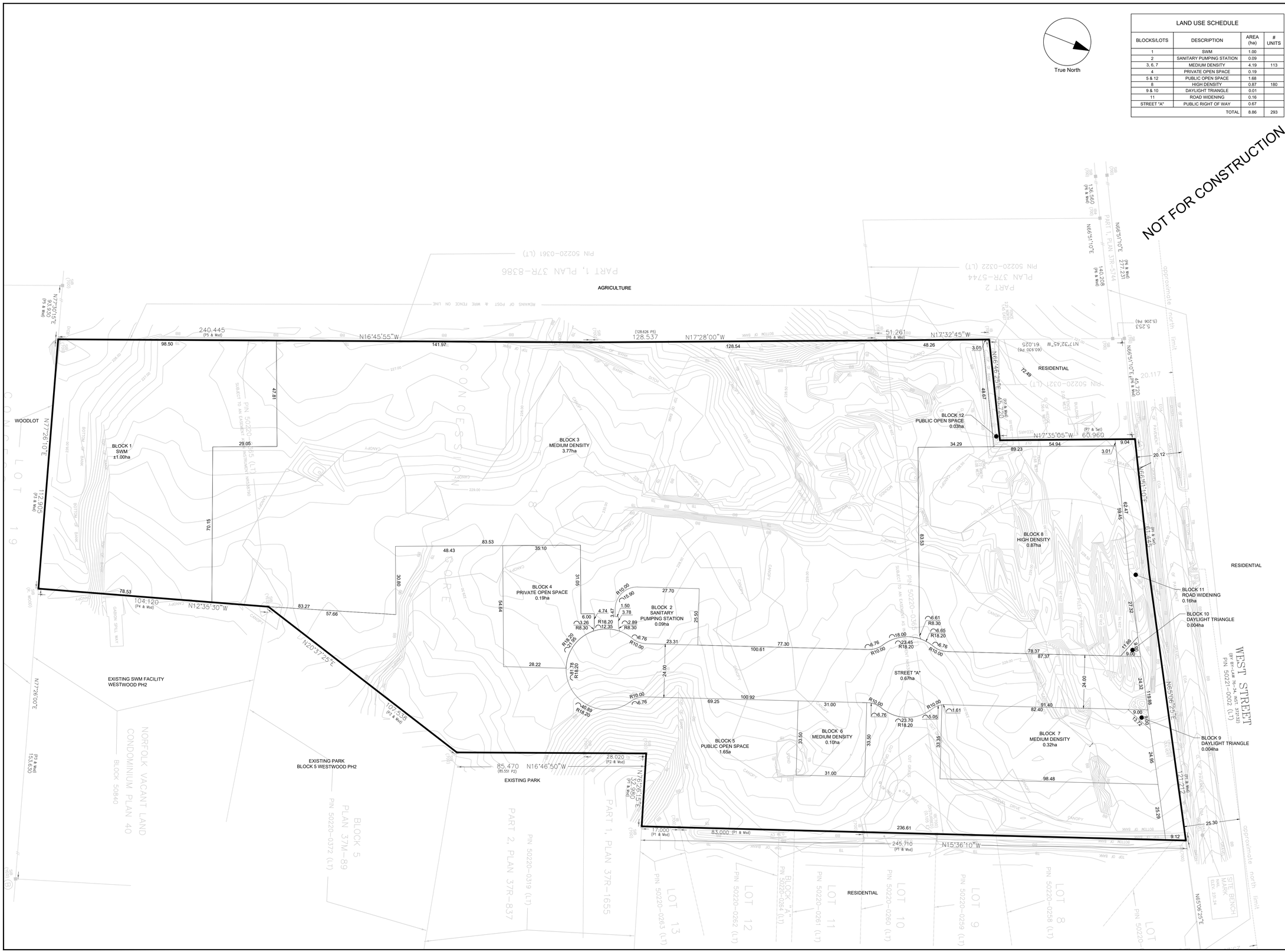
SHEET TITLE
CONCEPT PLAN 1

SHEET NUMBER
C1

ISSUE
01

SCALE CHECK
1 in

File Location: J:\124639_Westwood_III\7.0_Production\7.02_Conceptual_Design\7_Planning\124639C1- 2025-02-13.dwg Last Saved: February 23, 2026 by rojasm5605 Plotted: February 23, 2026 11:39:30 AM by Rojas Sandoval, Macarena


True North
NOT FOR CONSTRUCTION
AGRICULTURE
PART 1, PLAN 37R-8386
PIN 50220-0361 (LT)
PART 2
PLAN 37R-5744
PIN 50220-0322 (LT)
PART 1 PLAN 37R-5744
PIN 50220-0321 (LT)
approximate north limit
WOODLOT
BLOCK 1
SWM
±1.00ha
BLOCK 3
MEDIUM DENSITY
3.77ha
BLOCK 12
PUBLIC OPEN SPACE
0.03ha
RESIDENTIAL
BLOCK 4
PRIVATE OPEN SPACE
0.19ha
BLOCK 2
SANITARY
PUMPING STATION
0.09ha
STREET "A"
0.67ha
BLOCK 8
HIGH DENSITY
0.87ha
BLOCK 11
ROAD WIDENING
0.16ha
BLOCK 10
DAYLIGHT TRIANGLE
0.004ha
BLOCK 9
DAYLIGHT TRIANGLE
0.004ha
BLOCK 5
PUBLIC OPEN SPACE
1.65a
BLOCK 6
MEDIUM DENSITY
0.10ha
BLOCK 7
MEDIUM DENSITY
0.32ha
EXISTING SWM FACILITY
WESTWOOD PH2
EXISTING PARK
BLOCK 5 WESTWOOD PH2
EXISTING PARK
NORFOLK VACANT LAND
CONDOMINIUM PLAN 40
BLOCK 50840
BLOCK 5
PLAN 37M-89
PIN 50220-0372 (LT)
PART 2, PLAN 37R-837
PIN 50220-0319 (LT)
PART 1, PLAN 37R-1655
LOT 13
PIN 50220-0263 (LT)
LOT 12
PIN 50220-0262 (LT)
LOT 11
PIN 50220-0261 (LT)
LOT 10
PIN 50220-0260 (LT)
LOT 9
PIN 50220-0259 (LT)
LOT 8
PIN 50220-0258 (LT)
BLOCK "A"
PIN 50220-0264 (LT)
WEST STREET
(BY-LAW 76-34, INST. 70133)
PIN 50221-0002 (LT)
SITE BENCH MARK
NAIL
ELEV. 233.34
SUBJECT TO AN EASEMENT AS IN INSTRUMENT NUMBER
REFERENCE POINT
REFLAINS OF POST & WIRE FENCE ON LINE
N77°26'10"E
112.200
(P3 & Msd)
N16°45'55"W
240.445
(P5 & Msd)
98.50
141.97
(128.626 P5)
128.537
N17°28'00"W
128.54
51.261
(P6 & Msd)
N17°32'45"W
48.26
3.01
N17°32'45"W
61.025
(60.920 P6)
N65°46'25"E
72.49
48.67
N65°51'10"E
136.560
(P4 & Msd)
140.208
(P4 & Msd)
N65°51'10"E
277.23
N65°51'10"E
5.253
(5.206 P6)
N65°51'10"E
20.117
N65°51'10"E
(P5 & Msd)
5.720
N17°35'05"W
(P7 & Set)
60.960
54.94
89.23
34.29
9.04
3.01
20.12
64.47
59.45
N65°56'25"E
83.53
47.81
70.15
N77°26'10"E
112.200
(P3 & Msd)
78.53
104.120
(P4 & Msd)
N12°35'30"W
83.27
57.66
N20°37'25"E
104.535
(P3 & Msd)
48.43
83.53
35.10
30.09
54.64
31.05
27.70
25.50
6.00
3.26
4.74
3.47
1.50
3.78
2.89
6.76
23.31
77.30
100.61
28.22
24.00
69.25
100.92
31.00
33.50
33.50
33.35
31.00
98.48
6.61
6.65
18.00
23.45
6.76
78.37
87.37
24.00
24.32
119.98
9.00
3.71
24.95
25.29
25.30
9.12
236.61
245.710
(P1 & Msd)
N15°36'10"W
N65°56'25"E
28.020
(P2 & Msd)
85.470
(85.551 P2)
N16°46'50"W
N76°26'15"E
17.000
(P1 & Msd)
83.000 (P1 & Msd)
15.630
(P3 & Msd)
N77°26'10"E
R10.00
R18.20
R8.30
R12.35
R18.00
R18.20
R10.00
R8.30
R10.00
R18.20
R10.00
R18.20
R10.00
R18.20

# Westwood Phase 3

# Transportation Impact Study

Paradigm Transportation Solutions Limited

2025-12
250344

ptsl.com

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Project Summary

**Project Number:**

250344

**Date and Version:**

2025-12
1.0.0

**Client:**

**Westwood Trail Developments Inc.**

**Consultant Project Team**

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# Westwood Phase 3 Transportation Impact Study

<< Original Signed By >>

Andrew Steinsky, P.Eng., PTOE, PTP, RSP1

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# Executive Summary

## Content

Westwood Trail Developments Inc. retained Paradigm Transportation Solutions Limited (Paradigm) to prepare this Transportation Impact Study for a proposed residential development in the community of Simcoe.

The purpose of this study is to estimate the net impact(s) of the development-related traffic on the surrounding road network, and to identify any remedial measures, if necessary, to support the development from a transportation perspective.

## Site Description and Development Concept

The subject lands are on the south side of West Street, west of Holden Avenue and Virginia Avenue and are vacant. The property owner is proposing to develop the site into 298 residential units, comprising 12 single detached bungalows, 106 townhouses, and 180 apartment units in a four-to-six storey building.

Vehicle access is proposed via a new north-south all-moves street connection to West Street (denoted as Street A), as well as an all-moves driveway connection to West Street for the apartment block. Build-out is estimated by 2030.

## Findings

Based on the analyses contained herein, the findings of this study are as follows:

- Under existing conditions, the study intersections (West Street and Holden Avenue, and West Street/McDowell Road East and Hillcrest Road) are operating at acceptable levels of service and within capacity.
- Development of the site is estimated to generate 129 trips in the weekday AM peak hour and 135 trips in the weekday PM peak hour.
- Under 2030 and 2035 background traffic conditions (that us, without development of the subject site), the study intersections are forecast to operate at acceptable levels of service and within capacity in both the weekday AM peak hour and weekday PM peak hour. No critical movements are forecast.

- Under 2030 and 2035 total traffic conditions (that is, with development of the subject site), the study intersections are forecast to operate at acceptable levels of service and within capacity. The new street connection (Street A) and the driveway connection to the apartment block are both forecast to operate at acceptable levels of service and within capacity. No critical movements are forecast.
- Westbound left-turn lanes are not warranted on West Street at either of Street A or the driveway connection to the apartment block.

## Conclusions

Based on the findings of this study, it is concluded that the proposed development is not forecast to significantly impact traffic operations at West Street and Hillcrest Road or West Street and Holden Avenue. Further, westbound left-turn lanes are not warranted at either of Street A or the driveway connection to the apartment driveway.

## Recommendations

Based on the conclusions of this study, it is recommended the site be considered for approval with no requirement for off-site transportation network improvements.

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# 1 Introduction

## 1.1 Overview

Westwood Trail Developments Inc. retained Paradigm Transportation Solutions Limited (Paradigm) to prepare this Transportation Impact Study for a proposed residential development in the community of Simcoe. **Figure 1.1** illustrates the site location on the south side of West Street, west of Holden Avenue and Virginia Avenue.

## 1.2 Purpose and Scope

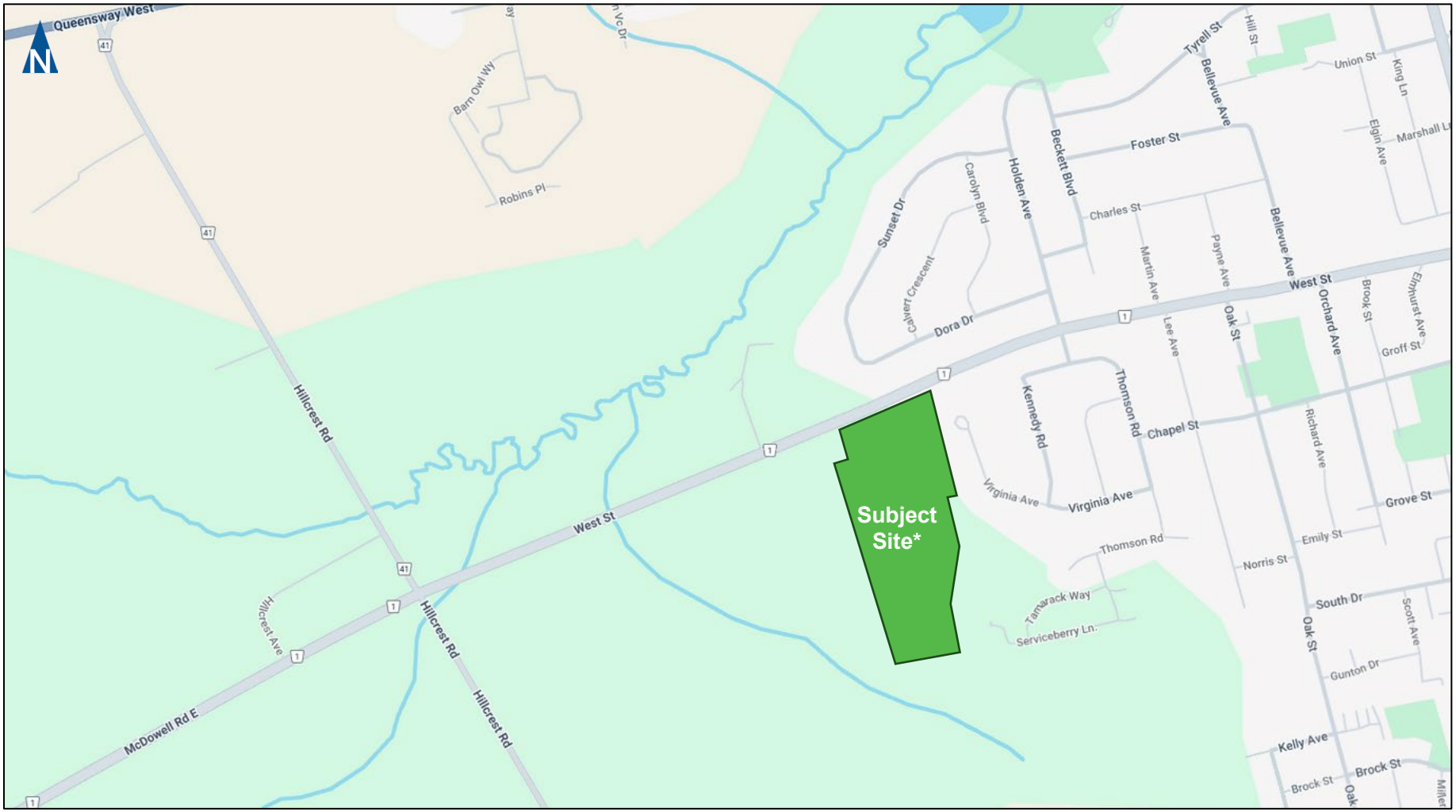
The purpose of this study is to estimate the net impact(s) of the development-related traffic on the surrounding road network, and to identify any remedial measures, if necessary, to support the development from a transportation perspective.

The scope of this study comprises

- An analysis of existing traffic volumes and operations in the weekday AM peak hour and weekday PM peak hour at
  - West Street and Hillcrest Road (signalized); and
  - West Street and Holden Avenue/Thomson Road (unsignalized).
- Estimates of future traffic volumes (with and without the proposed development) at two horizon years: the estimated opening year, and five years after the estimated opening year;
- Analyses of future traffic operations at the study intersections, with and without the proposed development; and
- The identification of remedial measures, if necessary, to support the proposed development.

This study has been prepared in general accordance with the Norfolk County *Transportation Impact Study Guidelines* published as Appendix J of the Norfolk County *Integrated Sustainable Master Plan (ISMP)*.[1]

[1] Norfolk County, *Integrated Sustainable Master Plan, Appendix J TIS Guidelines*, (Simcoe: Norfolk County, 2016).

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*Approximate site boundary, for illustrative purposes only.

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# Site Location

# 2 Existing Conditions

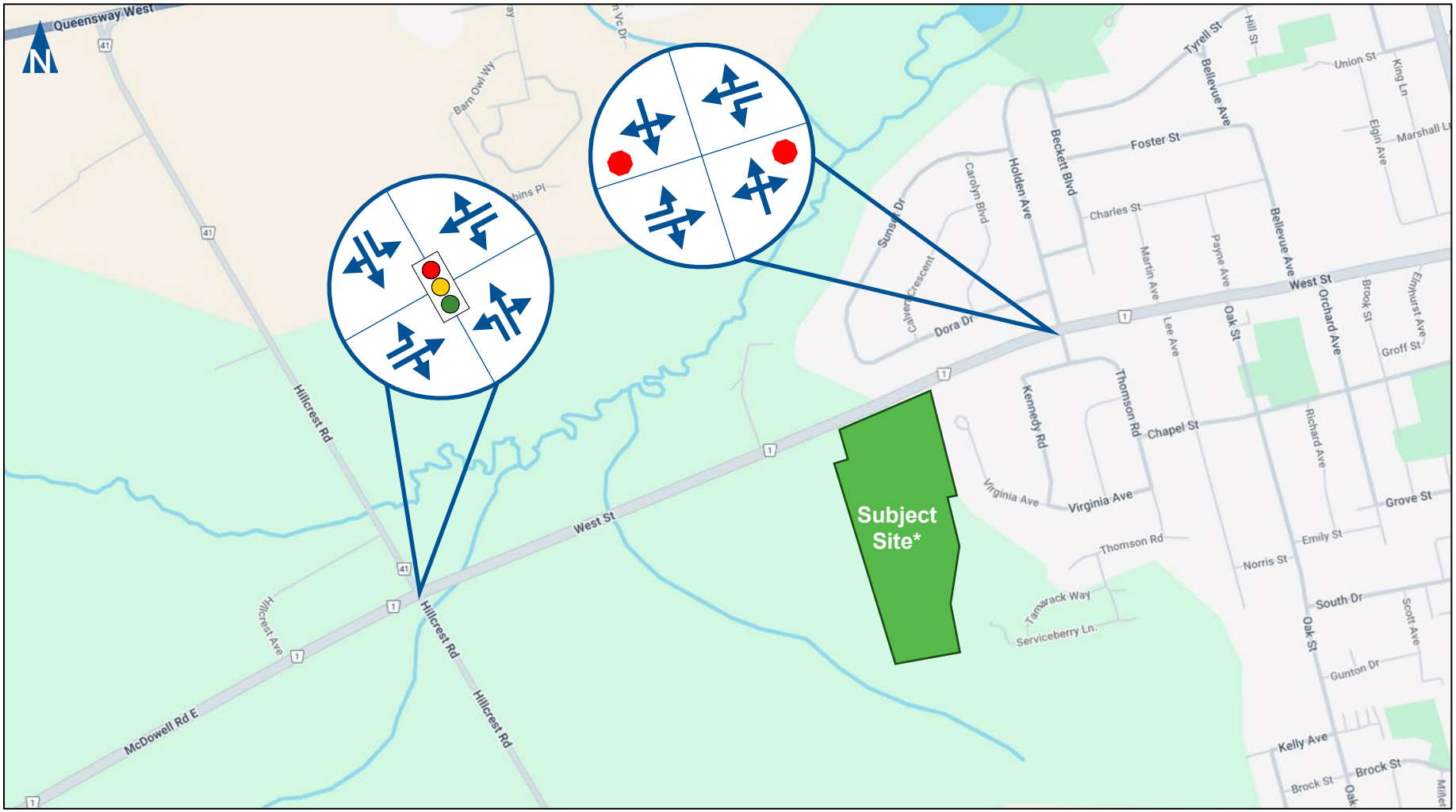
## 2.1 Road Characteristics

The study area roads comprise West Street/McDowell Road East, Hillcrest Road, and Holden Avenue, each of which are described as follows:

- **West Street (County Road 1)** is an east-west arterial road[2] with a two-lane rural cross-section comprising one general purpose travel lane per direction. The road operates with a posted speed limit of 50 km/h along the site frontage, but increases to 60 km/h just west of 520 West Street. West of Hillcrest Road, the road maintains a two-lane rural cross-section with a posted speed limit of 60 km/h, but is known at McDowell Road East (County Road 1).
- **Hillcrest Road** is a north-south road with a two-lane rural cross-section comprising one general purpose travel lane per direction. South of West Street, the road is classified as a collector road and operates with a posted speed limit of 60 km/h, terminating at Vittoria Road. North of West Street, the road is classified as an arterial road (County Road 41) and operates with a posted speed limit of 50 km/h.
- **Holden Avenue** and **Thomson Road** are north-south local roads, each with a two-lane urban cross-section comprising one general purpose travel lane per direction. The speed limit is not posted on Thomson Road and is assumed to be 50 km/h. The posted speed limit on Holden Avenue is 50 km/h.

**Figure 2.1** illustrates the existing lane configurations and traffic control at each study intersection.

[2] Norfolk County, *Official Plan Schedule E-2*, (Simcoe: Norfolk County, 2023 Consolidation).

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*Approximate site boundary, for illustrative purposes only.

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# Existing Lane Configurations and Traffic Control

## 2.2 Transit Services

Norfolk County provides on-demand public transit service through Ride Norfolk, with service provided in Delhi, Port Dover, Port Rowan, Simcoe, Waterford, and other communities in Norfolk County, such as Renton, St. Williams, and Wilsonville. Service is provided Monday to Friday between 7:30 AM and 6:00 PM. The nearest on-demand stop to the subject site is at 434 West Street, which is east of the subject site between Holden Avenue and Lee Avenue.

## 2.3 Active Transportation

Sidewalks are not provided on either side of any of the study roads, except on West Street, east of Holden Avenue/Thomson Road, where sidewalks are provided on both sides of the road. With the exception of paved shoulders on both side of West Street (east of Holden Avenue/Thomson Road) none of the study roads include dedicated cycling facilities, requiring all road users to share the available road space.

Schedule I-2 of the Norfolk County *Official Plan* does identify an on-road cycling route south of the subject site along Evergreen Hill Road; however, no connections are provided between this route and West Street. All of Hillcrest Road, West Street, and Holden Avenue are identified in Schedule I-2 as “additional routes being considered” for active transportation network improvements.

The 2016 *Norfolk County Active Transportation (AT) Strategy*[3] identified future signed routes along several roads north of West Street, such as Sunset Drive, Dora Drive, and Beckett Boulevard. It also identified a future paved shoulder on Hillcrest Road between Evergreen Hill Road and Vittoria Road. There were no provisions for network improvements along the segment of Hillcrest Road intersecting West Street, or West Street itself.

## 2.4 Traffic Volumes

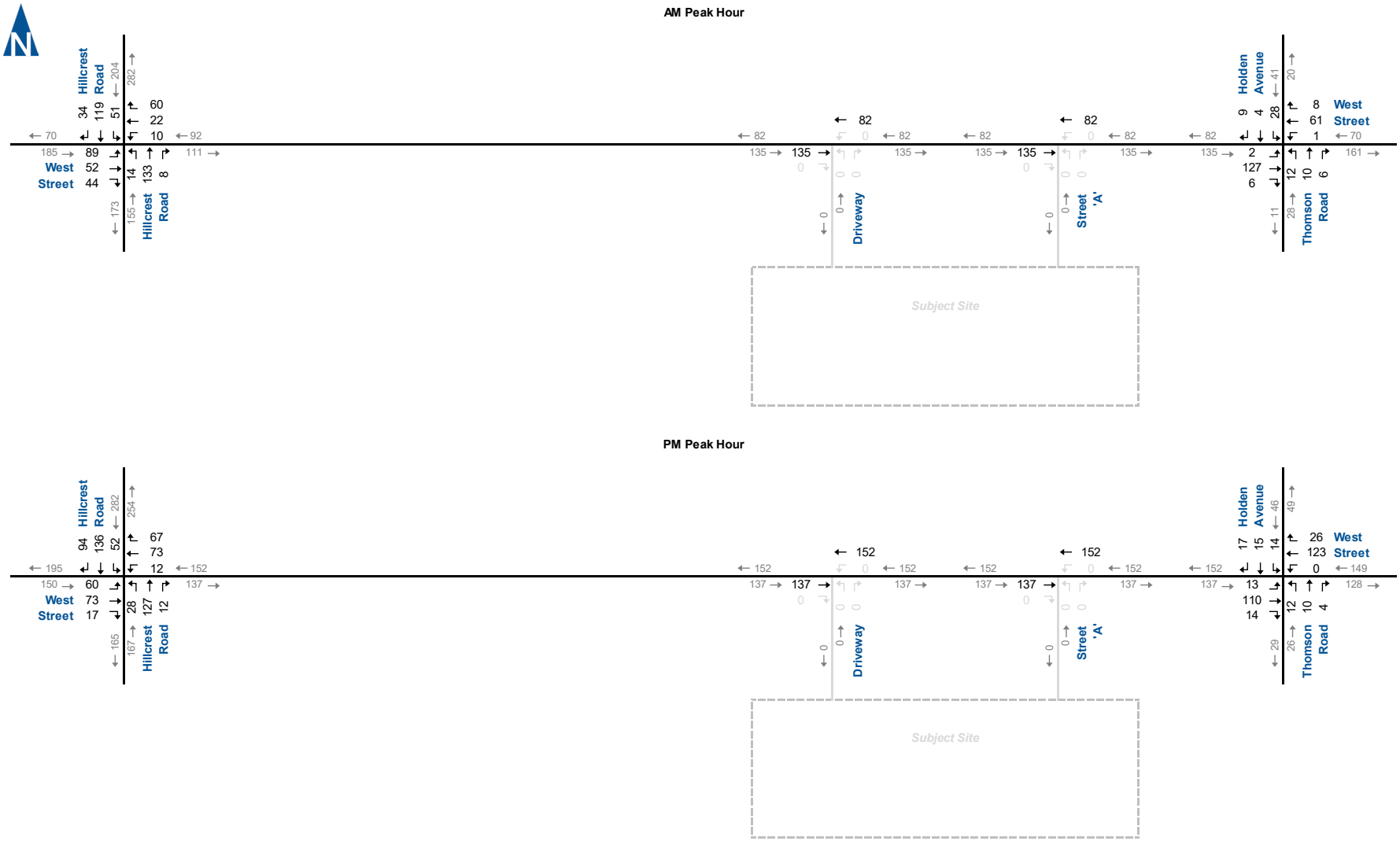
To assess intersection operations, turning movement counts (TMCs) are used to quantify the movement of vehicles through an intersection or roadway segment. Existing traffic data at an intersection or a road section forms the foundation for the operational analyses. The TMCs are usually conducted in such a manner to identify the peak periods at an intersection or road segment. This ensures that level of service analyses is conducted under worst-case operating conditions.

[3] Norfolk County, *Active Transportation Strategy,* (Simcoe: Norfolk County, 2016).

Paradigm conducted turning movement counts at both intersections on Thursday October 16, 2025 from 6:00 AM to 10:00 AM, 11:30 AM to 1:30 PM, and 2:00 PM to 6:00 PM. All vehicle, pedestrian, and cyclist movements were recorded in 15-minute intervals, and vehicles classified by type. **Appendix A** contains the raw turning movement count data.

Paradigm has estimated traffic volumes along the site's frontage based on the eastbound and westbound traffic volumes on West Street immediately west of Holden Avenue. Because both study intersections share a common weekday PM peak hour (3:30 PM to 4:30 PM), Paradigm has also balanced the traffic volumes on West Street; however, differences in traffic volumes between the intersections may be due to traffic from properties fronting onto West Street.

**Figure 2.2** illustrates the existing traffic volumes in the weekday AM peak hour and weekday PM peak hour.




# Existing Traffic Volumes

Westwood Phase 3 TIS
250344

Figure 2.2

## 2.5 Traffic Operations

Intersection Level of Service (LOS) is a recognized method of quantifying the efficiency of vehicular traffic flow at intersections and is based on the delay experienced by individual vehicles executing the various movements. The delay is related to the number of vehicles desiring to make a movement, compared to the estimated capacity for that movement. The capacity is based on several criteria related to opposing traffic flows, and at signalized intersections, signal timing.

The highest possible rating is LOS A, under which the average total delay at signalized and unsignalized intersections is equal to or less than 10 seconds per vehicle. When the average delay for a movement exceeds 80 seconds at signalized intersections, or 50 seconds at signalized intersections, the movement is classified as LOS F. Capacity is evaluated in terms of the ratio of demand flow to theoretical capacity, with an at-capacity condition represented by a volume-to-capacity (v/c) ratio of 1.00 (that is, volume equals capacity).

While the LOS and v/c ratio for each movement are related, they are calculated independently. Therefore, it is possible to have a poor level of service associated with a low v/c ratio, or a good level of service associated with a high v/c ratio. Volume-to-capacity ratios exceeding 1.00 indicate a movement is exceeding its theoretical capacity. The Norfolk County *Transportation Impact Study Guidelines* identify critical movements at signalized intersections as those experiencing a v/c ratio greater that 0.85.[4] No criteria is published for unsignalized intersections.

The operations of the study intersections have been modelled and analyzed using Synchro, which implements the methodologies of the Highway Capacity Manual (HCM). The assessment reflects the following parameters:

- Existing lane geometry and traffic control, including signal timing as provided by the County and included in **Appendix B**;
- Heavy vehicle percentages, peak hour factors, and pedestrian volumes as extracted from the turning movement counts; and
- Synchro defaults for all other inputs.

The analysis considers three separate measures of performance:

[4] Norfolk County, *Integrated Sustainable Master Plan, Appendix J TIS Guidelines*, (Simcoe: Norfolk County, 2016), 3.

- The level of service (LOS) and average delay for each turning movement, measured in seconds (s);
- The volume to capacity (v/c) ratio for each movement; and
- The 95th percentile queue length, in metres (m).

**Table 2.1** summarizes the existing intersection operations and indicates the study intersections are operating at acceptable levels of service and within capacity. There are no critical movements. **Appendix C** contains the detailed Synchro reports.

# TABLE 2.1: EXISTING TRAFFIC OPERATIONS

| Analysis Period | Intersection | Control Type | MOE | Direction / Movement / Approach | | | | | | | | | | | | | | | | Overall |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Eastbound | | | | Westbound | | | | Northbound | | | | Southbound | | | | |
| | | | | Left | Through | Right | Approach | Left | Through | Right | Approach | Left | Through | Right | Approach | Left | Through | Right | Approach | |
| AM Peak Hour | Hillcrest Road and McDowell Road East/West Street | TCS | LOS | B | B | > | B | B | B | > | B | C | C | > | C | C | C | > | C | B |
| | | | Delay | 14 | 12 | > | 13 | 13 | 12 | > | 12 | 22 | 21 | > | 21 | 23 | 21 | > | 21 | 17 |
| | | | V/C | 0.16 | 0.14 | > | | 0.02 | 0.14 | > | | 0.04 | 0.30 | > | | 0.15 | 0.31 | > | | |
| | | | Q | 17 | 13 | > | | 4 | 9 | > | | 6 | 32 | > | | 14 | 32 | > | | |
| | | | Ex | 60 | - | > | | 50 | - | > | | 60 | - | > | | 45 | - | > | | |
| | | | Avail. | 43 | - | > | | 47 | - | > | | 54 | - | > | | 31 | - | > | | |
| | West Street and Holden Avenue/Thomson Road | TWSC | LOS | A | A | > | A | A | A | > | A | < | B | > | B | < | B | > | B | |
| | | | Delay | 7 | 0 | > | 0 | 9 | 0 | > | 0 | < | 10 | > | 10 | < | 10 | > | 10 | |
| | | | V/C | 0.00 | 0.00 | > | | 0.00 | 0.00 | > | | < | 0.04 | > | | < | 0.06 | > | | |
| | | | Q | 0 | 0 | > | | 0 | 0 | > | | < | 1 | > | | < | 2 | > | | |
| | | | Ex | 20 | - | > | | 20 | - | > | | < | - | > | | < | - | > | | |
| | | | Avail. | 20 | - | > | | 20 | - | > | | < | - | > | | < | - | > | | |
| PM Peak Hour | Hillcrest Road and McDowell Road East/West Street | TCS | LOS | B | B | > | B | B | B | > | B | C | B | > | C | C | C | > | C | B |
| | | | Delay | 15 | 12 | > | 13 | 13 | 13 | > | 13 | 25 | 20 | > | 21 | 22 | 23 | > | 23 | 18 |
| | | | V/C | 0.12 | 0.12 | > | | 0.02 | 0.19 | > | | 0.09 | 0.25 | > | | 0.13 | 0.45 | > | | |
| | | | Q | 13 | 15 | > | | 4 | 16 | > | | 9 | 29 | > | | 14 | 42 | > | | |
| | | | Ex | 60 | - | > | | 50 | - | > | | 60 | - | > | | 45 | - | > | | |
| | | | Avail. | 48 | - | > | | 46 | - | > | | 51 | - | > | | 31 | - | > | | |
| | West Street and Holden Avenue/Thomson Road | TWSC | LOS | A | A | > | A | A | A | > | A | < | B | > | B | < | B | > | B | |
| | | | Delay | 8 | 0 | > | 1 | 0 | 0 | > | 0 | < | 11 | > | 11 | < | 11 | > | 11 | |
| | | | V/C | 0.01 | 0.00 | > | | 0.00 | 0.00 | > | | < | 0.05 | > | | < | 0.07 | > | | |
| | | | Q | 0 | 0 | > | | 0 | 0 | > | | < | 1 | > | | < | 2 | > | | |
| | | | Ex | 20 | - | > | | 20 | - | > | | < | - | > | | < | - | > | | |
| | | | Avail. | 20 | - | > | | 20 | - | > | | < | - | > | | < | - | > | | |

*MOE - Measure of Effectiveness*
*LOS - Level of Service*
*Delay - Average Delay per Vehicle in Seconds*
*Q - 95th Percentile Queue Length (m)*
*Ex. - Existing Available Storage (m)*
*Avail. - Available Storage (m)*
*TCS - Traffic Control Signal*
*TWSC - Two-Way Stop Control*
*<- Shared Left/Through Lane*
*>- Shared Right/Through Lane*

# 3 Site Description and Development Concept

## 3.1 Site Description

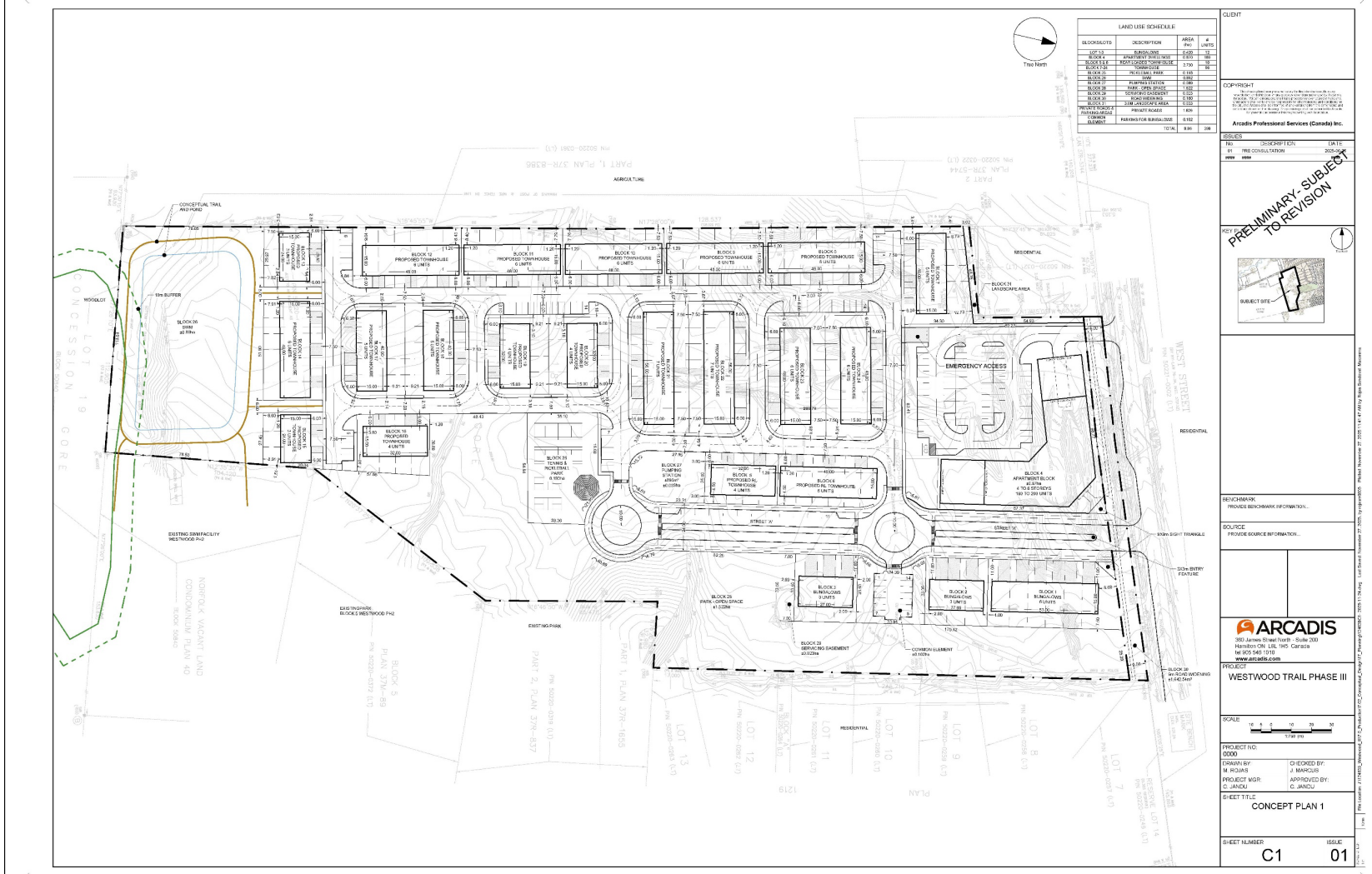
The subject lands are on the south of West Street, generally west of Virginia Avenue, and are vacant. The lands to the north and east are predominantly occupied by low-density residential land uses, comprising single detached dwellings on individual lots. A small parcel to the southeast does include townhouse dwellings. The lands to the west and south are generally vacant, except for some low-density residential uses fronting onto West Street. There are no other intersecting roads along the site's frontage, but there is a driveway connection to 515 West Street.

## 3.2 Development Concept

The property owner is proposing to develop the subject lands into 298 residential units, comprising 12 single detached bungalows, 106 townhouses, and 180 apartment units in a four-to-six storey building. The apartment building is proposed on a block fronting onto West Street, immediately east of 520 West Street.

Vehicle access to the lands is proposed via a new north-south all-moves connection to West Street (denoted as Street A), and an all-moves driveway connection to West Street for the apartment block. An internal emergency access connection is also proposed between the apartment block and the internal road network west of Street A. Build-out is estimated by 2030 in one phase.

**Figure 3.1** illustrates the conceptual block plan.

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# Conceptual Block Plan

Westwood Phase 3 TIS
250344

Figure 3.1

# 4 Future Conditions

## 4.1 Future Background Traffic

Future traffic forecasts and analyses correspond to two horizon years: the estimated opening year of the development (2030) and five years from the estimated opening year of the development (2035). These horizon years are consistent with those specified in the Norfolk County *Transportation Impact Study Guidelines* published as Appendix J of the Norfolk County *Integrated Sustainable Master Plan (ISMP)*.[5]

The future traffic volumes in the study area are assumed to comprise increased non-site traffic (referred to as background traffic) and traffic generated by the site itself (referred to as site generated traffic). Site generated traffic estimates are outlined in **Section 4.2**.

Future traffic growth estimates unrelated to development beyond the study area are based on a general background growth rate of 1.05% per annum applied to the existing traffic volumes. This growth rate is based on the per annum change in population in Norfolk County between 2016 and 2021, as detailed in the 2021 Canadian Census.[6]

Paradigm also conducted a review of the Norfolk County *Pending Development Applications* web portal, which identified a Zoning By-law Amendment application for lands south of Thomson Road between Fernwood Drive and Lee Avenue. During a site visit in November 2025 by Paradigm staff, it was noted that this property was for sale. In the absence of any information on potential development of these lands (land use, number of units, timing) Paradigm has assumed traffic volumes from any future application are captured in the aforementioned per annum growth rate.

**Figure 4.1** and **Figure 4.2** illustrate the estimated 2030 and 2035 background traffic volumes, respectively, for both the weekday AM peak hour and weekday PM peak hour.

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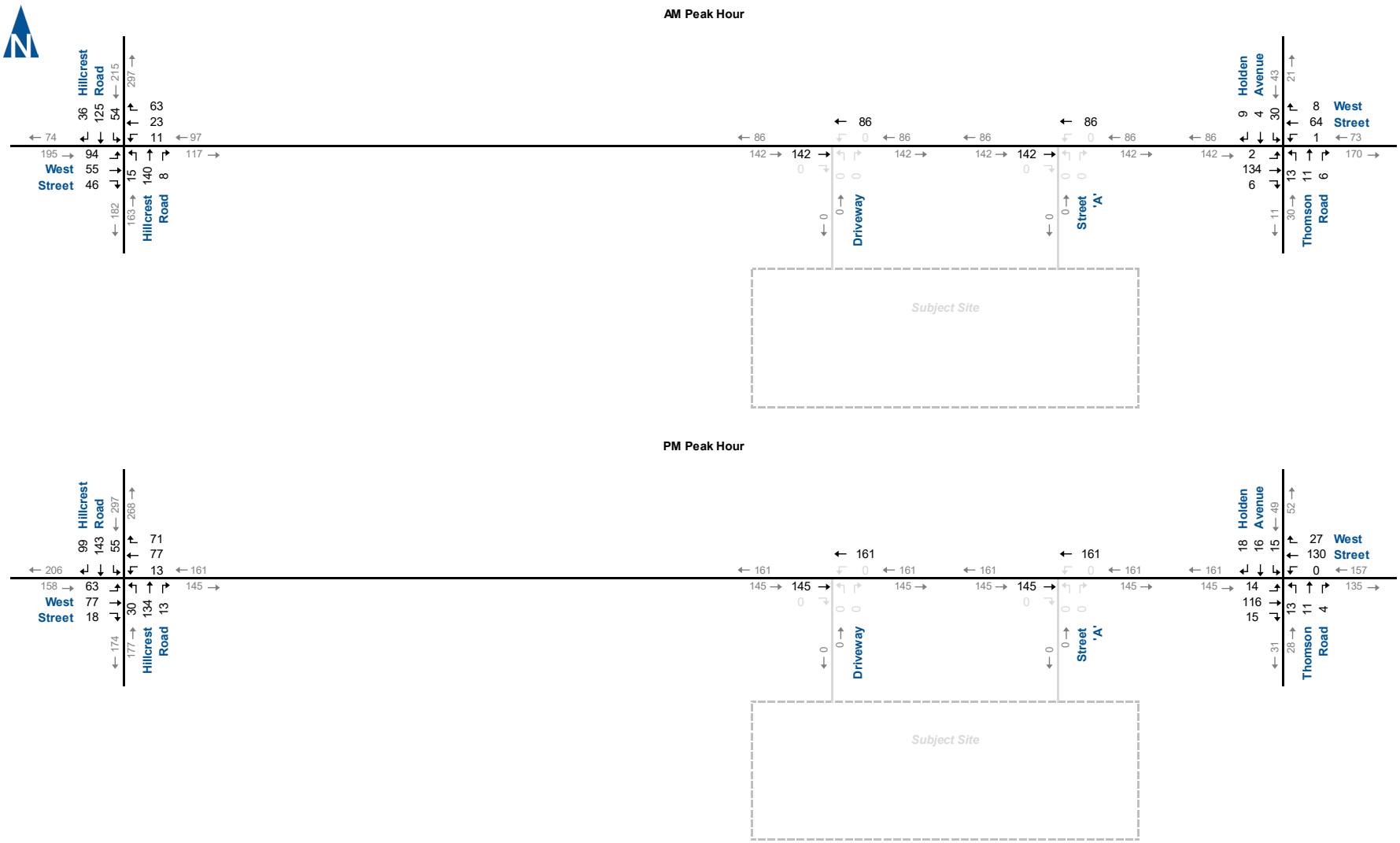
[5] Norfolk County, *Integrated Sustainable Master Plan, Appendix J TIS Guidelines*, (Simcoe: Norfolk County, 2016), 3.

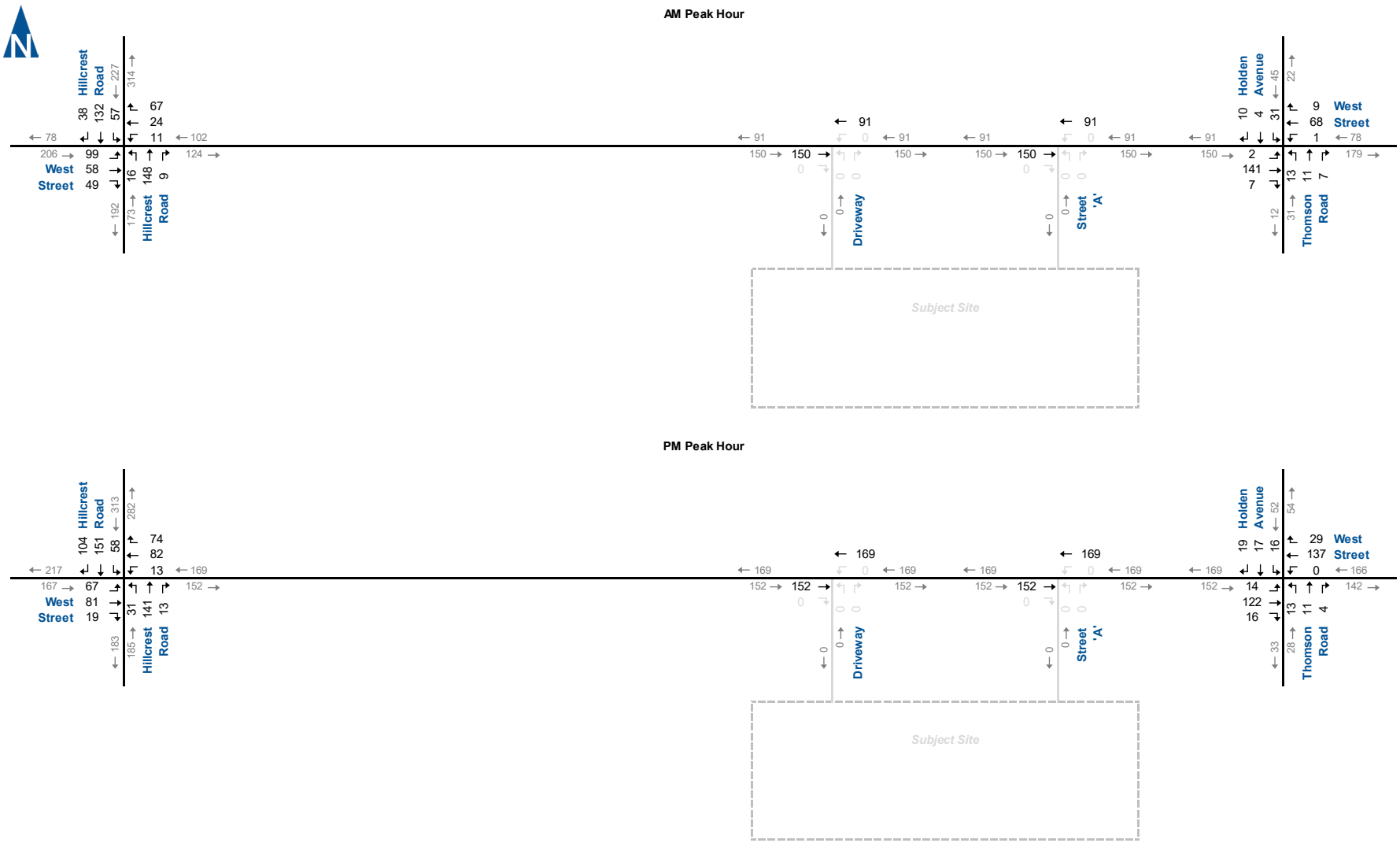
[6] Statistics Canada. 2023. (table). Census Profile. 2021 Census of Population. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released November 15, 2023.https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/index.cfm?Lang=E (accessed November 12, 2025).




# 2030 Background Traffic Volumes

Westwood Phase 3 TIS
250344

Figure 4.1




# 2035 Background Traffic Volumes

Figure 4.2

## 4.2 Forecast Site Traffic

### 4.2.1 Trip Generation

The site trip generation reflects information in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*[7] for land use codes (LUC):

- 210 (Single Family Detached Housing)
- 215 (Single Family Attached Housing); and
- 221 (Multifamily Housing, Mid-Rise).

The base trip generation for the subject lands is based on the regression equations for each land use code following the methodology in the ITE *Trip Generation Handbook*.[8] **Table 4.1** summarizes the estimated trip generation which is based on the number of dwelling units. The trip generation calculations indicate the site is forecast to generate 129 trips in the weekday AM peak hour and 135 trips in the weekday PM peak hour.

### 4.2.2 Trip Distribution and Assignment

The trip distribution developed for this study is based on the existing travel patterns documented in the traffic data presented in **Section 2.4**. Use of existing travel patterns is considered appropriate because these existing volumes represent general commuting trends, and the proposed land uses (residential) are consistent with the surrounding land uses that are generating these existing traffic volumes. **Table 4.2** summarizes the estimated trip distribution.

Paradigm has assigned all apartment related trips (LUC 221) to the driveway connection to West Street; all other trips associated with LUC 210 and LUC 215 have been assigned to Street A. **Figure 4.3** illustrates the site-generated traffic assignments for the weekday AM peak hour and weekday PM peak hour.

## 4.3 Future Total Traffic

**Figure 4.4** and **Figure 4.5** illustrate the estimated 2030 and 2035 future total traffic volumes, respectively, which are the summation of the respective future background traffic volumes (**Figure 4.1** or **Figure 4.2**) and the site generated traffic volumes (**Figure 4.3**).

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7 Institute of Transportation Engineers, *Trip Generation Manual*, 11th ed., (Washington, DC: ITE, 2021).

8 Institute of Transportation Engineers, *Trip Generation Handbook*, 3rd ed., (Washington, DC: ITE, 2017).

## TABLE 4.1: ESTIMATED TRIP GENERATION

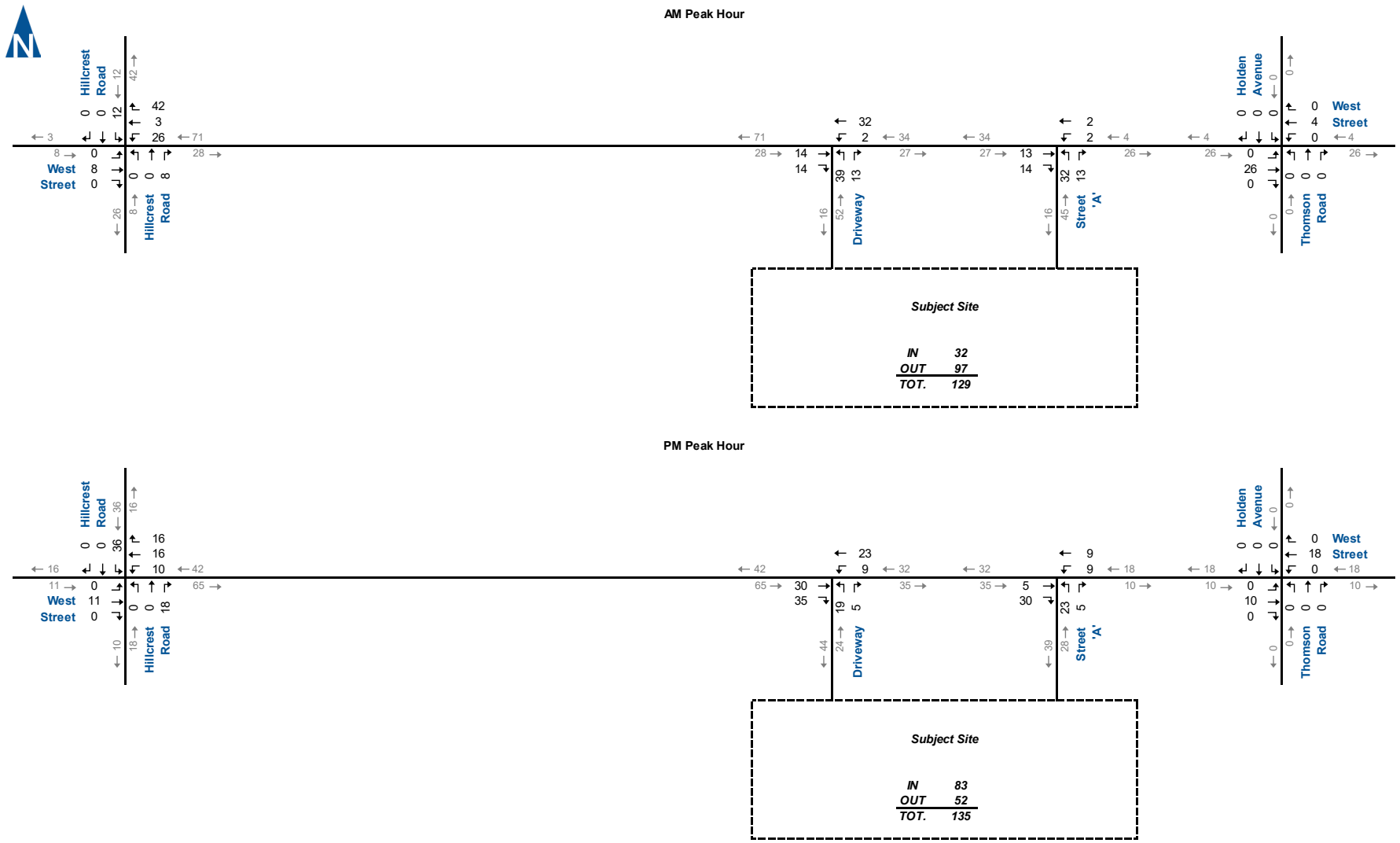
| Land Use Code and Number of Units | AM Peak Hour | | | | PM Peak Hour | | | |
|---|---|---|---|---|---|---|---|---|
| | Rate | In | Out | Total | Rate | In | Out | Total |
| LUC 210 (12 units) | Eqn.[1] | 4 | 10 | 14 | Eqn.[2] | 9 | 5 | 14 |
| LUC 215 (106 units) | Eqn.[3] | 12 | 35 | 47 | Eqn.[4] | 30 | 23 | 53 |
| LUC 221 (180 units) | Eqn.[5] | 16 | 52 | 68 | Eqn.[6] | 44 | 24 | 68 |
| **Total Trip Generation** | | **32** | **97** | **129** | | **83** | **52** | **135** |

Notes:

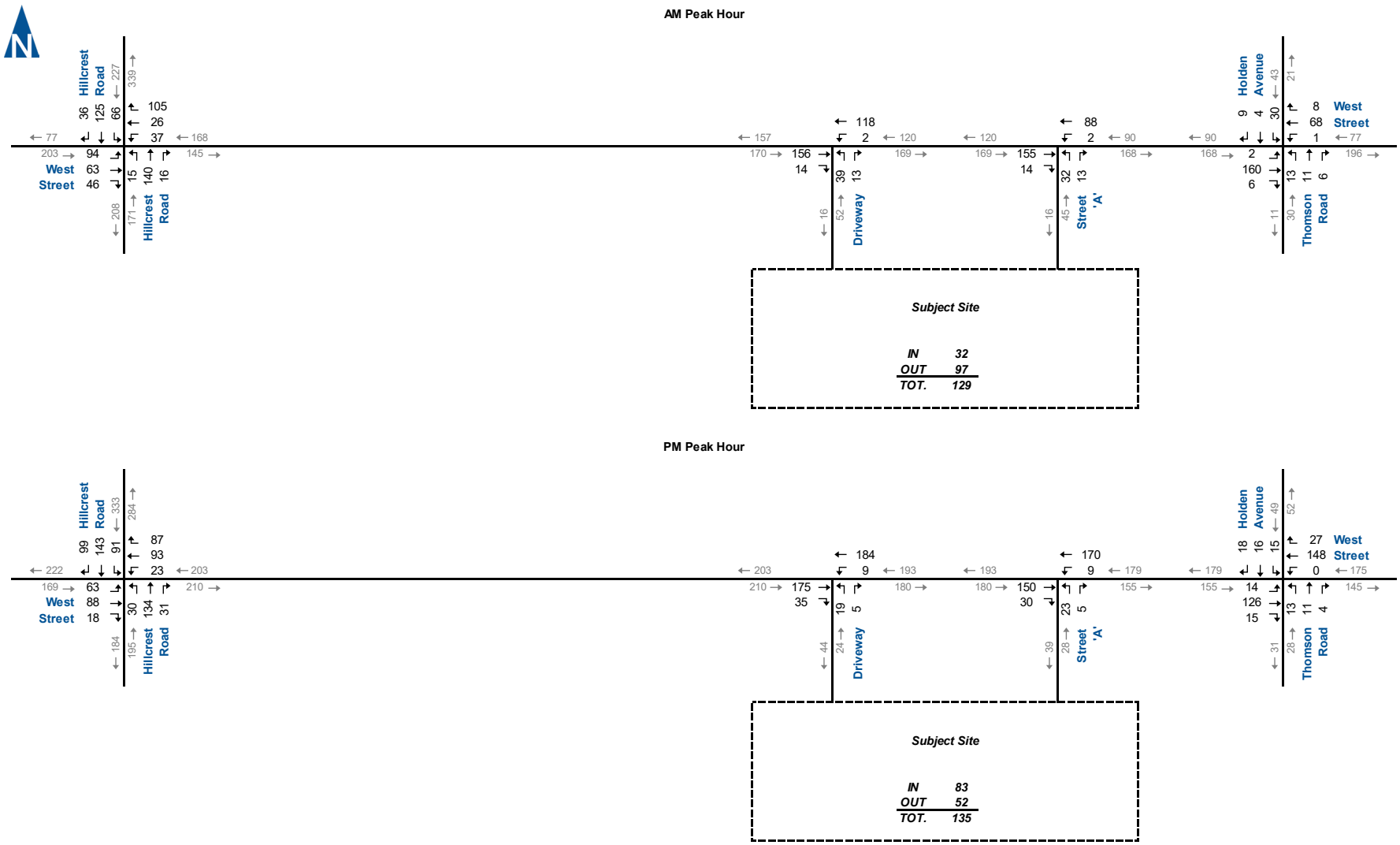
1. LUC 210 (AM): T = 0.67(X) + 5.59, 27% entering, 73% exiting
2. LUC 210 (PM): Ln(T) = 0.92Ln(X) + 0.33, 62% entering, 38% exiting
3. LUC 215 (AM): T = 0.59(X) – 15.25, 25% entering, 75% exiting
4. LUC 215 (PM): T = 0.57(X) – 7.84, 57% entering, 43% exiting
5. LUC 221 (AM): T = 0.42(X) – 7.77, 23% entering, 77% exiting
6. LUC 221 (PM): T = 0.36(X) + 3.07, 64% entering, 36% exiting

## TABLE 4.2: ESTIMATED TRIP DISTRIBUTION

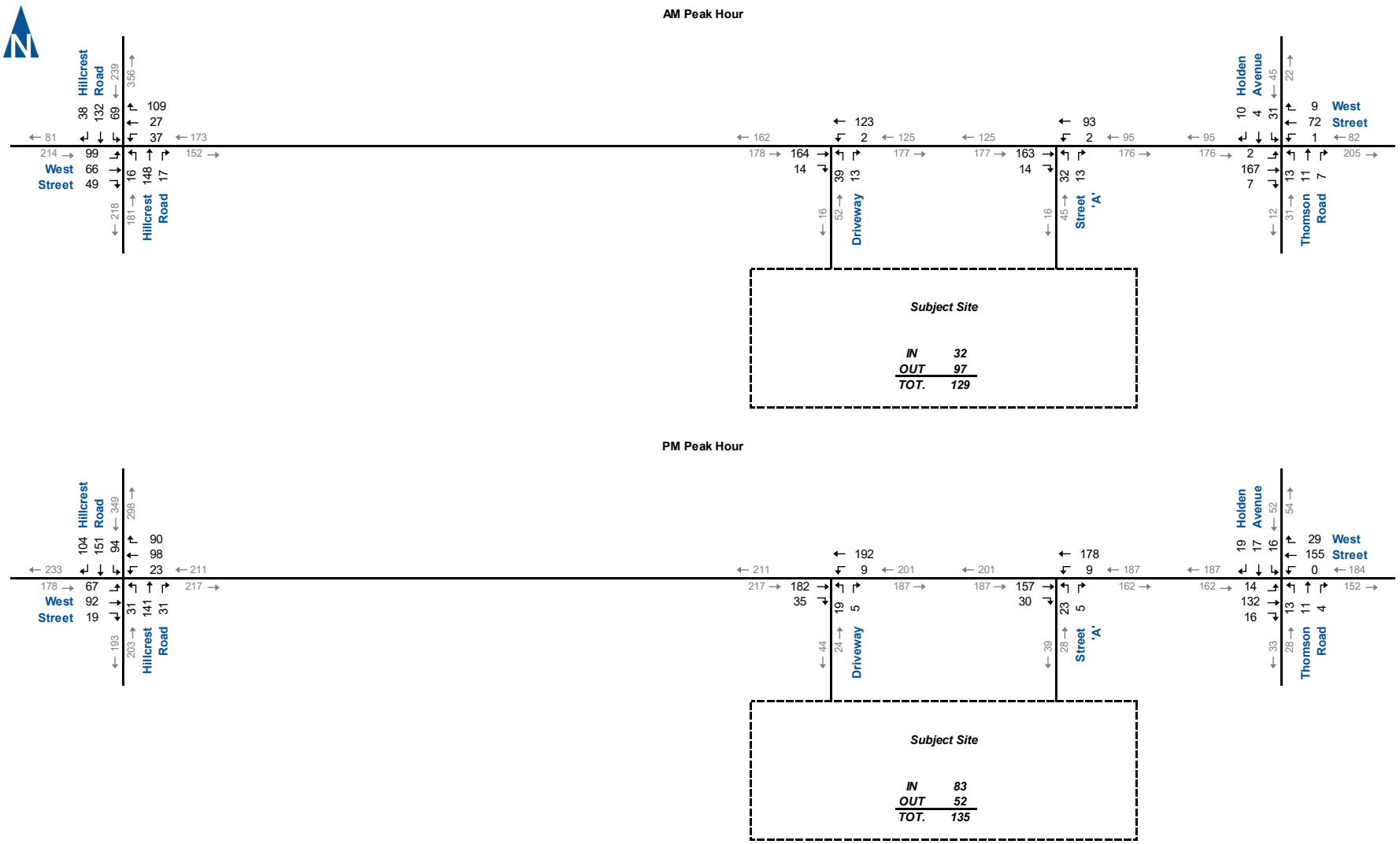
| Origin/Destination | AM Peak Hour | | PM Peak Hour | |
|---|---|---|---|---|
| | In | Out | In | Out |
| North via Hillcrest Road | 35% | 40% | 40% | 35% |
| East via West Street | 10% | 25% | 20% | 20% |
| South via Hillcrest Road | 25% | 25% | 20% | 20% |
| West via West Street | 30% | 10% | 20% | 25% |
| **Total** | **100%** | **100%** | **100%** | **100%** |




# Site Generated Traffic Volumes




# 2030 Total Traffic Volumes




# 2035 Total Traffic Volumes

# 5 Transportation Impact Assessment

## 5.1 Background Traffic Conditions

The analysis of background traffic conditions uses the same methodology as existing traffic conditions. To ensure a direct comparison to background traffic operations, signal timing splits and cycle lengths at the signalized study intersection is unaltered.

**Table 5.1** and **Table 5.2** summarize the 2030 and 2035 background traffic level of service conditions, respectively. The analyses indicate that the study intersections are forecast to operate at acceptable levels of service and within capacity at both horizon years and in both the AM peak hour and PM peak hour. No critical movements are forecast.

**Appendix D** contains the detailed Synchro reports.

## 5.2 Total Traffic Conditions

The analysis of total traffic conditions uses the same methodology as background traffic conditions. Both Street A and the driveway connection to West Street are assumed to operate with one shared inbound lane and one shared outbound lane. To ensure a direct comparison to background traffic operations, signal timing splits and cycle lengths at the signalized study intersection is unaltered.

**Table 5.3** and **Table 5.4** summarize the 2030 and 2035 total traffic level of service conditions, respectively. The analyses indicate that the study intersections are forecast to operate at acceptable levels of service and within capacity at both horizon years and in both the AM peak hour and PM peak hour. No critical movements are forecast.

**Appendix E** contains the detailed Synchro reports.

# TABLE 5.1: 2030 BACKGROUND TRAFFIC OPERATIONS

| Analysis Period | Intersection | Control Type | MOE | Direction / Movement / Approach | | | | | | | | | | | | | | | | Overall |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Eastbound | | | | Westbound | | | | Northbound | | | | Southbound | | | | |
| | | | | Left | Through | Right | Approach | Left | Through | Right | Approach | Left | Through | Right | Approach | Left | Through | Right | Approach | |
| AM Peak Hour | Hillcrest Road and McDowell Road East/West Street | TCS | LOS | B | B | > | B | B | B | > | B | C | C | > | C | C | C | > | C | B |
| | | | Delay | 15 | 12 | > | 13 | 13 | 12 | > | 12 | 22 | 21 | > | 21 | 23 | 21 | > | 21 | 18 |
| | | | V/C | 0.17 | 0.15 | > | | 0.02 | 0.14 | > | | 0.05 | 0.32 | > | | 0.16 | 0.32 | > | | |
| | | | Q | 18 | 13 | > | | 4 | 10 | > | | 6 | 33 | > | | 15 | 33 | > | | |
| | | | Ex | 60 | - | > | | 50 | - | > | | 60 | - | > | | 45 | - | > | | |
| | | | Avail. | 42 | - | > | | 46 | - | > | | 54 | - | > | | 30 | - | > | | |
| | West Street and Holden Avenue/Thomson Road | TWSC | LOS | A | A | > | A | A | A | > | A | < | B | > | B | < | B | > | B | |
| | | | Delay | 7 | 0 | > | 0 | 9 | 0 | > | 0 | < | 10 | > | 10 | < | 10 | > | 10 | |
| | | | V/C | 0.00 | 0.00 | > | | 0.00 | 0.00 | > | | < | 0.04 | > | | < | 0.06 | > | | |
| | | | Q | 0 | 0 | > | | 0 | 0 | > | | < | 1 | > | | < | 2 | > | | |
| | | | Ex | 20 | - | > | | 20 | - | > | | < | - | > | | < | - | > | | |
| | | | Avail. | 20 | - | > | | 20 | - | > | | < | - | > | | < | - | > | | |
| PM Peak Hour | Hillcrest Road and McDowell Road East/West Street | TCS | LOS | B | B | > | B | B | B | > | B | C | B | > | C | C | C | > | C | B |
| | | | Delay | 15 | 12 | > | 13 | 13 | 13 | > | 13 | 25 | 20 | > | 21 | 22 | 23 | > | 23 | 19 |
| | | | V/C | 0.12 | 0.12 | > | | 0.02 | 0.20 | > | | 0.10 | 0.26 | > | | 0.14 | 0.47 | > | | |
| | | | Q | 13 | 15 | > | | 4 | 17 | > | | 9 | 31 | > | | 15 | 45 | > | | |
| | | | Ex | 60 | - | > | | 50 | - | > | | 60 | - | > | | 45 | - | > | | |
| | | | Avail. | 47 | - | > | | 46 | - | > | | 51 | - | > | | 30 | - | > | | |
| | West Street and Holden Avenue/Thomson Road | TWSC | LOS | A | A | > | A | A | A | > | A | < | B | > | B | < | B | > | B | |
| | | | Delay | 8 | 0 | > | 1 | 0 | 0 | > | 0 | < | 11 | > | 11 | < | 11 | > | 11 | |
| | | | V/C | 0.01 | 0.00 | > | | 0.00 | 0.00 | > | | < | 0.05 | > | | < | 0.08 | > | | |
| | | | Q | 0 | 0 | > | | 0 | 0 | > | | < | 2 | > | | < | 2 | > | | |
| | | | Ex | 20 | - | > | | 20 | - | > | | < | - | > | | < | - | > | | |
| | | | Avail. | 20 | - | > | | 20 | - | > | | < | - | > | | < | - | > | | |

*MOE - Measure of Effectiveness*
*LOS - Level of Service*
*Delay - Average Delay per Vehicle in Seconds*
*Q - 95th Percentile Queue Length (m)*
*Ex. - Existing Available Storage (m)*
*Avail. - Available Storage (m)*
*TCS - Traffic Control Signal*
*TWSC - Two-Way Stop Control*
*<- Shared Left/Through Lane*
*>- Shared Right/Through Lane*

# TABLE 5.2: 2035 BACKGROUND TRAFFIC OPERATIONS

| Analysis Period | Intersection | Control Type | MOE | Direction / Movement / Approach | | | | | | | | | | | | | | | | Overall |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Eastbound | | | | Westbound | | | | Northbound | | | | Southbound | | | | |
| | | | | Left | Through | Right | Approach | Left | Through | Right | Approach | Left | Through | Right | Approach | Left | Through | Right | Approach | |
| AM Peak Hour | Hillcrest Road and McDowell Road East/West Street | TCS | LOS | B | B | > | B | B | B | > | B | C | C | > | C | C | C | > | C | B |
| | | | Delay | 15 | 12 | > | 14 | 13 | 12 | > | 12 | 22 | 21 | > | 21 | 24 | 21 | > | 22 | 18 |
| | | | V/C | 0.18 | 0.16 | > | | 0.02 | 0.15 | > | | 0.05 | 0.34 | > | | 0.17 | 0.34 | > | | |
| | | | Q | 19 | 14 | > | | 4 | 10 | > | | 6 | 35 | > | | 16 | 35 | > | | |
| | | | Ex | 60 | - | > | | 50 | - | > | | 60 | - | > | | 45 | - | > | | |
| | | | Avail. | 41 | - | > | | 46 | - | > | | 54 | - | > | | 29 | - | > | | |
| | West Street and Holden Avenue/Thomson Road | TWSC | LOS | A | A | > | A | A | A | > | A | < | B | > | B | < | B | > | B | |
| | | | Delay | 7 | 0 | > | 0 | 9 | 0 | > | 0 | < | 10 | > | 10 | < | 10 | > | 10 | |
| | | | V/C | 0.00 | 0.00 | > | | 0.00 | 0.00 | > | | < | 0.05 | > | | < | 0.07 | > | | |
| | | | Q | 0 | 0 | > | | 0 | 0 | > | | < | 1 | > | | < | 2 | > | | |
| | | | Ex | 20 | - | > | | 20 | - | > | | < | - | > | | < | - | > | | |
| | | | Avail. | 20 | - | > | | 20 | - | > | | < | - | > | | < | - | > | | |
| PM Peak Hour | Hillcrest Road and McDowell Road East/West Street | TCS | LOS | B | B | > | B | B | B | > | B | C | B | > | C | C | C | > | C | B |
| | | | Delay | 15 | 12 | > | 13 | 13 | 13 | > | 13 | 26 | 20 | > | 21 | 23 | 24 | > | 24 | 19 |
| | | | V/C | 0.13 | 0.13 | > | | 0.02 | 0.21 | > | | 0.11 | 0.27 | > | | 0.15 | 0.50 | > | | |
| | | | Q | 14 | 16 | > | | 4 | 18 | > | | 10 | 32 | > | | 15 | 48 | > | | |
| | | | Ex | 60 | - | > | | 50 | - | > | | 60 | - | > | | 45 | - | > | | |
| | | | Avail. | 47 | - | > | | 46 | - | > | | 50 | - | > | | 30 | - | > | | |
| | West Street and Holden Avenue/Thomson Road | TWSC | LOS | A | A | > | A | A | A | > | A | < | B | > | B | < | B | > | B | |
| | | | Delay | 8 | 0 | > | 1 | 0 | 0 | > | 0 | < | 11 | > | 11 | < | 11 | > | 11 | |
| | | | V/C | 0.01 | 0.00 | > | | 0.00 | 0.00 | > | | < | 0.05 | > | | < | 0.09 | > | | |
| | | | Q | 0 | 0 | > | | 0 | 0 | > | | < | 2 | > | | < | 2 | > | | |
| | | | Ex | 20 | - | > | | 20 | - | > | | < | - | > | | < | - | > | | |
| | | | Avail. | 20 | - | > | | 20 | - | > | | < | - | > | | < | - | > | | |

*MOE - Measure of Effectiveness*
*LOS - Level of Service*
*Delay - Average Delay per Vehicle in Seconds*
*Q - 95th Percentile Queue Length (m)*
*Ex. - Existing Available Storage (m)*
*Avail. - Available Storage (m)*
*TCS - Traffic Control Signal*
*TWSC - Two-Way Stop Control*
*<- Shared Left/Through Lane*
*>- Shared Right/Through Lane*

# TABLE 5.3: 2030 TOTAL TRAFFIC OPERATIONS

| Analysis Period | Intersection | Control Type | MOE | Direction / Movement / Approach | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Eastbound | | | | Westbound | | | | Northbound | | | | Southbound | | | | Overall |
| | | | | Left | Through | Right | Approach | Left | Through | Right | Approach | Left | Through | Right | Approach | Left | Through | Right | Approach | |
| AM Peak Hour | Hillcrest Road and McDowell Road East/West Street | TCS | LOS | B | B | > | **B** | B | B | > | **B** | C | C | > | **C** | C | C | > | **C** | **B** |
| | | | Delay | 16 | 12 | > | **14** | 14 | 13 | > | **13** | 22 | 21 | > | **21** | 24 | 21 | > | **22** | **18** |
| | | | V/C | 0.19 | 0.16 | > | | 0.07 | 0.22 | > | | 0.05 | 0.34 | > | | 0.20 | 0.32 | > | | |
| | | | Q | 19 | 15 | > | | 9 | 11 | > | | 6 | 34 | > | | 18 | 33 | > | | |
| | | | Ex | 60 | - | > | | 50 | - | > | | 60 | - | > | | 45 | - | > | | |
| | | | Avail. | 42 | - | > | | 42 | - | > | | 54 | - | > | | 28 | - | > | | |
| | West Street and Holden Avenue/Thmoson Road | TWSC | LOS | A | A | > | **A** | A | A | > | **A** | < | B | > | **B** | < | B | > | **B** | |
| | | | Delay | 7 | 0 | > | **0** | 9 | 0 | > | **0** | < | 10 | > | **10** | < | 11 | > | **11** | |
| | | | V/C | 0.00 | 0.00 | > | | 0.00 | 0.00 | > | | < | 0.05 | > | | < | 0.07 | > | | |
| | | | Q | 0 | 0 | > | | 0 | 0 | > | | < | 1 | > | | < | 2 | > | | |
| | | | Ex | 20 | - | > | | 20 | - | > | | < | - | > | | < | - | > | | |
| | | | Avail. | 20 | - | > | | 20 | - | > | | < | - | > | | < | - | > | | |
| | West Street and Street A | TWSC | LOS | | UM | > | **UM** | < | A | | **A** | B | | > | **B** | | | | | |
| | | | Delay | | | > | | < | 8 | | **0** | 10 | | > | **10** | | | | | |
| | | | V/C | | | > | | < | 0.00 | | | 0.07 | | > | | | | | | |
| | | | Q | | | > | | < | 0 | | | 2 | | > | | | | | | |
| | | | Ex | | | > | | < | - | | | - | | > | | | | | | |
| | | | Avail. | | | > | | < | - | | | - | | > | | | | | | |
| | West Street and Driveway (Apartment) | TWSC | LOS | | UM | > | **UM** | < | A | | **A** | B | | > | **B** | | | | | |
| | | | Delay | | | > | | < | 8 | | **0** | 10 | | > | **10** | | | | | |
| | | | V/C | | | > | | < | 0.00 | | | 0.08 | | > | | | | | | |
| | | | Q | | | > | | < | 0 | | | 2 | | > | | | | | | |
| | | | Ex | | | > | | < | - | | | - | | > | | | | | | |
| | | | Avail. | | | > | | < | - | | | - | | > | | | | | | |
| PM Peak Hour | Hillcrest Road and McDowell Road East/West Street | TCS | LOS | B | B | > | **B** | B | B | > | **B** | C | C | > | **C** | C | C | > | **C** | **B** |
| | | | Delay | 16 | 12 | > | **13** | 13 | 13 | > | **13** | 25 | 20 | > | **21** | 24 | 23 | > | **24** | **19** |
| | | | V/C | 0.13 | 0.14 | > | | 0.04 | 0.24 | > | | 0.10 | 0.30 | > | | 0.25 | 0.47 | > | | |
| | | | Q | 13 | 17 | > | | 6 | 21 | > | | 9 | 33 | > | | 23 | 45 | > | | |
| | | | Ex | 60 | - | > | | 50 | - | > | | 60 | - | > | | 45 | - | > | | |
| | | | Avail. | 47 | - | > | | 44 | - | > | | 51 | - | > | | 23 | - | > | | |
| | West Street and Holden Avenue/Thmoson Road | TWSC | LOS | A | A | > | **A** | A | A | > | **A** | < | B | > | **B** | < | B | > | **B** | |
| | | | Delay | 8 | 0 | > | **1** | 0 | 0 | > | **0** | < | 12 | > | **12** | < | 11 | > | **11** | |
| | | | V/C | 0.01 | 0.00 | > | | 0.00 | 0.00 | > | | < | 0.05 | > | | < | 0.08 | > | | |
| | | | Q | 0 | 0 | > | | 0 | 0 | > | | < | 2 | > | | < | 2 | > | | |
| | | | Ex | 20 | - | > | | 20 | - | > | | < | - | > | | < | - | > | | |
| | | | Avail. | 20 | - | > | | 20 | - | > | | < | - | > | | < | - | > | | |
| | West Street and Street A | TWSC | LOS | | UM | > | **UM** | < | A | | **A** | B | | > | **B** | | | | | |
| | | | Delay | | | > | | < | 8 | | **0** | 11 | | > | **11** | | | | | |
| | | | V/C | | | > | | < | 0.01 | | | 0.05 | | > | | | | | | |
| | | | Q | | | > | | < | 0 | | | 1 | | > | | | | | | |
| | | | Ex | | | > | | < | - | | | - | | > | | | | | | |
| | | | Avail. | | | > | | < | - | | | - | | > | | | | | | |
| | West Street and Driveway (Apartment) | TWSC | LOS | | UM | > | **UM** | < | A | | **A** | B | | > | **B** | | | | | |
| | | | Delay | | | > | | < | 0 | | **0** | 11 | | > | **11** | | | | | |
| | | | V/C | | | > | | < | 0.00 | | | 0.04 | | > | | | | | | |
| | | | Q | | | > | | < | 0 | | | 1 | | > | | | | | | |
| | | | Ex | | | > | | < | - | | | - | | > | | | | | | |
| | | | Avail. | | | > | | < | - | | | - | | > | | | | | | |

*MOE - Measure of Effectiveness*
*LOS - Level of Service*
*Delay - Average Delay per Vehicle in Seconds*
*Q - 95th Percentile Queue Length (m)*
*Ex. - Existing Available Storage (m)*
*Avail. - Available Storage (m)*
*TCS - Traffic Control Signal*
*TWSC - Two-Way Stop Control*
*<- Shared Left/Through Lane*
*>- Shared Right/Through Lane*
*UM - Unopposed Movement*

# TABLE 5.4: 2035 TOTAL TRAFFIC OPERATIONS

| Analysis Period | Intersection | Control Type | MOE | Direction / Movement / Approach | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Eastbound | | | | Westbound | | | | Northbound | | | | Southbound | | | | Overall |
| | | | | Left | Through | Right | Approach | Left | Through | Right | Approach | Left | Through | Right | Approach | Left | Through | Right | Approach | |
| AM Peak Hour | Hillcrest Road and McDowell Road East/West Street | TCS | LOS | B | B | > | B | B | B | > | B | C | C | > | C | C | C | > | C | B |
| | | | Delay | 16 | 13 | > | 14 | 14 | 13 | > | 13 | 22 | 21 | > | 21 | 25 | 21 | > | 22 | 18 |
| | | | V/C | 0.20 | 0.17 | > | | 0.07 | 0.23 | > | | 0.05 | 0.36 | > | | 0.21 | 0.34 | > | | |
| | | | Q | 19 | 15 | > | | 9 | 12 | > | | 6 | 36 | > | | 18 | 35 | > | | |
| | | | Ex | 60 | - | > | | 50 | - | > | | 60 | - | > | | 45 | - | > | | |
| | | | Avail. | 41 | - | > | | 42 | - | > | | 54 | - | > | | 27 | - | > | | |
| | West Street and Holden Avenue/Thmoson Road | TWSC | LOS | A | A | > | A | A | A | > | A | < | B | > | B | < | B | > | B | |
| | | | Delay | 7 | 0 | > | 0 | 9 | 0 | > | 0 | < | 11 | > | 11 | < | 11 | > | 11 | |
| | | | V/C | 0.00 | 0.00 | > | | 0.00 | 0.00 | > | | < | 0.05 | > | | < | 0.07 | > | | |
| | | | Q | 0 | 0 | > | | 0 | 0 | > | | < | 2 | > | | < | 2 | > | | |
| | | | Ex | 20 | - | > | | 20 | - | > | | < | - | > | | < | - | > | | |
| | | | Avail. | 20 | - | > | | 20 | - | > | | < | - | > | | < | - | > | | |
| | West Street and Street A | TWSC | LOS | | UM | > | UM | < | A | | A | B | | > | B | | | | | |
| | | | Delay | | | > | | < | 8 | | 0 | 10 | | > | 10 | | | | | |
| | | | V/C | | | > | | < | 0.00 | | | 0.07 | | > | | | | | | |
| | | | Q | | | > | | < | 0 | | | 2 | | > | | | | | | |
| | | | Ex | | | > | | < | - | | | - | | > | | | | | | |
| | | | Avail. | | | > | | < | - | | | - | | > | | | | | | |
| | West Street and Driveway (Apartment) | TWSC | LOS | | UM | > | UM | < | A | | A | B | | > | B | | | | | |
| | | | Delay | | | > | | < | 8 | | 0 | 11 | | > | 11 | | | | | |
| | | | V/C | | | > | | < | 0.00 | | | 0.08 | | > | | | | | | |
| | | | Q | | | > | | < | 0 | | | 2 | | > | | | | | | |
| | | | Ex | | | > | | < | - | | | - | | > | | | | | | |
| | | | Avail. | | | > | | < | - | | | - | | > | | | | | | |
| PM Peak Hour | Hillcrest Road and McDowell Road East/West Street | TCS | LOS | B | B | > | B | B | B | > | B | C | C | > | C | C | C | > | C | B |
| | | | Delay | 16 | 12 | > | 14 | 13 | 13 | > | 13 | 26 | 20 | > | 21 | 25 | 24 | > | 24 | 19 |
| | | | V/C | 0.14 | 0.14 | > | | 0.04 | 0.25 | > | | 0.11 | 0.31 | > | | 0.26 | 0.50 | > | | |
| | | | Q | 14 | 18 | > | | 6 | 22 | > | | 10 | 34 | > | | 23 | 48 | > | | |
| | | | Ex | 60 | - | > | | 50 | - | > | | 60 | - | > | | 45 | - | > | | |
| | | | Avail. | 47 | - | > | | 44 | - | > | | 50 | - | > | | 22 | - | > | | |
| | West Street and Holden Avenue/Thmoson Road | TWSC | LOS | A | A | > | A | A | A | > | A | < | B | > | B | < | B | > | B | |
| | | | Delay | 8 | 0 | > | 1 | 0 | 0 | > | 0 | < | 12 | > | 12 | < | 11 | > | 11 | |
| | | | V/C | 0.01 | 0.00 | > | | 0.00 | 0.00 | > | | < | 0.05 | > | | < | 0.09 | > | | |
| | | | Q | 0 | 0 | > | | 0 | 0 | > | | < | 2 | > | | < | 2 | > | | |
| | | | Ex | 20 | - | > | | 20 | - | > | | < | - | > | | < | - | > | | |
| | | | Avail. | 20 | - | > | | 20 | - | > | | < | - | > | | < | - | > | | |
| | West Street and Street A | TWSC | LOS | | UM | > | UM | < | A | | A | B | | > | B | | | | | |
| | | | Delay | | | > | | < | 8 | | 0 | 11 | | > | 11 | | | | | |
| | | | V/C | | | > | | < | 0.01 | | | 0.05 | | > | | | | | | |
| | | | Q | | | > | | < | 0 | | | 1 | | > | | | | | | |
| | | | Ex | | | > | | < | - | | | - | | > | | | | | | |
| | | | Avail. | | | > | | < | - | | | - | | > | | | | | | |
| | West Street and Driveway (Apartment) | TWSC | LOS | | UM | > | UM | < | A | | A | B | | > | B | | | | | |
| | | | Delay | | | > | | < | 0 | | 0 | 11 | | > | 11 | | | | | |
| | | | V/C | | | > | | < | 0.00 | | | 0.04 | | > | | | | | | |
| | | | Q | | | > | | < | 0 | | | 1 | | > | | | | | | |
| | | | Ex | | | > | | < | - | | | - | | > | | | | | | |
| | | | Avail. | | | > | | < | - | | | - | | > | | | | | | |

*MOE - Measure of Effectiveness*
*LOS - Level of Service*
*Delay - Average Delay per Vehicle in Seconds*
*Q - 95th Percentile Queue Length (m)*
*Ex. - Existing Available Storage (m)*
*Avail. - Available Storage (m)*
*TCS - Traffic Control Signal*
*TWSC - Two-Way Stop Control*
*<- Shared Left/Through Lane*
*>- Shared Right/Through Lane*
*UM - Unopposed Movement*

## 5.3 Remedial Measures

The analyses presented in **Section 5.1** and **Section 5.2** indicate the proposed development is forecast to have a negligible impact on traffic operations at the study intersections. For completeness, Paradigm has analyzed the need for a westbound left-turn lane at both Street A and the proposed driveway connection to the apartment block.

### 5.3.1 Left-Turn Lane Warrants

Exclusive left-turn lanes provide a dedicated lane for left-turning vehicles to complete their movement. The Transportation Association of Canada (TAC) *Geometric Design Guide for Canadian Roads* states, "when the number of left-turning vehicles at intersections is such that it creates a hazard and reduces capacity, consideration should be given to the provision of a separate left-turn lane."[9]

The Ministry of Transportation's (MTO) *Design Supplement*[10] to the Transportation Association of Canada (TAC) *Geometric Design Guide for Canadian Roads*[11] contains the warrants for left-turn lanes. For two-lane roads, the warrant is based on a combination of the advancing and opposing design hour volumes, the design speed of the road, and the percentage of left-turning vehicles in the advancing volume. Left-turn lanes are not typically warranted where the left-turning volume is less than 5% of the advancing volume.

Under 2035 future total traffic conditions, the westbound left-turn volume from West Street represents no more than 5% of the advancing volume at both Street A and driveway to the apartment block. For completeness, Paradigm has also analyzed a scenario where all traffic enters the site from the east.

**Appendix F** contains the left-turn warrant analyses based on design speeds of 60 km/h and 70 km/h, which are 10 km/h above both of the posted speed limits on West Street between Hillcrest Road and Holden Avenue/Thomson Road. The analyses indicate a westbound left-turn lane is not warranted at Street A or the driveway to the apartment block at either design speed or trip distribution (that is, all trips to/from the east, or based on the distribution referenced in **Table 4.2**).

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9 Transportation Association of Canada, "Left-Turn Lanes," chap. 9.17 in *Geometric Design Guide for Canadian Roads,* (Ottawa: TAC, 2017), 122.

10 Ministry of Transportation, Ontario, *Design Supplement for the TAC Geometric Design Guide for Canadian Roads, Appendix 9A for Section 9.17 (Left-Turn Lanes)*, (Toronto: MTO, 2017).

11 Transportation Association of Canada, "Left-Turn Lanes," chap 9.17 in *Geometric Design Guide for Canadian Roads*, (Ottawa: TAC, 2017), 122-152.

## 5.4 Street A Configuration

The conceptual block plan illustrated in **Figure 3.1** proposes Street A as a two-lane road with a centre median, terminating in a cul-de-sac. An intermediary roundabout on Street A would provide vehicular access to the dwellings on the east side of Street A, and the townhouse blocks internal to the subject site. Residents in Blocks 1, 2, 3, and 4 would be required to travel southerly along Street A before turning around within the roundabout or cul-de-sac termination and travelling northerly on the other side of Street A.

This centre median on Street A is intended to maintain emergency vehicle access by providing two independent means of ingress, in the event of a blockage along Street A. An internal emergency access is also proposed between the apartment block and the townhouse blocks.

## 5.5 Active Transportation Network Connectivity

As noted in **Section 2.3** none of the study area roads (except West Street east of Holden Avenue/Thomson Road) include sidewalks or dedicated cycling facilities, and neither Hillcrest Road (between Highway 3 and West Street), or West Street along the site's frontage are identified for network improvements in the August 2016 *Active Transportation Strategy.* Within this existing network, the site is self-contained from the County sidewalk network, because there are no existing connections along West Street to connect to the site.

The conceptual block plan illustrated in **Figure 3.1** does show a combination of buffered and curb-adjacent sidewalks within the site. Delineated pedestrian crossings are also illustrated at both internal intersections between Street A and the east-west roads/lanes connecting to the townhouse blocks. These connections terminate at the property line but do not prevent future connectivity to neighbouring lands, subject to more detailed development plans being known for these surrounding parcels.

It is noted that in the absence of existing pedestrian infrastructure along West Street, the proposed pedestrian network illustrated on the conceptual block plan is self-contained. However, this self-contained network provides connectivity within the site (for example, between residential and recreational uses) and provides an opportunity for future connectivity to adjacent lands. Future improvements to West Street to include sidewalk facilities could connect the site to the sidewalk network in Simcoe.

# 6 Findings and Conclusions

## 6.1 Findings

Based on the analyses contained herein, the findings of this study are as follows:

- Under existing conditions, the study intersections (West Street and Holden Avenue, and West Street/McDowell Road East and Hillcrest Road) are operating at acceptable levels of service and within capacity.
- Development of the site is estimated to generate 129 trips in the weekday AM peak hour and 135 trips in the weekday PM peak hour.
- Under 2030 and 2035 background traffic conditions (that us, without development of the subject site), the study intersections are forecast to operate at acceptable levels of service and within capacity in both the weekday AM peak hour and weekday PM peak hour. No critical movements are forecast.
- Under 2030 and 2035 total traffic conditions (that is, with development of the subject site), the study intersections are forecast to operate at acceptable levels of service and within capacity. The new street connection (Street A) and the driveway connection to the apartment block are both forecast to operate at acceptable levels of service and within capacity. No critical movements are forecast.
- Westbound left-turn lanes are not warranted on West Street at either of Street A or the driveway connection to the apartment block.

## 6.2 Conclusions

Based on the findings of this study, it is concluded that the proposed development is not forecast to significantly impact traffic operations at West Street and Hillcrest Road or West Street and Holden Avenue. Further, westbound left-turn lanes are not warranted at either of Street A or the driveway connection to the apartment driveway.

## 6.3 Recommendations

Based on the conclusions of this study, it is recommended the site be considered for approval with no requirement for off-site transportation network improvements.

# Appendix A

## Turning Movement Count Data

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada  N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: West Street & Hillcrest Road
Site Code: 250344
Start Date: 10/16/2025


# Turning Movement Data

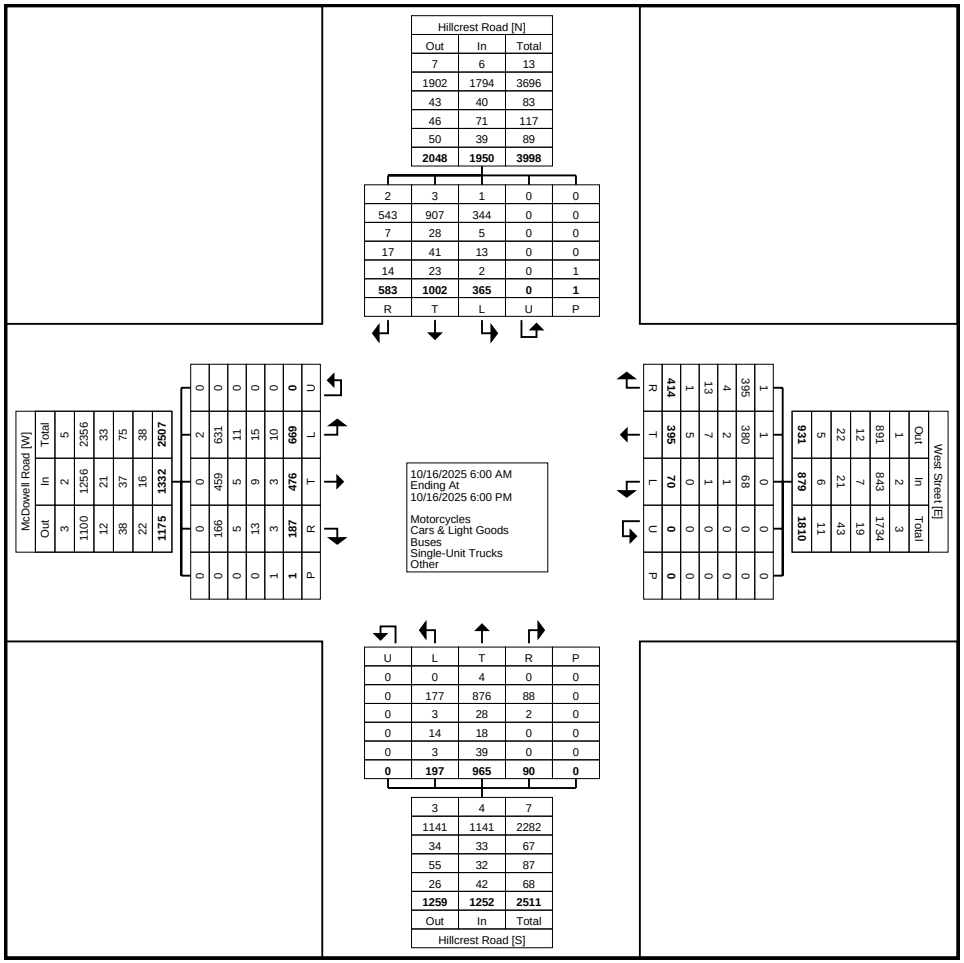
| Start Time | McDowell Road Eastbound | | | | | | West Street Westbound | | | | | | Hillcrest Road Northbound | | | | | | Hillcrest Road Southbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 6:00 AM | 18 | 1 | 1 | 0 | 0 | 20 | 0 | 1 | 7 | 0 | 0 | 8 | 1 | 11 | 0 | 0 | 0 | 12 | 3 | 13 | 2 | 0 | 0 | 18 | 58 |
| 6:15 AM | 18 | 2 | 4 | 0 | 0 | 24 | 0 | 3 | 6 | 0 | 0 | 9 | 5 | 14 | 2 | 0 | 0 | 21 | 3 | 10 | 4 | 0 | 0 | 17 | 71 |
| 6:30 AM | 14 | 10 | 4 | 0 | 0 | 28 | 0 | 2 | 5 | 0 | 0 | 7 | 2 | 15 | 1 | 0 | 0 | 18 | 4 | 17 | 5 | 0 | 0 | 26 | 79 |
| 6:45 AM | 15 | 9 | 3 | 0 | 0 | 27 | 0 | 5 | 10 | 0 | 0 | 15 | 1 | 24 | 2 | 0 | 0 | 27 | 4 | 12 | 6 | 0 | 0 | 22 | 91 |
| Hourly Total | 65 | 22 | 12 | 0 | 0 | 99 | 0 | 11 | 28 | 0 | 0 | 39 | 9 | 64 | 5 | 0 | 0 | 78 | 14 | 52 | 17 | 0 | 0 | 83 | 299 |
| 7:00 AM | 15 | 5 | 3 | 0 | 0 | 23 | 3 | 8 | 7 | 0 | 0 | 18 | 2 | 9 | 0 | 0 | 0 | 11 | 3 | 8 | 9 | 0 | 0 | 20 | 72 |
| 7:15 AM | 14 | 5 | 2 | 0 | 0 | 21 | 1 | 8 | 9 | 0 | 0 | 18 | 0 | 18 | 2 | 0 | 0 | 20 | 5 | 10 | 3 | 0 | 0 | 18 | 77 |
| 7:30 AM | 13 | 7 | 11 | 0 | 0 | 31 | 2 | 3 | 9 | 0 | 0 | 14 | 2 | 28 | 1 | 0 | 0 | 31 | 6 | 17 | 3 | 0 | 0 | 26 | 102 |
| 7:45 AM | 21 | 17 | 6 | 0 | 0 | 44 | 4 | 8 | 15 | 0 | 0 | 27 | 2 | 37 | 2 | 0 | 0 | 41 | 5 | 24 | 9 | 0 | 0 | 38 | 150 |
| Hourly Total | 63 | 34 | 22 | 0 | 0 | 119 | 10 | 27 | 40 | 0 | 0 | 77 | 6 | 92 | 5 | 0 | 0 | 103 | 19 | 59 | 24 | 0 | 0 | 102 | 401 |
| 8:00 AM | 19 | 23 | 6 | 0 | 0 | 48 | 0 | 8 | 9 | 0 | 0 | 17 | 5 | 20 | 5 | 0 | 0 | 30 | 10 | 19 | 3 | 0 | 0 | 32 | 127 |
| 8:15 AM | 19 | 17 | 12 | 0 | 0 | 48 | 1 | 4 | 11 | 0 | 0 | 16 | 2 | 28 | 1 | 0 | 0 | 31 | 16 | 35 | 9 | 0 | 0 | 60 | 155 |
| 8:30 AM | 29 | 17 | 20 | 0 | 0 | 66 | 3 | 6 | 16 | 0 | 0 | 25 | 5 | 25 | 2 | 0 | 0 | 32 | 13 | 41 | 3 | 0 | 0 | 57 | 180 |
| 8:45 AM | 20 | 12 | 10 | 0 | 0 | 42 | 5 | 6 | 16 | 0 | 0 | 27 | 5 | 46 | 2 | 0 | 0 | 53 | 12 | 26 | 11 | 0 | 0 | 49 | 171 |
| Hourly Total | 87 | 69 | 48 | 0 | 0 | 204 | 9 | 24 | 52 | 0 | 0 | 85 | 17 | 119 | 10 | 0 | 0 | 146 | 51 | 121 | 26 | 0 | 0 | 198 | 633 |
| 9:00 AM | 21 | 6 | 2 | 0 | 0 | 29 | 1 | 6 | 17 | 0 | 0 | 24 | 2 | 34 | 3 | 0 | 0 | 39 | 10 | 17 | 11 | 0 | 0 | 38 | 130 |
| 9:15 AM | 13 | 20 | 3 | 0 | 0 | 36 | 2 | 5 | 8 | 0 | 0 | 15 | 1 | 19 | 2 | 0 | 0 | 22 | 4 | 21 | 5 | 0 | 0 | 30 | 103 |
| 9:30 AM | 13 | 15 | 3 | 0 | 0 | 31 | 1 | 7 | 11 | 0 | 0 | 19 | 3 | 20 | 3 | 0 | 0 | 26 | 8 | 24 | 9 | 0 | 0 | 41 | 117 |
| 9:45 AM | 15 | 13 | 3 | 0 | 0 | 31 | 2 | 8 | 14 | 0 | 0 | 24 | 3 | 18 | 2 | 0 | 0 | 23 | 7 | 18 | 7 | 0 | 0 | 32 | 110 |
| Hourly Total | 62 | 54 | 11 | 0 | 0 | 127 | 6 | 26 | 50 | 0 | 0 | 82 | 9 | 91 | 10 | 0 | 0 | 110 | 29 | 80 | 32 | 0 | 0 | 141 | 460 |
| *** BREAK *** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 11:30 AM | 15 | 7 | 2 | 0 | 0 | 24 | 3 | 14 | 7 | 0 | 0 | 24 | 4 | 20 | 4 | 0 | 0 | 28 | 9 | 21 | 9 | 0 | 1 | 39 | 115 |
| 11:45 AM | 11 | 10 | 3 | 0 | 1 | 24 | 2 | 10 | 7 | 0 | 0 | 19 | 2 | 12 | 1 | 0 | 0 | 15 | 6 | 24 | 17 | 0 | 0 | 47 | 105 |
| Hourly Total | 26 | 17 | 5 | 0 | 1 | 48 | 5 | 24 | 14 | 0 | 0 | 43 | 6 | 32 | 5 | 0 | 0 | 43 | 15 | 45 | 26 | 0 | 1 | 86 | 220 |
| 12:00 PM | 18 | 14 | 2 | 0 | 0 | 34 | 2 | 11 | 10 | 0 | 0 | 23 | 2 | 12 | 1 | 0 | 0 | 15 | 3 | 20 | 16 | 0 | 0 | 39 | 111 |
| 12:15 PM | 16 | 6 | 6 | 0 | 0 | 28 | 1 | 9 | 7 | 0 | 0 | 17 | 5 | 24 | 1 | 0 | 0 | 30 | 13 | 23 | 17 | 0 | 0 | 53 | 128 |
| 12:30 PM | 21 | 11 | 2 | 0 | 0 | 34 | 2 | 9 | 7 | 0 | 0 | 18 | 2 | 13 | 1 | 0 | 0 | 16 | 11 | 31 | 17 | 0 | 0 | 59 | 127 |
| 12:45 PM | 18 | 17 | 4 | 0 | 0 | 39 | 1 | 12 | 10 | 0 | 0 | 23 | 6 | 29 | 2 | 0 | 0 | 37 | 11 | 18 | 12 | 0 | 0 | 41 | 140 |
| Hourly Total | 73 | 48 | 14 | 0 | 0 | 135 | 6 | 41 | 34 | 0 | 0 | 81 | 15 | 78 | 5 | 0 | 0 | 98 | 38 | 92 | 62 | 0 | 0 | 192 | 506 |
| 1:00 PM | 22 | 8 | 4 | 0 | 0 | 34 | 1 | 10 | 9 | 0 | 0 | 20 | 3 | 27 | 0 | 0 | 0 | 30 | 7 | 24 | 19 | 0 | 0 | 50 | 134 |
| 1:15 PM | 13 | 11 | 6 | 0 | 0 | 30 | 3 | 8 | 7 | 0 | 0 | 18 | 6 | 14 | 3 | 0 | 0 | 23 | 9 | 28 | 10 | 0 | 0 | 47 | 118 |
| *** BREAK *** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hourly Total | 35 | 19 | 10 | 0 | 0 | 64 | 4 | 18 | 16 | 0 | 0 | 38 | 9 | 41 | 3 | 0 | 0 | 53 | 16 | 52 | 29 | 0 | 0 | 97 | 252 |
| 2:00 PM | 11 | 17 | 5 | 0 | 0 | 33 | 1 | 13 | 9 | 0 | 0 | 23 | 9 | 29 | 2 | 0 | 0 | 40 | 12 | 27 | 16 | 0 | 0 | 55 | 151 |
| 2:15 PM | 19 | 12 | 4 | 0 | 0 | 35 | 0 | 8 | 7 | 0 | 0 | 15 | 2 | 29 | 4 | 0 | 0 | 35 | 9 | 24 | 18 | 0 | 0 | 51 | 136 |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2:30 PM | 17 | 12 | 0 | 0 | 0 | 29 | 3 | 14 | 10 | 0 | 0 | 27 | 7 | 31 | 6 | 0 | 0 | 44 | 16 | 34 | 15 | 0 | 0 | 65 | 165 |
| 2:45 PM | 12 | 8 | 3 | 0 | 0 | 23 | 0 | 16 | 12 | 0 | 0 | 28 | 2 | 20 | 1 | 0 | 0 | 23 | 7 | 46 | 18 | 0 | 0 | 71 | 145 |
| Hourly Total | 59 | 49 | 12 | 0 | 0 | 120 | 4 | 51 | 38 | 0 | 0 | 93 | 20 | 109 | 13 | 0 | 0 | 142 | 44 | 131 | 67 | 0 | 0 | 242 | 597 |
| 3:00 PM | 12 | 9 | 2 | 0 | 0 | 23 | 3 | 19 | 13 | 0 | 0 | 35 | 23 | 33 | 4 | 0 | 0 | 60 | 11 | 36 | 16 | 0 | 0 | 63 | 181 |
| 3:15 PM | 14 | 9 | 3 | 0 | 0 | 26 | 1 | 14 | 10 | 0 | 0 | 25 | 7 | 36 | 2 | 0 | 0 | 45 | 10 | 29 | 26 | 0 | 0 | 65 | 161 |
| 3:30 PM | 10 | 16 | 7 | 0 | 0 | 33 | 6 | 15 | 21 | 0 | 0 | 42 | 7 | 30 | 2 | 0 | 0 | 39 | 19 | 31 | 22 | 0 | 0 | 72 | 186 |
| 3:45 PM | 20 | 17 | 3 | 0 | 0 | 40 | 3 | 18 | 14 | 0 | 0 | 35 | 3 | 31 | 2 | 0 | 0 | 36 | 11 | 25 | 18 | 0 | 0 | 54 | 165 |
| Hourly Total | 56 | 51 | 15 | 0 | 0 | 122 | 13 | 66 | 58 | 0 | 0 | 137 | 40 | 130 | 10 | 0 | 0 | 180 | 51 | 121 | 82 | 0 | 0 | 254 | 693 |
| 4:00 PM | 17 | 23 | 3 | 0 | 0 | 43 | 3 | 17 | 20 | 0 | 0 | 40 | 9 | 30 | 5 | 0 | 0 | 44 | 6 | 37 | 26 | 0 | 0 | 69 | 196 |
| 4:15 PM | 13 | 16 | 4 | 0 | 0 | 33 | 0 | 20 | 10 | 0 | 0 | 30 | 9 | 36 | 3 | 0 | 0 | 48 | 16 | 43 | 28 | 0 | 0 | 87 | 198 |
| 4:30 PM | 19 | 13 | 7 | 0 | 0 | 39 | 3 | 16 | 7 | 0 | 0 | 26 | 6 | 20 | 2 | 0 | 0 | 28 | 7 | 35 | 36 | 0 | 0 | 78 | 171 |
| 4:45 PM | 28 | 19 | 7 | 0 | 0 | 54 | 1 | 15 | 8 | 0 | 0 | 24 | 4 | 25 | 4 | 0 | 0 | 33 | 11 | 31 | 25 | 0 | 0 | 67 | 178 |
| Hourly Total | 77 | 71 | 21 | 0 | 0 | 169 | 7 | 68 | 45 | 0 | 0 | 120 | 28 | 111 | 14 | 0 | 0 | 153 | 40 | 146 | 115 | 0 | 0 | 301 | 743 |
| 5:00 PM | 13 | 9 | 3 | 0 | 0 | 25 | 2 | 10 | 12 | 0 | 0 | 24 | 12 | 37 | 3 | 0 | 0 | 52 | 14 | 24 | 31 | 0 | 0 | 69 | 170 |
| 5:15 PM | 18 | 9 | 7 | 0 | 0 | 34 | 2 | 11 | 10 | 0 | 0 | 23 | 15 | 31 | 3 | 0 | 0 | 49 | 10 | 34 | 31 | 0 | 0 | 75 | 181 |
| 5:30 PM | 20 | 11 | 2 | 0 | 0 | 33 | 1 | 11 | 8 | 0 | 0 | 20 | 7 | 12 | 1 | 0 | 0 | 20 | 17 | 22 | 25 | 0 | 0 | 64 | 137 |
| 5:45 PM | 15 | 13 | 5 | 0 | 0 | 33 | 1 | 7 | 9 | 0 | 0 | 17 | 4 | 18 | 3 | 0 | 0 | 25 | 7 | 23 | 16 | 0 | 0 | 46 | 121 |
| Hourly Total | 66 | 42 | 17 | 0 | 0 | 125 | 6 | 39 | 39 | 0 | 0 | 84 | 38 | 98 | 10 | 0 | 0 | 146 | 48 | 103 | 103 | 0 | 0 | 254 | 609 |
| Grand Total | 669 | 476 | 187 | 0 | 1 | 1332 | 70 | 395 | 414 | 0 | 0 | 879 | 197 | 965 | 90 | 0 | 0 | 1252 | 365 | 1002 | 583 | 0 | 1 | 1950 | 5413 |
| Approach % | 50.2 | 35.7 | 14.0 | 0.0 | - | - | 8.0 | 44.9 | 47.1 | 0.0 | - | - | 15.7 | 77.1 | 7.2 | 0.0 | - | - | 18.7 | 51.4 | 29.9 | 0.0 | - | - | - |
| Total % | 12.4 | 8.8 | 3.5 | 0.0 | - | 24.6 | 1.3 | 7.3 | 7.6 | 0.0 | - | 16.2 | 3.6 | 17.8 | 1.7 | 0.0 | - | 23.1 | 6.7 | 18.5 | 10.8 | 0.0 | - | 36.0 | - |
| Motorcycles | 2 | 0 | 0 | 0 | - | 2 | 0 | 1 | 1 | 0 | - | 2 | 0 | 4 | 0 | 0 | - | 4 | 1 | 3 | 2 | 0 | - | 6 | 14 |
| % Motorcycles | 0.3 | 0.0 | 0.0 | - | - | 0.2 | 0.0 | 0.3 | 0.2 | - | - | 0.2 | 0.0 | 0.4 | 0.0 | - | - | 0.3 | 0.3 | 0.3 | 0.3 | - | - | 0.3 | 0.3 |
| Cars & Light Goods | 631 | 459 | 166 | 0 | - | 1256 | 68 | 380 | 395 | 0 | - | 843 | 177 | 876 | 88 | 0 | - | 1141 | 344 | 907 | 543 | 0 | - | 1794 | 5034 |
| % Cars & Light Goods | 94.3 | 96.4 | 88.8 | - | - | 94.3 | 97.1 | 96.2 | 95.4 | - | - | 95.9 | 89.8 | 90.8 | 97.8 | - | - | 91.1 | 94.2 | 90.5 | 93.1 | - | - | 92.0 | 93.0 |
| Buses | 11 | 5 | 5 | 0 | - | 21 | 1 | 2 | 4 | 0 | - | 7 | 3 | 28 | 2 | 0 | - | 33 | 5 | 28 | 7 | 0 | - | 40 | 101 |
| % Buses | 1.6 | 1.1 | 2.7 | - | - | 1.6 | 1.4 | 0.5 | 1.0 | - | - | 0.8 | 1.5 | 2.9 | 2.2 | - | - | 2.6 | 1.4 | 2.8 | 1.2 | - | - | 2.1 | 1.9 |
| Single-Unit Trucks | 15 | 9 | 13 | 0 | - | 37 | 1 | 7 | 13 | 0 | - | 21 | 14 | 18 | 0 | 0 | - | 32 | 13 | 41 | 17 | 0 | - | 71 | 161 |
| % Single-Unit Trucks | 2.2 | 1.9 | 7.0 | - | - | 2.8 | 1.4 | 1.8 | 3.1 | - | - | 2.4 | 7.1 | 1.9 | 0.0 | - | - | 2.6 | 3.6 | 4.1 | 2.9 | - | - | 3.6 | 3.0 |
| Articulated Trucks | 10 | 0 | 3 | 0 | - | 13 | 0 | 2 | 1 | 0 | - | 3 | 3 | 39 | 0 | 0 | - | 42 | 2 | 23 | 13 | 0 | - | 38 | 96 |
| % Articulated Trucks | 1.5 | 0.0 | 1.6 | - | - | 1.0 | 0.0 | 0.5 | 0.2 | - | - | 0.3 | 1.5 | 4.0 | 0.0 | - | - | 3.4 | 0.5 | 2.3 | 2.2 | - | - | 1.9 | 1.8 |
| Bicycles on Road | 0 | 3 | 0 | 0 | - | 3 | 0 | 3 | 0 | 0 | - | 3 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 1 | 0 | - | 1 | 7 |
| % Bicycles on Road | 0.0 | 0.6 | 0.0 | - | - | 0.2 | 0.0 | 0.8 | 0.0 | - | - | 0.3 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.2 | - | - | 0.1 | 0.1 |
| Bicycles on Crosswalk | - | - | - | - | 1 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | 100.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 1 | - | - |
| % Pedestrians | - | - | - | - | 0.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 100.0 | - | - |

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada  N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: West Street & Hillcrest Road
Site Code: 250344
Start Date: 10/16/2025


Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: West Street & Hillcrest Road
Site Code: 250344
Start Date: 10/16/2025

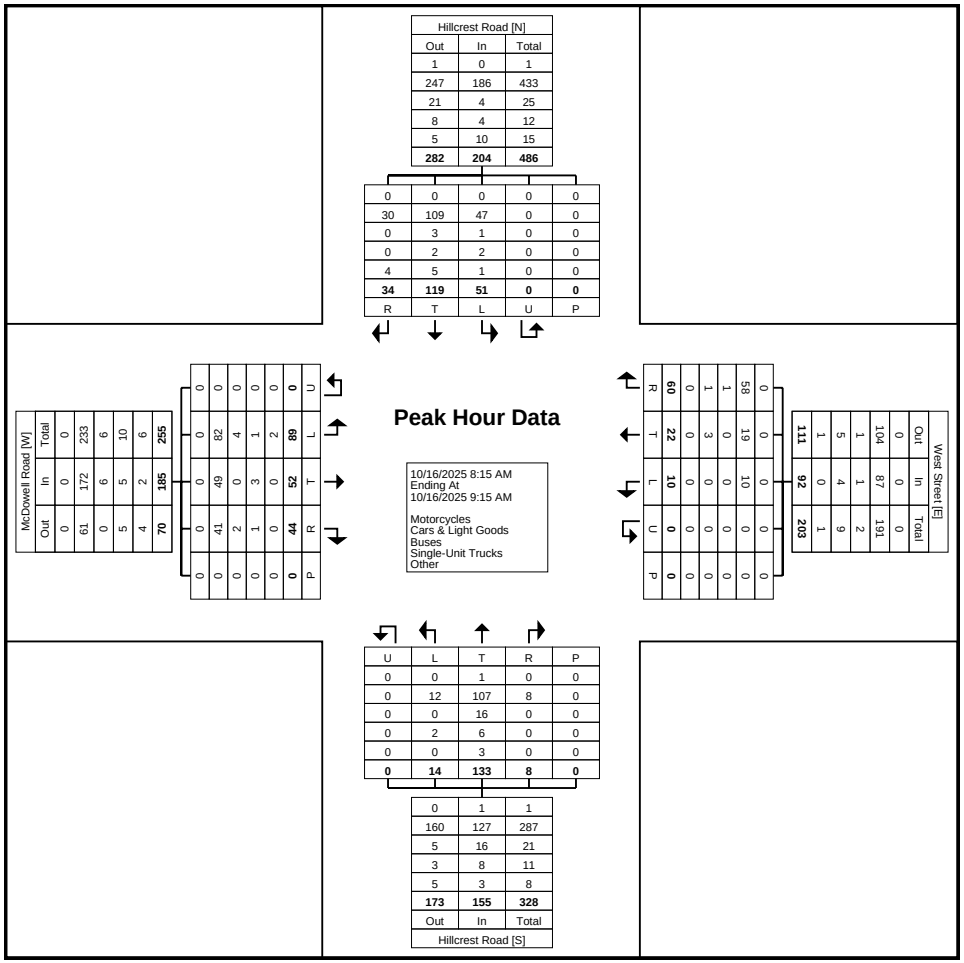

# Turning Movement Peak Hour Data (8:15 AM)

| Start Time | McDowell Road Eastbound | | | | | | West Street Westbound | | | | | | Hillcrest Road Northbound | | | | | | Hillcrest Road Southbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 8:15 AM | 19 | 17 | 12 | 0 | 0 | 48 | 1 | 4 | 11 | 0 | 0 | 16 | 2 | 28 | 1 | 0 | 0 | 31 | 16 | 35 | 9 | 0 | 0 | 60 | 155 |
| 8:30 AM | 29 | 17 | 20 | 0 | 0 | 66 | 3 | 6 | 16 | 0 | 0 | 25 | 5 | 25 | 2 | 0 | 0 | 32 | 13 | 41 | 3 | 0 | 0 | 57 | 180 |
| 8:45 AM | 20 | 12 | 10 | 0 | 0 | 42 | 5 | 6 | 16 | 0 | 0 | 27 | 5 | 46 | 2 | 0 | 0 | 53 | 12 | 26 | 11 | 0 | 0 | 49 | 171 |
| 9:00 AM | 21 | 6 | 2 | 0 | 0 | 29 | 1 | 6 | 17 | 0 | 0 | 24 | 2 | 34 | 3 | 0 | 0 | 39 | 10 | 17 | 11 | 0 | 0 | 38 | 130 |
| Total | 89 | 52 | 44 | 0 | 0 | 185 | 10 | 22 | 60 | 0 | 0 | 92 | 14 | 133 | 8 | 0 | 0 | 155 | 51 | 119 | 34 | 0 | 0 | 204 | 636 |
| Approach % | 48.1 | 28.1 | 23.8 | 0.0 | - | - | 10.9 | 23.9 | 65.2 | 0.0 | - | - | 9.0 | 85.8 | 5.2 | 0.0 | - | - | 25.0 | 58.3 | 16.7 | 0.0 | - | - | - |
| Total % | 14.0 | 8.2 | 6.9 | 0.0 | - | 29.1 | 1.6 | 3.5 | 9.4 | 0.0 | - | 14.5 | 2.2 | 20.9 | 1.3 | 0.0 | - | 24.4 | 8.0 | 18.7 | 5.3 | 0.0 | - | 32.1 | - |
| PHF | 0.767 | 0.765 | 0.550 | 0.000 | - | 0.701 | 0.500 | 0.917 | 0.882 | 0.000 | - | 0.852 | 0.700 | 0.723 | 0.667 | 0.000 | - | 0.731 | 0.797 | 0.726 | 0.773 | 0.000 | - | 0.850 | 0.883 |
| Motorcycles | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 1 | 0 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 1 |
| % Motorcycles | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.8 | 0.0 | - | - | 0.6 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.2 |
| Cars & Light Goods | 82 | 49 | 41 | 0 | - | 172 | 10 | 19 | 58 | 0 | - | 87 | 12 | 107 | 8 | 0 | - | 127 | 47 | 109 | 30 | 0 | - | 186 | 572 |
| % Cars & Light Goods | 92.1 | 94.2 | 93.2 | - | - | 93.0 | 100.0 | 86.4 | 96.7 | - | - | 94.6 | 85.7 | 80.5 | 100.0 | - | - | 81.9 | 92.2 | 91.6 | 88.2 | - | - | 91.2 | 89.9 |
| Buses | 4 | 0 | 2 | 0 | - | 6 | 0 | 0 | 1 | 0 | - | 1 | 0 | 16 | 0 | 0 | - | 16 | 1 | 3 | 0 | 0 | - | 4 | 27 |
| % Buses | 4.5 | 0.0 | 4.5 | - | - | 3.2 | 0.0 | 0.0 | 1.7 | - | - | 1.1 | 0.0 | 12.0 | 0.0 | - | - | 10.3 | 2.0 | 2.5 | 0.0 | - | - | 2.0 | 4.2 |
| Single-Unit Trucks | 1 | 3 | 1 | 0 | - | 5 | 0 | 3 | 1 | 0 | - | 4 | 2 | 6 | 0 | 0 | - | 8 | 2 | 2 | 0 | 0 | - | 4 | 21 |
| % Single-Unit Trucks | 1.1 | 5.8 | 2.3 | - | - | 2.7 | 0.0 | 13.6 | 1.7 | - | - | 4.3 | 14.3 | 4.5 | 0.0 | - | - | 5.2 | 3.9 | 1.7 | 0.0 | - | - | 2.0 | 3.3 |
| Articulated Trucks | 2 | 0 | 0 | 0 | - | 2 | 0 | 0 | 0 | 0 | - | 0 | 0 | 3 | 0 | 0 | - | 3 | 1 | 5 | 4 | 0 | - | 10 | 15 |
| % Articulated Trucks | 2.2 | 0.0 | 0.0 | - | - | 1.1 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 2.3 | 0.0 | - | - | 1.9 | 2.0 | 4.2 | 11.8 | - | - | 4.9 | 2.4 |
| Bicycles on Road | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Bicycles on Road | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada  N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: West Street & Hillcrest Road
Site Code: 250344
Start Date: 10/16/2025


Turning Movement Peak Hour Data Plot (8:15 AM)

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5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: West Street & Hillcrest Road
Site Code: 250344
Start Date: 10/16/2025


# Turning Movement Peak Hour Data (12:15 PM)

| Start Time | McDowell Road Eastbound | | | | | | West Street Westbound | | | | | | Hillcrest Road Northbound | | | | | | Hillcrest Road Southbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 12:15 PM | 16 | 6 | 6 | 0 | 0 | 28 | 1 | 9 | 7 | 0 | 0 | 17 | 5 | 24 | 1 | 0 | 0 | 30 | 13 | 23 | 17 | 0 | 0 | 53 | 128 |
| 12:30 PM | 21 | 11 | 2 | 0 | 0 | 34 | 2 | 9 | 7 | 0 | 0 | 18 | 2 | 13 | 1 | 0 | 0 | 16 | 11 | 31 | 17 | 0 | 0 | 59 | 127 |
| 12:45 PM | 18 | 17 | 4 | 0 | 0 | 39 | 1 | 12 | 10 | 0 | 0 | 23 | 6 | 29 | 2 | 0 | 0 | 37 | 11 | 18 | 12 | 0 | 0 | 41 | 140 |
| 1:00 PM | 22 | 8 | 4 | 0 | 0 | 34 | 1 | 10 | 9 | 0 | 0 | 20 | 3 | 27 | 0 | 0 | 0 | 30 | 7 | 24 | 19 | 0 | 0 | 50 | 134 |
| Total | 77 | 42 | 16 | 0 | 0 | 135 | 5 | 40 | 33 | 0 | 0 | 78 | 16 | 93 | 4 | 0 | 0 | 113 | 42 | 96 | 65 | 0 | 0 | 203 | 529 |
| Approach % | 57.0 | 31.1 | 11.9 | 0.0 | - | - | 6.4 | 51.3 | 42.3 | 0.0 | - | - | 14.2 | 82.3 | 3.5 | 0.0 | - | - | 20.7 | 47.3 | 32.0 | 0.0 | - | - | - |
| Total % | 14.6 | 7.9 | 3.0 | 0.0 | - | 25.5 | 0.9 | 7.6 | 6.2 | 0.0 | - | 14.7 | 3.0 | 17.6 | 0.8 | 0.0 | - | 21.4 | 7.9 | 18.1 | 12.3 | 0.0 | - | 38.4 | - |
| PHF | 0.875 | 0.618 | 0.667 | 0.000 | - | 0.865 | 0.625 | 0.833 | 0.825 | 0.000 | - | 0.848 | 0.667 | 0.802 | 0.500 | 0.000 | - | 0.764 | 0.808 | 0.774 | 0.855 | 0.000 | - | 0.860 | 0.945 |
| Motorcycles | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 1 | 0 | 0 | - | 1 | 0 | 0 | 1 | 0 | - | 1 | 2 |
| % Motorcycles | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 1.1 | 0.0 | - | - | 0.9 | 0.0 | 0.0 | 1.5 | - | - | 0.5 | 0.4 |
| Cars & Light Goods | 69 | 40 | 15 | 0 | - | 124 | 5 | 40 | 33 | 0 | - | 78 | 12 | 78 | 4 | 0 | - | 94 | 40 | 88 | 61 | 0 | - | 189 | 485 |
| % Cars & Light Goods | 89.6 | 95.2 | 93.8 | - | - | 91.9 | 100.0 | 100.0 | 100.0 | - | - | 100.0 | 75.0 | 83.9 | 100.0 | - | - | 83.2 | 95.2 | 91.7 | 93.8 | - | - | 93.1 | 91.7 |
| Buses | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 1 | 1 | 0 | 0 | - | 2 | 2 |
| % Buses | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 2.4 | 1.0 | 0.0 | - | - | 1.0 | 0.4 |
| Single-Unit Trucks | 7 | 0 | 1 | 0 | - | 8 | 0 | 0 | 0 | 0 | - | 0 | 2 | 1 | 0 | 0 | - | 3 | 1 | 5 | 1 | 0 | - | 7 | 18 |
| % Single-Unit Trucks | 9.1 | 0.0 | 6.3 | - | - | 5.9 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 12.5 | 1.1 | 0.0 | - | - | 2.7 | 2.4 | 5.2 | 1.5 | - | - | 3.4 | 3.4 |
| Articulated Trucks | 1 | 0 | 0 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 2 | 13 | 0 | 0 | - | 15 | 0 | 2 | 2 | 0 | - | 4 | 20 |
| % Articulated Trucks | 1.3 | 0.0 | 0.0 | - | - | 0.7 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 12.5 | 14.0 | 0.0 | - | - | 13.3 | 0.0 | 2.1 | 3.1 | - | - | 2.0 | 3.8 |
| Bicycles on Road | 0 | 2 | 0 | 0 | - | 2 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 2 |
| % Bicycles on Road | 0.0 | 4.8 | 0.0 | - | - | 1.5 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.4 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Paradigm Transportation Solutions Limited
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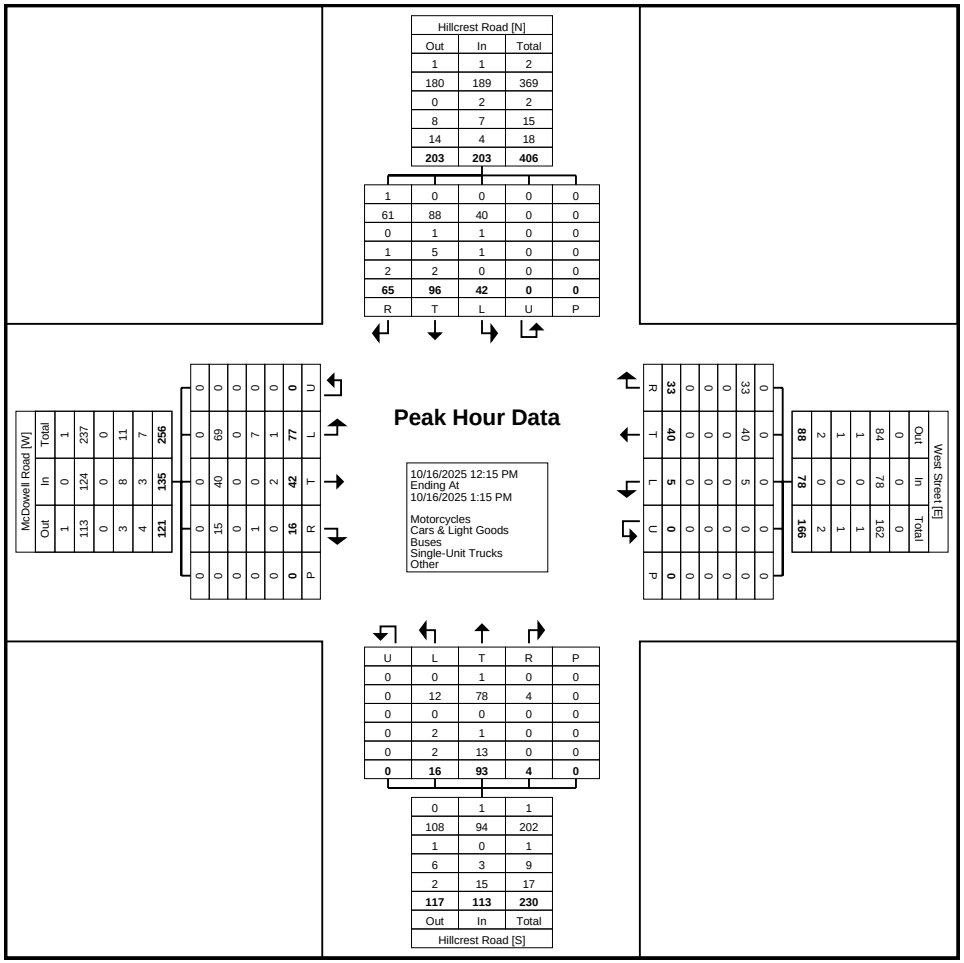
Start Date: 10/16/2025


Turning Movement Peak Hour Data Plot (12:15 PM)

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5A-150 Pinebush Rd

Cambridge, Ontario, Canada  N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: West Street & Hillcrest Road
Site Code: 250344
Start Date: 10/16/2025


# Turning Movement Peak Hour Data (3:30 PM)

| Start Time | McDowell Road Eastbound | | | | | | West Street Westbound | | | | | | Hillcrest Road Northbound | | | | | | Hillcrest Road Southbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 3:30 PM | 10 | 16 | 7 | 0 | 0 | 33 | 6 | 15 | 21 | 0 | 0 | 42 | 7 | 30 | 2 | 0 | 0 | 39 | 19 | 31 | 22 | 0 | 0 | 72 | 186 |
| 3:45 PM | 20 | 17 | 3 | 0 | 0 | 40 | 3 | 18 | 14 | 0 | 0 | 35 | 3 | 31 | 2 | 0 | 0 | 36 | 11 | 25 | 18 | 0 | 0 | 54 | 165 |
| 4:00 PM | 17 | 23 | 3 | 0 | 0 | 43 | 3 | 17 | 20 | 0 | 0 | 40 | 9 | 30 | 5 | 0 | 0 | 44 | 6 | 37 | 26 | 0 | 0 | 69 | 196 |
| 4:15 PM | 13 | 16 | 4 | 0 | 0 | 33 | 0 | 20 | 10 | 0 | 0 | 30 | 9 | 36 | 3 | 0 | 0 | 48 | 16 | 43 | 28 | 0 | 0 | 87 | 198 |
| Total | 60 | 72 | 17 | 0 | 0 | 149 | 12 | 70 | 65 | 0 | 0 | 147 | 28 | 127 | 12 | 0 | 0 | 167 | 52 | 136 | 94 | 0 | 0 | 282 | 745 |
| Approach % | 40.3 | 48.3 | 11.4 | 0.0 | - | - | 8.2 | 47.6 | 44.2 | 0.0 | - | - | 16.8 | 76.0 | 7.2 | 0.0 | - | - | 18.4 | 48.2 | 33.3 | 0.0 | - | - | - |
| Total % | 8.1 | 9.7 | 2.3 | 0.0 | - | 20.0 | 1.6 | 9.4 | 8.7 | 0.0 | - | 19.7 | 3.8 | 17.0 | 1.6 | 0.0 | - | 22.4 | 7.0 | 18.3 | 12.6 | 0.0 | - | 37.9 | - |
| PHF | 0.750 | 0.783 | 0.607 | 0.000 | - | 0.866 | 0.500 | 0.875 | 0.774 | 0.000 | - | 0.875 | 0.778 | 0.882 | 0.600 | 0.000 | - | 0.870 | 0.684 | 0.791 | 0.839 | 0.000 | - | 0.810 | 0.941 |
| Motorcycles | 0 | 0 | 0 | 0 | - | 0 | 0 | 1 | 0 | 0 | - | 1 | 0 | 1 | 0 | 0 | - | 1 | 1 | 0 | 0 | 0 | - | 1 | 3 |
| % Motorcycles | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 1.4 | 0.0 | - | - | 0.7 | 0.0 | 0.8 | 0.0 | - | - | 0.6 | 1.9 | 0.0 | 0.0 | - | - | 0.4 | 0.4 |
| Cars & Light Goods | 51 | 69 | 13 | 0 | - | 133 | 12 | 67 | 60 | 0 | - | 139 | 26 | 122 | 12 | 0 | - | 160 | 48 | 124 | 88 | 0 | - | 260 | 692 |
| % Cars & Light Goods | 85.0 | 95.8 | 76.5 | - | - | 89.3 | 100.0 | 95.7 | 92.3 | - | - | 94.6 | 92.9 | 96.1 | 100.0 | - | - | 95.8 | 92.3 | 91.2 | 93.6 | - | - | 92.2 | 92.9 |
| Buses | 4 | 2 | 0 | 0 | - | 6 | 0 | 1 | 2 | 0 | - | 3 | 0 | 1 | 0 | 0 | - | 1 | 1 | 2 | 1 | 0 | - | 4 | 14 |
| % Buses | 6.7 | 2.8 | 0.0 | - | - | 4.0 | 0.0 | 1.4 | 3.1 | - | - | 2.0 | 0.0 | 0.8 | 0.0 | - | - | 0.6 | 1.9 | 1.5 | 1.1 | - | - | 1.4 | 1.9 |
| Single-Unit Trucks | 5 | 1 | 4 | 0 | - | 10 | 0 | 1 | 3 | 0 | - | 4 | 2 | 1 | 0 | 0 | - | 3 | 2 | 6 | 3 | 0 | - | 11 | 28 |
| % Single-Unit Trucks | 8.3 | 1.4 | 23.5 | - | - | 6.7 | 0.0 | 1.4 | 4.6 | - | - | 2.7 | 7.1 | 0.8 | 0.0 | - | - | 1.8 | 3.8 | 4.4 | 3.2 | - | - | 3.9 | 3.8 |
| Articulated Trucks | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 2 | 0 | 0 | - | 2 | 0 | 4 | 2 | 0 | - | 6 | 8 |
| % Articulated Trucks | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 1.6 | 0.0 | - | - | 1.2 | 0.0 | 2.9 | 2.1 | - | - | 2.1 | 1.1 |
| Bicycles on Road | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Bicycles on Road | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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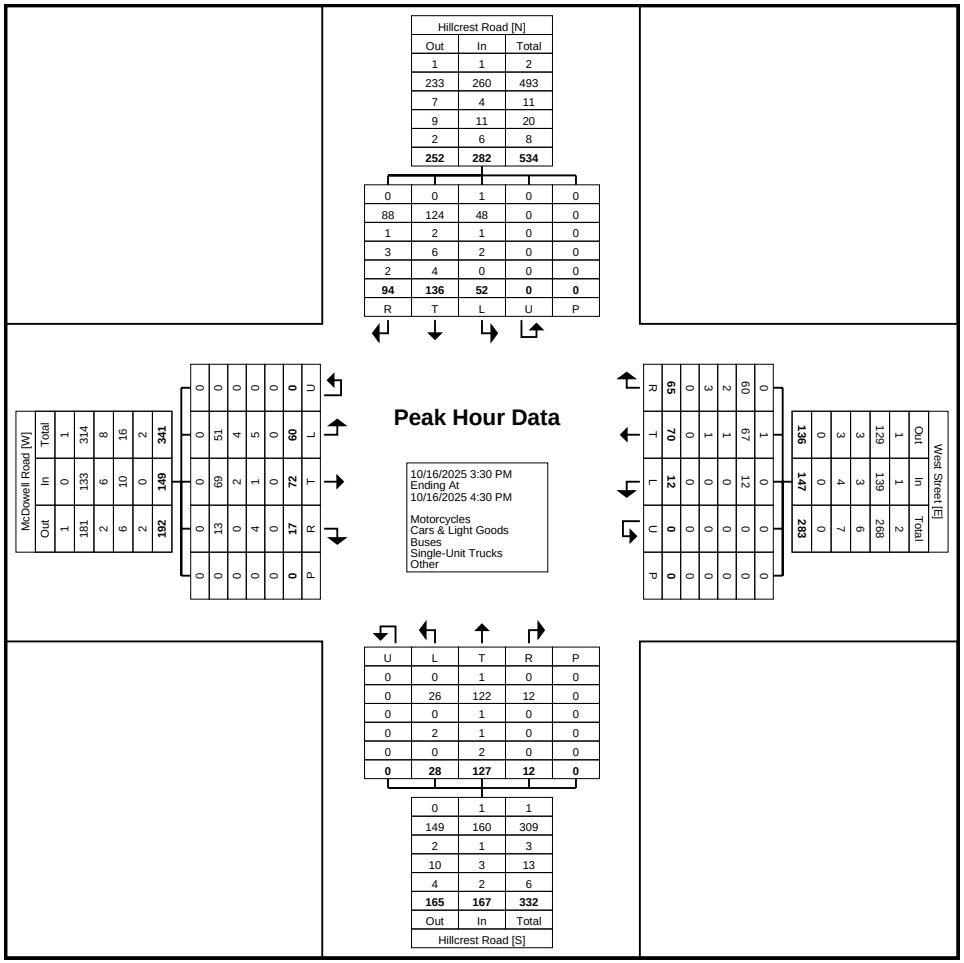
Site Code: 250344
Start Date: 10/16/2025


Turning Movement Peak Hour Data Plot (3:30 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada  N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: West Street & Holden Avenue
Site Code: 250344
Start Date: 10/16/2025


# Turning Movement Data

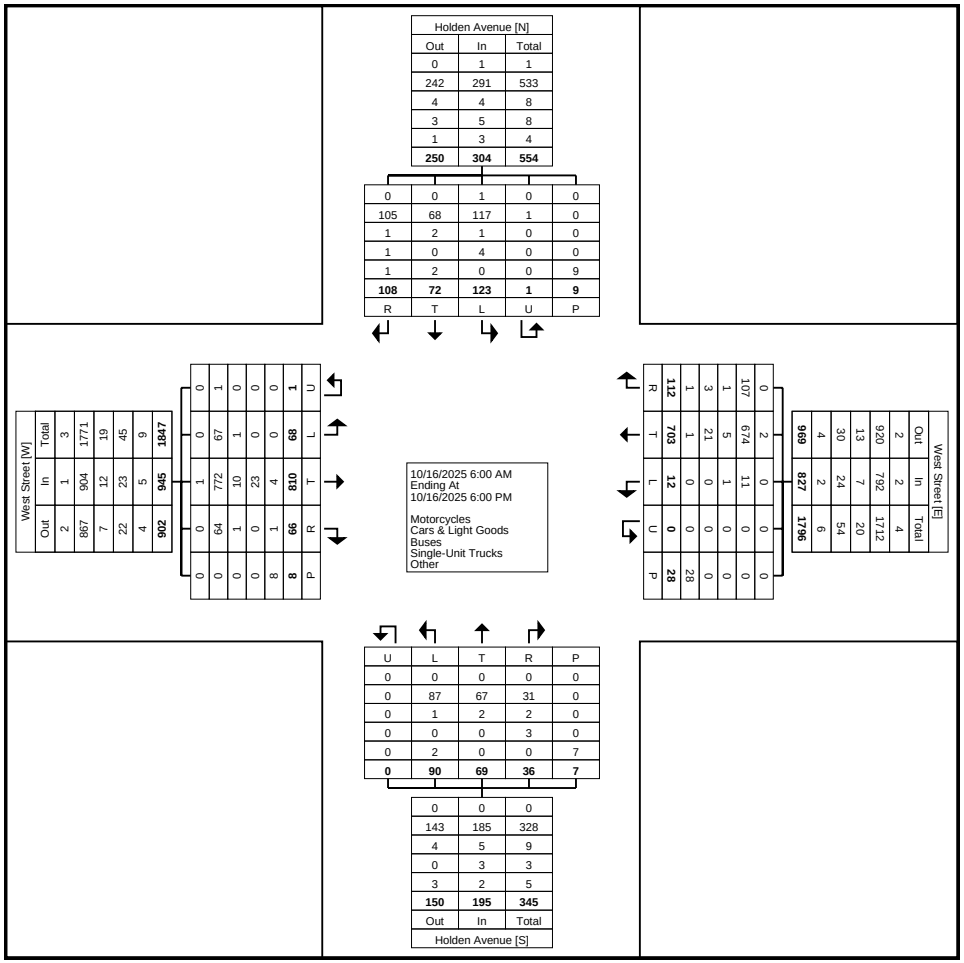
| Start Time | West Street Eastbound | | | | | | West Street Westbound | | | | | | Holden Avenue Northbound | | | | | | Holden Avenue Southbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 6:00 AM | 0 | 3 | 0 | 0 | 0 | 3 | 0 | 7 | 0 | 0 | 3 | 7 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 12 |
| 6:15 AM | 0 | 5 | 0 | 0 | 0 | 5 | 0 | 9 | 0 | 0 | 0 | 9 | 0 | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 1 | 17 |
| 6:30 AM | 0 | 11 | 0 | 0 | 0 | 11 | 0 | 5 | 0 | 0 | 0 | 5 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 2 | 0 | 0 | 4 | 21 |
| 6:45 AM | 1 | 19 | 0 | 0 | 0 | 20 | 0 | 11 | 0 | 0 | 2 | 11 | 2 | 4 | 0 | 0 | 0 | 6 | 1 | 0 | 2 | 0 | 0 | 3 | 40 |
| Hourly Total | 1 | 38 | 0 | 0 | 0 | 39 | 0 | 32 | 0 | 0 | 5 | 32 | 2 | 6 | 2 | 0 | 0 | 10 | 2 | 1 | 6 | 0 | 0 | 9 | 90 |
| 7:00 AM | 2 | 5 | 1 | 0 | 0 | 8 | 1 | 17 | 0 | 0 | 0 | 18 | 1 | 1 | 0 | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 0 | 2 | 30 |
| 7:15 AM | 0 | 10 | 0 | 0 | 1 | 10 | 0 | 17 | 1 | 0 | 0 | 18 | 1 | 2 | 0 | 0 | 0 | 3 | 4 | 0 | 1 | 0 | 0 | 5 | 36 |
| 7:30 AM | 1 | 17 | 0 | 0 | 0 | 18 | 0 | 8 | 2 | 0 | 1 | 10 | 2 | 1 | 0 | 0 | 0 | 3 | 5 | 0 | 4 | 0 | 1 | 9 | 40 |
| 7:45 AM | 1 | 21 | 1 | 0 | 1 | 23 | 1 | 18 | 2 | 0 | 3 | 21 | 8 | 2 | 4 | 0 | 3 | 14 | 5 | 2 | 3 | 0 | 1 | 10 | 68 |
| Hourly Total | 4 | 53 | 2 | 0 | 2 | 59 | 2 | 60 | 5 | 0 | 4 | 67 | 12 | 6 | 4 | 0 | 3 | 22 | 15 | 2 | 9 | 0 | 2 | 26 | 174 |
| 8:00 AM | 1 | 31 | 2 | 0 | 0 | 34 | 0 | 14 | 4 | 0 | 1 | 18 | 2 | 2 | 1 | 0 | 0 | 5 | 7 | 0 | 1 | 0 | 0 | 8 | 65 |
| 8:15 AM | 0 | 32 | 0 | 0 | 0 | 32 | 1 | 11 | 2 | 0 | 0 | 14 | 3 | 2 | 0 | 0 | 0 | 5 | 7 | 1 | 4 | 0 | 0 | 12 | 63 |
| 8:30 AM | 0 | 32 | 2 | 0 | 1 | 34 | 0 | 20 | 0 | 0 | 0 | 20 | 0 | 3 | 2 | 0 | 0 | 5 | 9 | 2 | 2 | 0 | 0 | 13 | 72 |
| 8:45 AM | 1 | 32 | 2 | 0 | 0 | 35 | 0 | 16 | 2 | 0 | 0 | 18 | 7 | 3 | 3 | 0 | 0 | 13 | 5 | 1 | 2 | 0 | 0 | 8 | 74 |
| Hourly Total | 2 | 127 | 6 | 0 | 1 | 135 | 1 | 61 | 8 | 0 | 1 | 70 | 12 | 10 | 6 | 0 | 0 | 28 | 28 | 4 | 9 | 0 | 0 | 41 | 274 |
| 9:00 AM | 2 | 19 | 0 | 0 | 0 | 21 | 0 | 18 | 1 | 0 | 0 | 19 | 6 | 0 | 1 | 0 | 0 | 7 | 5 | 2 | 2 | 0 | 0 | 9 | 56 |
| 9:15 AM | 0 | 17 | 1 | 0 | 1 | 18 | 0 | 12 | 1 | 0 | 0 | 13 | 2 | 2 | 0 | 0 | 0 | 4 | 1 | 1 | 1 | 0 | 0 | 3 | 38 |
| 9:30 AM | 1 | 30 | 2 | 0 | 0 | 33 | 0 | 15 | 3 | 0 | 0 | 18 | 3 | 4 | 0 | 0 | 0 | 7 | 1 | 1 | 0 | 0 | 0 | 2 | 60 |
| 9:45 AM | 1 | 21 | 0 | 0 | 0 | 22 | 0 | 15 | 0 | 0 | 1 | 15 | 4 | 2 | 0 | 0 | 0 | 6 | 4 | 1 | 4 | 0 | 0 | 9 | 52 |
| Hourly Total | 4 | 87 | 3 | 0 | 1 | 94 | 0 | 60 | 5 | 0 | 1 | 65 | 15 | 8 | 1 | 0 | 0 | 24 | 11 | 5 | 7 | 0 | 0 | 23 | 206 |
| *** BREAK *** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 11:30 AM | 1 | 19 | 0 | 0 | 0 | 20 | 0 | 17 | 2 | 0 | 2 | 19 | 4 | 0 | 0 | 0 | 0 | 4 | 3 | 1 | 3 | 0 | 0 | 7 | 50 |
| 11:45 AM | 2 | 20 | 0 | 0 | 0 | 22 | 0 | 17 | 5 | 0 | 0 | 22 | 1 | 0 | 0 | 0 | 0 | 1 | 3 | 2 | 2 | 0 | 0 | 7 | 52 |
| Hourly Total | 3 | 39 | 0 | 0 | 0 | 42 | 0 | 34 | 7 | 0 | 2 | 41 | 5 | 0 | 0 | 0 | 0 | 5 | 6 | 3 | 5 | 0 | 0 | 14 | 102 |
| 12:00 PM | 1 | 16 | 2 | 0 | 2 | 19 | 0 | 19 | 3 | 0 | 0 | 22 | 2 | 0 | 0 | 0 | 0 | 2 | 5 | 2 | 6 | 0 | 0 | 13 | 56 |
| 12:15 PM | 1 | 21 | 1 | 0 | 0 | 23 | 0 | 14 | 2 | 0 | 0 | 16 | 2 | 0 | 0 | 0 | 0 | 2 | 2 | 1 | 2 | 0 | 0 | 5 | 46 |
| 12:30 PM | 1 | 20 | 1 | 0 | 0 | 22 | 1 | 16 | 1 | 0 | 0 | 18 | 1 | 1 | 0 | 0 | 0 | 2 | 3 | 1 | 0 | 0 | 0 | 4 | 46 |
| 12:45 PM | 2 | 19 | 4 | 0 | 0 | 25 | 0 | 14 | 1 | 0 | 1 | 15 | 5 | 2 | 0 | 0 | 0 | 7 | 3 | 2 | 3 | 0 | 1 | 8 | 55 |
| Hourly Total | 5 | 76 | 8 | 0 | 2 | 89 | 1 | 63 | 7 | 0 | 1 | 71 | 10 | 3 | 0 | 0 | 0 | 13 | 13 | 6 | 11 | 0 | 1 | 30 | 203 |
| 1:00 PM | 2 | 18 | 2 | 0 | 0 | 22 | 0 | 11 | 6 | 0 | 0 | 17 | 2 | 6 | 2 | 0 | 0 | 10 | 3 | 2 | 4 | 1 | 0 | 10 | 59 |
| 1:15 PM | 2 | 17 | 1 | 0 | 0 | 20 | 0 | 12 | 3 | 0 | 0 | 15 | 1 | 4 | 2 | 0 | 0 | 7 | 4 | 0 | 5 | 0 | 0 | 9 | 51 |
| *** BREAK *** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hourly Total | 4 | 35 | 3 | 0 | 0 | 42 | 0 | 23 | 9 | 0 | 0 | 32 | 3 | 10 | 4 | 0 | 0 | 17 | 7 | 2 | 9 | 1 | 0 | 19 | 110 |
| 2:00 PM | 3 | 23 | 2 | 0 | 0 | 28 | 3 | 20 | 1 | 0 | 0 | 24 | 1 | 1 | 0 | 0 | 0 | 2 | 2 | 2 | 4 | 0 | 0 | 8 | 62 |
| 2:15 PM | 0 | 18 | 4 | 0 | 0 | 22 | 0 | 15 | 3 | 0 | 1 | 18 | 0 | 2 | 1 | 0 | 1 | 3 | 0 | 2 | 0 | 0 | 2 | 2 | 45 |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2:30 PM | 3 | 25 | 5 | 0 | 0 | 33 | 0 | 21 | 1 | 0 | 0 | 22 | 1 | 0 | 4 | 0 | 0 | 5 | 3 | 2 | 6 | 0 | 0 | 11 | 71 |
| 2:45 PM | 4 | 14 | 2 | 0 | 1 | 20 | 0 | 24 | 3 | 0 | 1 | 27 | 2 | 2 | 2 | 0 | 0 | 6 | 6 | 3 | 2 | 0 | 0 | 11 | 64 |
| Hourly Total | 10 | 80 | 13 | 0 | 1 | 103 | 3 | 80 | 8 | 0 | 2 | 91 | 4 | 5 | 7 | 0 | 1 | 16 | 11 | 9 | 12 | 0 | 2 | 32 | 242 |
| 3:00 PM | 2 | 15 | 1 | 0 | 0 | 18 | 0 | 31 | 7 | 0 | 1 | 38 | 2 | 2 | 1 | 0 | 1 | 5 | 4 | 3 | 3 | 0 | 0 | 10 | 71 |
| 3:15 PM | 1 | 20 | 1 | 0 | 1 | 22 | 0 | 23 | 2 | 0 | 0 | 25 | 6 | 1 | 2 | 0 | 2 | 9 | 2 | 5 | 1 | 0 | 0 | 8 | 64 |
| 3:30 PM | 1 | 25 | 1 | 0 | 0 | 27 | 0 | 30 | 10 | 0 | 1 | 40 | 7 | 3 | 1 | 0 | 0 | 11 | 0 | 4 | 2 | 0 | 0 | 6 | 84 |
| 3:45 PM | 3 | 30 | 5 | 0 | 0 | 38 | 0 | 32 | 5 | 0 | 0 | 37 | 3 | 3 | 2 | 0 | 0 | 8 | 4 | 3 | 4 | 0 | 0 | 11 | 94 |
| Hourly Total | 7 | 90 | 8 | 0 | 1 | 105 | 0 | 116 | 24 | 0 | 2 | 140 | 18 | 9 | 6 | 0 | 3 | 33 | 10 | 15 | 10 | 0 | 0 | 35 | 313 |
| 4:00 PM | 6 | 28 | 6 | 0 | 0 | 40 | 0 | 31 | 5 | 0 | 1 | 36 | 1 | 3 | 0 | 0 | 0 | 4 | 5 | 4 | 7 | 0 | 0 | 16 | 96 |
| 4:15 PM | 3 | 27 | 2 | 0 | 0 | 32 | 0 | 30 | 6 | 0 | 1 | 36 | 1 | 1 | 1 | 0 | 0 | 3 | 5 | 4 | 4 | 0 | 2 | 13 | 84 |
| 4:30 PM | 3 | 22 | 1 | 0 | 0 | 26 | 0 | 21 | 4 | 0 | 1 | 25 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 3 | 7 | 0 | 2 | 11 | 63 |
| 4:45 PM | 5 | 27 | 3 | 0 | 0 | 35 | 0 | 23 | 8 | 0 | 0 | 31 | 1 | 0 | 1 | 0 | 0 | 2 | 0 | 3 | 0 | 0 | 0 | 3 | 71 |
| Hourly Total | 17 | 104 | 12 | 0 | 0 | 133 | 0 | 105 | 23 | 0 | 3 | 128 | 3 | 5 | 2 | 0 | 0 | 10 | 11 | 14 | 18 | 0 | 4 | 43 | 314 |
| 5:00 PM | 3 | 19 | 4 | 0 | 0 | 26 | 0 | 18 | 6 | 0 | 1 | 24 | 3 | 1 | 0 | 0 | 0 | 4 | 2 | 3 | 4 | 0 | 0 | 9 | 63 |
| 5:15 PM | 3 | 16 | 5 | 0 | 0 | 24 | 0 | 20 | 5 | 0 | 3 | 25 | 0 | 1 | 0 | 0 | 0 | 1 | 3 | 5 | 4 | 0 | 0 | 12 | 62 |
| 5:30 PM | 5 | 22 | 1 | 0 | 0 | 28 | 0 | 18 | 3 | 0 | 0 | 21 | 1 | 5 | 0 | 0 | 0 | 6 | 2 | 2 | 2 | 0 | 0 | 6 | 61 |
| 5:45 PM | 0 | 24 | 1 | 1 | 0 | 26 | 5 | 13 | 2 | 0 | 3 | 20 | 2 | 0 | 4 | 0 | 0 | 6 | 2 | 1 | 2 | 0 | 0 | 5 | 57 |
| Hourly Total | 11 | 81 | 11 | 1 | 0 | 104 | 5 | 69 | 16 | 0 | 7 | 90 | 6 | 7 | 4 | 0 | 0 | 17 | 9 | 11 | 12 | 0 | 0 | 32 | 243 |
| Grand Total | 68 | 810 | 66 | 1 | 8 | 945 | 12 | 703 | 112 | 0 | 28 | 827 | 90 | 69 | 36 | 0 | 7 | 195 | 123 | 72 | 108 | 1 | 9 | 304 | 2271 |
| Approach % | 7.2 | 85.7 | 7.0 | 0.1 | - | - | 1.5 | 85.0 | 13.5 | 0.0 | - | - | 46.2 | 35.4 | 18.5 | 0.0 | - | - | 40.5 | 23.7 | 35.5 | 0.3 | - | - | - |
| Total % | 3.0 | 35.7 | 2.9 | 0.0 | - | 41.6 | 0.5 | 31.0 | 4.9 | 0.0 | - | 36.4 | 4.0 | 3.0 | 1.6 | 0.0 | - | 8.6 | 5.4 | 3.2 | 4.8 | 0.0 | - | 13.4 | - |
| Motorcycles | 0 | 1 | 0 | 0 | - | 1 | 0 | 2 | 0 | 0 | - | 2 | 0 | 0 | 0 | 0 | - | 0 | 1 | 0 | 0 | 0 | - | 1 | 4 |
| % Motorcycles | 0.0 | 0.1 | 0.0 | 0.0 | - | 0.1 | 0.0 | 0.3 | 0.0 | - | - | 0.2 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.8 | 0.0 | 0.0 | 0.0 | - | 0.3 | 0.2 |
| Cars & Light Goods | 67 | 772 | 64 | 1 | - | 904 | 11 | 674 | 107 | 0 | - | 792 | 87 | 67 | 31 | 0 | - | 185 | 117 | 68 | 105 | 1 | - | 291 | 2172 |
| % Cars & Light Goods | 98.5 | 95.3 | 97.0 | 100.0 | - | 95.7 | 91.7 | 95.9 | 95.5 | - | - | 95.8 | 96.7 | 97.1 | 86.1 | - | - | 94.9 | 95.1 | 94.4 | 97.2 | 100.0 | - | 95.7 | 95.6 |
| Buses | 1 | 10 | 1 | 0 | - | 12 | 1 | 5 | 1 | 0 | - | 7 | 1 | 2 | 2 | 0 | - | 5 | 1 | 2 | 1 | 0 | - | 4 | 28 |
| % Buses | 1.5 | 1.2 | 1.5 | 0.0 | - | 1.3 | 8.3 | 0.7 | 0.9 | - | - | 0.8 | 1.1 | 2.9 | 5.6 | - | - | 2.6 | 0.8 | 2.8 | 0.9 | 0.0 | - | 1.3 | 1.2 |
| Single-Unit Trucks | 0 | 23 | 0 | 0 | - | 23 | 0 | 21 | 3 | 0 | - | 24 | 0 | 0 | 3 | 0 | - | 3 | 4 | 0 | 1 | 0 | - | 5 | 55 |
| % Single-Unit Trucks | 0.0 | 2.8 | 0.0 | 0.0 | - | 2.4 | 0.0 | 3.0 | 2.7 | - | - | 2.9 | 0.0 | 0.0 | 8.3 | - | - | 1.5 | 3.3 | 0.0 | 0.9 | 0.0 | - | 1.6 | 2.4 |
| Articulated Trucks | 0 | 1 | 0 | 0 | - | 1 | 0 | 1 | 0 | 0 | - | 1 | 1 | 0 | 0 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 3 |
| % Articulated Trucks | 0.0 | 0.1 | 0.0 | 0.0 | - | 0.1 | 0.0 | 0.1 | 0.0 | - | - | 0.1 | 1.1 | 0.0 | 0.0 | - | - | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.1 |
| Bicycles on Road | 0 | 3 | 1 | 0 | - | 4 | 0 | 0 | 1 | 0 | - | 1 | 1 | 0 | 0 | 0 | - | 1 | 0 | 2 | 1 | 0 | - | 3 | 9 |
| % Bicycles on Road | 0.0 | 0.4 | 1.5 | 0.0 | - | 0.4 | 0.0 | 0.0 | 0.9 | - | - | 0.1 | 1.1 | 0.0 | 0.0 | - | - | 0.5 | 0.0 | 2.8 | 0.9 | 0.0 | - | 1.0 | 0.4 |
| Bicycles on Crosswalk | - | - | - | - | 1 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 6 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | 12.5 | - | - | - | - | - | 0.0 | - | - | - | - | - | 0.0 | - | - | - | - | - | 66.7 | - | - |
| Pedestrians | - | - | - | - | 7 | - | - | - | - | - | 28 | - | - | - | - | - | 7 | - | - | - | - | - | 3 | - | - |
| % Pedestrians | - | - | - | - | 87.5 | - | - | - | - | - | 100.0 | - | - | - | - | - | 100.0 | - | - | - | - | - | 33.3 | - | - |

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada  N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: West Street & Holden Avenue
Site Code: 250344
Start Date: 10/16/2025


Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada  N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: West Street & Holden Avenue
Site Code: 250344
Start Date: 10/16/2025


# Turning Movement Peak Hour Data (8:00 AM)

| Start Time | West Street Eastbound | | | | | | West Street Westbound | | | | | | Holden Avenue Northbound | | | | | | Holden Avenue Southbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 8:00 AM | 1 | 31 | 2 | 0 | 0 | 34 | 0 | 14 | 4 | 0 | 1 | 18 | 2 | 2 | 1 | 0 | 0 | 5 | 7 | 0 | 1 | 0 | 0 | 8 | 65 |
| 8:15 AM | 0 | 32 | 0 | 0 | 0 | 32 | 1 | 11 | 2 | 0 | 0 | 14 | 3 | 2 | 0 | 0 | 0 | 5 | 7 | 1 | 4 | 0 | 0 | 12 | 63 |
| 8:30 AM | 0 | 32 | 2 | 0 | 1 | 34 | 0 | 20 | 0 | 0 | 0 | 20 | 0 | 3 | 2 | 0 | 0 | 5 | 9 | 2 | 2 | 0 | 0 | 13 | 72 |
| 8:45 AM | 1 | 32 | 2 | 0 | 0 | 35 | 0 | 16 | 2 | 0 | 0 | 18 | 7 | 3 | 3 | 0 | 0 | 13 | 5 | 1 | 2 | 0 | 0 | 8 | 74 |
| Total | 2 | 127 | 6 | 0 | 1 | 135 | 1 | 61 | 8 | 0 | 1 | 70 | 12 | 10 | 6 | 0 | 0 | 28 | 28 | 4 | 9 | 0 | 0 | 41 | 274 |
| Approach % | 1.5 | 94.1 | 4.4 | 0.0 | - | - | 1.4 | 87.1 | 11.4 | 0.0 | - | - | 42.9 | 35.7 | 21.4 | 0.0 | - | - | 68.3 | 9.8 | 22.0 | 0.0 | - | - | - |
| Total % | 0.7 | 46.4 | 2.2 | 0.0 | - | 49.3 | 0.4 | 22.3 | 2.9 | 0.0 | - | 25.5 | 4.4 | 3.6 | 2.2 | 0.0 | - | 10.2 | 10.2 | 1.5 | 3.3 | 0.0 | - | 15.0 | - |
| PHF | 0.500 | 0.992 | 0.750 | 0.000 | - | 0.964 | 0.250 | 0.763 | 0.500 | 0.000 | - | 0.875 | 0.429 | 0.833 | 0.500 | 0.000 | - | 0.538 | 0.778 | 0.500 | 0.563 | 0.000 | - | 0.788 | 0.926 |
| Motorcycles | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Motorcycles | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Cars & Light Goods | 2 | 116 | 5 | 0 | - | 123 | 0 | 58 | 6 | 0 | - | 64 | 12 | 10 | 6 | 0 | - | 28 | 27 | 2 | 9 | 0 | - | 38 | 253 |
| % Cars & Light Goods | 100.0 | 91.3 | 83.3 | - | - | 91.1 | 0.0 | 95.1 | 75.0 | - | - | 91.4 | 100.0 | 100.0 | 100.0 | - | - | 100.0 | 96.4 | 50.0 | 100.0 | - | - | 92.7 | 92.3 |
| Buses | 0 | 5 | 0 | 0 | - | 5 | 1 | 0 | 1 | 0 | - | 2 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 7 |
| % Buses | 0.0 | 3.9 | 0.0 | - | - | 3.7 | 100.0 | 0.0 | 12.5 | - | - | 2.9 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 2.6 |
| Single-Unit Trucks | 0 | 5 | 0 | 0 | - | 5 | 0 | 3 | 1 | 0 | - | 4 | 0 | 0 | 0 | 0 | - | 0 | 1 | 0 | 0 | 0 | - | 1 | 10 |
| % Single-Unit Trucks | 0.0 | 3.9 | 0.0 | - | - | 3.7 | 0.0 | 4.9 | 12.5 | - | - | 5.7 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 3.6 | 0.0 | 0.0 | - | - | 2.4 | 3.6 |
| Articulated Trucks | 0 | 1 | 0 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 1 |
| % Articulated Trucks | 0.0 | 0.8 | 0.0 | - | - | 0.7 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.4 |
| Bicycles on Road | 0 | 0 | 1 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 2 | 0 | 0 | - | 2 | 3 |
| % Bicycles on Road | 0.0 | 0.0 | 16.7 | - | - | 0.7 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 50.0 | 0.0 | - | - | 4.9 | 1.1 |
| Bicycles on Crosswalk | - | - | - | - | 1 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | 100.0 | - | - | - | - | - | 0.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 1 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | 0.0 | - | - | - | - | - | 100.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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Count Name: West Street & Holden Avenue
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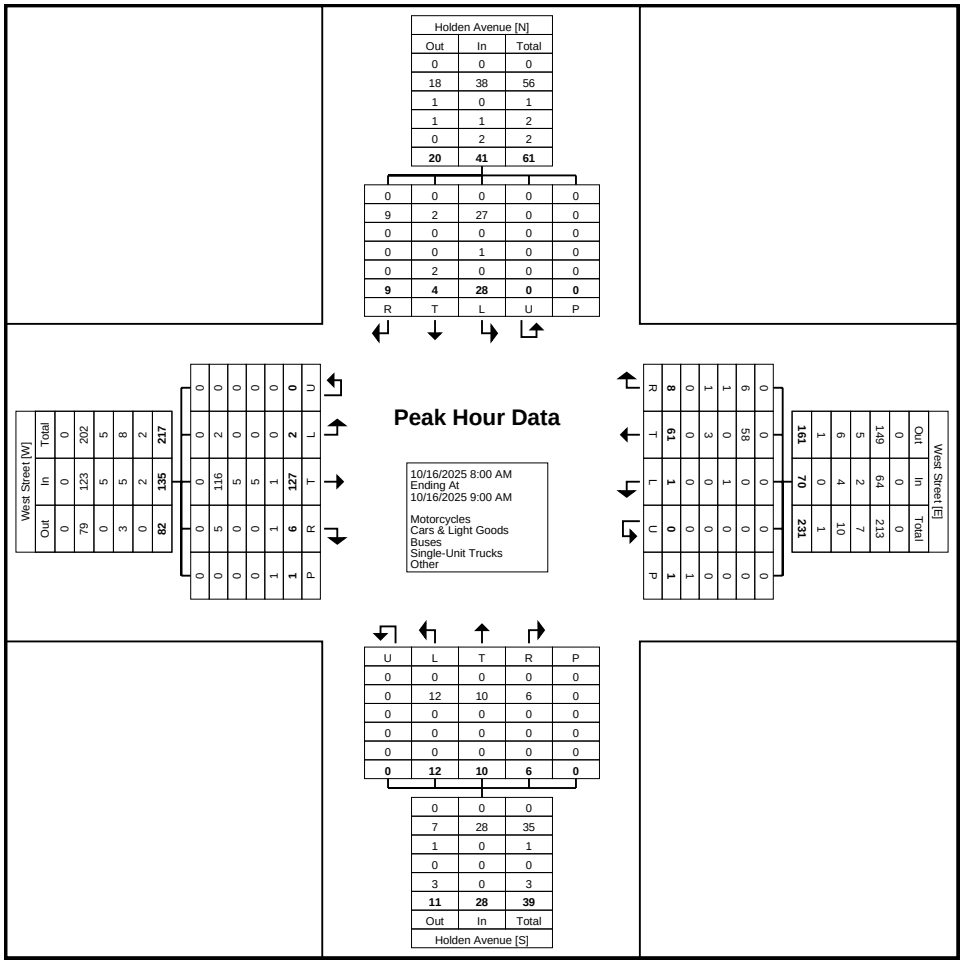
Start Date: 10/16/2025


Turning Movement Peak Hour Data Plot (8:00 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada  N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: West Street & Holden Avenue
Site Code: 250344
Start Date: 10/16/2025

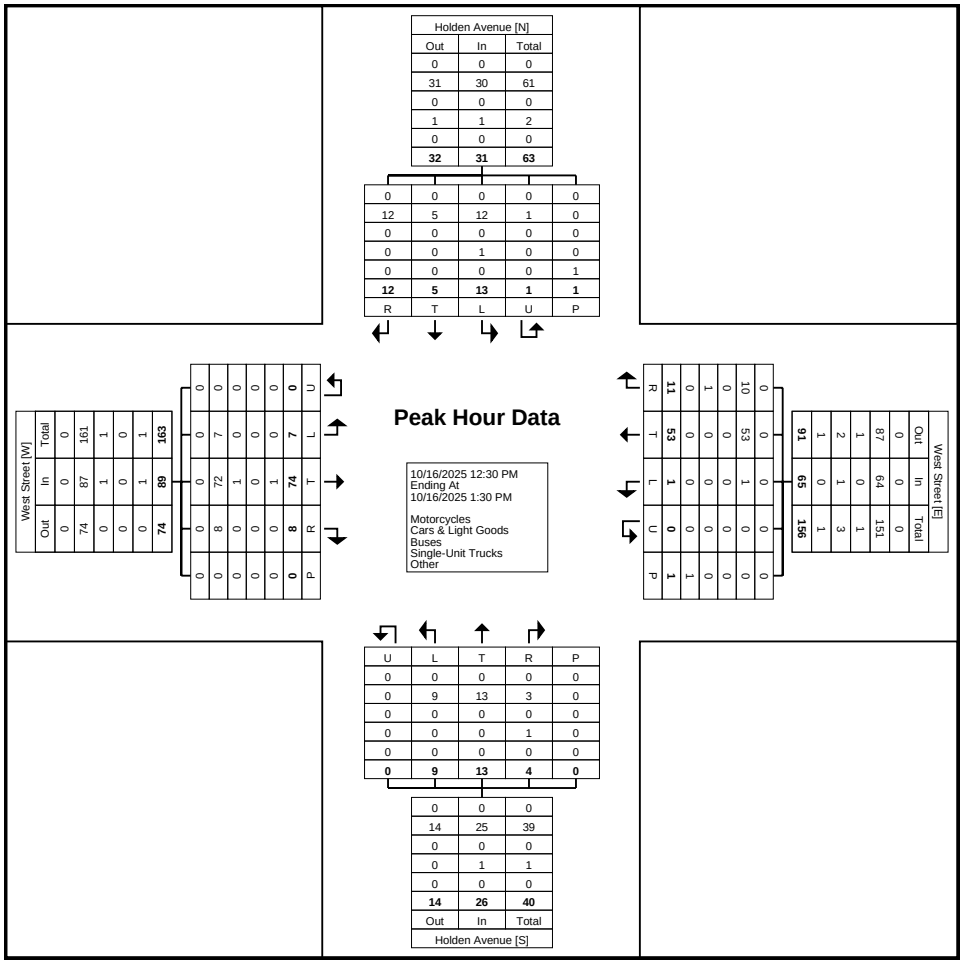

# Turning Movement Peak Hour Data (12:30 PM)

| Start Time | West Street Eastbound | | | | | | West Street Westbound | | | | | | Holden Avenue Northbound | | | | | | Holden Avenue Southbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 12:30 PM | 1 | 20 | 1 | 0 | 0 | 22 | 1 | 16 | 1 | 0 | 0 | 18 | 1 | 1 | 0 | 0 | 0 | 2 | 3 | 1 | 0 | 0 | 0 | 4 | 46 |
| 12:45 PM | 2 | 19 | 4 | 0 | 0 | 25 | 0 | 14 | 1 | 0 | 1 | 15 | 5 | 2 | 0 | 0 | 0 | 7 | 3 | 2 | 3 | 0 | 1 | 8 | 55 |
| 1:00 PM | 2 | 18 | 2 | 0 | 0 | 22 | 0 | 11 | 6 | 0 | 0 | 17 | 2 | 6 | 2 | 0 | 0 | 10 | 3 | 2 | 4 | 1 | 0 | 10 | 59 |
| 1:15 PM | 2 | 17 | 1 | 0 | 0 | 20 | 0 | 12 | 3 | 0 | 0 | 15 | 1 | 4 | 2 | 0 | 0 | 7 | 4 | 0 | 5 | 0 | 0 | 9 | 51 |
| Total | 7 | 74 | 8 | 0 | 0 | 89 | 1 | 53 | 11 | 0 | 1 | 65 | 9 | 13 | 4 | 0 | 0 | 26 | 13 | 5 | 12 | 1 | 1 | 31 | 211 |
| Approach % | 7.9 | 83.1 | 9.0 | 0.0 | - | - | 1.5 | 81.5 | 16.9 | 0.0 | - | - | 34.6 | 50.0 | 15.4 | 0.0 | - | - | 41.9 | 16.1 | 38.7 | 3.2 | - | - | - |
| Total % | 3.3 | 35.1 | 3.8 | 0.0 | - | 42.2 | 0.5 | 25.1 | 5.2 | 0.0 | - | 30.8 | 4.3 | 6.2 | 1.9 | 0.0 | - | 12.3 | 6.2 | 2.4 | 5.7 | 0.5 | - | 14.7 | - |
| PHF | 0.875 | 0.925 | 0.500 | 0.000 | - | 0.890 | 0.250 | 0.828 | 0.458 | 0.000 | - | 0.903 | 0.450 | 0.542 | 0.500 | 0.000 | - | 0.650 | 0.813 | 0.625 | 0.600 | 0.250 | - | 0.775 | 0.894 |
| Motorcycles | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Motorcycles | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 |
| Cars & Light Goods | 7 | 72 | 8 | 0 | - | 87 | 1 | 53 | 10 | 0 | - | 64 | 9 | 13 | 3 | 0 | - | 25 | 12 | 5 | 12 | 1 | - | 30 | 206 |
| % Cars & Light Goods | 100.0 | 97.3 | 100.0 | - | - | 97.8 | 100.0 | 100.0 | 90.9 | - | - | 98.5 | 100.0 | 100.0 | 75.0 | - | - | 96.2 | 92.3 | 100.0 | 100.0 | 100.0 | - | 96.8 | 97.6 |
| Buses | 0 | 1 | 0 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 1 |
| % Buses | 0.0 | 1.4 | 0.0 | - | - | 1.1 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.5 |
| Single-Unit Trucks | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 1 | 0 | - | 1 | 0 | 0 | 1 | 0 | - | 1 | 1 | 0 | 0 | 0 | - | 1 | 3 |
| % Single-Unit Trucks | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 9.1 | - | - | 1.5 | 0.0 | 0.0 | 25.0 | - | - | 3.8 | 7.7 | 0.0 | 0.0 | 0.0 | - | 3.2 | 1.4 |
| Articulated Trucks | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Articulated Trucks | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 |
| Bicycles on Road | 0 | 1 | 0 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 1 |
| % Bicycles on Road | 0.0 | 1.4 | 0.0 | - | - | 1.1 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.5 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 1 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - | - | - | - | - | - | - | - | - | - | 100.0 | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 1 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | 100.0 | - | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - |

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada  N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: West Street & Holden Avenue
Site Code: 250344
Start Date: 10/16/2025


Turning Movement Peak Hour Data Plot (12:30 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada  N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: West Street & Holden Avenue
Site Code: 250344
Start Date: 10/16/2025


# Turning Movement Peak Hour Data (3:30 PM)

| Start Time | West Street Eastbound | | | | | | West Street Westbound | | | | | | Holden Avenue Northbound | | | | | | Holden Avenue Southbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 3:30 PM | 1 | 25 | 1 | 0 | 0 | 27 | 0 | 30 | 10 | 0 | 1 | 40 | 7 | 3 | 1 | 0 | 0 | 11 | 0 | 4 | 2 | 0 | 0 | 6 | 84 |
| 3:45 PM | 3 | 30 | 5 | 0 | 0 | 38 | 0 | 32 | 5 | 0 | 0 | 37 | 3 | 3 | 2 | 0 | 0 | 8 | 4 | 3 | 4 | 0 | 0 | 11 | 94 |
| 4:00 PM | 6 | 28 | 6 | 0 | 0 | 40 | 0 | 31 | 5 | 0 | 1 | 36 | 1 | 3 | 0 | 0 | 0 | 4 | 5 | 4 | 7 | 0 | 0 | 16 | 96 |
| 4:15 PM | 3 | 27 | 2 | 0 | 0 | 32 | 0 | 30 | 6 | 0 | 1 | 36 | 1 | 1 | 1 | 0 | 0 | 3 | 5 | 4 | 4 | 0 | 2 | 13 | 84 |
| Total | 13 | 110 | 14 | 0 | 0 | 137 | 0 | 123 | 26 | 0 | 3 | 149 | 12 | 10 | 4 | 0 | 0 | 26 | 14 | 15 | 17 | 0 | 2 | 46 | 358 |
| Approach % | 9.5 | 80.3 | 10.2 | 0.0 | - | - | 0.0 | 82.6 | 17.4 | 0.0 | - | - | 46.2 | 38.5 | 15.4 | 0.0 | - | - | 30.4 | 32.6 | 37.0 | 0.0 | - | - | - |
| Total % | 3.6 | 30.7 | 3.9 | 0.0 | - | 38.3 | 0.0 | 34.4 | 7.3 | 0.0 | - | 41.6 | 3.4 | 2.8 | 1.1 | 0.0 | - | 7.3 | 3.9 | 4.2 | 4.7 | 0.0 | - | 12.8 | - |
| PHF | 0.542 | 0.917 | 0.583 | 0.000 | - | 0.856 | 0.000 | 0.961 | 0.650 | 0.000 | - | 0.931 | 0.429 | 0.833 | 0.500 | 0.000 | - | 0.591 | 0.700 | 0.938 | 0.607 | 0.000 | - | 0.719 | 0.932 |
| Motorcycles | 0 | 1 | 0 | 0 | - | 1 | 0 | 1 | 0 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 2 |
| % Motorcycles | 0.0 | 0.9 | 0.0 | - | - | 0.7 | - | 0.8 | 0.0 | - | - | 0.7 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.6 |
| Cars & Light Goods | 12 | 103 | 14 | 0 | - | 129 | 0 | 115 | 26 | 0 | - | 141 | 12 | 9 | 2 | 0 | - | 23 | 12 | 15 | 16 | 0 | - | 43 | 336 |
| % Cars & Light Goods | 92.3 | 93.6 | 100.0 | - | - | 94.2 | - | 93.5 | 100.0 | - | - | 94.6 | 100.0 | 90.0 | 50.0 | - | - | 88.5 | 85.7 | 100.0 | 94.1 | - | - | 93.5 | 93.9 |
| Buses | 1 | 2 | 0 | 0 | - | 3 | 0 | 3 | 0 | 0 | - | 3 | 0 | 1 | 2 | 0 | - | 3 | 1 | 0 | 1 | 0 | - | 2 | 11 |
| % Buses | 7.7 | 1.8 | 0.0 | - | - | 2.2 | - | 2.4 | 0.0 | - | - | 2.0 | 0.0 | 10.0 | 50.0 | - | - | 11.5 | 7.1 | 0.0 | 5.9 | - | - | 4.3 | 3.1 |
| Single-Unit Trucks | 0 | 4 | 0 | 0 | - | 4 | 0 | 4 | 0 | 0 | - | 4 | 0 | 0 | 0 | 0 | - | 0 | 1 | 0 | 0 | 0 | - | 1 | 9 |
| % Single-Unit Trucks | 0.0 | 3.6 | 0.0 | - | - | 2.9 | - | 3.3 | 0.0 | - | - | 2.7 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 7.1 | 0.0 | 0.0 | - | - | 2.2 | 2.5 |
| Articulated Trucks | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Articulated Trucks | 0.0 | 0.0 | 0.0 | - | - | 0.0 | - | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Bicycles on Road | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Bicycles on Road | 0.0 | 0.0 | 0.0 | - | - | 0.0 | - | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 2 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - | - | - | - | - | - | - | - | - | - | 100.0 | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 3 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | 100.0 | - | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - |

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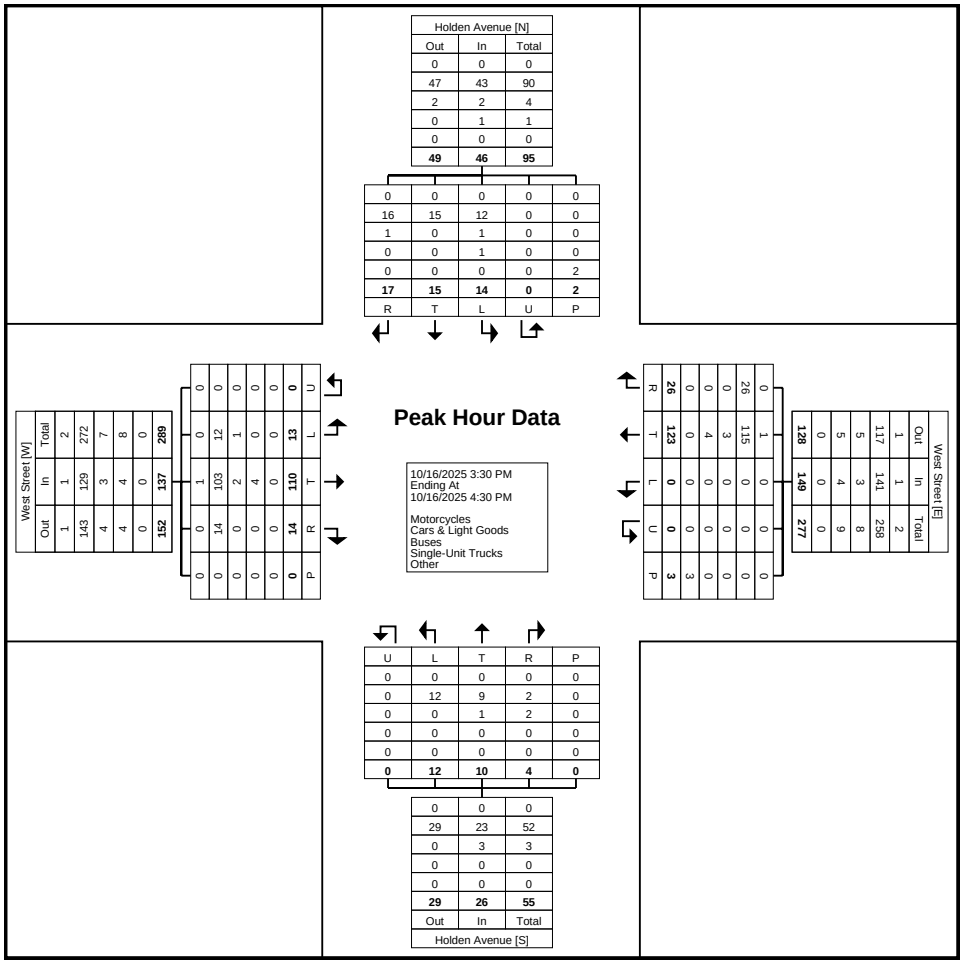



Turning Movement Peak Hour Data Plot (3:30 PM)

# Appendix B

## Signal Timing Data

# Norfolk County
# Controller Timing Sheet

**Location:** West Street and Hillcrest Road, Hillcrest

**Designated Main Street:** Hillcrest Road **Intersection ID No.** 24

**Mode of Control:** Fixed **Recorded by:** Paradigm - JC

### 1-1-1. PHASE RING SEQUENCE AND ASSIGNMENT

| CONTROLLER SEQUENCE | | [1] | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SEQUENCE COMMANDS | | | | | . | HW ALT SEQ ENA. | | | | | | | |
| **PHASE** | | **1** | **2** | | **3** | **4** | | **5** | **6** | | **7** | **8** | |
| BC | B | - | - | B | - | - | B | - | - | B | - | - | B |
| R1 | | 1 | 2 | | 3 | 4 | | 9 | 10 | | 13 | 14 | |
| R2 | | 5 | 6 | | 7 | 8 | | 11 | 12 | | 15 | 16 | |

### 1-1-3. BACKUP PREVENT PHASES

| TMG/BKUP | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | X | | | | | | | | | | | |
| 2 | | X | | | | | | | | | | |
| 3 | | | X | | | | | | | | | |
| 4 | | | | X | | | | | | | | |
| 5 | | | | | X | | | | | | | |
| 6 | | | | | | X | | | | | | |
| 7 | | | | | | | X | | | | | |
| 8 | | | | | | | | X | | | | |
| 9 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | |

### 1-2. PHASE IN USE/EXCLUSIVE PEDESTRIAN

| **PHASE** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PHASES IN USE | | X | | X | | | | | | | | |
| EXCLUSIVE PED | | | | | | | | | | | | |

### 1-3. LD SWITCH ASSIGN (MMU CHANNEL)

| LOAD SWITCH | PHASE /OVLP | TYPE | DIMMING R | Y | G | D | FLASH PWR | AUT | TGR |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | | | | | | A | | |
| 2 | 2 | | | | | | A | | |
| 3 | 3 | | | | | | A | | |
| 4 | 4 | | | | | | A | | |
| 5 | 5 | | | | | | A | | |
| 6 | 6 | | | | | | A | | |
| 7 | 7 | | | | | | A | | |
| 8 | 8 | | | | | | A | | |
| 9 | 2 | P | | | | | A | | |
| 10 | 4 | P | | | | | A | | |
| 11 | 6 | P | | | | | A | | |
| 12 | 8 | P | | | | | A | | |

### 2-5. START / FLASH DATA

| START UP | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PHASE** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** |
| | | | | | | | | | | | | |
| **OVERLAP** | **A** | **B** | **C** | **D** | **E** | **F** | **G** | **H** | **I** | **J** | **K** | **L** |
| | | | | | | | | | | | | |
| FLASH>MON. | | | | | FL TIME | | | | ALL RED | | | |
| PWR START SEQ. | | | | | | | | | | | | |
| AUTOMATIC FLASH | | | | | | | | | | | | |
| **PHASE** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** |
| ENTRY | | | | | | | | | | | | |
| EXIT | | | | | | | | | | | | |
| **OVERLAP** | **A** | **B** | **C** | **D** | **E** | **F** | **G** | **H** | **I** | **J** | **K** | **L** |
| EXIT | | | | | | | | | | | | |
| FLASH>MON. | | | | EXIT FL | | | | MIN FLASH | | | | |
| MINIMUM RECALL | | | | | CYCLE THROUGH PHASE | | | | | | | |

### 2-1. CONTROLLER TIMING DATA

| TIMING PLAN | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PHASE** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** |
| MIN GRN | | 33 | | 22 | | | | | | | | |
| BK MGRN | | | | | | | | | | | | |
| CS MGRN | | | | | | | | | | | | |
| WALK | | 7 | | 7 | | | | | | | | |
| PED CLR | | 5 | | 5 | | | | | | | | |
| VEH EXT | | | | | | | | | | | | |
| VEH EXT2 | | | | | | | | | | | | |
| DYN MAX | | | | | | | | | | | | |
| DYN STEP | | | | | | | | | | | | |
| MAX 1 | | 35 | | 25 | | | | | | | | |
| MAX 2 | | 40 | | 30 | | | | | | | | |
| MAX 3 | | | | | | | | | | | | |
| YELLOW | | 5.0 | | 5.0 | | | | | | | | |
| RED CLR (TP1) | | 3.0 | | 3.0 | | | | | | | | |
| RED CLR (TP2) | | | | | | | | | | | | |
| RED RVT | | 2 | | 2 | | | | | | | | |

### 2-6-1. CONTROLLER OPTIONS

| PED CLEAR PROTECT | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UNIT RED REVERT | | | | | | | | | | | | |
| **PHASE** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** |
| FLASHING GRN PH | | | | | | | | | | | | |
| NON-ACT I | | X | | | | X | | | | | | |
| NON-ACT II | | | | X | | | | X | | | | |
| DUAL ENTRY | | X | | X | | X | | X | | | | |
| COND SERVICE | X | | X | | X | | X | | | | | |
| COND RESERVICE | | | | | | | | | | | | |
| PED RESERVICE | | | | | | | | | | | | |
| REST IN WALK | | | | | | | | | | | | |
| FLASHING WALK | | | | | | | | | | | | |
| PED CLR > YELL | | | | | | | | | | | | |
| PED CLE > RED | | | | | | | | | | | | |
| IG + VEH EXT | | | | | | | | | | | | |

### 2-8. CONTROLLER RECALL DATA

| **PHASE** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOCK DET | | | | | | | | | | | | |
| VE RCALL | | X | | X | | | | | | | | |
| PD RCALL | | | | | | | | | | | | |
| MX RCALL | | | | | | | | | | | | |
| SF RCALL | | | | | | | | | | | | |
| NO REST | | | | | | | | | | | | |
| AI CALC | | | | | | | | | | | | |

### Recorded Traffic Signal Timings

| | Main Street | Minor Street |
|---|---|---|
| Vehicle Green Time (Minimum) | 33 | 22 |
| Pedestrian Walk Time (Minimum) | n/a | n/a |
| Pedestrian Clearance Time | 7 | 7 |
| Vehicle Green Extension Time | 5 | 5 |
| Maximum Vehicle Green Time | 35 | 25 |
| Vehicle Yellow Clearance Time | 5 | 5 |
| Vehicle All-Red Clearance Time | 3 | 3 |

# Appendix C

## Existing Conditions Traffic Operations Reports

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 89 | 52 | 44 | 10 | 22 | 60 | 14 | 133 | 8 | 51 | 119 | 34 |
| Future Volume (vph) | 89 | 52 | 44 | 10 | 22 | 60 | 14 | 133 | 8 | 51 | 119 | 34 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 60.0 | | 0.0 | 50.0 | | 0.0 | 60.0 | | 0.0 | 45.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 80.0 | | | 100.0 | | | 80.0 | | | 85.0 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.931 | | | 0.890 | | | 0.992 | | | 0.966 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1671 | 1662 | 0 | 1805 | 1596 | 0 | 1583 | 1598 | 0 | 1671 | 1685 | 0 |
| Flt Permitted | 0.697 | | | 0.687 | | | 0.647 | | | 0.656 | | |
| Satd. Flow (perm) | 1226 | 1662 | 0 | 1305 | 1596 | 0 | 1078 | 1598 | 0 | 1154 | 1685 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 50 | | | 68 | | | 4 | | | 20 | |
| Link Speed (k/h) | | 60 | | | 60 | | | 60 | | | 50 | |
| Link Distance (m) | | 396.4 | | | 1287.4 | | | 344.1 | | | 264.4 | |
| Travel Time (s) | | 23.8 | | | 77.2 | | | 20.6 | | | 19.0 | |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles (%) | 8% | 6% | 7% | 0% | 14% | 3% | 14% | 19% | 0% | 8% | 8% | 12% |
| Adj. Flow (vph) | 101 | 59 | 50 | 11 | 25 | 68 | 16 | 151 | 9 | 58 | 135 | 39 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 101 | 109 | 0 | 11 | 93 | 0 | 16 | 160 | 0 | 58 | 174 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.6 | | | 3.6 | | | 3.6 | | | 3.6 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (k/h) | 25 | | 15 | 25 | | 15 | 25 | | 15 | 25 | | 15 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Minimum Split (s) | 43.0 | 43.0 | | 43.0 | 43.0 | | 33.0 | 33.0 | | 33.0 | 33.0 | |
| Total Split (s) | 43.0 | 43.0 | | 43.0 | 43.0 | | 33.0 | 33.0 | | 33.0 | 33.0 | |
| Total Split (%) | 56.6% | 56.6% | | 56.6% | 56.6% | | 43.4% | 43.4% | | 43.4% | 43.4% | |
| Maximum Green (s) | 35.0 | 35.0 | | 35.0 | 35.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Yellow Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| All-Red Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Act Effct Green (s) | 35.0 | 35.0 | | 35.0 | 35.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Actuated g/C Ratio | 0.46 | 0.46 | | 0.46 | 0.46 | | 0.33 | 0.33 | | 0.33 | 0.33 | |
| v/c Ratio | 0.18 | 0.14 | | 0.02 | 0.12 | | 0.05 | 0.30 | | 0.15 | 0.31 | |
| Control Delay | 13.2 | 7.5 | | 11.4 | 5.2 | | 17.9 | 20.5 | | 19.4 | 18.6 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |

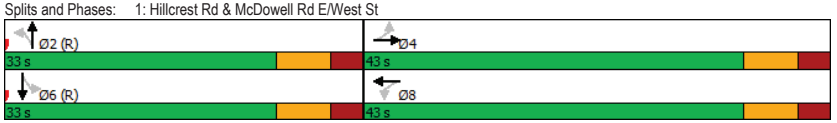




| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay | 13.2 | 7.5 | | 11.4 | 5.2 | | 17.9 | 20.5 | | 19.4 | 18.6 | |
| LOS | B | A | | B | A | | B | C | | B | B | |
| Approach Delay | | 10.2 | | | 5.9 | | | 20.3 | | | 18.8 | |
| Approach LOS | | B | | | A | | | C | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 76 | | | |
| Actuated Cycle Length: 76 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 80 | | | |
| Control Type: Pretimed | | | |
| Maximum v/c Ratio: 0.31 | | | |
| Intersection Signal Delay: 14.8 | | Intersection LOS: B | |
| Intersection Capacity Utilization 84.9% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Hillcrest Rd & McDowell Rd E/West St



## Queues
### 1: Hillcrest Rd & McDowell Rd E/West St

Existing: AM Peak Hour

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 101 | 109 | 11 | 93 | 16 | 160 | 58 | 174 |
| v/c Ratio | 0.18 | 0.14 | 0.02 | 0.12 | 0.05 | 0.30 | 0.15 | 0.31 |
| Control Delay | 13.2 | 7.5 | 11.4 | 5.2 | 17.9 | 20.5 | 19.4 | 18.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 13.2 | 7.5 | 11.4 | 5.2 | 17.9 | 20.5 | 19.4 | 18.6 |
| Queue Length 50th (m) | 8.6 | 4.8 | 0.9 | 2.0 | 1.6 | 17.3 | 6.1 | 16.9 |
| Queue Length 95th (m) | 17.4 | 12.9 | 3.5 | 9.2 | 5.7 | 31.5 | 14.3 | 31.5 |
| Internal Link Dist (m) | | 372.4 | | 1263.4 | | 320.1 | | 240.4 |
| Turn Bay Length (m) | 60.0 | | 50.0 | | 60.0 | | 45.0 | |
| Base Capacity (vph) | 564 | 792 | 600 | 771 | 354 | 528 | 379 | 567 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.18 | 0.14 | 0.02 | 0.12 | 0.05 | 0.30 | 0.15 | 0.31 |

| Intersection Summary |
|---|



## HCM 6th Signalized Intersection Summary
### 1: Hillcrest Rd & McDowell Rd E/West St

Existing: AM Peak Hour

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 89 | 52 | 44 | 10 | 22 | 60 | 14 | 133 | 8 | 51 | 119 | 34 |
| Future Volume (veh/h) | 89 | 52 | 44 | 10 | 22 | 60 | 14 | 133 | 8 | 51 | 119 | 34 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1781 | 1811 | 1796 | 1900 | 1693 | 1856 | 1693 | 1618 | 1900 | 1781 | 1781 | 1722 |
| Adj Flow Rate, veh/h | 101 | 59 | 50 | 11 | 25 | 68 | 16 | 151 | 9 | 58 | 135 | 39 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Percent Heavy Veh, % | 8 | 6 | 7 | 0 | 14 | 3 | 14 | 19 | 0 | 8 | 8 | 12 |
| Cap, veh/h | 622 | 417 | 353 | 647 | 185 | 504 | 372 | 497 | 30 | 392 | 437 | 126 |
| Arrive On Green | 0.46 | 0.46 | 0.46 | 0.46 | 0.46 | 0.46 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 |
| Sat Flow, veh/h | 1241 | 906 | 767 | 1305 | 402 | 1094 | 1096 | 1512 | 90 | 1168 | 1329 | 384 |
| Grp Volume(v), veh/h | 101 | 0 | 109 | 11 | 0 | 93 | 16 | 0 | 160 | 58 | 0 | 174 |
| Grp Sat Flow(s),veh/h/ln | 1241 | 0 | 1673 | 1305 | 0 | 1496 | 1096 | 0 | 1602 | 1168 | 0 | 1712 |
| Q Serve(g_s), s | 3.9 | 0.0 | 2.9 | 0.4 | 0.0 | 2.7 | 0.8 | 0.0 | 5.7 | 3.0 | 0.0 | 5.8 |
| Cycle Q Clear(g_c), s | 6.6 | 0.0 | 2.9 | 3.2 | 0.0 | 2.7 | 6.6 | 0.0 | 5.7 | 8.6 | 0.0 | 5.8 |
| Prop In Lane | 1.00 | | 0.46 | 1.00 | | 0.73 | 1.00 | | 0.06 | 1.00 | | 0.22 |
| Lane Grp Cap(c), veh/h | 622 | 0 | 770 | 647 | 0 | 689 | 372 | 0 | 527 | 392 | 0 | 563 |
| V/C Ratio(X) | 0.16 | 0.00 | 0.14 | 0.02 | 0.00 | 0.14 | 0.04 | 0.00 | 0.30 | 0.15 | 0.00 | 0.31 |
| Avail Cap(c_a), veh/h | 622 | 0 | 770 | 647 | 0 | 689 | 372 | 0 | 527 | 392 | 0 | 563 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 13.7 | 0.0 | 11.8 | 12.8 | 0.0 | 11.8 | 21.5 | 0.0 | 19.0 | 22.2 | 0.0 | 19.0 |
| Incr Delay (d2), s/veh | 0.6 | 0.0 | 0.4 | 0.0 | 0.0 | 0.4 | 0.2 | 0.0 | 1.5 | 0.8 | 0.0 | 1.4 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 0.0 | 0.1 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 | 0.7 | 0.4 | 0.0 | 0.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 14.2 | 0.0 | 12.2 | 12.8 | 0.0 | 12.2 | 21.7 | 0.0 | 20.5 | 23.0 | 0.0 | 20.5 |
| LnGrp LOS | B | A | B | B | A | B | C | A | C | C | A | C |
| Approach Vol, veh/h | | 210 | | | 104 | | | 176 | | | 232 | |
| Approach Delay, s/veh | | 13.2 | | | 12.3 | | | 20.6 | | | 21.1 | |
| Approach LOS | | B | | | B | | | C | | | C | |

| Timer - Assigned Phs | | 2 | | 4 | | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | | 33.0 | | 43.0 | | 33.0 | | 43.0 | | | | |
| Change Period (Y+Rc), s | | 8.0 | | 8.0 | | 8.0 | | 8.0 | | | | |
| Max Green Setting (Gmax), s | | 25.0 | | 35.0 | | 25.0 | | 35.0 | | | | |
| Max Q Clear Time (g_c+I1), s | | 8.6 | | 8.6 | | 10.6 | | 5.2 | | | | |
| Green Ext Time (p_c), s | | 0.9 | | 1.2 | | 1.2 | | 0.7 | | | | |

| Intersection Summary | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HCM 6th Ctrl Delay | | | 17.4 | | | | | | | | | |
| HCM 6th LOS | | | B | | | | | | | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 2 | 127 | 6 | 1 | 61 | 8 | 12 | 10 | 6 | 28 | 4 | 9 |
| Future Volume (vph) | 2 | 127 | 6 | 1 | 61 | 8 | 12 | 10 | 6 | 28 | 4 | 9 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 20.0 | | 0.0 | 20.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 30.0 | | | 30.0 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | | | | | | | |
| Frt | | 0.994 | | | 0.982 | | | 0.973 | | | 0.969 | |
| Flt Protected | 0.950 | | | 0.950 | | | | 0.979 | | | 0.967 | |
| Satd. Flow (prot) | 1805 | 1727 | 0 | 902 | 1737 | 0 | 0 | 1810 | 0 | 0 | 1660 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | | 0.979 | | | 0.967 | |
| Satd. Flow (perm) | 1805 | 1727 | 0 | 902 | 1737 | 0 | 0 | 1810 | 0 | 0 | 1660 | 0 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 1287.4 | | | 348.1 | | | 122.5 | | | 227.1 | |
| Travel Time (s) | | 92.7 | | | 25.1 | | | 8.8 | | | 16.4 | |
| Confl. Peds. (#/hr) | | | | | | | 1 | | 1 | 1 | | 1 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Heavy Vehicles (%) | 0% | 9% | 17% | 100% | 5% | 25% | 0% | 0% | 0% | 4% | 50% | 0% |
| Adj. Flow (vph) | 2 | 137 | 6 | 1 | 66 | 9 | 13 | 11 | 6 | 30 | 4 | 10 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 2 | 143 | 0 | 1 | 75 | 0 | 0 | 30 | 0 | 0 | 44 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.6 | | | 3.6 | | | 0.0 | | | 0.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (k/h) | 25 | | 15 | 25 | | 15 | 25 | | 15 | 25 | | 15 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 17.7% | ICU Level of Service A | |
| Analysis Period (min) | 15 | | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 2.6 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 2 | 127 | 6 | 1 | 61 | 8 | 12 | 10 | 6 | 28 | 4 | 9 |
| Future Vol, veh/h | 2 | 127 | 6 | 1 | 61 | 8 | 12 | 10 | 6 | 28 | 4 | 9 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 20 | - | - | 20 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 |
| Heavy Vehicles, % | 0 | 9 | 17 | 100 | 5 | 25 | 0 | 0 | 0 | 4 | 50 | 0 |
| Mvmt Flow | 2 | 137 | 6 | 1 | 66 | 9 | 13 | 11 | 6 | 30 | 4 | 10 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 75 | 0 | 0 | 143 | 0 | 0 | 225 | 221 | 141 | 227 | 220 | 72 |
| Stage 1 | - | - | - | - | - | - | 144 | 144 | - | 73 | 73 | - |
| Stage 2 | - | - | - | - | - | - | 81 | 77 | - | 154 | 147 | - |
| Critical Hdwy | 4.1 | - | - | 5.1 | - | - | 7.1 | 6.5 | 6.2 | 7.14 | 7 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.1 | 5.5 | - | 6.14 | 6 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.1 | 5.5 | - | 6.14 | 6 | - |
| Follow-up Hdwy | 2.2 | - | - | 3.1 | - | - | 3.5 | 4 | 3.3 | 3.536 | 4.45 | 3.3 |
| Pot Cap-1 Maneuver | 1537 | - | - | 1008 | - | - | 735 | 681 | 912 | 724 | 602 | 996 |
| Stage 1 | - | - | - | - | - | - | 864 | 782 | - | 932 | 749 | - |
| Stage 2 | - | - | - | - | - | - | 932 | 835 | - | 844 | 692 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1537 | - | - | 1008 | - | - | 722 | 680 | 911 | 708 | 601 | 995 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 722 | 680 | - | 708 | 601 | - |
| Stage 1 | - | - | - | - | - | - | 863 | 781 | - | 931 | 748 | - |
| Stage 2 | - | - | - | - | - | - | 916 | 834 | - | 825 | 691 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.1 | 0.1 | 10.1 | 10.2 |
| HCM LOS | | | B | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 739 | 1537 | - | - | 1008 | - | - | 742 |
| HCM Lane V/C Ratio | 0.041 | 0.001 | - | - | 0.001 | - | - | 0.059 |
| HCM Control Delay (s) | 10.1 | 7.3 | - | - | 8.6 | - | - | 10.2 |
| HCM Lane LOS | B | A | - | - | A | - | - | B |
| HCM 95th %tile Q(veh) | 0.1 | 0 | - | - | 0 | - | - | 0.2 |

## Lanes, Volumes, Timings
## 1: Hillcrest Rd & McDowell Rd E/West St

Existing: PM Peak Hour

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 60 | 73 | 17 | 12 | 73 | 67 | 28 | 127 | 12 | 52 | 136 | 94 |
| Future Volume (vph) | 60 | 73 | 17 | 12 | 73 | 67 | 28 | 127 | 12 | 52 | 136 | 94 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 60.0 | | 0.0 | 50.0 | | 0.0 | 60.0 | | 0.0 | 45.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 80.0 | | | 100.0 | | | 80.0 | | | 85.0 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.972 | | | 0.929 | | | 0.987 | | | 0.939 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1570 | 1714 | 0 | 1805 | 1675 | 0 | 1687 | 1825 | 0 | 1703 | 1655 | 0 |
| Flt Permitted | 0.662 | | | 0.695 | | | 0.606 | | | 0.663 | | |
| Satd. Flow (perm) | 1094 | 1714 | 0 | 1320 | 1675 | 0 | 1076 | 1825 | 0 | 1188 | 1655 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 18 | | | 71 | | | 7 | | | 49 | |
| Link Speed (k/h) | | 60 | | | 60 | | | 60 | | | 50 | |
| Link Distance (m) | | 396.4 | | | 1287.4 | | | 344.1 | | | 264.4 | |
| Travel Time (s) | | 23.8 | | | 77.2 | | | 20.6 | | | 19.0 | |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles (%) | 15% | 4% | 24% | 0% | 3% | 8% | 7% | 3% | 0% | 6% | 9% | 6% |
| Adj. Flow (vph) | 64 | 78 | 18 | 13 | 78 | 71 | 30 | 135 | 13 | 55 | 145 | 100 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 64 | 96 | 0 | 13 | 149 | 0 | 30 | 148 | 0 | 55 | 245 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.6 | | | 3.6 | | | 3.6 | | | 3.6 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (k/h) | 25 | | 15 | 25 | | 15 | 25 | | 15 | 25 | | 15 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Minimum Split (s) | 43.0 | 43.0 | | 43.0 | 43.0 | | 33.0 | 33.0 | | 33.0 | 33.0 | |
| Total Split (s) | 43.0 | 43.0 | | 43.0 | 43.0 | | 33.0 | 33.0 | | 33.0 | 33.0 | |
| Total Split (%) | 56.6% | 56.6% | | 56.6% | 56.6% | | 43.4% | 43.4% | | 43.4% | 43.4% | |
| Maximum Green (s) | 35.0 | 35.0 | | 35.0 | 35.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Yellow Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| All-Red Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Act Effct Green (s) | 35.0 | 35.0 | | 35.0 | 35.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Actuated g/C Ratio | 0.46 | 0.46 | | 0.46 | 0.46 | | 0.33 | 0.33 | | 0.33 | 0.33 | |
| v/c Ratio | 0.13 | 0.12 | | 0.02 | 0.18 | | 0.08 | 0.24 | | 0.14 | 0.42 | |
| Control Delay | 12.7 | 10.2 | | 11.4 | 7.3 | | 18.5 | 19.0 | | 19.2 | 18.4 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |



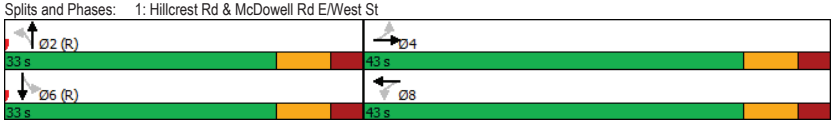
## Lanes, Volumes, Timings
## 1: Hillcrest Rd & McDowell Rd E/West St

Existing: PM Peak Hour

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay | 12.7 | 10.2 | | 11.4 | 7.3 | | 18.5 | 19.0 | | 19.2 | 18.4 | |
| LOS | B | B | | B | A | | B | B | | B | B | |
| Approach Delay | | 11.2 | | | 7.6 | | | 19.0 | | | 18.6 | |
| Approach LOS | | B | | | A | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 76 | | | |
| Actuated Cycle Length: 76 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 80 | | | |
| Control Type: Pretimed | | | |
| Maximum v/c Ratio: 0.42 | | | |
| Intersection Signal Delay: 15.0 | | Intersection LOS: B | |
| Intersection Capacity Utilization 106.4% | | ICU Level of Service G | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Hillcrest Rd & McDowell Rd E/West St



## Queues
### 1: Hillcrest Rd & McDowell Rd E/West St

Existing: PM Peak Hour

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 64 | 96 | 13 | 149 | 30 | 148 | 55 | 245 |
| v/c Ratio | 0.13 | 0.12 | 0.02 | 0.18 | 0.08 | 0.24 | 0.14 | 0.42 |
| Control Delay | 12.7 | 10.2 | 11.4 | 7.3 | 18.5 | 19.0 | 19.2 | 18.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 12.7 | 10.2 | 11.4 | 7.3 | 18.5 | 19.0 | 19.2 | 18.4 |
| Queue Length 50th (m) | 5.3 | 6.4 | 1.0 | 6.4 | 3.1 | 15.3 | 5.8 | 22.2 |
| Queue Length 95th (m) | 12.5 | 14.5 | 4.0 | 16.4 | 9.0 | 29.0 | 14.0 | 42.1 |
| Internal Link Dist (m) | | 372.4 | | 1263.4 | | 320.1 | | 240.4 |
| Turn Bay Length (m) | 60.0 | | 50.0 | | 60.0 | | 45.0 | |
| Base Capacity (vph) | 503 | 799 | 607 | 809 | 353 | 605 | 390 | 577 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.13 | 0.12 | 0.02 | 0.18 | 0.08 | 0.24 | 0.14 | 0.42 |

| Intersection Summary |
|---|



## HCM 6th Signalized Intersection Summary
### 1: Hillcrest Rd & McDowell Rd E/West St

Existing: PM Peak Hour

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 60 | 73 | 17 | 12 | 73 | 67 | 28 | 127 | 12 | 52 | 136 | 94 |
| Future Volume (veh/h) | 60 | 73 | 17 | 12 | 73 | 67 | 28 | 127 | 12 | 52 | 136 | 94 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1678 | 1841 | 1544 | 1900 | 1856 | 1781 | 1796 | 1856 | 1900 | 1811 | 1767 | 1811 |
| Adj Flow Rate, veh/h | 64 | 78 | 18 | 13 | 78 | 71 | 30 | 135 | 13 | 55 | 145 | 100 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 15 | 4 | 24 | 0 | 3 | 8 | 7 | 3 | 0 | 6 | 9 | 6 |
| Cap, veh/h | 549 | 666 | 154 | 662 | 412 | 375 | 325 | 548 | 53 | 419 | 320 | 221 |
| Arrive On Green | 0.46 | 0.46 | 0.46 | 0.46 | 0.46 | 0.46 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 |
| Sat Flow, veh/h | 1111 | 1447 | 334 | 1320 | 895 | 814 | 1090 | 1666 | 160 | 1200 | 974 | 672 |
| Grp Volume(v), veh/h | 64 | 0 | 96 | 13 | 0 | 149 | 30 | 0 | 148 | 55 | 0 | 245 |
| Grp Sat Flow(s),veh/h/ln | 1111 | 0 | 1781 | 1320 | 0 | 1709 | 1090 | 0 | 1827 | 1200 | 0 | 1646 |
| Q Serve(g_s), s | 2.7 | 0.0 | 2.3 | 0.4 | 0.0 | 3.9 | 1.7 | 0.0 | 4.5 | 2.7 | 0.0 | 8.9 |
| Cycle Q Clear(g_c), s | 6.7 | 0.0 | 2.3 | 2.8 | 0.0 | 3.9 | 10.6 | 0.0 | 4.5 | 7.2 | 0.0 | 8.9 |
| Prop In Lane | 1.00 | | 0.19 | 1.00 | | 0.48 | 1.00 | | 0.09 | 1.00 | | 0.41 |
| Lane Grp Cap(c), veh/h | 549 | 0 | 820 | 662 | 0 | 787 | 325 | 0 | 601 | 419 | 0 | 541 |
| V/C Ratio(X) | 0.12 | 0.00 | 0.12 | 0.02 | 0.00 | 0.19 | 0.09 | 0.00 | 0.25 | 0.13 | 0.00 | 0.45 |
| Avail Cap(c_a), veh/h | 549 | 0 | 820 | 662 | 0 | 787 | 325 | 0 | 601 | 419 | 0 | 541 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 14.1 | 0.0 | 11.7 | 12.5 | 0.0 | 12.1 | 24.3 | 0.0 | 18.6 | 21.2 | 0.0 | 20.1 |
| Incr Delay (d2), s/veh | 0.4 | 0.0 | 0.3 | 0.1 | 0.0 | 0.5 | 0.6 | 0.0 | 1.0 | 0.6 | 0.0 | 2.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.1 | 0.2 | 0.0 | 0.6 | 0.4 | 0.0 | 1.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 14.5 | 0.0 | 12.0 | 12.5 | 0.0 | 12.6 | 24.9 | 0.0 | 19.6 | 21.9 | 0.0 | 22.8 |
| LnGrp LOS | B | A | B | B | A | B | C | A | B | C | A | C |
| Approach Vol, veh/h | | 160 | | | 162 | | | 178 | | | 300 | |
| Approach Delay, s/veh | | 13.0 | | | 12.6 | | | 20.5 | | | 22.7 | |
| Approach LOS | | B | | | B | | | C | | | C | |

| Timer - Assigned Phs | | 2 | | 4 | | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | | 33.0 | | 43.0 | | 33.0 | | 43.0 | | | | |
| Change Period (Y+Rc), s | | 8.0 | | 8.0 | | 8.0 | | 8.0 | | | | |
| Max Green Setting (Gmax), s | | 25.0 | | 35.0 | | 25.0 | | 35.0 | | | | |
| Max Q Clear Time (g_c+I1), s | | 12.6 | | 8.7 | | 10.9 | | 5.9 | | | | |
| Green Ext Time (p_c), s | | 0.8 | | 0.9 | | 1.7 | | 1.1 | | | | |

| Intersection Summary | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HCM 6th Ctrl Delay | | | 18.2 | | | | | | | | | |
| HCM 6th LOS | | | B | | | | | | | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 13 | 110 | 14 | 0 | 123 | 26 | 12 | 10 | 4 | 14 | 15 | 17 |
| Future Volume (vph) | 13 | 110 | 14 | 0 | 123 | 26 | 12 | 10 | 4 | 14 | 15 | 17 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 20.0 | | 0.0 | 20.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 30.0 | | | 30.0 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | | | | | | | |
| Frt | | 0.983 | | | 0.974 | | | 0.981 | | | 0.950 | |
| Flt Protected | 0.950 | | | | | | | 0.977 | | | 0.985 | |
| Satd. Flow (prot) | 1671 | 1788 | 0 | 1900 | 1763 | 0 | 0 | 1640 | 0 | 0 | 1670 | 0 |
| Flt Permitted | 0.950 | | | | | | | 0.977 | | | 0.985 | |
| Satd. Flow (perm) | 1671 | 1788 | 0 | 1900 | 1763 | 0 | 0 | 1640 | 0 | 0 | 1670 | 0 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 1287.4 | | | 348.1 | | | 122.5 | | | 227.1 | |
| Travel Time (s) | | 92.7 | | | 25.1 | | | 8.8 | | | 16.4 | |
| Confl. Peds. (#/hr) | 2 | | | | | 2 | | | 3 | 3 | | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Heavy Vehicles (%) | 8% | 5% | 0% | 0% | 6% | 0% | 0% | 10% | 50% | 14% | 0% | 6% |
| Adj. Flow (vph) | 14 | 118 | 15 | 0 | 132 | 28 | 13 | 11 | 4 | 15 | 16 | 18 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 14 | 133 | 0 | 0 | 160 | 0 | 0 | 28 | 0 | 0 | 49 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.6 | | | 3.6 | | | 0.0 | | | 0.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (k/h) | 25 | | 15 | 25 | | 15 | 25 | | 15 | 25 | | 15 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 21.8% | ICU Level of Service A | |
| Analysis Period (min) | 15 | | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 2.4 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 13 | 110 | 14 | 0 | 123 | 26 | 12 | 10 | 4 | 14 | 15 | 17 |
| Future Vol, veh/h | 13 | 110 | 14 | 0 | 123 | 26 | 12 | 10 | 4 | 14 | 15 | 17 |
| Conflicting Peds, #/hr | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 3 | 3 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 20 | - | - | 20 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 |
| Heavy Vehicles, % | 8 | 5 | 0 | 0 | 6 | 0 | 0 | 10 | 50 | 14 | 0 | 6 |
| Mvmt Flow | 14 | 118 | 15 | 0 | 132 | 28 | 13 | 11 | 4 | 15 | 16 | 18 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 162 | 0 | 0 | 133 | 0 | 0 | 317 | 316 | 129 | 312 | 309 | 148 |
| Stage 1 | - | - | - | - | - | - | 154 | 154 | - | 148 | 148 | - |
| Stage 2 | - | - | - | - | - | - | 163 | 162 | - | 164 | 161 | - |
| Critical Hdwy | 4.18 | - | - | 4.1 | - | - | 7.1 | 6.6 | 6.7 | 7.24 | 6.5 | 6.26 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.1 | 5.6 | - | 6.24 | 5.5 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.1 | 5.6 | - | 6.24 | 5.5 | - |
| Follow-up Hdwy | 2.272 | - | - | 2.2 | - | - | 3.5 | 4.09 | 3.75 | 3.626 | 4 | 3.354 |
| Pot Cap-1 Maneuver | 1381 | - | - | 1464 | - | - | 640 | 587 | 807 | 618 | 609 | 888 |
| Stage 1 | - | - | - | - | - | - | 853 | 755 | - | 827 | 779 | - |
| Stage 2 | - | - | - | - | - | - | 844 | 749 | - | 811 | 769 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1379 | - | - | 1464 | - | - | 609 | 580 | 805 | 599 | 602 | 886 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 609 | 580 | - | 599 | 602 | - |
| Stage 1 | - | - | - | - | - | - | 844 | 747 | - | 817 | 777 | - |
| Stage 2 | - | - | - | - | - | - | 809 | 748 | - | 785 | 761 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.7 | 0 | 11.1 | 10.7 |
| HCM LOS | | | B | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 620 | 1379 | - | - | 1464 | - | - | 682 |
| HCM Lane V/C Ratio | 0.045 | 0.01 | - | - | - | - | - | 0.073 |
| HCM Control Delay (s) | 11.1 | 7.6 | - | - | 0 | - | - | 10.7 |
| HCM Lane LOS | B | A | - | - | A | - | - | B |
| HCM 95th %tile Q(veh) | 0.1 | 0 | - | - | 0 | - | - | 0.2 |

# Appendix D

## 2030 Background Traffic Operations Reports

## Lanes, Volumes, Timings
## 1: Hillcrest Rd & McDowell Rd E/West St

2030 Background: AM Peak Hour

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 94 | 55 | 46 | 11 | 23 | 63 | 15 | 140 | 8 | 54 | 125 | 36 |
| Future Volume (vph) | 94 | 55 | 46 | 11 | 23 | 63 | 15 | 140 | 8 | 54 | 125 | 36 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 60.0 | | 0.0 | 50.0 | | 0.0 | 60.0 | | 0.0 | 45.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 80.0 | | | 100.0 | | | 80.0 | | | 85.0 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.932 | | | 0.890 | | | 0.992 | | | 0.966 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1671 | 1663 | 0 | 1805 | 1597 | 0 | 1583 | 1598 | 0 | 1671 | 1685 | 0 |
| Flt Permitted | 0.694 | | | 0.683 | | | 0.642 | | | 0.651 | | |
| Satd. Flow (perm) | 1221 | 1663 | 0 | 1298 | 1597 | 0 | 1070 | 1598 | 0 | 1145 | 1685 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 52 | | | 72 | | | 4 | | | 20 | |
| Link Speed (k/h) | | 60 | | | 60 | | | 60 | | | 50 | |
| Link Distance (m) | | 396.4 | | | 1287.4 | | | 344.1 | | | 264.4 | |
| Travel Time (s) | | 23.8 | | | 77.2 | | | 20.6 | | | 19.0 | |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles (%) | 8% | 6% | 7% | 0% | 14% | 3% | 14% | 19% | 0% | 8% | 8% | 12% |
| Adj. Flow (vph) | 107 | 63 | 52 | 13 | 26 | 72 | 17 | 159 | 9 | 61 | 142 | 41 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 107 | 115 | 0 | 13 | 98 | 0 | 17 | 168 | 0 | 61 | 183 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.6 | | | 3.6 | | | 3.6 | | | 3.6 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (k/h) | 25 | | 15 | 25 | | 15 | 25 | | 15 | 25 | | 15 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Minimum Split (s) | 43.0 | 43.0 | | 43.0 | 43.0 | | 33.0 | 33.0 | | 33.0 | 33.0 | |
| Total Split (s) | 43.0 | 43.0 | | 43.0 | 43.0 | | 33.0 | 33.0 | | 33.0 | 33.0 | |
| Total Split (%) | 56.6% | 56.6% | | 56.6% | 56.6% | | 43.4% | 43.4% | | 43.4% | 43.4% | |
| Maximum Green (s) | 35.0 | 35.0 | | 35.0 | 35.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Yellow Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| All-Red Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Act Effct Green (s) | 35.0 | 35.0 | | 35.0 | 35.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Actuated g/C Ratio | 0.46 | 0.46 | | 0.46 | 0.46 | | 0.33 | 0.33 | | 0.33 | 0.33 | |
| v/c Ratio | 0.19 | 0.15 | | 0.02 | 0.13 | | 0.05 | 0.32 | | 0.16 | 0.32 | |
| Control Delay | 13.3 | 7.6 | | 11.5 | 5.1 | | 18.0 | 20.7 | | 19.6 | 18.9 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |



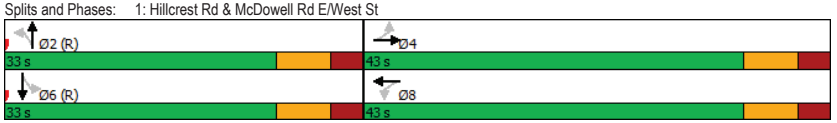
## Lanes, Volumes, Timings
## 1: Hillcrest Rd & McDowell Rd E/West St

2030 Background: AM Peak Hour

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay | 13.3 | 7.6 | | 11.5 | 5.1 | | 18.0 | 20.7 | | 19.6 | 18.9 | |
| LOS | B | A | | B | A | | B | C | | B | B | |
| Approach Delay | | 10.3 | | | 5.9 | | | 20.5 | | | 19.1 | |
| Approach LOS | | B | | | A | | | C | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 76 | | | |
| Actuated Cycle Length: 76 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 80 | | | |
| Control Type: Pretimed | | | |
| Maximum v/c Ratio: 0.32 | | | |
| Intersection Signal Delay: 14.9 | | Intersection LOS: B | |
| Intersection Capacity Utilization 87.4% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Hillcrest Rd & McDowell Rd E/West St



## Queues
### 1: Hillcrest Rd & McDowell Rd E/West St

2030 Background: AM Peak Hour

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 107 | 115 | 13 | 98 | 17 | 168 | 61 | 183 |
| v/c Ratio | 0.19 | 0.15 | 0.02 | 0.13 | 0.05 | 0.32 | 0.16 | 0.32 |
| Control Delay | 13.3 | 7.6 | 11.5 | 5.1 | 18.0 | 20.7 | 19.6 | 18.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 13.3 | 7.6 | 11.5 | 5.1 | 18.0 | 20.7 | 19.6 | 18.9 |
| Queue Length 50th (m) | 9.1 | 5.1 | 1.0 | 2.1 | 1.7 | 18.3 | 6.4 | 18.1 |
| Queue Length 95th (m) | 18.3 | 13.4 | 3.9 | 9.5 | 5.9 | 33.0 | 14.8 | 33.2 |
| Internal Link Dist (m) | | 372.4 | | 1263.4 | | 320.1 | | 240.4 |
| Turn Bay Length (m) | 60.0 | | 50.0 | | 60.0 | | 45.0 | |
| Base Capacity (vph) | 562 | 793 | 597 | 774 | 351 | 528 | 376 | 567 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.19 | 0.15 | 0.02 | 0.13 | 0.05 | 0.32 | 0.16 | 0.32 |

| Intersection Summary |
|---|



## HCM 6th Signalized Intersection Summary
### 1: Hillcrest Rd & McDowell Rd E/West St

2030 Background: AM Peak Hour

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 94 | 55 | 46 | 11 | 23 | 63 | 15 | 140 | 8 | 54 | 125 | 36 |
| Future Volume (veh/h) | 94 | 55 | 46 | 11 | 23 | 63 | 15 | 140 | 8 | 54 | 125 | 36 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1781 | 1811 | 1796 | 1900 | 1693 | 1856 | 1693 | 1618 | 1900 | 1781 | 1781 | 1722 |
| Adj Flow Rate, veh/h | 107 | 62 | 52 | 12 | 26 | 72 | 17 | 159 | 9 | 61 | 142 | 41 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Percent Heavy Veh, % | 8 | 6 | 7 | 0 | 14 | 3 | 14 | 19 | 0 | 8 | 8 | 12 |
| Cap, veh/h | 617 | 419 | 352 | 642 | 183 | 506 | 365 | 499 | 28 | 385 | 437 | 126 |
| Arrive On Green | 0.46 | 0.46 | 0.46 | 0.46 | 0.46 | 0.46 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 |
| Sat Flow, veh/h | 1236 | 910 | 763 | 1299 | 397 | 1098 | 1087 | 1517 | 86 | 1159 | 1329 | 384 |
| Grp Volume(v), veh/h | 107 | 0 | 114 | 12 | 0 | 98 | 17 | 0 | 168 | 61 | 0 | 183 |
| Grp Sat Flow(s),veh/h/ln | 1236 | 0 | 1674 | 1299 | 0 | 1495 | 1087 | 0 | 1603 | 1159 | 0 | 1712 |
| Q Serve(g_s), s | 4.2 | 0.0 | 3.0 | 0.4 | 0.0 | 2.9 | 0.9 | 0.0 | 6.0 | 3.2 | 0.0 | 6.1 |
| Cycle Q Clear(g_c), s | 7.0 | 0.0 | 3.0 | 3.4 | 0.0 | 2.9 | 7.0 | 0.0 | 6.0 | 9.1 | 0.0 | 6.1 |
| Prop In Lane | 1.00 | | 0.46 | 1.00 | | 0.73 | 1.00 | | 0.05 | 1.00 | | 0.22 |
| Lane Grp Cap(c), veh/h | 617 | 0 | 771 | 642 | 0 | 688 | 365 | 0 | 527 | 385 | 0 | 563 |
| V/C Ratio(X) | 0.17 | 0.00 | 0.15 | 0.02 | 0.00 | 0.14 | 0.05 | 0.00 | 0.32 | 0.16 | 0.00 | 0.32 |
| Avail Cap(c_a), veh/h | 617 | 0 | 771 | 642 | 0 | 688 | 365 | 0 | 527 | 385 | 0 | 563 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 13.9 | 0.0 | 11.9 | 12.9 | 0.0 | 11.8 | 21.8 | 0.0 | 19.1 | 22.5 | 0.0 | 19.2 |
| Incr Delay (d2), s/veh | 0.6 | 0.0 | 0.4 | 0.1 | 0.0 | 0.4 | 0.2 | 0.0 | 1.6 | 0.9 | 0.0 | 1.5 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 0.0 | 0.1 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 | 0.8 | 0.4 | 0.0 | 1.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 14.5 | 0.0 | 12.3 | 12.9 | 0.0 | 12.3 | 22.0 | 0.0 | 20.7 | 23.4 | 0.0 | 20.7 |
| LnGrp LOS | B | A | B | B | A | B | C | A | C | C | A | C |
| Approach Vol, veh/h | | 221 | | | 110 | | | 185 | | | 244 | |
| Approach Delay, s/veh | | 13.3 | | | 12.3 | | | 20.8 | | | 21.4 | |
| Approach LOS | | B | | | B | | | C | | | C | |

| Timer - Assigned Phs | | 2 | | 4 | | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | | 33.0 | | 43.0 | | 33.0 | | 43.0 | | | | |
| Change Period (Y+Rc), s | | 8.0 | | 8.0 | | 8.0 | | 8.0 | | | | |
| Max Green Setting (Gmax), s | | 25.0 | | 35.0 | | 25.0 | | 35.0 | | | | |
| Max Q Clear Time (g_c+I1), s | | 9.0 | | 9.0 | | 11.1 | | 5.4 | | | | |
| Green Ext Time (p_c), s | | 1.0 | | 1.3 | | 1.3 | | 0.7 | | | | |

| Intersection Summary | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HCM 6th Ctrl Delay | | | 17.6 | | | | | | | | | |
| HCM 6th LOS | | | B | | | | | | | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 2 | 134 | 6 | 1 | 64 | 8 | 13 | 11 | 6 | 30 | 4 | 9 |
| Future Volume (vph) | 2 | 134 | 6 | 1 | 64 | 8 | 13 | 11 | 6 | 30 | 4 | 9 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 20.0 | | 0.0 | 20.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 30.0 | | | 30.0 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | | | | | | | |
| Frt | | 0.994 | | | 0.983 | | | 0.975 | | | 0.971 | |
| Flt Protected | 0.950 | | | 0.950 | | | | 0.979 | | | 0.966 | |
| Satd. Flow (prot) | 1805 | 1728 | 0 | 902 | 1741 | 0 | 0 | 1814 | 0 | 0 | 1664 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | | 0.979 | | | 0.966 | |
| Satd. Flow (perm) | 1805 | 1728 | 0 | 902 | 1741 | 0 | 0 | 1814 | 0 | 0 | 1664 | 0 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 1287.4 | | | 348.1 | | | 122.5 | | | 227.1 | |
| Travel Time (s) | | 92.7 | | | 25.1 | | | 8.8 | | | 16.4 | |
| Confl. Peds. (#/hr) | | | | | | | 1 | | 1 | 1 | | 1 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Heavy Vehicles (%) | 0% | 9% | 17% | 100% | 5% | 25% | 0% | 0% | 0% | 4% | 50% | 0% |
| Adj. Flow (vph) | 2 | 144 | 6 | 1 | 69 | 9 | 14 | 12 | 6 | 32 | 4 | 10 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 2 | 150 | 0 | 1 | 78 | 0 | 0 | 32 | 0 | 0 | 46 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.6 | | | 3.6 | | | 0.0 | | | 0.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (k/h) | 25 | | 15 | 25 | | 15 | 25 | | 15 | 25 | | 15 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 18.3% | ICU Level of Service A | |
| Analysis Period (min) | 15 | | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 2.7 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 2 | 134 | 6 | 1 | 64 | 8 | 13 | 11 | 6 | 30 | 4 | 9 |
| Future Vol, veh/h | 2 | 134 | 6 | 1 | 64 | 8 | 13 | 11 | 6 | 30 | 4 | 9 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 20 | - | - | 20 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 |
| Heavy Vehicles, % | 0 | 9 | 17 | 100 | 5 | 25 | 0 | 0 | 0 | 4 | 50 | 0 |
| Mvmt Flow | 2 | 144 | 6 | 1 | 69 | 9 | 14 | 12 | 6 | 32 | 4 | 10 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 78 | 0 | 0 | 150 | 0 | 0 | 235 | 231 | 148 | 237 | 230 | 75 |
| Stage 1 | - | - | - | - | - | - | 151 | 151 | - | 76 | 76 | - |
| Stage 2 | - | - | - | - | - | - | 84 | 80 | - | 161 | 154 | - |
| Critical Hdwy | 4.1 | - | - | 5.1 | - | - | 7.1 | 6.5 | 6.2 | 7.14 | 7 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.1 | 5.5 | - | 6.14 | 6 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.1 | 5.5 | - | 6.14 | 6 | - |
| Follow-up Hdwy | 2.2 | - | - | 3.1 | - | - | 3.5 | 4 | 3.3 | 3.536 | 4.45 | 3.3 |
| Pot Cap-1 Maneuver | 1533 | - | - | 1001 | - | - | 724 | 672 | 904 | 713 | 594 | 992 |
| Stage 1 | - | - | - | - | - | - | 856 | 776 | - | 928 | 747 | - |
| Stage 2 | - | - | - | - | - | - | 929 | 832 | - | 836 | 687 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1533 | - | - | 1001 | - | - | 711 | 671 | 903 | 697 | 593 | 991 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 711 | 671 | - | 697 | 593 | - |
| Stage 1 | - | - | - | - | - | - | 855 | 775 | - | 927 | 746 | - |
| Stage 2 | - | - | - | - | - | - | 913 | 831 | - | 816 | 686 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.1 | 0.1 | 10.2 | 10.3 |
| HCM LOS | | | B | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 726 | 1533 | - | - | 1001 | - | - | 730 |
| HCM Lane V/C Ratio | 0.044 | 0.001 | - | - | 0.001 | - | - | 0.063 |
| HCM Control Delay (s) | 10.2 | 7.4 | - | - | 8.6 | - | - | 10.3 |
| HCM Lane LOS | B | A | - | - | A | - | - | B |
| HCM 95th %tile Q(veh) | 0.1 | 0 | - | - | 0 | - | - | 0.2 |

## Lanes, Volumes, Timings
## 1: Hillcrest Rd & McDowell Rd E/West St

2030 Background: PM Peak Hour

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 63 | 77 | 18 | 13 | 77 | 71 | 30 | 134 | 13 | 55 | 143 | 99 |
| Future Volume (vph) | 63 | 77 | 18 | 13 | 77 | 71 | 30 | 134 | 13 | 55 | 143 | 99 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 60.0 | | 0.0 | 50.0 | | 0.0 | 60.0 | | 0.0 | 45.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 80.0 | | | 100.0 | | | 80.0 | | | 85.0 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.972 | | | 0.928 | | | 0.987 | | | 0.939 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1570 | 1714 | 0 | 1805 | 1673 | 0 | 1687 | 1825 | 0 | 1703 | 1655 | 0 |
| Flt Permitted | 0.657 | | | 0.692 | | | 0.588 | | | 0.657 | | |
| Satd. Flow (perm) | 1085 | 1714 | 0 | 1315 | 1673 | 0 | 1044 | 1825 | 0 | 1178 | 1655 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 19 | | | 76 | | | 7 | | | 49 | |
| Link Speed (k/h) | | 60 | | | 60 | | | 60 | | | 50 | |
| Link Distance (m) | | 396.4 | | | 1287.4 | | | 344.1 | | | 264.4 | |
| Travel Time (s) | | 23.8 | | | 77.2 | | | 20.6 | | | 19.0 | |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles (%) | 15% | 4% | 24% | 0% | 3% | 8% | 7% | 3% | 0% | 6% | 9% | 6% |
| Adj. Flow (vph) | 67 | 82 | 19 | 14 | 82 | 76 | 32 | 143 | 14 | 59 | 152 | 105 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 67 | 101 | 0 | 14 | 158 | 0 | 32 | 157 | 0 | 59 | 257 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.6 | | | 3.6 | | | 3.6 | | | 3.6 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (k/h) | 25 | | 15 | 25 | | 15 | 25 | | 15 | 25 | | 15 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Minimum Split (s) | 43.0 | 43.0 | | 43.0 | 43.0 | | 33.0 | 33.0 | | 33.0 | 33.0 | |
| Total Split (s) | 43.0 | 43.0 | | 43.0 | 43.0 | | 33.0 | 33.0 | | 33.0 | 33.0 | |
| Total Split (%) | 56.6% | 56.6% | | 56.6% | 56.6% | | 43.4% | 43.4% | | 43.4% | 43.4% | |
| Maximum Green (s) | 35.0 | 35.0 | | 35.0 | 35.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Yellow Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| All-Red Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Act Effct Green (s) | 35.0 | 35.0 | | 35.0 | 35.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Actuated g/C Ratio | 0.46 | 0.46 | | 0.46 | 0.46 | | 0.33 | 0.33 | | 0.33 | 0.33 | |
| v/c Ratio | 0.13 | 0.13 | | 0.02 | 0.19 | | 0.09 | 0.26 | | 0.15 | 0.45 | |
| Control Delay | 12.8 | 10.2 | | 11.5 | 7.3 | | 18.7 | 19.3 | | 19.4 | 19.0 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |



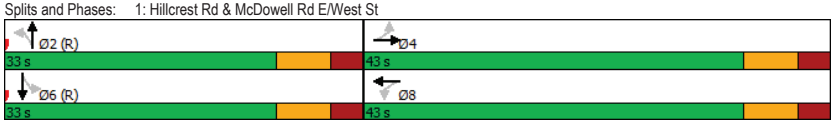
## Lanes, Volumes, Timings
## 1: Hillcrest Rd & McDowell Rd E/West St

2030 Background: PM Peak Hour

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay | 12.8 | 10.2 | | 11.5 | 7.3 | | 18.7 | 19.3 | | 19.4 | 19.0 | |
| LOS | B | B | | B | A | | B | B | | B | B | |
| Approach Delay | | 11.2 | | | 7.6 | | | 19.2 | | | 19.0 | |
| Approach LOS | | B | | | A | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 76 | | | |
| Actuated Cycle Length: 76 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 80 | | | |
| Control Type: Pretimed | | | |
| Maximum v/c Ratio: 0.45 | | | |
| Intersection Signal Delay: 15.2 | | Intersection LOS: B | |
| Intersection Capacity Utilization 111.4% | | ICU Level of Service H | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Hillcrest Rd & McDowell Rd E/West St



## Queues
### 1: Hillcrest Rd & McDowell Rd E/West St

2030 Background: PM Peak Hour

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 67 | 101 | 14 | 158 | 32 | 157 | 59 | 257 |
| v/c Ratio | 0.13 | 0.13 | 0.02 | 0.19 | 0.09 | 0.26 | 0.15 | 0.45 |
| Control Delay | 12.8 | 10.2 | 11.5 | 7.3 | 18.7 | 19.3 | 19.4 | 19.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 12.8 | 10.2 | 11.5 | 7.3 | 18.7 | 19.3 | 19.4 | 19.0 |
| Queue Length 50th (m) | 5.6 | 6.7 | 1.1 | 6.7 | 3.3 | 16.4 | 6.2 | 23.8 |
| Queue Length 95th (m) | 12.9 | 15.2 | 4.1 | 17.1 | 9.4 | 30.6 | 14.7 | 44.6 |
| Internal Link Dist (m) | | 372.4 | | 1263.4 | | 320.1 | | 240.4 |
| Turn Bay Length (m) | 60.0 | | 50.0 | | 60.0 | | 45.0 | |
| Base Capacity (vph) | 499 | 799 | 605 | 811 | 343 | 605 | 387 | 577 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.13 | 0.13 | 0.02 | 0.19 | 0.09 | 0.26 | 0.15 | 0.45 |

Intersection Summary



## HCM 6th Signalized Intersection Summary
### 1: Hillcrest Rd & McDowell Rd E/West St

2030 Background: PM Peak Hour

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 63 | 77 | 18 | 13 | 77 | 71 | 30 | 134 | 13 | 55 | 143 | 99 |
| Future Volume (veh/h) | 63 | 77 | 18 | 13 | 77 | 71 | 30 | 134 | 13 | 55 | 143 | 99 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1678 | 1841 | 1544 | 1900 | 1856 | 1781 | 1796 | 1856 | 1900 | 1811 | 1767 | 1811 |
| Adj Flow Rate, veh/h | 67 | 82 | 19 | 14 | 82 | 76 | 32 | 143 | 14 | 59 | 152 | 105 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 15 | 4 | 24 | 0 | 3 | 8 | 7 | 3 | 0 | 6 | 9 | 6 |
| Cap, veh/h | 542 | 666 | 154 | 657 | 408 | 378 | 315 | 547 | 54 | 411 | 320 | 221 |
| Arrive On Green | 0.46 | 0.46 | 0.46 | 0.46 | 0.46 | 0.46 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 |
| Sat Flow, veh/h | 1102 | 1445 | 335 | 1314 | 886 | 821 | 1078 | 1663 | 163 | 1191 | 973 | 672 |
| Grp Volume(v), veh/h | 67 | 0 | 101 | 14 | 0 | 158 | 32 | 0 | 157 | 59 | 0 | 257 |
| Grp Sat Flow(s),veh/h/ln | 1102 | 0 | 1780 | 1314 | 0 | 1708 | 1078 | 0 | 1826 | 1191 | 0 | 1646 |
| Q Serve(g_s), s | 2.9 | 0.0 | 2.5 | 0.5 | 0.0 | 4.2 | 1.8 | 0.0 | 4.8 | 2.9 | 0.0 | 9.4 |
| Cycle Q Clear(g_c), s | 7.1 | 0.0 | 2.5 | 2.9 | 0.0 | 4.2 | 11.3 | 0.0 | 4.8 | 7.7 | 0.0 | 9.4 |
| Prop In Lane | 1.00 | | 0.19 | 1.00 | | 0.48 | 1.00 | | 0.09 | 1.00 | | 0.41 |
| Lane Grp Cap(c), veh/h | 542 | 0 | 820 | 657 | 0 | 786 | 315 | 0 | 601 | 411 | 0 | 541 |
| V/C Ratio(X) | 0.12 | 0.00 | 0.12 | 0.02 | 0.00 | 0.20 | 0.10 | 0.00 | 0.26 | 0.14 | 0.00 | 0.47 |
| Avail Cap(c_a), veh/h | 542 | 0 | 820 | 657 | 0 | 786 | 315 | 0 | 601 | 411 | 0 | 541 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 14.3 | 0.0 | 11.7 | 12.6 | 0.0 | 12.2 | 24.8 | 0.0 | 18.7 | 21.6 | 0.0 | 20.3 |
| Incr Delay (d2), s/veh | 0.5 | 0.0 | 0.3 | 0.1 | 0.0 | 0.6 | 0.6 | 0.0 | 1.1 | 0.7 | 0.0 | 3.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 0.0 | 0.1 | 0.0 | 0.0 | 0.1 | 0.2 | 0.0 | 0.7 | 0.4 | 0.0 | 1.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 14.8 | 0.0 | 12.0 | 12.6 | 0.0 | 12.8 | 25.4 | 0.0 | 19.8 | 22.3 | 0.0 | 23.2 |
| LnGrp LOS | B | A | B | B | A | B | C | A | B | C | A | C |
| Approach Vol, veh/h | | 168 | | | 172 | | | 189 | | | 316 | |
| Approach Delay, s/veh | | 13.1 | | | 12.8 | | | 20.7 | | | 23.1 | |
| Approach LOS | | B | | | B | | | C | | | C | |
| Timer - Assigned Phs | | 2 | | 4 | | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | | 33.0 | | 43.0 | | 33.0 | | 43.0 | | | | |
| Change Period (Y+Rc), s | | 8.0 | | 8.0 | | 8.0 | | 8.0 | | | | |
| Max Green Setting (Gmax), s | | 25.0 | | 35.0 | | 25.0 | | 35.0 | | | | |
| Max Q Clear Time (g_c+I1), s | | 13.3 | | 9.1 | | 11.4 | | 6.2 | | | | |
| Green Ext Time (p_c), s | | 0.8 | | 1.0 | | 1.8 | | 1.1 | | | | |

| Intersection Summary | | |
|---|---|---|
| HCM 6th Ctrl Delay | | 18.5 |
| HCM 6th LOS | | B |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 14 | 116 | 15 | 0 | 130 | 27 | 13 | 11 | 4 | 15 | 16 | 18 |
| Future Volume (vph) | 14 | 116 | 15 | 0 | 130 | 27 | 13 | 11 | 4 | 15 | 16 | 18 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 20.0 | | 0.0 | 20.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 30.0 | | | 30.0 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | | | | | | | |
| Frt | | 0.983 | | | 0.974 | | | 0.982 | | | 0.951 | |
| Flt Protected | 0.950 | | | | | | | 0.977 | | | 0.985 | |
| Satd. Flow (prot) | 1671 | 1788 | 0 | 1900 | 1763 | 0 | 0 | 1647 | 0 | 0 | 1671 | 0 |
| Flt Permitted | 0.950 | | | | | | | 0.977 | | | 0.985 | |
| Satd. Flow (perm) | 1671 | 1788 | 0 | 1900 | 1763 | 0 | 0 | 1647 | 0 | 0 | 1671 | 0 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 1287.4 | | | 348.1 | | | 122.5 | | | 227.1 | |
| Travel Time (s) | | 92.7 | | | 25.1 | | | 8.8 | | | 16.4 | |
| Confl. Peds. (#/hr) | 2 | | | | | 2 | | | 3 | 3 | | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Heavy Vehicles (%) | 8% | 5% | 0% | 0% | 6% | 0% | 0% | 10% | 50% | 14% | 0% | 6% |
| Adj. Flow (vph) | 15 | 125 | 16 | 0 | 140 | 29 | 14 | 12 | 4 | 16 | 17 | 19 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 15 | 141 | 0 | 0 | 169 | 0 | 0 | 30 | 0 | 0 | 52 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.6 | | | 3.6 | | | 0.0 | | | 0.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (k/h) | 25 | | 15 | 25 | | 15 | 25 | | 15 | 25 | | 15 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 22.6% | ICU Level of Service A | |
| Analysis Period (min) | 15 | | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 2.5 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 14 | 116 | 15 | 0 | 130 | 27 | 13 | 11 | 4 | 15 | 16 | 18 |
| Future Vol, veh/h | 14 | 116 | 15 | 0 | 130 | 27 | 13 | 11 | 4 | 15 | 16 | 18 |
| Conflicting Peds, #/hr | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 3 | 3 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 20 | - | - | 20 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 |
| Heavy Vehicles, % | 8 | 5 | 0 | 0 | 6 | 0 | 0 | 10 | 50 | 14 | 0 | 6 |
| Mvmt Flow | 15 | 125 | 16 | 0 | 140 | 29 | 14 | 12 | 4 | 16 | 17 | 19 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 171 | 0 | 0 | 141 | 0 | 0 | 336 | 334 | 136 | 331 | 328 | 157 |
| Stage 1 | - | - | - | - | - | - | 163 | 163 | - | 157 | 157 | - |
| Stage 2 | - | - | - | - | - | - | 173 | 171 | - | 174 | 171 | - |
| Critical Hdwy | 4.18 | - | - | 4.1 | - | - | 7.1 | 6.6 | 6.7 | 7.24 | 6.5 | 6.26 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.1 | 5.6 | - | 6.24 | 5.5 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.1 | 5.6 | - | 6.24 | 5.5 | - |
| Follow-up Hdwy | 2.272 | - | - | 2.2 | - | - | 3.5 | 4.09 | 3.75 | 3.626 | 4 | 3.354 |
| Pot Cap-1 Maneuver | 1371 | - | - | 1455 | - | - | 622 | 573 | 799 | 600 | 594 | 878 |
| Stage 1 | - | - | - | - | - | - | 844 | 748 | - | 818 | 772 | - |
| Stage 2 | - | - | - | - | - | - | 834 | 742 | - | 801 | 761 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1369 | - | - | 1455 | - | - | 590 | 566 | 797 | 580 | 586 | 877 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 590 | 566 | - | 580 | 586 | - |
| Stage 1 | - | - | - | - | - | - | 835 | 740 | - | 807 | 770 | - |
| Stage 2 | - | - | - | - | - | - | 797 | 741 | - | 773 | 753 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.7 | 0 | 11.3 | 10.9 |
| HCM LOS | | | B | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 602 | 1369 | - | - | 1455 | - | - | 665 |
| HCM Lane V/C Ratio | 0.05 | 0.011 | - | - | - | - | - | 0.079 |
| HCM Control Delay (s) | 11.3 | 7.7 | - | - | 0 | - | - | 10.9 |
| HCM Lane LOS | B | A | - | - | A | - | - | B |
| HCM 95th %tile Q(veh) | 0.2 | 0 | - | - | 0 | - | - | 0.3 |

## Lanes, Volumes, Timings
## 1: Hillcrest Rd & McDowell Rd E/West St

2035 Background: AM Peak Hour

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 99 | 58 | 49 | 11 | 24 | 67 | 16 | 148 | 9 | 57 | 132 | 38 |
| Future Volume (vph) | 99 | 58 | 49 | 11 | 24 | 67 | 16 | 148 | 9 | 57 | 132 | 38 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 60.0 | | 0.0 | 50.0 | | 0.0 | 60.0 | | 0.0 | 45.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 80.0 | | | 100.0 | | | 80.0 | | | 85.0 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.931 | | | 0.889 | | | 0.992 | | | 0.967 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1671 | 1662 | 0 | 1805 | 1595 | 0 | 1583 | 1598 | 0 | 1671 | 1687 | 0 |
| Flt Permitted | 0.690 | | | 0.679 | | | 0.636 | | | 0.645 | | |
| Satd. Flow (perm) | 1214 | 1662 | 0 | 1290 | 1595 | 0 | 1060 | 1598 | 0 | 1135 | 1687 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 56 | | | 76 | | | 4 | | | 20 | |
| Link Speed (k/h) | | 60 | | | 60 | | | 60 | | | 50 | |
| Link Distance (m) | | 396.4 | | | 1287.4 | | | 344.1 | | | 264.4 | |
| Travel Time (s) | | 23.8 | | | 77.2 | | | 20.6 | | | 19.0 | |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles (%) | 8% | 6% | 7% | 0% | 14% | 3% | 14% | 19% | 0% | 8% | 8% | 12% |
| Adj. Flow (vph) | 113 | 66 | 56 | 13 | 27 | 76 | 18 | 168 | 10 | 65 | 150 | 43 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 113 | 122 | 0 | 13 | 103 | 0 | 18 | 178 | 0 | 65 | 193 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.6 | | | 3.6 | | | 3.6 | | | 3.6 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (k/h) | 25 | | 15 | 25 | | 15 | 25 | | 15 | 25 | | 15 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Minimum Split (s) | 43.0 | 43.0 | | 43.0 | 43.0 | | 33.0 | 33.0 | | 33.0 | 33.0 | |
| Total Split (s) | 43.0 | 43.0 | | 43.0 | 43.0 | | 33.0 | 33.0 | | 33.0 | 33.0 | |
| Total Split (%) | 56.6% | 56.6% | | 56.6% | 56.6% | | 43.4% | 43.4% | | 43.4% | 43.4% | |
| Maximum Green (s) | 35.0 | 35.0 | | 35.0 | 35.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Yellow Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| All-Red Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Act Effct Green (s) | 35.0 | 35.0 | | 35.0 | 35.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Actuated g/C Ratio | 0.46 | 0.46 | | 0.46 | 0.46 | | 0.33 | 0.33 | | 0.33 | 0.33 | |
| v/c Ratio | 0.20 | 0.15 | | 0.02 | 0.13 | | 0.05 | 0.34 | | 0.17 | 0.34 | |
| Control Delay | 13.4 | 7.5 | | 11.5 | 5.1 | | 18.1 | 21.0 | | 19.8 | 19.3 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |



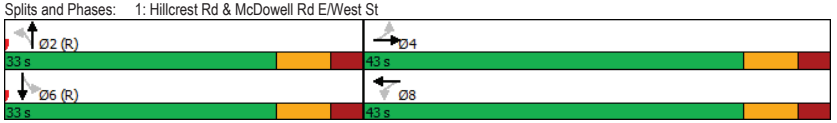
## Lanes, Volumes, Timings
## 1: Hillcrest Rd & McDowell Rd E/West St

2035 Background: AM Peak Hour

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay | 13.4 | 7.5 | | 11.5 | 5.1 | | 18.1 | 21.0 | | 19.8 | 19.3 | |
| LOS | B | A | | B | A | | B | C | | B | B | |
| Approach Delay | | 10.3 | | | 5.8 | | | 20.8 | | | 19.4 | |
| Approach LOS | | B | | | A | | | C | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 76 | | | |
| Actuated Cycle Length: 76 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 80 | | | |
| Control Type: Pretimed | | | |
| Maximum v/c Ratio: 0.34 | | | |
| Intersection Signal Delay: 15.1 | | Intersection LOS: B | |
| Intersection Capacity Utilization 89.9% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Hillcrest Rd & McDowell Rd E/West St



## Queues
### 1: Hillcrest Rd & McDowell Rd E/West St

2035 Background: AM Peak Hour

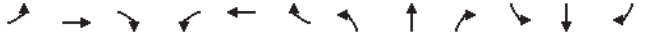
| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 113 | 122 | 13 | 103 | 18 | 178 | 65 | 193 |
| v/c Ratio | 0.20 | 0.15 | 0.02 | 0.13 | 0.05 | 0.34 | 0.17 | 0.34 |
| Control Delay | 13.4 | 7.5 | 11.5 | 5.1 | 18.1 | 21.0 | 19.8 | 19.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 13.4 | 7.5 | 11.5 | 5.1 | 18.1 | 21.0 | 19.8 | 19.3 |
| Queue Length 50th (m) | 9.7 | 5.4 | 1.0 | 2.2 | 1.8 | 19.5 | 6.9 | 19.3 |
| Queue Length 95th (m) | 19.2 | 13.9 | 3.9 | 9.7 | 6.1 | 34.9 | 15.6 | 34.9 |
| Internal Link Dist (m) | | 372.4 | | 1263.4 | | 320.1 | | 240.4 |
| Turn Bay Length (m) | 60.0 | | 50.0 | | 60.0 | | 45.0 | |
| Base Capacity (vph) | 559 | 795 | 594 | 775 | 348 | 528 | 373 | 568 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.20 | 0.15 | 0.02 | 0.13 | 0.05 | 0.34 | 0.17 | 0.34 |

| Intersection Summary |
|---|



## HCM 6th Signalized Intersection Summary
### 1: Hillcrest Rd & McDowell Rd E/West St

2035 Background: AM Peak Hour



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 99 | 58 | 49 | 11 | 24 | 67 | 16 | 148 | 9 | 57 | 132 | 38 |
| Future Volume (veh/h) | 99 | 58 | 49 | 11 | 24 | 67 | 16 | 148 | 9 | 57 | 132 | 38 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1781 | 1811 | 1796 | 1900 | 1693 | 1856 | 1693 | 1618 | 1900 | 1781 | 1781 | 1722 |
| Adj Flow Rate, veh/h | 112 | 66 | 56 | 12 | 27 | 76 | 18 | 168 | 10 | 65 | 150 | 43 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Percent Heavy Veh, % | 8 | 6 | 7 | 0 | 14 | 3 | 14 | 19 | 0 | 8 | 8 | 12 |
| Cap, veh/h | 612 | 417 | 354 | 634 | 180 | 508 | 357 | 497 | 30 | 376 | 438 | 126 |
| Arrive On Green | 0.46 | 0.46 | 0.46 | 0.46 | 0.46 | 0.46 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 |
| Sat Flow, veh/h | 1230 | 905 | 768 | 1289 | 392 | 1102 | 1077 | 1512 | 90 | 1149 | 1331 | 382 |
| Grp Volume(v), veh/h | 112 | 0 | 122 | 12 | 0 | 103 | 18 | 0 | 178 | 65 | 0 | 193 |
| Grp Sat Flow(s),veh/h/ln | 1230 | 0 | 1673 | 1289 | 0 | 1494 | 1077 | 0 | 1602 | 1149 | 0 | 1713 |
| Q Serve(g_s), s | 4.4 | 0.0 | 3.2 | 0.4 | 0.0 | 3.0 | 1.0 | 0.0 | 6.4 | 3.4 | 0.0 | 6.5 |
| Cycle Q Clear(g_c), s | 7.4 | 0.0 | 3.2 | 3.6 | 0.0 | 3.0 | 7.5 | 0.0 | 6.4 | 9.8 | 0.0 | 6.5 |
| Prop In Lane | 1.00 | | 0.46 | 1.00 | | 0.74 | 1.00 | | 0.06 | 1.00 | | 0.22 |
| Lane Grp Cap(c), veh/h | 612 | 0 | 770 | 634 | 0 | 688 | 357 | 0 | 527 | 376 | 0 | 563 |
| V/C Ratio(X) | 0.18 | 0.00 | 0.16 | 0.02 | 0.00 | 0.15 | 0.05 | 0.00 | 0.34 | 0.17 | 0.00 | 0.34 |
| Avail Cap(c_a), veh/h | 612 | 0 | 770 | 634 | 0 | 688 | 357 | 0 | 527 | 376 | 0 | 563 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 14.0 | 0.0 | 11.9 | 13.0 | 0.0 | 11.9 | 22.1 | 0.0 | 19.3 | 23.0 | 0.0 | 19.3 |
| Incr Delay (d2), s/veh | 0.7 | 0.0 | 0.4 | 0.1 | 0.0 | 0.5 | 0.3 | 0.0 | 1.7 | 1.0 | 0.0 | 1.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 0.0 | 0.1 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 | 0.8 | 0.5 | 0.0 | 1.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 14.7 | 0.0 | 12.4 | 13.0 | 0.0 | 12.3 | 22.4 | 0.0 | 21.0 | 24.0 | 0.0 | 20.9 |
| LnGrp LOS | B | A | B | B | A | B | C | A | C | C | A | C |
| Approach Vol, veh/h | | 234 | | | 115 | | | 196 | | | 258 | |
| Approach Delay, s/veh | | 13.5 | | | 12.4 | | | 21.1 | | | 21.7 | |
| Approach LOS | | B | | | B | | | C | | | C | |

| Timer - Assigned Phs | | 2 | | 4 | | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | | 33.0 | | 43.0 | | 33.0 | | 43.0 | | | | |
| Change Period (Y+Rc), s | | 8.0 | | 8.0 | | 8.0 | | 8.0 | | | | |
| Max Green Setting (Gmax), s | | 25.0 | | 35.0 | | 25.0 | | 35.0 | | | | |
| Max Q Clear Time (g_c+I1), s | | 9.5 | | 9.4 | | 11.8 | | 5.6 | | | | |
| Green Ext Time (p_c), s | | 1.1 | | 1.4 | | 1.3 | | 0.7 | | | | |

| Intersection Summary | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HCM 6th Ctrl Delay | | | 17.8 | | | | | | | | | |
| HCM 6th LOS | | | B | | | | | | | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 2 | 141 | 7 | 1 | 68 | 9 | 13 | 11 | 7 | 31 | 4 | 10 |
| Future Volume (vph) | 2 | 141 | 7 | 1 | 68 | 9 | 13 | 11 | 7 | 31 | 4 | 10 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 20.0 | | 0.0 | 20.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 30.0 | | | 30.0 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | | | | | | | |
| Frt | | 0.992 | | | 0.982 | | | 0.968 | | | 0.969 | |
| Flt Protected | 0.950 | | | 0.950 | | | | 0.980 | | | 0.967 | |
| Satd. Flow (prot) | 1805 | 1723 | 0 | 902 | 1737 | 0 | 0 | 1802 | 0 | 0 | 1665 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | | 0.980 | | | 0.967 | |
| Satd. Flow (perm) | 1805 | 1723 | 0 | 902 | 1737 | 0 | 0 | 1802 | 0 | 0 | 1665 | 0 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 1287.4 | | | 348.1 | | | 122.5 | | | 227.1 | |
| Travel Time (s) | | 92.7 | | | 25.1 | | | 8.8 | | | 16.4 | |
| Confl. Peds. (#/hr) | | | | | | | 1 | | 1 | 1 | | 1 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Heavy Vehicles (%) | 0% | 9% | 17% | 100% | 5% | 25% | 0% | 0% | 0% | 4% | 50% | 0% |
| Adj. Flow (vph) | 2 | 152 | 8 | 1 | 73 | 10 | 14 | 12 | 8 | 33 | 4 | 11 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 2 | 160 | 0 | 1 | 83 | 0 | 0 | 34 | 0 | 0 | 48 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.6 | | | 3.6 | | | 0.0 | | | 0.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (k/h) | 25 | | 15 | 25 | | 15 | 25 | | 15 | 25 | | 15 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 19.0% | ICU Level of Service A | |
| Analysis Period (min) | 15 | | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 2.7 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 2 | 141 | 7 | 1 | 68 | 9 | 13 | 11 | 7 | 31 | 4 | 10 |
| Future Vol, veh/h | 2 | 141 | 7 | 1 | 68 | 9 | 13 | 11 | 7 | 31 | 4 | 10 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 20 | - | - | 20 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 |
| Heavy Vehicles, % | 0 | 9 | 17 | 100 | 5 | 25 | 0 | 0 | 0 | 4 | 50 | 0 |
| Mvmt Flow | 2 | 152 | 8 | 1 | 73 | 10 | 14 | 12 | 8 | 33 | 4 | 11 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 83 | 0 | 0 | 160 | 0 | 0 | 249 | 245 | 157 | 251 | 244 | 79 |
| Stage 1 | - | - | - | - | - | - | 160 | 160 | - | 80 | 80 | - |
| Stage 2 | - | - | - | - | - | - | 89 | 85 | - | 171 | 164 | - |
| Critical Hdwy | 4.1 | - | - | 5.1 | - | - | 7.1 | 6.5 | 6.2 | 7.14 | 7 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.1 | 5.5 | - | 6.14 | 6 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.1 | 5.5 | - | 6.14 | 6 | - |
| Follow-up Hdwy | 2.2 | - | - | 3.1 | - | - | 3.5 | 4 | 3.3 | 3.536 | 4.45 | 3.3 |
| Pot Cap-1 Maneuver | 1527 | - | - | 991 | - | - | 709 | 661 | 894 | 698 | 583 | 987 |
| Stage 1 | - | - | - | - | - | - | 847 | 769 | - | 924 | 744 | - |
| Stage 2 | - | - | - | - | - | - | 923 | 828 | - | 826 | 680 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1527 | - | - | 991 | - | - | 696 | 660 | 893 | 681 | 582 | 986 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 696 | 660 | - | 681 | 582 | - |
| Stage 1 | - | - | - | - | - | - | 846 | 768 | - | 923 | 743 | - |
| Stage 2 | - | - | - | - | - | - | 906 | 827 | - | 805 | 679 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.1 | 0.1 | 10.3 | 10.4 |
| HCM LOS | | | B | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 718 | 1527 | - | - | 991 | - | - | 720 |
| HCM Lane V/C Ratio | 0.046 | 0.001 | - | - | 0.001 | - | - | 0.067 |
| HCM Control Delay (s) | 10.3 | 7.4 | - | - | 8.6 | - | - | 10.4 |
| HCM Lane LOS | B | A | - | - | A | - | - | B |
| HCM 95th %tile Q(veh) | 0.1 | 0 | - | - | 0 | - | - | 0.2 |

## Lanes, Volumes, Timings
## 1: Hillcrest Rd & McDowell Rd E/West St

2035 Background: PM Peak Hour

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 67 | 81 | 19 | 13 | 82 | 74 | 31 | 141 | 13 | 58 | 151 | 104 |
| Future Volume (vph) | 67 | 81 | 19 | 13 | 82 | 74 | 31 | 141 | 13 | 58 | 151 | 104 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 60.0 | | 0.0 | 50.0 | | 0.0 | 60.0 | | 0.0 | 45.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 80.0 | | | 100.0 | | | 80.0 | | | 85.0 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.972 | | | 0.929 | | | 0.987 | | | 0.939 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1570 | 1714 | 0 | 1805 | 1675 | 0 | 1687 | 1825 | 0 | 1703 | 1655 | 0 |
| Flt Permitted | 0.652 | | | 0.689 | | | 0.566 | | | 0.653 | | |
| Satd. Flow (perm) | 1077 | 1714 | 0 | 1309 | 1675 | 0 | 1005 | 1825 | 0 | 1170 | 1655 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 20 | | | 79 | | | 7 | | | 49 | |
| Link Speed (k/h) | | 60 | | | 60 | | | 60 | | | 50 | |
| Link Distance (m) | | 396.4 | | | 1287.4 | | | 344.1 | | | 264.4 | |
| Travel Time (s) | | 23.8 | | | 77.2 | | | 20.6 | | | 19.0 | |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles (%) | 15% | 4% | 24% | 0% | 3% | 8% | 7% | 3% | 0% | 6% | 9% | 6% |
| Adj. Flow (vph) | 71 | 86 | 20 | 14 | 87 | 79 | 33 | 150 | 14 | 62 | 161 | 111 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 71 | 106 | 0 | 14 | 166 | 0 | 33 | 164 | 0 | 62 | 272 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.6 | | | 3.6 | | | 3.6 | | | 3.6 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (k/h) | 25 | | 15 | 25 | | 15 | 25 | | 15 | 25 | | 15 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Minimum Split (s) | 43.0 | 43.0 | | 43.0 | 43.0 | | 33.0 | 33.0 | | 33.0 | 33.0 | |
| Total Split (s) | 43.0 | 43.0 | | 43.0 | 43.0 | | 33.0 | 33.0 | | 33.0 | 33.0 | |
| Total Split (%) | 56.6% | 56.6% | | 56.6% | 56.6% | | 43.4% | 43.4% | | 43.4% | 43.4% | |
| Maximum Green (s) | 35.0 | 35.0 | | 35.0 | 35.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Yellow Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| All-Red Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Act Effct Green (s) | 35.0 | 35.0 | | 35.0 | 35.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Actuated g/C Ratio | 0.46 | 0.46 | | 0.46 | 0.46 | | 0.33 | 0.33 | | 0.33 | 0.33 | |
| v/c Ratio | 0.14 | 0.13 | | 0.02 | 0.20 | | 0.10 | 0.27 | | 0.16 | 0.47 | |
| Control Delay | 12.9 | 10.2 | | 11.5 | 7.3 | | 18.8 | 19.5 | | 19.5 | 19.7 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |



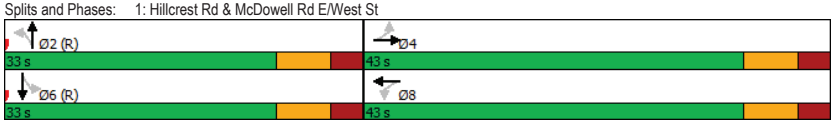
## Lanes, Volumes, Timings
## 1: Hillcrest Rd & McDowell Rd E/West St

2035 Background: PM Peak Hour

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay | 12.9 | 10.2 | | 11.5 | 7.3 | | 18.8 | 19.5 | | 19.5 | 19.7 | |
| LOS | B | B | | B | A | | B | B | | B | B | |
| Approach Delay | | 11.3 | | | 7.7 | | | 19.4 | | | 19.6 | |
| Approach LOS | | B | | | A | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 76 | | | |
| Actuated Cycle Length: 76 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 80 | | | |
| Control Type: Pretimed | | | |
| Maximum v/c Ratio: 0.47 | | | |
| Intersection Signal Delay: 15.5 | | Intersection LOS: B | |
| Intersection Capacity Utilization 117.2% | | ICU Level of Service H | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Hillcrest Rd & McDowell Rd E/West St



## Queues
### 1: Hillcrest Rd & McDowell Rd E/West St

2035 Background: PM Peak Hour

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 71 | 106 | 14 | 166 | 33 | 164 | 62 | 272 |
| v/c Ratio | 0.14 | 0.13 | 0.02 | 0.20 | 0.10 | 0.27 | 0.16 | 0.47 |
| Control Delay | 12.9 | 10.2 | 11.5 | 7.3 | 18.8 | 19.5 | 19.5 | 19.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 12.9 | 10.2 | 11.5 | 7.3 | 18.8 | 19.5 | 19.5 | 19.7 |
| Queue Length 50th (m) | 5.9 | 7.1 | 1.1 | 7.2 | 3.4 | 17.2 | 6.6 | 25.9 |
| Queue Length 95th (m) | 13.5 | 15.8 | 4.1 | 17.9 | 9.6 | 31.9 | 15.4 | 47.6 |
| Internal Link Dist (m) | | 372.4 | | 1263.4 | | 320.1 | | 240.4 |
| Turn Bay Length (m) | 60.0 | | 50.0 | | 60.0 | | 45.0 | |
| Base Capacity (vph) | 495 | 800 | 602 | 814 | 330 | 605 | 384 | 577 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.14 | 0.13 | 0.02 | 0.20 | 0.10 | 0.27 | 0.16 | 0.47 |

| Intersection Summary |
|---|



## HCM 6th Signalized Intersection Summary
### 1: Hillcrest Rd & McDowell Rd E/West St

2035 Background: PM Peak Hour

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 67 | 81 | 19 | 13 | 82 | 74 | 31 | 141 | 13 | 58 | 151 | 104 |
| Future Volume (veh/h) | 67 | 81 | 19 | 13 | 82 | 74 | 31 | 141 | 13 | 58 | 151 | 104 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1678 | 1841 | 1544 | 1900 | 1856 | 1781 | 1796 | 1856 | 1900 | 1811 | 1767 | 1811 |
| Adj Flow Rate, veh/h | 71 | 86 | 20 | 14 | 87 | 79 | 33 | 150 | 14 | 62 | 161 | 111 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 15 | 4 | 24 | 0 | 3 | 8 | 7 | 3 | 0 | 6 | 9 | 6 |
| Cap, veh/h | 535 | 665 | 155 | 653 | 413 | 375 | 303 | 550 | 51 | 406 | 320 | 221 |
| Arrive On Green | 0.46 | 0.46 | 0.46 | 0.46 | 0.46 | 0.46 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 |
| Sat Flow, veh/h | 1094 | 1444 | 336 | 1308 | 896 | 813 | 1063 | 1671 | 156 | 1183 | 974 | 672 |
| Grp Volume(v), veh/h | 71 | 0 | 106 | 14 | 0 | 166 | 33 | 0 | 164 | 62 | 0 | 272 |
| Grp Sat Flow(s),veh/h/ln | 1094 | 0 | 1780 | 1308 | 0 | 1709 | 1063 | 0 | 1827 | 1183 | 0 | 1646 |
| Q Serve(g_s), s | 3.2 | 0.0 | 2.6 | 0.5 | 0.0 | 4.4 | 2.0 | 0.0 | 5.0 | 3.1 | 0.0 | 10.1 |
| Cycle Q Clear(g_c), s | 7.6 | 0.0 | 2.6 | 3.1 | 0.0 | 4.4 | 12.1 | 0.0 | 5.0 | 8.1 | 0.0 | 10.1 |
| Prop In Lane | 1.00 | | 0.19 | 1.00 | | 0.48 | 1.00 | | 0.09 | 1.00 | | 0.41 |
| Lane Grp Cap(c), veh/h | 535 | 0 | 820 | 653 | 0 | 787 | 303 | 0 | 601 | 406 | 0 | 541 |
| V/C Ratio(X) | 0.13 | 0.00 | 0.13 | 0.02 | 0.00 | 0.21 | 0.11 | 0.00 | 0.27 | 0.15 | 0.00 | 0.50 |
| Avail Cap(c_a), veh/h | 535 | 0 | 820 | 653 | 0 | 787 | 303 | 0 | 601 | 406 | 0 | 541 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 14.5 | 0.0 | 11.8 | 12.6 | 0.0 | 12.2 | 25.3 | 0.0 | 18.8 | 21.8 | 0.0 | 20.5 |
| Incr Delay (d2), s/veh | 0.5 | 0.0 | 0.3 | 0.1 | 0.0 | 0.6 | 0.7 | 0.0 | 1.1 | 0.8 | 0.0 | 3.3 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 0.0 | 0.1 | 0.0 | 0.0 | 0.1 | 0.3 | 0.0 | 0.7 | 0.4 | 0.0 | 1.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 15.0 | 0.0 | 12.1 | 12.7 | 0.0 | 12.9 | 26.1 | 0.0 | 19.9 | 22.6 | 0.0 | 23.8 |
| LnGrp LOS | B | A | B | B | A | B | C | A | B | C | A | C |
| Approach Vol, veh/h | | 177 | | | 180 | | | 197 | | | 334 | |
| Approach Delay, s/veh | | 13.3 | | | 12.8 | | | 20.9 | | | 23.6 | |
| Approach LOS | | B | | | B | | | C | | | C | |

| Timer - Assigned Phs | | 2 | | 4 | | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | | 33.0 | | 43.0 | | 33.0 | | 43.0 | | | | |
| Change Period (Y+Rc), s | | 8.0 | | 8.0 | | 8.0 | | 8.0 | | | | |
| Max Green Setting (Gmax), s | | 25.0 | | 35.0 | | 25.0 | | 35.0 | | | | |
| Max Q Clear Time (g_c+I1), s | | 14.1 | | 9.6 | | 12.1 | | 6.4 | | | | |
| Green Ext Time (p_c), s | | 0.8 | | 1.1 | | 1.9 | | 1.2 | | | | |

| Intersection Summary | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HCM 6th Ctrl Delay | | | 18.8 | | | | | | | | | |
| HCM 6th LOS | | | B | | | | | | | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 14 | 122 | 16 | 0 | 137 | 29 | 13 | 11 | 4 | 16 | 17 | 19 |
| Future Volume (vph) | 14 | 122 | 16 | 0 | 137 | 29 | 13 | 11 | 4 | 16 | 17 | 19 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 20.0 | | 0.0 | 20.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 30.0 | | | 30.0 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | | | | | | | |
| Frt | | 0.983 | | | 0.974 | | | 0.982 | | | 0.951 | |
| Flt Protected | 0.950 | | | | | | | 0.977 | | | 0.985 | |
| Satd. Flow (prot) | 1671 | 1789 | 0 | 1900 | 1763 | 0 | 0 | 1647 | 0 | 0 | 1671 | 0 |
| Flt Permitted | 0.950 | | | | | | | 0.977 | | | 0.985 | |
| Satd. Flow (perm) | 1671 | 1789 | 0 | 1900 | 1763 | 0 | 0 | 1647 | 0 | 0 | 1671 | 0 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 1287.4 | | | 348.1 | | | 122.5 | | | 227.1 | |
| Travel Time (s) | | 92.7 | | | 25.1 | | | 8.8 | | | 16.4 | |
| Confl. Peds. (#/hr) | 2 | | | | | 2 | | | 3 | 3 | | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Heavy Vehicles (%) | 8% | 5% | 0% | 0% | 6% | 0% | 0% | 10% | 50% | 14% | 0% | 6% |
| Adj. Flow (vph) | 15 | 131 | 17 | 0 | 147 | 31 | 14 | 12 | 4 | 17 | 18 | 20 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 15 | 148 | 0 | 0 | 178 | 0 | 0 | 30 | 0 | 0 | 55 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.6 | | | 3.6 | | | 0.0 | | | 0.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (k/h) | 25 | | 15 | 25 | | 15 | 25 | | 15 | 25 | | 15 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 22.6% | ICU Level of Service A | |
| Analysis Period (min) | 15 | | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 2.5 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 14 | 122 | 16 | 0 | 137 | 29 | 13 | 11 | 4 | 16 | 17 | 19 |
| Future Vol, veh/h | 14 | 122 | 16 | 0 | 137 | 29 | 13 | 11 | 4 | 16 | 17 | 19 |
| Conflicting Peds, #/hr | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 3 | 3 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 20 | - | - | 20 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 |
| Heavy Vehicles, % | 8 | 5 | 0 | 0 | 6 | 0 | 0 | 10 | 50 | 14 | 0 | 6 |
| Mvmt Flow | 15 | 131 | 17 | 0 | 147 | 31 | 14 | 12 | 4 | 17 | 18 | 20 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 180 | 0 | 0 | 148 | 0 | 0 | 352 | 350 | 143 | 346 | 343 | 165 |
| Stage 1 | - | - | - | - | - | - | 170 | 170 | - | 165 | 165 | - |
| Stage 2 | - | - | - | - | - | - | 182 | 180 | - | 181 | 178 | - |
| Critical Hdwy | 4.18 | - | - | 4.1 | - | - | 7.1 | 6.6 | 6.7 | 7.24 | 6.5 | 6.26 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.1 | 5.6 | - | 6.24 | 5.5 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.1 | 5.6 | - | 6.24 | 5.5 | - |
| Follow-up Hdwy | 2.272 | - | - | 2.2 | - | - | 3.5 | 4.09 | 3.75 | 3.626 | 4 | 3.354 |
| Pot Cap-1 Maneuver | 1360 | - | - | 1446 | - | - | 607 | 562 | 792 | 586 | 583 | 869 |
| Stage 1 | - | - | - | - | - | - | 837 | 743 | - | 810 | 766 | - |
| Stage 2 | - | - | - | - | - | - | 824 | 736 | - | 794 | 756 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1358 | - | - | 1446 | - | - | 574 | 555 | 790 | 566 | 575 | 868 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 574 | 555 | - | 566 | 575 | - |
| Stage 1 | - | - | - | - | - | - | 828 | 735 | - | 799 | 764 | - |
| Stage 2 | - | - | - | - | - | - | 785 | 735 | - | 766 | 748 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.7 | 0 | 11.4 | 11 |
| HCM LOS | | | B | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 589 | 1358 | - | - | 1446 | - | - | 652 |
| HCM Lane V/C Ratio | 0.051 | 0.011 | - | - | - | - | - | 0.086 |
| HCM Control Delay (s) | 11.4 | 7.7 | - | - | 0 | - | - | 11 |
| HCM Lane LOS | B | A | - | - | A | - | - | B |
| HCM 95th %tile Q(veh) | 0.2 | 0 | - | - | 0 | - | - | 0.3 |

# Appendix E

## 2030 Total Traffic Operations Reports

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 94 | 63 | 46 | 37 | 26 | 105 | 15 | 140 | 16 | 66 | 125 | 36 |
| Future Volume (vph) | 94 | 63 | 46 | 37 | 26 | 105 | 15 | 140 | 16 | 66 | 125 | 36 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 60.0 | | 0.0 | 50.0 | | 0.0 | 60.0 | | 0.0 | 45.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 80.0 | | | 100.0 | | | 80.0 | | | 85.0 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.937 | | | 0.880 | | | 0.985 | | | 0.966 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1671 | 1673 | 0 | 1805 | 1589 | 0 | 1583 | 1599 | 0 | 1671 | 1685 | 0 |
| Flt Permitted | 0.662 | | | 0.677 | | | 0.642 | | | 0.646 | | |
| Satd. Flow (perm) | 1165 | 1673 | 0 | 1286 | 1589 | 0 | 1070 | 1599 | 0 | 1136 | 1685 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 52 | | | 119 | | | 8 | | | 20 | |
| Link Speed (k/h) | | 60 | | | 60 | | | 60 | | | 50 | |
| Link Distance (m) | | 396.4 | | | 847.2 | | | 344.1 | | | 264.4 | |
| Travel Time (s) | | 23.8 | | | 50.8 | | | 20.6 | | | 19.0 | |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles (%) | 8% | 6% | 7% | 0% | 14% | 3% | 14% | 19% | 0% | 8% | 8% | 12% |
| Adj. Flow (vph) | 107 | 72 | 52 | 42 | 30 | 119 | 17 | 159 | 18 | 75 | 142 | 41 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 107 | 124 | 0 | 42 | 149 | 0 | 17 | 177 | 0 | 75 | 183 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.6 | | | 3.6 | | | 3.6 | | | 3.6 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (k/h) | 25 | | 15 | 25 | | 15 | 25 | | 15 | 25 | | 15 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Minimum Split (s) | 43.0 | 43.0 | | 43.0 | 43.0 | | 33.0 | 33.0 | | 33.0 | 33.0 | |
| Total Split (s) | 43.0 | 43.0 | | 43.0 | 43.0 | | 33.0 | 33.0 | | 33.0 | 33.0 | |
| Total Split (%) | 56.6% | 56.6% | | 56.6% | 56.6% | | 43.4% | 43.4% | | 43.4% | 43.4% | |
| Maximum Green (s) | 35.0 | 35.0 | | 35.0 | 35.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Yellow Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| All-Red Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Act Effct Green (s) | 35.0 | 35.0 | | 35.0 | 35.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Actuated g/C Ratio | 0.46 | 0.46 | | 0.46 | 0.46 | | 0.33 | 0.33 | | 0.33 | 0.33 | |
| v/c Ratio | 0.20 | 0.16 | | 0.07 | 0.19 | | 0.05 | 0.33 | | 0.20 | 0.32 | |
| Control Delay | 13.5 | 7.9 | | 11.9 | 4.4 | | 18.0 | 20.5 | | 20.2 | 18.9 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |

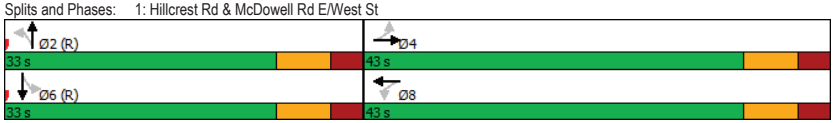




| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay | 13.5 | 7.9 | | 11.9 | 4.4 | | 18.0 | 20.5 | | 20.2 | 18.9 | |
| LOS | B | A | | B | A | | B | C | | C | B | |
| Approach Delay | | 10.5 | | | 6.1 | | | 20.3 | | | 19.3 | |
| Approach LOS | | B | | | A | | | C | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 76 | | | |
| Actuated Cycle Length: 76 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 80 | | | |
| Control Type: Pretimed | | | |
| Maximum v/c Ratio: 0.33 | | | |
| Intersection Signal Delay: 14.3 | | Intersection LOS: B | |
| Intersection Capacity Utilization 126.7% | | ICU Level of Service H | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Hillcrest Rd & McDowell Rd E/West St



## Queues
### 1: Hillcrest Rd & McDowell Rd E/West St

2030 Total: AM Peak Hour

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 107 | 124 | 42 | 149 | 17 | 177 | 75 | 183 |
| v/c Ratio | 0.20 | 0.16 | 0.07 | 0.19 | 0.05 | 0.33 | 0.20 | 0.32 |
| Control Delay | 13.5 | 7.9 | 11.9 | 4.4 | 18.0 | 20.5 | 20.2 | 18.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 13.5 | 7.9 | 11.9 | 4.4 | 18.0 | 20.5 | 20.2 | 18.9 |
| Queue Length 50th (m) | 9.2 | 5.9 | 3.4 | 2.4 | 1.7 | 18.9 | 8.1 | 18.1 |
| Queue Length 95th (m) | 18.5 | 14.6 | 8.5 | 11.4 | 5.9 | 34.2 | 17.5 | 33.2 |
| Internal Link Dist (m) | | 372.4 | | 823.2 | | 320.1 | | 240.4 |
| Turn Bay Length (m) | 60.0 | | 50.0 | | 60.0 | | 45.0 | |
| Base Capacity (vph) | 536 | 798 | 592 | 795 | 351 | 531 | 373 | 567 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.20 | 0.16 | 0.07 | 0.19 | 0.05 | 0.33 | 0.20 | 0.32 |

| Intersection Summary |
|---|



## HCM 6th Signalized Intersection Summary
### 1: Hillcrest Rd & McDowell Rd E/West St

2030 Total: AM Peak Hour

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 94 | 63 | 46 | 37 | 26 | 105 | 15 | 140 | 16 | 66 | 125 | 36 |
| Future Volume (veh/h) | 94 | 63 | 46 | 37 | 26 | 105 | 15 | 140 | 16 | 66 | 125 | 36 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1781 | 1811 | 1796 | 1900 | 1693 | 1856 | 1693 | 1618 | 1900 | 1781 | 1781 | 1722 |
| Adj Flow Rate, veh/h | 107 | 72 | 52 | 42 | 30 | 119 | 17 | 159 | 18 | 75 | 142 | 41 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Percent Heavy Veh, % | 8 | 6 | 7 | 0 | 14 | 3 | 14 | 19 | 0 | 8 | 8 | 12 |
| Cap, veh/h | 567 | 450 | 325 | 632 | 137 | 544 | 365 | 470 | 53 | 376 | 437 | 126 |
| Arrive On Green | 0.46 | 0.46 | 0.46 | 0.46 | 0.46 | 0.46 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 |
| Sat Flow, veh/h | 1180 | 978 | 706 | 1287 | 298 | 1182 | 1087 | 1428 | 162 | 1150 | 1329 | 384 |
| Grp Volume(v), veh/h | 107 | 0 | 124 | 42 | 0 | 149 | 17 | 0 | 177 | 75 | 0 | 183 |
| Grp Sat Flow(s),veh/h/ln | 1180 | 0 | 1684 | 1287 | 0 | 1480 | 1087 | 0 | 1589 | 1150 | 0 | 1712 |
| Q Serve(g_s), s | 4.5 | 0.0 | 3.3 | 1.5 | 0.0 | 4.6 | 0.9 | 0.0 | 6.4 | 4.0 | 0.0 | 6.1 |
| Cycle Q Clear(g_c), s | 9.1 | 0.0 | 3.3 | 4.8 | 0.0 | 4.6 | 7.0 | 0.0 | 6.4 | 10.4 | 0.0 | 6.1 |
| Prop In Lane | 1.00 | | 0.42 | 1.00 | | 0.80 | 1.00 | | 0.10 | 1.00 | | 0.22 |
| Lane Grp Cap(c), veh/h | 567 | 0 | 776 | 632 | 0 | 681 | 365 | 0 | 523 | 376 | 0 | 563 |
| V/C Ratio(X) | 0.19 | 0.00 | 0.16 | 0.07 | 0.00 | 0.22 | 0.05 | 0.00 | 0.34 | 0.20 | 0.00 | 0.32 |
| Avail Cap(c_a), veh/h | 567 | 0 | 776 | 632 | 0 | 681 | 365 | 0 | 523 | 376 | 0 | 563 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 15.0 | 0.0 | 11.9 | 13.3 | 0.0 | 12.3 | 21.8 | 0.0 | 19.3 | 23.2 | 0.0 | 19.2 |
| Incr Delay (d2), s/veh | 0.7 | 0.0 | 0.4 | 0.2 | 0.0 | 0.7 | 0.2 | 0.0 | 1.8 | 1.2 | 0.0 | 1.5 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.3 | 0.0 | 0.1 | 0.1 | 0.0 | 0.2 | 0.1 | 0.0 | 0.8 | 0.6 | 0.0 | 1.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 15.8 | 0.0 | 12.4 | 13.5 | 0.0 | 13.0 | 22.0 | 0.0 | 21.0 | 24.4 | 0.0 | 20.7 |
| LnGrp LOS | B | A | B | B | A | B | C | A | C | C | A | C |
| Approach Vol, veh/h | | 231 | | | 191 | | | 194 | | | 258 | |
| Approach Delay, s/veh | | 14.0 | | | 13.1 | | | 21.1 | | | 21.8 | |
| Approach LOS | | B | | | B | | | C | | | C | |

| Timer - Assigned Phs | | 2 | | 4 | | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | | 33.0 | | 43.0 | | 33.0 | | 43.0 | | | | |
| Change Period (Y+Rc), s | | 8.0 | | 8.0 | | 8.0 | | 8.0 | | | | |
| Max Green Setting (Gmax), s | | 25.0 | | 35.0 | | 25.0 | | 35.0 | | | | |
| Max Q Clear Time (g_c+I1), s | | 9.0 | | 11.1 | | 12.4 | | 6.8 | | | | |
| Green Ext Time (p_c), s | | 1.1 | | 1.4 | | 1.3 | | 1.3 | | | | |

| Intersection Summary | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HCM 6th Ctrl Delay | | | 17.7 | | | | | | | | | |
| HCM 6th LOS | | | B | | | | | | | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 2 | 160 | 6 | 1 | 68 | 8 | 13 | 11 | 6 | 30 | 4 | 9 |
| Future Volume (vph) | 2 | 160 | 6 | 1 | 68 | 8 | 13 | 11 | 6 | 30 | 4 | 9 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 20.0 | | 0.0 | 20.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 30.0 | | | 30.0 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | | | | | | | |
| Frt | | 0.995 | | | 0.984 | | | 0.975 | | | 0.971 | |
| Flt Protected | 0.950 | | | 0.950 | | | | 0.979 | | | 0.966 | |
| Satd. Flow (prot) | 1805 | 1730 | 0 | 902 | 1744 | 0 | 0 | 1814 | 0 | 0 | 1664 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | | 0.979 | | | 0.966 | |
| Satd. Flow (perm) | 1805 | 1730 | 0 | 902 | 1744 | 0 | 0 | 1814 | 0 | 0 | 1664 | 0 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 354.6 | | | 348.1 | | | 122.5 | | | 227.1 | |
| Travel Time (s) | | 25.5 | | | 25.1 | | | 8.8 | | | 16.4 | |
| Confl. Peds. (#/hr) | | | | | | | 1 | | 1 | 1 | | 1 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Heavy Vehicles (%) | 0% | 9% | 17% | 100% | 5% | 25% | 0% | 0% | 0% | 4% | 50% | 0% |
| Adj. Flow (vph) | 2 | 172 | 6 | 1 | 73 | 9 | 14 | 12 | 6 | 32 | 4 | 10 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 2 | 178 | 0 | 1 | 82 | 0 | 0 | 32 | 0 | 0 | 46 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.6 | | | 3.6 | | | 0.0 | | | 0.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (k/h) | 25 | | 15 | 25 | | 15 | 25 | | 15 | 25 | | 15 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 19.7% | ICU Level of Service A | |
| Analysis Period (min) | 15 | | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 2.5 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 2 | 160 | 6 | 1 | 68 | 8 | 13 | 11 | 6 | 30 | 4 | 9 |
| Future Vol, veh/h | 2 | 160 | 6 | 1 | 68 | 8 | 13 | 11 | 6 | 30 | 4 | 9 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 20 | - | - | 20 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 |
| Heavy Vehicles, % | 0 | 9 | 17 | 100 | 5 | 25 | 0 | 0 | 0 | 4 | 50 | 0 |
| Mvmt Flow | 2 | 172 | 6 | 1 | 73 | 9 | 14 | 12 | 6 | 32 | 4 | 10 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 82 | 0 | 0 | 178 | 0 | 0 | 267 | 263 | 176 | 269 | 262 | 79 |
| Stage 1 | - | - | - | - | - | - | 179 | 179 | - | 80 | 80 | - |
| Stage 2 | - | - | - | - | - | - | 88 | 84 | - | 189 | 182 | - |
| Critical Hdwy | 4.1 | - | - | 5.1 | - | - | 7.1 | 6.5 | 6.2 | 7.14 | 7 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.1 | 5.5 | - | 6.14 | 6 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.1 | 5.5 | - | 6.14 | 6 | - |
| Follow-up Hdwy | 2.2 | - | - | 3.1 | - | - | 3.5 | 4 | 3.3 | 3.536 | 4.45 | 3.3 |
| Pot Cap-1 Maneuver | 1528 | - | - | 973 | - | - | 690 | 646 | 872 | 680 | 569 | 987 |
| Stage 1 | - | - | - | - | - | - | 827 | 755 | - | 924 | 744 | - |
| Stage 2 | - | - | - | - | - | - | 925 | 829 | - | 808 | 667 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1528 | - | - | 973 | - | - | 678 | 645 | 871 | 664 | 568 | 986 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 678 | 645 | - | 664 | 568 | - |
| Stage 1 | - | - | - | - | - | - | 826 | 754 | - | 923 | 743 | - |
| Stage 2 | - | - | - | - | - | - | 909 | 828 | - | 788 | 666 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.1 | 0.1 | 10.4 | 10.5 |
| HCM LOS | | | B | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 696 | 1528 | - | - | 973 | - | - | 701 |
| HCM Lane V/C Ratio | 0.046 | 0.001 | - | - | 0.001 | - | - | 0.066 |
| HCM Control Delay (s) | 10.4 | 7.4 | - | - | 8.7 | - | - | 10.5 |
| HCM Lane LOS | B | A | - | - | A | - | - | B |
| HCM 95th %tile Q(veh) | 0.1 | 0 | - | - | 0 | - | - | 0.2 |

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 155 | 14 | 2 | 88 | 32 | 13 |
| Future Volume (vph) | 155 | 14 | 2 | 88 | 32 | 13 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 0.989 | | | | 0.961 | |
| Flt Protected | | | | 0.999 | 0.966 | |
| Satd. Flow (prot) | 1736 | 0 | 0 | 1827 | 1764 | 0 |
| Flt Permitted | | | | 0.999 | 0.966 | |
| Satd. Flow (perm) | 1736 | 0 | 0 | 1827 | 1764 | 0 |
| Link Speed (k/h) | 50 | | | 50 | 50 | |
| Link Distance (m) | 85.6 | | | 354.6 | 193.7 | |
| Travel Time (s) | 6.2 | | | 25.5 | 13.9 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 9% | 0% | 0% | 4% | 0% | 0% |
| Adj. Flow (vph) | 168 | 15 | 2 | 96 | 35 | 14 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 183 | 0 | 0 | 98 | 49 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.6 | | | 3.6 | 3.6 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 4.8 | | | 4.8 | 4.8 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (k/h) | | 15 | 25 | | 25 | 15 |
| Sign Control | Free | | | Free | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 19.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 1.6 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 155 | 14 | 2 | 88 | 32 | 13 |
| Future Vol, veh/h | 155 | 14 | 2 | 88 | 32 | 13 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 9 | 0 | 0 | 4 | 0 | 0 |
| Mvmt Flow | 168 | 15 | 2 | 96 | 35 | 14 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 183 | 0 | 276 | 176 |
| Stage 1 | - | - | - | - | 176 | - |
| Stage 2 | - | - | - | - | 100 | - |
| Critical Hdwy | - | - | 4.1 | - | 6.4 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.4 | - |
| Follow-up Hdwy | - | - | 2.2 | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | - | - | 1404 | - | 718 | 872 |
| Stage 1 | - | - | - | - | 859 | - |
| Stage 2 | - | - | - | - | 929 | - |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1404 | - | 717 | 872 |
| Mov Cap-2 Maneuver | - | - | - | - | 717 | - |
| Stage 1 | - | - | - | - | 859 | - |
| Stage 2 | - | - | - | - | 927 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 0.2 | 10.1 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | 756 | - | - | 1404 | - |
| HCM Lane V/C Ratio | 0.065 | - | - | 0.002 | - |
| HCM Control Delay (s) | 10.1 | - | - | 7.6 | 0 |
| HCM Lane LOS | B | - | - | A | A |
| HCM 95th %tile Q(veh) | 0.2 | - | - | 0 | - |

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 156 | 14 | 2 | 118 | 39 | 13 |
| Future Volume (vph) | 156 | 14 | 2 | 118 | 39 | 13 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 0.989 | | | | 0.966 | |
| Flt Protected | | | | 0.999 | 0.964 | |
| Satd. Flow (prot) | 1736 | 0 | 0 | 1826 | 1769 | 0 |
| Flt Permitted | | | | 0.999 | 0.964 | |
| Satd. Flow (perm) | 1736 | 0 | 0 | 1826 | 1769 | 0 |
| Link Speed (k/h) | 50 | | | 50 | 50 | |
| Link Distance (m) | 847.2 | | | 85.6 | 96.9 | |
| Travel Time (s) | 61.0 | | | 6.2 | 7.0 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 9% | 0% | 0% | 4% | 0% | 0% |
| Adj. Flow (vph) | 170 | 15 | 2 | 128 | 42 | 14 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 185 | 0 | 0 | 130 | 56 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.6 | | | 3.6 | 3.6 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 4.8 | | | 4.8 | 4.8 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (k/h) | | 15 | 25 | | 25 | 15 |
| Sign Control | Free | | | Free | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 19.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 1.6 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 156 | 14 | 2 | 118 | 39 | 13 |
| Future Vol, veh/h | 156 | 14 | 2 | 118 | 39 | 13 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 9 | 0 | 0 | 4 | 0 | 0 |
| Mvmt Flow | 170 | 15 | 2 | 128 | 42 | 14 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 185 | 0 | 310 | 178 |
| Stage 1 | - | - | - | - | 178 | - |
| Stage 2 | - | - | - | - | 132 | - |
| Critical Hdwy | - | - | 4.1 | - | 6.4 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.4 | - |
| Follow-up Hdwy | - | - | 2.2 | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | - | - | 1402 | - | 687 | 870 |
| Stage 1 | - | - | - | - | 858 | - |
| Stage 2 | - | - | - | - | 899 | - |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1402 | - | 686 | 870 |
| Mov Cap-2 Maneuver | - | - | - | - | 686 | - |
| Stage 1 | - | - | - | - | 858 | - |
| Stage 2 | - | - | - | - | 897 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 0.1 | 10.4 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | 724 | - | - | 1402 | - |
| HCM Lane V/C Ratio | 0.078 | - | - | 0.002 | - |
| HCM Control Delay (s) | 10.4 | - | - | 7.6 | 0 |
| HCM Lane LOS | B | - | - | A | A |
| HCM 95th %tile Q(veh) | 0.3 | - | - | 0 | - |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 63 | 88 | 18 | 23 | 93 | 87 | 30 | 134 | 31 | 91 | 143 | 99 |
| Future Volume (vph) | 63 | 88 | 18 | 23 | 93 | 87 | 30 | 134 | 31 | 91 | 143 | 99 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 60.0 | | 0.0 | 50.0 | | 0.0 | 60.0 | | 0.0 | 45.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 80.0 | | | 100.0 | | | 80.0 | | | 85.0 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.975 | | | 0.927 | | | 0.972 | | | 0.939 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1570 | 1725 | 0 | 1805 | 1671 | 0 | 1687 | 1803 | 0 | 1703 | 1655 | 0 |
| Flt Permitted | 0.637 | | | 0.684 | | | 0.588 | | | 0.646 | | |
| Satd. Flow (perm) | 1052 | 1725 | 0 | 1300 | 1671 | 0 | 1044 | 1803 | 0 | 1158 | 1655 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 18 | | | 82 | | | 16 | | | 49 | |
| Link Speed (k/h) | | 60 | | | 60 | | | 60 | | | 50 | |
| Link Distance (m) | | 396.4 | | | 847.2 | | | 344.1 | | | 264.4 | |
| Travel Time (s) | | 23.8 | | | 50.8 | | | 20.6 | | | 19.0 | |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles (%) | 15% | 4% | 24% | 0% | 3% | 8% | 7% | 3% | 0% | 6% | 9% | 6% |
| Adj. Flow (vph) | 67 | 94 | 19 | 24 | 99 | 93 | 32 | 143 | 33 | 97 | 152 | 105 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 67 | 113 | 0 | 24 | 192 | 0 | 32 | 176 | 0 | 97 | 257 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.6 | | | 3.6 | | | 3.6 | | | 3.6 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (k/h) | 25 | | 15 | 25 | | 15 | 25 | | 15 | 25 | | 15 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Minimum Split (s) | 43.0 | 43.0 | | 43.0 | 43.0 | | 33.0 | 33.0 | | 33.0 | 33.0 | |
| Total Split (s) | 43.0 | 43.0 | | 43.0 | 43.0 | | 33.0 | 33.0 | | 33.0 | 33.0 | |
| Total Split (%) | 56.6% | 56.6% | | 56.6% | 56.6% | | 43.4% | 43.4% | | 43.4% | 43.4% | |
| Maximum Green (s) | 35.0 | 35.0 | | 35.0 | 35.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Yellow Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| All-Red Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Act Effct Green (s) | 35.0 | 35.0 | | 35.0 | 35.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Actuated g/C Ratio | 0.46 | 0.46 | | 0.46 | 0.46 | | 0.33 | 0.33 | | 0.33 | 0.33 | |
| v/c Ratio | 0.14 | 0.14 | | 0.04 | 0.24 | | 0.09 | 0.29 | | 0.26 | 0.45 | |
| Control Delay | 12.8 | 10.5 | | 11.6 | 7.9 | | 18.7 | 18.8 | | 21.0 | 19.0 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |

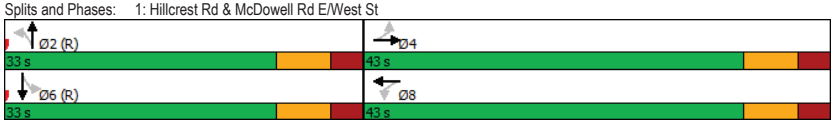




| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay | 12.8 | 10.5 | | 11.6 | 7.9 | | 18.7 | 18.8 | | 21.0 | 19.0 | |
| LOS | B | B | | B | A | | B | B | | C | B | |
| Approach Delay | | 11.4 | | | 8.3 | | | 18.7 | | | 19.5 | |
| Approach LOS | | B | | | A | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 76 | | | |
| Actuated Cycle Length: 76 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 80 | | | |
| Control Type: Pretimed | | | |
| Maximum v/c Ratio: 0.45 | | | |
| Intersection Signal Delay: 15.3 | | Intersection LOS: B | |
| Intersection Capacity Utilization 114.0% | | ICU Level of Service H | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Hillcrest Rd & McDowell Rd E/West St



## Queues
### 1: Hillcrest Rd & McDowell Rd E/West St

2030 Total: PM Peak Hour

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 67 | 113 | 24 | 192 | 32 | 176 | 97 | 257 |
| v/c Ratio | 0.14 | 0.14 | 0.04 | 0.24 | 0.09 | 0.29 | 0.26 | 0.45 |
| Control Delay | 12.8 | 10.5 | 11.6 | 7.9 | 18.7 | 18.8 | 21.0 | 19.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 12.8 | 10.5 | 11.6 | 7.9 | 18.7 | 18.8 | 21.0 | 19.0 |
| Queue Length 50th (m) | 5.6 | 7.8 | 1.9 | 9.2 | 3.3 | 17.6 | 10.6 | 23.8 |
| Queue Length 95th (m) | 13.0 | 16.8 | 5.9 | 21.0 | 9.4 | 32.9 | 22.5 | 44.6 |
| Internal Link Dist (m) | | 372.4 | | 823.2 | | 320.1 | | 240.4 |
| Turn Bay Length (m) | 60.0 | | 50.0 | | 60.0 | | 45.0 | |
| Base Capacity (vph) | 484 | 804 | 598 | 813 | 343 | 603 | 380 | 577 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.14 | 0.14 | 0.04 | 0.24 | 0.09 | 0.29 | 0.26 | 0.45 |

| Intersection Summary |
|---|



## HCM 6th Signalized Intersection Summary
### 1: Hillcrest Rd & McDowell Rd E/West St

2030 Total: PM Peak Hour

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 63 | 88 | 18 | 23 | 93 | 87 | 30 | 134 | 31 | 91 | 143 | 99 |
| Future Volume (veh/h) | 63 | 88 | 18 | 23 | 93 | 87 | 30 | 134 | 31 | 91 | 143 | 99 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1678 | 1841 | 1544 | 1900 | 1856 | 1781 | 1796 | 1856 | 1900 | 1811 | 1767 | 1811 |
| Adj Flow Rate, veh/h | 67 | 94 | 19 | 24 | 99 | 93 | 32 | 143 | 33 | 97 | 152 | 105 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 15 | 4 | 24 | 0 | 3 | 8 | 7 | 3 | 0 | 6 | 9 | 6 |
| Cap, veh/h | 514 | 684 | 138 | 646 | 405 | 381 | 315 | 480 | 111 | 394 | 320 | 221 |
| Arrive On Green | 0.46 | 0.46 | 0.46 | 0.46 | 0.46 | 0.46 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 |
| Sat Flow, veh/h | 1068 | 1486 | 300 | 1300 | 880 | 827 | 1078 | 1458 | 337 | 1170 | 973 | 672 |
| Grp Volume(v), veh/h | 67 | 0 | 113 | 24 | 0 | 192 | 32 | 0 | 176 | 97 | 0 | 257 |
| Grp Sat Flow(s),veh/h/ln | 1068 | 0 | 1787 | 1300 | 0 | 1707 | 1078 | 0 | 1795 | 1170 | 0 | 1646 |
| Q Serve(g_s), s | 3.1 | 0.0 | 2.8 | 0.8 | 0.0 | 5.2 | 1.8 | 0.0 | 5.5 | 5.1 | 0.0 | 9.4 |
| Cycle Q Clear(g_c), s | 8.3 | 0.0 | 2.8 | 3.6 | 0.0 | 5.2 | 11.3 | 0.0 | 5.5 | 10.7 | 0.0 | 9.4 |
| Prop In Lane | 1.00 | | 0.17 | 1.00 | | 0.48 | 1.00 | | 0.19 | 1.00 | | 0.41 |
| Lane Grp Cap(c), veh/h | 514 | 0 | 823 | 646 | 0 | 786 | 315 | 0 | 590 | 394 | 0 | 541 |
| V/C Ratio(X) | 0.13 | 0.00 | 0.14 | 0.04 | 0.00 | 0.24 | 0.10 | 0.00 | 0.30 | 0.25 | 0.00 | 0.47 |
| Avail Cap(c_a), veh/h | 514 | 0 | 823 | 646 | 0 | 786 | 315 | 0 | 590 | 394 | 0 | 541 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 15.0 | 0.0 | 11.8 | 12.8 | 0.0 | 12.5 | 24.8 | 0.0 | 19.0 | 22.9 | 0.0 | 20.3 |
| Incr Delay (d2), s/veh | 0.5 | 0.0 | 0.3 | 0.1 | 0.0 | 0.7 | 0.6 | 0.0 | 1.3 | 1.5 | 0.0 | 3.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 0.0 | 0.1 | 0.0 | 0.0 | 0.2 | 0.2 | 0.0 | 0.8 | 0.7 | 0.0 | 1.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 15.5 | 0.0 | 12.2 | 12.9 | 0.0 | 13.2 | 25.4 | 0.0 | 20.3 | 24.4 | 0.0 | 23.2 |
| LnGrp LOS | B | A | B | B | A | B | C | A | C | C | A | C |
| Approach Vol, veh/h | | 180 | | | 216 | | | 208 | | | 354 | |
| Approach Delay, s/veh | | 13.4 | | | 13.2 | | | 21.1 | | | 23.6 | |
| Approach LOS | | B | | | B | | | C | | | C | |

| Timer - Assigned Phs | | 2 | | 4 | | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | | 33.0 | | 43.0 | | 33.0 | | 43.0 | | | | |
| Change Period (Y+Rc), s | | 8.0 | | 8.0 | | 8.0 | | 8.0 | | | | |
| Max Green Setting (Gmax), s | | 25.0 | | 35.0 | | 25.0 | | 35.0 | | | | |
| Max Q Clear Time (g_c+I1), s | | 13.3 | | 10.3 | | 12.7 | | 7.2 | | | | |
| Green Ext Time (p_c), s | | 0.9 | | 1.1 | | 1.9 | | 1.5 | | | | |

| Intersection Summary | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HCM 6th Ctrl Delay | | | 18.8 | | | | | | | | | |
| HCM 6th LOS | | | B | | | | | | | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 14 | 126 | 15 | 0 | 148 | 27 | 13 | 11 | 4 | 15 | 16 | 18 |
| Future Volume (vph) | 14 | 126 | 15 | 0 | 148 | 27 | 13 | 11 | 4 | 15 | 16 | 18 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 20.0 | | 0.0 | 20.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 30.0 | | | 30.0 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | | | | | | | |
| Frt | | 0.984 | | | 0.977 | | | 0.982 | | | 0.951 | |
| Flt Protected | 0.950 | | | | | | | 0.977 | | | 0.985 | |
| Satd. Flow (prot) | 1671 | 1790 | 0 | 1900 | 1767 | 0 | 0 | 1647 | 0 | 0 | 1671 | 0 |
| Flt Permitted | 0.950 | | | | | | | 0.977 | | | 0.985 | |
| Satd. Flow (perm) | 1671 | 1790 | 0 | 1900 | 1767 | 0 | 0 | 1647 | 0 | 0 | 1671 | 0 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 354.6 | | | 348.1 | | | 122.5 | | | 227.1 | |
| Travel Time (s) | | 25.5 | | | 25.1 | | | 8.8 | | | 16.4 | |
| Confl. Peds. (#/hr) | 2 | | | | | 2 | | | 3 | 3 | | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Heavy Vehicles (%) | 8% | 5% | 0% | 0% | 6% | 0% | 0% | 10% | 50% | 14% | 0% | 6% |
| Adj. Flow (vph) | 15 | 135 | 16 | 0 | 159 | 29 | 14 | 12 | 4 | 16 | 17 | 19 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 15 | 151 | 0 | 0 | 188 | 0 | 0 | 30 | 0 | 0 | 52 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.6 | | | 3.6 | | | 0.0 | | | 0.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (k/h) | 25 | | 15 | 25 | | 15 | 25 | | 15 | 25 | | 15 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 22.6% | ICU Level of Service A | |
| Analysis Period (min) | 15 | | |





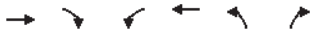
| Intersection | |
|---|---|
| Int Delay, s/veh | 2.4 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 14 | 126 | 15 | 0 | 148 | 27 | 13 | 11 | 4 | 15 | 16 | 18 |
| Future Vol, veh/h | 14 | 126 | 15 | 0 | 148 | 27 | 13 | 11 | 4 | 15 | 16 | 18 |
| Conflicting Peds, #/hr | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 3 | 3 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 20 | - | - | 20 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 |
| Heavy Vehicles, % | 8 | 5 | 0 | 0 | 6 | 0 | 0 | 10 | 50 | 14 | 0 | 6 |
| Mvmt Flow | 15 | 135 | 16 | 0 | 159 | 29 | 14 | 12 | 4 | 16 | 17 | 19 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 190 | 0 | 0 | 151 | 0 | 0 | 365 | 363 | 146 | 360 | 357 | 176 |
| Stage 1 | - | - | - | - | - | - | 173 | 173 | - | 176 | 176 | - |
| Stage 2 | - | - | - | - | - | - | 192 | 190 | - | 184 | 181 | - |
| Critical Hdwy | 4.18 | - | - | 4.1 | - | - | 7.1 | 6.6 | 6.7 | 7.24 | 6.5 | 6.26 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.1 | 5.6 | - | 6.24 | 5.5 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.1 | 5.6 | - | 6.24 | 5.5 | - |
| Follow-up Hdwy | 2.272 | - | - | 2.2 | - | - | 3.5 | 4.09 | 3.75 | 3.626 | 4 | 3.354 |
| Pot Cap-1 Maneuver | 1349 | - | - | 1442 | - | - | 595 | 552 | 789 | 574 | 572 | 857 |
| Stage 1 | - | - | - | - | - | - | 834 | 741 | - | 799 | 757 | - |
| Stage 2 | - | - | - | - | - | - | 814 | 728 | - | 791 | 754 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1347 | - | - | 1442 | - | - | 563 | 545 | 787 | 554 | 565 | 856 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 563 | 545 | - | 554 | 565 | - |
| Stage 1 | - | - | - | - | - | - | 825 | 733 | - | 789 | 755 | - |
| Stage 2 | - | - | - | - | - | - | 777 | 727 | - | 763 | 746 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.7 | 0 | 11.6 | 11.1 |
| HCM LOS | | | B | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 579 | 1347 | - | - | 1442 | - | - | 641 |
| HCM Lane V/C Ratio | 0.052 | 0.011 | - | - | - | - | - | 0.082 |
| HCM Control Delay (s) | 11.6 | 7.7 | - | - | 0 | - | - | 11.1 |
| HCM Lane LOS | B | A | - | - | A | - | - | B |
| HCM 95th %tile Q(veh) | 0.2 | 0 | - | - | 0 | - | - | 0.3 |



| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 150 | 30 | 9 | 170 | 23 | 5 |
| Future Volume (vph) | 150 | 30 | 9 | 170 | 23 | 5 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 0.977 | | | | 0.977 | |
| Flt Protected | | | | 0.997 | 0.960 | |
| Satd. Flow (prot) | 1782 | 0 | 0 | 1809 | 1782 | 0 |
| Flt Permitted | | | | 0.997 | 0.960 | |
| Satd. Flow (perm) | 1782 | 0 | 0 | 1809 | 1782 | 0 |
| Link Speed (k/h) | 50 | | | 50 | 50 | |
| Link Distance (m) | 85.6 | | | 354.6 | 193.7 | |
| Travel Time (s) | 6.2 | | | 25.5 | 13.9 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 5% | 0% | 0% | 5% | 0% | 0% |
| Adj. Flow (vph) | 163 | 33 | 10 | 185 | 25 | 5 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 196 | 0 | 0 | 195 | 30 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.6 | | | 3.6 | 3.6 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 4.8 | | | 4.8 | 4.8 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (k/h) | | 15 | 25 | | 25 | 15 |
| Sign Control | Free | | | Free | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 26.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 1 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 150 | 30 | 9 | 170 | 23 | 5 |
| Future Vol, veh/h | 150 | 30 | 9 | 170 | 23 | 5 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 5 | 0 | 0 | 5 | 0 | 0 |
| Mvmt Flow | 163 | 33 | 10 | 185 | 25 | 5 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 196 | 0 | 385 | 180 |
| Stage 1 | - | - | - | - | 180 | - |
| Stage 2 | - | - | - | - | 205 | - |
| Critical Hdwy | - | - | 4.1 | - | 6.4 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.4 | - |
| Follow-up Hdwy | - | - | 2.2 | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | - | - | 1389 | - | 622 | 868 |
| Stage 1 | - | - | - | - | 856 | - |
| Stage 2 | - | - | - | - | 834 | - |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1389 | - | 617 | 868 |
| Mov Cap-2 Maneuver | - | - | - | - | 617 | - |
| Stage 1 | - | - | - | - | 856 | - |
| Stage 2 | - | - | - | - | 827 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 0.4 | 10.8 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | 651 | - | - | 1389 | - |
| HCM Lane V/C Ratio | 0.047 | - | - | 0.007 | - |
| HCM Control Delay (s) | 10.8 | - | - | 7.6 | 0 |
| HCM Lane LOS | B | - | - | A | A |
| HCM 95th %tile Q(veh) | 0.1 | - | - | 0 | - |

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 175 | 35 | 9 | 184 | 19 | 5 |
| Future Volume (vph) | 175 | 35 | 9 | 184 | 19 | 5 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 0.977 | | | | 0.974 | |
| Flt Protected | | | | 0.998 | 0.961 | |
| Satd. Flow (prot) | 1782 | 0 | 0 | 1810 | 1778 | 0 |
| Flt Permitted | | | | 0.998 | 0.961 | |
| Satd. Flow (perm) | 1782 | 0 | 0 | 1810 | 1778 | 0 |
| Link Speed (k/h) | 50 | | | 50 | 50 | |
| Link Distance (m) | 847.2 | | | 85.6 | 96.9 | |
| Travel Time (s) | 61.0 | | | 6.2 | 7.0 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 5% | 0% | 0% | 5% | 0% | 0% |
| Adj. Flow (vph) | 190 | 38 | 10 | 200 | 21 | 5 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 228 | 0 | 0 | 210 | 26 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.6 | | | 3.6 | 3.6 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 4.8 | | | 4.8 | 4.8 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (k/h) | | 15 | 25 | | 25 | 15 |
| Sign Control | Free | | | Free | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 27.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 0.8 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 175 | 35 | 9 | 184 | 19 | 5 |
| Future Vol, veh/h | 175 | 35 | 9 | 184 | 19 | 5 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 5 | 0 | 0 | 5 | 0 | 0 |
| Mvmt Flow | 190 | 38 | 10 | 200 | 21 | 5 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 228 | 0 | 429 | 209 |
| Stage 1 | - | - | - | - | 209 | - |
| Stage 2 | - | - | - | - | 220 | - |
| Critical Hdwy | - | - | 4.1 | - | 6.4 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.4 | - |
| Follow-up Hdwy | - | - | 2.2 | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | - | - | 1352 | - | 587 | 836 |
| Stage 1 | - | - | - | - | 831 | - |
| Stage 2 | - | - | - | - | 821 | - |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1352 | - | 582 | 836 |
| Mov Cap-2 Maneuver | - | - | - | - | 582 | - |
| Stage 1 | - | - | - | - | 831 | - |
| Stage 2 | - | - | - | - | 814 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 0.4 | 11.1 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | 621 | - | - | 1352 | - |
| HCM Lane V/C Ratio | 0.042 | - | - | 0.007 | - |
| HCM Control Delay (s) | 11.1 | - | - | 7.7 | 0 |
| HCM Lane LOS | B | - | - | A | A |
| HCM 95th %tile Q(veh) | 0.1 | - | - | 0 | - |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 99 | 66 | 49 | 37 | 27 | 109 | 16 | 148 | 17 | 69 | 132 | 38 |
| Future Volume (vph) | 99 | 66 | 49 | 37 | 27 | 109 | 16 | 148 | 17 | 69 | 132 | 38 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 60.0 | | 0.0 | 50.0 | | 0.0 | 60.0 | | 0.0 | 45.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 80.0 | | | 100.0 | | | 80.0 | | | 85.0 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.936 | | | 0.880 | | | 0.985 | | | 0.967 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1671 | 1671 | 0 | 1805 | 1589 | 0 | 1583 | 1599 | 0 | 1671 | 1687 | 0 |
| Flt Permitted | 0.659 | | | 0.673 | | | 0.636 | | | 0.640 | | |
| Satd. Flow (perm) | 1159 | 1671 | 0 | 1279 | 1589 | 0 | 1060 | 1599 | 0 | 1126 | 1687 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 56 | | | 124 | | | 8 | | | 20 | |
| Link Speed (k/h) | | 60 | | | 60 | | | 60 | | | 50 | |
| Link Distance (m) | | 396.4 | | | 847.2 | | | 344.1 | | | 264.4 | |
| Travel Time (s) | | 23.8 | | | 50.8 | | | 20.6 | | | 19.0 | |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles (%) | 8% | 6% | 7% | 0% | 14% | 3% | 14% | 19% | 0% | 8% | 8% | 12% |
| Adj. Flow (vph) | 113 | 75 | 56 | 42 | 31 | 124 | 18 | 168 | 19 | 78 | 150 | 43 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 113 | 131 | 0 | 42 | 155 | 0 | 18 | 187 | 0 | 78 | 193 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.6 | | | 3.6 | | | 3.6 | | | 3.6 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (k/h) | 25 | | 15 | 25 | | 15 | 25 | | 15 | 25 | | 15 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Minimum Split (s) | 43.0 | 43.0 | | 43.0 | 43.0 | | 33.0 | 33.0 | | 33.0 | 33.0 | |
| Total Split (s) | 43.0 | 43.0 | | 43.0 | 43.0 | | 33.0 | 33.0 | | 33.0 | 33.0 | |
| Total Split (%) | 56.6% | 56.6% | | 56.6% | 56.6% | | 43.4% | 43.4% | | 43.4% | 43.4% | |
| Maximum Green (s) | 35.0 | 35.0 | | 35.0 | 35.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Yellow Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| All-Red Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Act Effct Green (s) | 35.0 | 35.0 | | 35.0 | 35.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Actuated g/C Ratio | 0.46 | 0.46 | | 0.46 | 0.46 | | 0.33 | 0.33 | | 0.33 | 0.33 | |
| v/c Ratio | 0.21 | 0.16 | | 0.07 | 0.19 | | 0.05 | 0.35 | | 0.21 | 0.34 | |
| Control Delay | 13.6 | 7.8 | | 11.9 | 4.4 | | 18.1 | 20.8 | | 20.4 | 19.3 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |

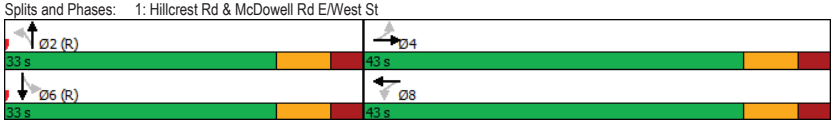




| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay | 13.6 | 7.8 | | 11.9 | 4.4 | | 18.1 | 20.8 | | 20.4 | 19.3 | |
| LOS | B | A | | B | A | | B | C | | C | B | |
| Approach Delay | | 10.5 | | | 6.0 | | | 20.6 | | | 19.6 | |
| Approach LOS | | B | | | A | | | C | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 76 | | | |
| Actuated Cycle Length: 76 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 80 | | | |
| Control Type: Pretimed | | | |
| Maximum v/c Ratio: 0.35 | | | |
| Intersection Signal Delay: 14.5 | | Intersection LOS: B | |
| Intersection Capacity Utilization 126.7% | | ICU Level of Service H | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Hillcrest Rd & McDowell Rd E/West St



## Queues
### 1: Hillcrest Rd & McDowell Rd E/West St

2035 Total: AM Peak Hour

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 113 | 131 | 42 | 155 | 18 | 187 | 78 | 193 |
| v/c Ratio | 0.21 | 0.16 | 0.07 | 0.19 | 0.05 | 0.35 | 0.21 | 0.34 |
| Control Delay | 13.6 | 7.8 | 11.9 | 4.4 | 18.1 | 20.8 | 20.4 | 19.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 13.6 | 7.8 | 11.9 | 4.4 | 18.1 | 20.8 | 20.4 | 19.3 |
| Queue Length 50th (m) | 9.8 | 6.1 | 3.4 | 2.5 | 1.8 | 20.2 | 8.4 | 19.3 |
| Queue Length 95th (m) | 19.4 | 15.1 | 8.5 | 11.6 | 6.1 | 36.0 | 18.2 | 34.9 |
| Internal Link Dist (m) | | 372.4 | | 823.2 | | 320.1 | | 240.4 |
| Turn Bay Length (m) | 60.0 | | 50.0 | | 60.0 | | 45.0 | |
| Base Capacity (vph) | 533 | 799 | 589 | 798 | 348 | 531 | 370 | 568 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.21 | 0.16 | 0.07 | 0.19 | 0.05 | 0.35 | 0.21 | 0.34 |

| Intersection Summary |
|---|



## HCM 6th Signalized Intersection Summary
### 1: Hillcrest Rd & McDowell Rd E/West St

2035 Total: AM Peak Hour

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 99 | 66 | 49 | 37 | 27 | 109 | 16 | 148 | 17 | 69 | 132 | 38 |
| Future Volume (veh/h) | 99 | 66 | 49 | 37 | 27 | 109 | 16 | 148 | 17 | 69 | 132 | 38 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1781 | 1811 | 1796 | 1900 | 1693 | 1856 | 1693 | 1618 | 1900 | 1781 | 1781 | 1722 |
| Adj Flow Rate, veh/h | 112 | 75 | 56 | 42 | 31 | 124 | 18 | 168 | 19 | 78 | 150 | 43 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Percent Heavy Veh, % | 8 | 6 | 7 | 0 | 14 | 3 | 14 | 19 | 0 | 8 | 8 | 12 |
| Cap, veh/h | 561 | 443 | 331 | 625 | 136 | 545 | 357 | 470 | 53 | 368 | 438 | 126 |
| Arrive On Green | 0.46 | 0.46 | 0.46 | 0.46 | 0.46 | 0.46 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 |
| Sat Flow, veh/h | 1173 | 963 | 719 | 1279 | 296 | 1184 | 1077 | 1428 | 161 | 1140 | 1331 | 382 |
| Grp Volume(v), veh/h | 112 | 0 | 131 | 42 | 0 | 155 | 18 | 0 | 187 | 78 | 0 | 193 |
| Grp Sat Flow(s),veh/h/ln | 1173 | 0 | 1682 | 1279 | 0 | 1479 | 1077 | 0 | 1589 | 1140 | 0 | 1713 |
| Q Serve(g_s), s | 4.8 | 0.0 | 3.5 | 1.5 | 0.0 | 4.8 | 1.0 | 0.0 | 6.8 | 4.2 | 0.0 | 6.5 |
| Cycle Q Clear(g_c), s | 9.6 | 0.0 | 3.5 | 5.0 | 0.0 | 4.8 | 7.5 | 0.0 | 6.8 | 11.0 | 0.0 | 6.5 |
| Prop In Lane | 1.00 | | 0.43 | 1.00 | | 0.80 | 1.00 | | 0.10 | 1.00 | | 0.22 |
| Lane Grp Cap(c), veh/h | 561 | 0 | 774 | 625 | 0 | 681 | 357 | 0 | 523 | 368 | 0 | 563 |
| V/C Ratio(X) | 0.20 | 0.00 | 0.17 | 0.07 | 0.00 | 0.23 | 0.05 | 0.00 | 0.36 | 0.21 | 0.00 | 0.34 |
| Avail Cap(c_a), veh/h | 561 | 0 | 774 | 625 | 0 | 681 | 357 | 0 | 523 | 368 | 0 | 563 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 15.3 | 0.0 | 12.0 | 13.4 | 0.0 | 12.4 | 22.1 | 0.0 | 19.4 | 23.6 | 0.0 | 19.3 |
| Incr Delay (d2), s/veh | 0.8 | 0.0 | 0.5 | 0.2 | 0.0 | 0.8 | 0.3 | 0.0 | 1.9 | 1.3 | 0.0 | 1.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.3 | 0.0 | 0.1 | 0.1 | 0.0 | 0.2 | 0.1 | 0.0 | 0.9 | 0.6 | 0.0 | 1.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 16.1 | 0.0 | 12.5 | 13.7 | 0.0 | 13.1 | 22.4 | 0.0 | 21.3 | 24.9 | 0.0 | 20.9 |
| LnGrp LOS | B | A | B | B | A | B | C | A | C | C | A | C |
| Approach Vol, veh/h | | 243 | | | 197 | | | 205 | | | 271 | |
| Approach Delay, s/veh | | 14.1 | | | 13.2 | | | 21.4 | | | 22.1 | |
| Approach LOS | | B | | | B | | | C | | | C | |

| Timer - Assigned Phs | | 2 | | 4 | | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | | 33.0 | | 43.0 | | 33.0 | | 43.0 | | | | |
| Change Period (Y+Rc), s | | 8.0 | | 8.0 | | 8.0 | | 8.0 | | | | |
| Max Green Setting (Gmax), s | | 25.0 | | 35.0 | | 25.0 | | 35.0 | | | | |
| Max Q Clear Time (g_c+I1), s | | 9.5 | | 11.6 | | 13.0 | | 7.0 | | | | |
| Green Ext Time (p_c), s | | 1.1 | | 1.4 | | 1.3 | | 1.3 | | | | |

| Intersection Summary | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HCM 6th Ctrl Delay | | | 17.9 | | | | | | | | | |
| HCM 6th LOS | | | B | | | | | | | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 2 | 167 | 7 | 1 | 72 | 9 | 13 | 11 | 7 | 31 | 4 | 10 |
| Future Volume (vph) | 2 | 167 | 7 | 1 | 72 | 9 | 13 | 11 | 7 | 31 | 4 | 10 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 20.0 | | 0.0 | 20.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 30.0 | | | 30.0 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | | | | | | | |
| Frt | | 0.994 | | | 0.983 | | | 0.968 | | | 0.969 | |
| Flt Protected | 0.950 | | | 0.950 | | | | 0.980 | | | 0.967 | |
| Satd. Flow (prot) | 1805 | 1727 | 0 | 902 | 1741 | 0 | 0 | 1802 | 0 | 0 | 1665 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | | 0.980 | | | 0.967 | |
| Satd. Flow (perm) | 1805 | 1727 | 0 | 902 | 1741 | 0 | 0 | 1802 | 0 | 0 | 1665 | 0 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 354.6 | | | 348.1 | | | 122.5 | | | 227.1 | |
| Travel Time (s) | | 25.5 | | | 25.1 | | | 8.8 | | | 16.4 | |
| Confl. Peds. (#/hr) | | | | | | | 1 | | 1 | 1 | | 1 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Heavy Vehicles (%) | 0% | 9% | 17% | 100% | 5% | 25% | 0% | 0% | 0% | 4% | 50% | 0% |
| Adj. Flow (vph) | 2 | 180 | 8 | 1 | 77 | 10 | 14 | 12 | 8 | 33 | 4 | 11 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 2 | 188 | 0 | 1 | 87 | 0 | 0 | 34 | 0 | 0 | 48 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.6 | | | 3.6 | | | 0.0 | | | 0.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (k/h) | 25 | | 15 | 25 | | 15 | 25 | | 15 | 25 | | 15 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 20.3% | ICU Level of Service A | |
| Analysis Period (min) | 15 | | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 2.5 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 2 | 167 | 7 | 1 | 72 | 9 | 13 | 11 | 7 | 31 | 4 | 10 |
| Future Vol, veh/h | 2 | 167 | 7 | 1 | 72 | 9 | 13 | 11 | 7 | 31 | 4 | 10 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 20 | - | - | 20 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 |
| Heavy Vehicles, % | 0 | 9 | 17 | 100 | 5 | 25 | 0 | 0 | 0 | 4 | 50 | 0 |
| Mvmt Flow | 2 | 180 | 8 | 1 | 77 | 10 | 14 | 12 | 8 | 33 | 4 | 11 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 87 | 0 | 0 | 188 | 0 | 0 | 281 | 277 | 185 | 283 | 276 | 83 |
| Stage 1 | - | - | - | - | - | - | 188 | 188 | - | 84 | 84 | - |
| Stage 2 | - | - | - | - | - | - | 93 | 89 | - | 199 | 192 | - |
| Critical Hdwy | 4.1 | - | - | 5.1 | - | - | 7.1 | 6.5 | 6.2 | 7.14 | 7 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.1 | 5.5 | - | 6.14 | 6 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.1 | 5.5 | - | 6.14 | 6 | - |
| Follow-up Hdwy | 2.2 | - | - | 3.1 | - | - | 3.5 | 4 | 3.3 | 3.536 | 4.45 | 3.3 |
| Pot Cap-1 Maneuver | 1522 | - | - | 964 | - | - | 675 | 634 | 862 | 665 | 558 | 982 |
| Stage 1 | - | - | - | - | - | - | 818 | 748 | - | 919 | 740 | - |
| Stage 2 | - | - | - | - | - | - | 919 | 825 | - | 798 | 660 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1522 | - | - | 964 | - | - | 662 | 633 | 861 | 648 | 557 | 981 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 662 | 633 | - | 648 | 557 | - |
| Stage 1 | - | - | - | - | - | - | 817 | 747 | - | 918 | 739 | - |
| Stage 2 | - | - | - | - | - | - | 902 | 824 | - | 777 | 659 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.1 | 0.1 | 10.5 | 10.6 |
| HCM LOS | | | B | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 687 | 1522 | - | - | 964 | - | - | 690 |
| HCM Lane V/C Ratio | 0.049 | 0.001 | - | - | 0.001 | - | - | 0.07 |
| HCM Control Delay (s) | 10.5 | 7.4 | - | - | 8.7 | - | - | 10.6 |
| HCM Lane LOS | B | A | - | - | A | - | - | B |
| HCM 95th %tile Q(veh) | 0.2 | 0 | - | - | 0 | - | - | 0.2 |

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 163 | 14 | 2 | 93 | 32 | 13 |
| Future Volume (vph) | 163 | 14 | 2 | 93 | 32 | 13 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 0.989 | | | | 0.961 | |
| Flt Protected | | | | 0.999 | 0.966 | |
| Satd. Flow (prot) | 1735 | 0 | 0 | 1826 | 1764 | 0 |
| Flt Permitted | | | | 0.999 | 0.966 | |
| Satd. Flow (perm) | 1735 | 0 | 0 | 1826 | 1764 | 0 |
| Link Speed (k/h) | 50 | | | 50 | 50 | |
| Link Distance (m) | 85.6 | | | 354.6 | 193.7 | |
| Travel Time (s) | 6.2 | | | 25.5 | 13.9 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 9% | 0% | 0% | 4% | 0% | 0% |
| Adj. Flow (vph) | 177 | 15 | 2 | 101 | 35 | 14 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 192 | 0 | 0 | 103 | 49 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.6 | | | 3.6 | 3.6 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 4.8 | | | 4.8 | 4.8 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (k/h) | | 15 | 25 | | 25 | 15 |
| Sign Control | Free | | | Free | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 19.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 1.5 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 163 | 14 | 2 | 93 | 32 | 13 |
| Future Vol, veh/h | 163 | 14 | 2 | 93 | 32 | 13 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 9 | 0 | 0 | 4 | 0 | 0 |
| Mvmt Flow | 177 | 15 | 2 | 101 | 35 | 14 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 192 | 0 | 290 | 185 |
| Stage 1 | - | - | - | - | 185 | - |
| Stage 2 | - | - | - | - | 105 | - |
| Critical Hdwy | - | - | 4.1 | - | 6.4 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.4 | - |
| Follow-up Hdwy | - | - | 2.2 | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | - | - | 1394 | - | 705 | 862 |
| Stage 1 | - | - | - | - | 852 | - |
| Stage 2 | - | - | - | - | 924 | - |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1394 | - | 704 | 862 |
| Mov Cap-2 Maneuver | - | - | - | - | 704 | - |
| Stage 1 | - | - | - | - | 852 | - |
| Stage 2 | - | - | - | - | 922 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 0.2 | 10.2 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | 743 | - | - | 1394 | - |
| HCM Lane V/C Ratio | 0.066 | - | - | 0.002 | - |
| HCM Control Delay (s) | 10.2 | - | - | 7.6 | 0 |
| HCM Lane LOS | B | - | - | A | A |
| HCM 95th %tile Q(veh) | 0.2 | - | - | 0 | - |

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 164 | 14 | 2 | 123 | 39 | 13 |
| Future Volume (vph) | 164 | 14 | 2 | 123 | 39 | 13 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 0.990 | | | | 0.966 | |
| Flt Protected | | | | 0.999 | 0.964 | |
| Satd. Flow (prot) | 1737 | 0 | 0 | 1826 | 1769 | 0 |
| Flt Permitted | | | | 0.999 | 0.964 | |
| Satd. Flow (perm) | 1737 | 0 | 0 | 1826 | 1769 | 0 |
| Link Speed (k/h) | 50 | | | 50 | 50 | |
| Link Distance (m) | 847.2 | | | 85.6 | 96.9 | |
| Travel Time (s) | 61.0 | | | 6.2 | 7.0 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 9% | 0% | 0% | 4% | 0% | 0% |
| Adj. Flow (vph) | 178 | 15 | 2 | 134 | 42 | 14 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 193 | 0 | 0 | 136 | 56 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.6 | | | 3.6 | 3.6 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 4.8 | | | 4.8 | 4.8 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (k/h) | | 15 | 25 | | 25 | 15 |
| Sign Control | Free | | | Free | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 19.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 1.6 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 164 | 14 | 2 | 123 | 39 | 13 |
| Future Vol, veh/h | 164 | 14 | 2 | 123 | 39 | 13 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 9 | 0 | 0 | 4 | 0 | 0 |
| Mvmt Flow | 178 | 15 | 2 | 134 | 42 | 14 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 193 | 0 | 324 | 186 |
| Stage 1 | - | - | - | - | 186 | - |
| Stage 2 | - | - | - | - | 138 | - |
| Critical Hdwy | - | - | 4.1 | - | 6.4 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.4 | - |
| Follow-up Hdwy | - | - | 2.2 | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | - | - | 1392 | - | 674 | 861 |
| Stage 1 | - | - | - | - | 851 | - |
| Stage 2 | - | - | - | - | 894 | - |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1392 | - | 673 | 861 |
| Mov Cap-2 Maneuver | - | - | - | - | 673 | - |
| Stage 1 | - | - | - | - | 851 | - |
| Stage 2 | - | - | - | - | 892 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 0.1 | 10.5 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | 712 | - | - | 1392 | - |
| HCM Lane V/C Ratio | 0.079 | - | - | 0.002 | - |
| HCM Control Delay (s) | 10.5 | - | - | 7.6 | 0 |
| HCM Lane LOS | B | - | - | A | A |
| HCM 95th %tile Q(veh) | 0.3 | - | - | 0 | - |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 67 | 92 | 19 | 23 | 98 | 90 | 31 | 141 | 31 | 94 | 151 | 104 |
| Future Volume (vph) | 67 | 92 | 19 | 23 | 98 | 90 | 31 | 141 | 31 | 94 | 151 | 104 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 60.0 | | 0.0 | 50.0 | | 0.0 | 60.0 | | 0.0 | 45.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 80.0 | | | 100.0 | | | 80.0 | | | 85.0 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.975 | | | 0.928 | | | 0.973 | | | 0.939 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1570 | 1725 | 0 | 1805 | 1673 | 0 | 1687 | 1804 | 0 | 1703 | 1655 | 0 |
| Flt Permitted | 0.632 | | | 0.681 | | | 0.566 | | | 0.642 | | |
| Satd. Flow (perm) | 1044 | 1725 | 0 | 1294 | 1673 | 0 | 1005 | 1804 | 0 | 1151 | 1655 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 18 | | | 81 | | | 16 | | | 49 | |
| Link Speed (k/h) | | 60 | | | 60 | | | 60 | | | 50 | |
| Link Distance (m) | | 396.4 | | | 847.2 | | | 344.1 | | | 264.4 | |
| Travel Time (s) | | 23.8 | | | 50.8 | | | 20.6 | | | 19.0 | |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles (%) | 15% | 4% | 24% | 0% | 3% | 8% | 7% | 3% | 0% | 6% | 9% | 6% |
| Adj. Flow (vph) | 71 | 98 | 20 | 24 | 104 | 96 | 33 | 150 | 33 | 100 | 161 | 111 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 71 | 118 | 0 | 24 | 200 | 0 | 33 | 183 | 0 | 100 | 272 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.6 | | | 3.6 | | | 3.6 | | | 3.6 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (k/h) | 25 | | 15 | 25 | | 15 | 25 | | 15 | 25 | | 15 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Minimum Split (s) | 43.0 | 43.0 | | 43.0 | 43.0 | | 33.0 | 33.0 | | 33.0 | 33.0 | |
| Total Split (s) | 43.0 | 43.0 | | 43.0 | 43.0 | | 33.0 | 33.0 | | 33.0 | 33.0 | |
| Total Split (%) | 56.6% | 56.6% | | 56.6% | 56.6% | | 43.4% | 43.4% | | 43.4% | 43.4% | |
| Maximum Green (s) | 35.0 | 35.0 | | 35.0 | 35.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Yellow Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| All-Red Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Act Effct Green (s) | 35.0 | 35.0 | | 35.0 | 35.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Actuated g/C Ratio | 0.46 | 0.46 | | 0.46 | 0.46 | | 0.33 | 0.33 | | 0.33 | 0.33 | |
| v/c Ratio | 0.15 | 0.15 | | 0.04 | 0.25 | | 0.10 | 0.30 | | 0.26 | 0.47 | |
| Control Delay | 13.0 | 10.6 | | 11.6 | 8.2 | | 18.8 | 19.0 | | 21.1 | 19.7 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |

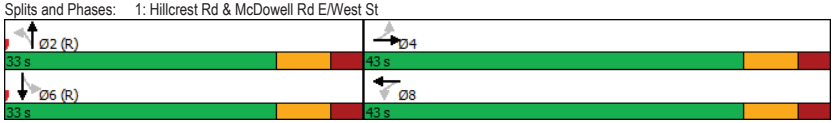


Lanes, Volumes, Timings
1: Hillcrest Rd & McDowell Rd E/West St
2035 Total: PM Peak Hour

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay | 13.0 | 10.6 | | 11.6 | 8.2 | | 18.8 | 19.0 | | 21.1 | 19.7 | |
| LOS | B | B | | B | A | | B | B | | C | B | |
| Approach Delay | | 11.5 | | | 8.6 | | | 19.0 | | | 20.1 | |
| Approach LOS | | B | | | A | | | B | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 76 | | | |
| Actuated Cycle Length: 76 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 80 | | | |
| Control Type: Pretimed | | | |
| Maximum v/c Ratio: 0.47 | | | |
| Intersection Signal Delay: 15.6 | | Intersection LOS: B | |
| Intersection Capacity Utilization 117.3% | | ICU Level of Service H | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Hillcrest Rd & McDowell Rd E/West St



## Queues
### 1: Hillcrest Rd & McDowell Rd E/West St

2035 Total: PM Peak Hour

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 71 | 118 | 24 | 200 | 33 | 183 | 100 | 272 |
| v/c Ratio | 0.15 | 0.15 | 0.04 | 0.25 | 0.10 | 0.30 | 0.26 | 0.47 |
| Control Delay | 13.0 | 10.6 | 11.6 | 8.2 | 18.8 | 19.0 | 21.1 | 19.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 13.0 | 10.6 | 11.6 | 8.2 | 18.8 | 19.0 | 21.1 | 19.7 |
| Queue Length 50th (m) | 5.9 | 8.3 | 1.9 | 10.0 | 3.4 | 18.4 | 11.0 | 25.9 |
| Queue Length 95th (m) | 13.5 | 17.6 | 5.9 | 22.1 | 9.6 | 34.1 | 23.1 | 47.6 |
| Internal Link Dist (m) | | 372.4 | | 823.2 | | 320.1 | | 240.4 |
| Turn Bay Length (m) | 60.0 | | 50.0 | | 60.0 | | 45.0 | |
| Base Capacity (vph) | 480 | 804 | 595 | 814 | 330 | 604 | 378 | 577 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.15 | 0.15 | 0.04 | 0.25 | 0.10 | 0.30 | 0.26 | 0.47 |

| Intersection Summary |
|---|



## HCM 6th Signalized Intersection Summary
### 1: Hillcrest Rd & McDowell Rd E/West St

2035 Total: PM Peak Hour

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 67 | 92 | 19 | 23 | 98 | 90 | 31 | 141 | 31 | 94 | 151 | 104 |
| Future Volume (veh/h) | 67 | 92 | 19 | 23 | 98 | 90 | 31 | 141 | 31 | 94 | 151 | 104 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1678 | 1841 | 1544 | 1900 | 1856 | 1781 | 1796 | 1856 | 1900 | 1811 | 1767 | 1811 |
| Adj Flow Rate, veh/h | 71 | 98 | 20 | 24 | 104 | 96 | 33 | 150 | 33 | 100 | 161 | 111 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 15 | 4 | 24 | 0 | 3 | 8 | 7 | 3 | 0 | 6 | 9 | 6 |
| Cap, veh/h | 507 | 683 | 139 | 641 | 409 | 378 | 303 | 485 | 107 | 389 | 320 | 221 |
| Arrive On Green | 0.46 | 0.46 | 0.46 | 0.46 | 0.46 | 0.46 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 |
| Sat Flow, veh/h | 1061 | 1483 | 303 | 1294 | 888 | 820 | 1063 | 1473 | 324 | 1163 | 974 | 672 |
| Grp Volume(v), veh/h | 71 | 0 | 118 | 24 | 0 | 200 | 33 | 0 | 183 | 100 | 0 | 272 |
| Grp Sat Flow(s),veh/h/ln | 1061 | 0 | 1786 | 1294 | 0 | 1708 | 1063 | 0 | 1797 | 1163 | 0 | 1646 |
| Q Serve(g_s), s | 3.3 | 0.0 | 2.9 | 0.8 | 0.0 | 5.4 | 2.0 | 0.0 | 5.8 | 5.3 | 0.0 | 10.1 |
| Cycle Q Clear(g_c), s | 8.8 | 0.0 | 2.9 | 3.7 | 0.0 | 5.4 | 12.1 | 0.0 | 5.8 | 11.1 | 0.0 | 10.1 |
| Prop In Lane | 1.00 | | 0.17 | 1.00 | | 0.48 | 1.00 | | 0.18 | 1.00 | | 0.41 |
| Lane Grp Cap(c), veh/h | 507 | 0 | 823 | 641 | 0 | 787 | 303 | 0 | 591 | 389 | 0 | 541 |
| V/C Ratio(X) | 0.14 | 0.00 | 0.14 | 0.04 | 0.00 | 0.25 | 0.11 | 0.00 | 0.31 | 0.26 | 0.00 | 0.50 |
| Avail Cap(c_a), veh/h | 507 | 0 | 823 | 641 | 0 | 787 | 303 | 0 | 591 | 389 | 0 | 541 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 15.2 | 0.0 | 11.8 | 12.9 | 0.0 | 12.5 | 25.3 | 0.0 | 19.1 | 23.2 | 0.0 | 20.5 |
| Incr Delay (d2), s/veh | 0.6 | 0.0 | 0.4 | 0.1 | 0.0 | 0.8 | 0.7 | 0.0 | 1.4 | 1.6 | 0.0 | 3.3 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 0.0 | 0.1 | 0.0 | 0.0 | 0.2 | 0.3 | 0.0 | 0.8 | 0.7 | 0.0 | 1.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 15.8 | 0.0 | 12.2 | 13.0 | 0.0 | 13.3 | 26.1 | 0.0 | 20.4 | 24.8 | 0.0 | 23.8 |
| LnGrp LOS | B | A | B | B | A | B | C | A | C | C | A | C |
| Approach Vol, veh/h | | 189 | | | 224 | | | 216 | | | 372 | |
| Approach Delay, s/veh | | 13.6 | | | 13.3 | | | 21.3 | | | 24.1 | |
| Approach LOS | | B | | | B | | | C | | | C | |

| Timer - Assigned Phs | | 2 | | 4 | | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | | 33.0 | | 43.0 | | 33.0 | | 43.0 | | | | |
| Change Period (Y+Rc), s | | 8.0 | | 8.0 | | 8.0 | | 8.0 | | | | |
| Max Green Setting (Gmax), s | | 25.0 | | 35.0 | | 25.0 | | 35.0 | | | | |
| Max Q Clear Time (g_c+I1), s | | 14.1 | | 10.8 | | 13.1 | | 7.4 | | | | |
| Green Ext Time (p_c), s | | 0.9 | | 1.2 | | 2.0 | | 1.5 | | | | |

| Intersection Summary | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HCM 6th Ctrl Delay | | | 19.1 | | | | | | | | | |
| HCM 6th LOS | | | B | | | | | | | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 14 | 132 | 16 | 0 | 155 | 29 | 13 | 11 | 4 | 16 | 17 | 19 |
| Future Volume (vph) | 14 | 132 | 16 | 0 | 155 | 29 | 13 | 11 | 4 | 16 | 17 | 19 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 20.0 | | 0.0 | 20.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 30.0 | | | 30.0 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | | | | | | | |
| Frt | | 0.984 | | | 0.977 | | | 0.982 | | | 0.951 | |
| Flt Protected | 0.950 | | | | | | | 0.977 | | | 0.985 | |
| Satd. Flow (prot) | 1671 | 1790 | 0 | 1900 | 1767 | 0 | 0 | 1647 | 0 | 0 | 1671 | 0 |
| Flt Permitted | 0.950 | | | | | | | 0.977 | | | 0.985 | |
| Satd. Flow (perm) | 1671 | 1790 | 0 | 1900 | 1767 | 0 | 0 | 1647 | 0 | 0 | 1671 | 0 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 354.6 | | | 348.1 | | | 122.5 | | | 227.1 | |
| Travel Time (s) | | 25.5 | | | 25.1 | | | 8.8 | | | 16.4 | |
| Confl. Peds. (#/hr) | 2 | | | | | 2 | | | 3 | 3 | | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Heavy Vehicles (%) | 8% | 5% | 0% | 0% | 6% | 0% | 0% | 10% | 50% | 14% | 0% | 6% |
| Adj. Flow (vph) | 15 | 142 | 17 | 0 | 167 | 31 | 14 | 12 | 4 | 17 | 18 | 20 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 15 | 159 | 0 | 0 | 198 | 0 | 0 | 30 | 0 | 0 | 55 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.6 | | | 3.6 | | | 0.0 | | | 0.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | | | 4.8 | | | 4.8 | | | 4.8 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (k/h) | 25 | | 15 | 25 | | 15 | 25 | | 15 | 25 | | 15 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 22.6% | ICU Level of Service A | |
| Analysis Period (min) | 15 | | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 2.4 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 14 | 132 | 16 | 0 | 155 | 29 | 13 | 11 | 4 | 16 | 17 | 19 |
| Future Vol, veh/h | 14 | 132 | 16 | 0 | 155 | 29 | 13 | 11 | 4 | 16 | 17 | 19 |
| Conflicting Peds, #/hr | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 3 | 3 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 20 | - | - | 20 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 |
| Heavy Vehicles, % | 8 | 5 | 0 | 0 | 6 | 0 | 0 | 10 | 50 | 14 | 0 | 6 |
| Mvmt Flow | 15 | 142 | 17 | 0 | 167 | 31 | 14 | 12 | 4 | 17 | 18 | 20 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 200 | 0 | 0 | 159 | 0 | 0 | 383 | 381 | 154 | 377 | 374 | 185 |
| Stage 1 | - | - | - | - | - | - | 181 | 181 | - | 185 | 185 | - |
| Stage 2 | - | - | - | - | - | - | 202 | 200 | - | 192 | 189 | - |
| Critical Hdwy | 4.18 | - | - | 4.1 | - | - | 7.1 | 6.6 | 6.7 | 7.24 | 6.5 | 6.26 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.1 | 5.6 | - | 6.24 | 5.5 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.1 | 5.6 | - | 6.24 | 5.5 | - |
| Follow-up Hdwy | 2.272 | - | - | 2.2 | - | - | 3.5 | 4.09 | 3.75 | 3.626 | 4 | 3.354 |
| Pot Cap-1 Maneuver | 1337 | - | - | 1433 | - | - | 579 | 539 | 780 | 559 | 560 | 847 |
| Stage 1 | - | - | - | - | - | - | 825 | 735 | - | 790 | 751 | - |
| Stage 2 | - | - | - | - | - | - | 805 | 721 | - | 783 | 748 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1335 | - | - | 1433 | - | - | 546 | 532 | 778 | 539 | 553 | 846 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 546 | 532 | - | 539 | 553 | - |
| Stage 1 | - | - | - | - | - | - | 816 | 727 | - | 780 | 749 | - |
| Stage 2 | - | - | - | - | - | - | 766 | 720 | - | 755 | 740 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.7 | 0 | 11.7 | 11.3 |
| HCM LOS | | | B | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 564 | 1335 | - | - | 1433 | - | - | 627 |
| HCM Lane V/C Ratio | 0.053 | 0.011 | - | - | - | - | - | 0.089 |
| HCM Control Delay (s) | 11.7 | 7.7 | - | - | 0 | - | - | 11.3 |
| HCM Lane LOS | B | A | - | - | A | - | - | B |
| HCM 95th %tile Q(veh) | 0.2 | 0 | - | - | 0 | - | - | 0.3 |

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 157 | 30 | 9 | 178 | 23 | 5 |
| Future Volume (vph) | 157 | 30 | 9 | 178 | 23 | 5 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 0.978 | | | | 0.977 | |
| Flt Protected | | | | 0.998 | 0.960 | |
| Satd. Flow (prot) | 1783 | 0 | 0 | 1810 | 1782 | 0 |
| Flt Permitted | | | | 0.998 | 0.960 | |
| Satd. Flow (perm) | 1783 | 0 | 0 | 1810 | 1782 | 0 |
| Link Speed (k/h) | 50 | | | 50 | 50 | |
| Link Distance (m) | 85.6 | | | 354.6 | 193.7 | |
| Travel Time (s) | 6.2 | | | 25.5 | 13.9 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 5% | 0% | 0% | 5% | 0% | 0% |
| Adj. Flow (vph) | 171 | 33 | 10 | 193 | 25 | 5 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 204 | 0 | 0 | 203 | 30 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.6 | | | 3.6 | 3.6 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 4.8 | | | 4.8 | 4.8 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (k/h) | | 15 | 25 | | 25 | 15 |
| Sign Control | Free | | | Free | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 26.7% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 0.9 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 157 | 30 | 9 | 178 | 23 | 5 |
| Future Vol, veh/h | 157 | 30 | 9 | 178 | 23 | 5 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 5 | 0 | 0 | 5 | 0 | 0 |
| Mvmt Flow | 171 | 33 | 10 | 193 | 25 | 5 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 204 | 0 | 401 | 188 |
| Stage 1 | - | - | - | - | 188 | - |
| Stage 2 | - | - | - | - | 213 | - |
| Critical Hdwy | - | - | 4.1 | - | 6.4 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.4 | - |
| Follow-up Hdwy | - | - | 2.2 | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | - | - | 1380 | - | 609 | 859 |
| Stage 1 | - | - | - | - | 849 | - |
| Stage 2 | - | - | - | - | 827 | - |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1380 | - | 604 | 859 |
| Mov Cap-2 Maneuver | - | - | - | - | 604 | - |
| Stage 1 | - | - | - | - | 849 | - |
| Stage 2 | - | - | - | - | 820 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 0.4 | 10.9 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | 638 | - | - | 1380 | - |
| HCM Lane V/C Ratio | 0.048 | - | - | 0.007 | - |
| HCM Control Delay (s) | 10.9 | - | - | 7.6 | 0 |
| HCM Lane LOS | B | - | - | A | A |
| HCM 95th %tile Q(veh) | 0.1 | - | - | 0 | - |

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 182 | 35 | 9 | 192 | 19 | 5 |
| Future Volume (vph) | 182 | 35 | 9 | 192 | 19 | 5 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 0.978 | | | | 0.974 | |
| Flt Protected | | | | 0.998 | 0.961 | |
| Satd. Flow (prot) | 1783 | 0 | 0 | 1810 | 1778 | 0 |
| Flt Permitted | | | | 0.998 | 0.961 | |
| Satd. Flow (perm) | 1783 | 0 | 0 | 1810 | 1778 | 0 |
| Link Speed (k/h) | 50 | | | 50 | 50 | |
| Link Distance (m) | 847.2 | | | 85.6 | 96.9 | |
| Travel Time (s) | 61.0 | | | 6.2 | 7.0 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 5% | 0% | 0% | 5% | 0% | 0% |
| Adj. Flow (vph) | 198 | 38 | 10 | 209 | 21 | 5 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 236 | 0 | 0 | 219 | 26 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.6 | | | 3.6 | 3.6 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 4.8 | | | 4.8 | 4.8 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (k/h) | | 15 | 25 | | 25 | 15 |
| Sign Control | Free | | | Free | Stop | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Control Type: Unsignalized | | | |
| Intersection Capacity Utilization | 27.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 0.7 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 182 | 35 | 9 | 192 | 19 | 5 |
| Future Vol, veh/h | 182 | 35 | 9 | 192 | 19 | 5 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 5 | 0 | 0 | 5 | 0 | 0 |
| Mvmt Flow | 198 | 38 | 10 | 209 | 21 | 5 |

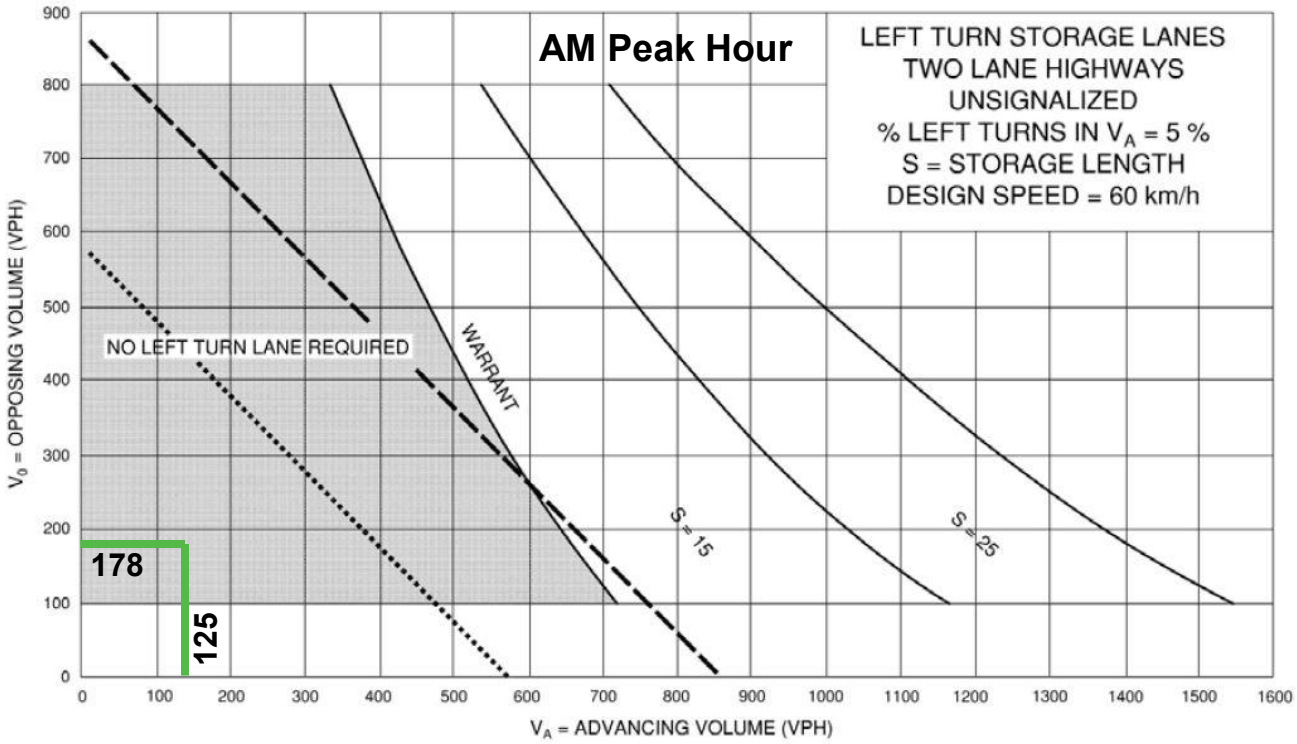
| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 236 | 0 | 446 | 217 |
| Stage 1 | - | - | - | - | 217 | - |
| Stage 2 | - | - | - | - | 229 | - |
| Critical Hdwy | - | - | 4.1 | - | 6.4 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.4 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.4 | - |
| Follow-up Hdwy | - | - | 2.2 | - | 3.5 | 3.3 |
| Pot Cap-1 Maneuver | - | - | 1343 | - | 574 | 828 |
| Stage 1 | - | - | - | - | 824 | - |
| Stage 2 | - | - | - | - | 814 | - |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1343 | - | 569 | 828 |
| Mov Cap-2 Maneuver | - | - | - | - | 569 | - |
| Stage 1 | - | - | - | - | 824 | - |
| Stage 2 | - | - | - | - | 807 | - |

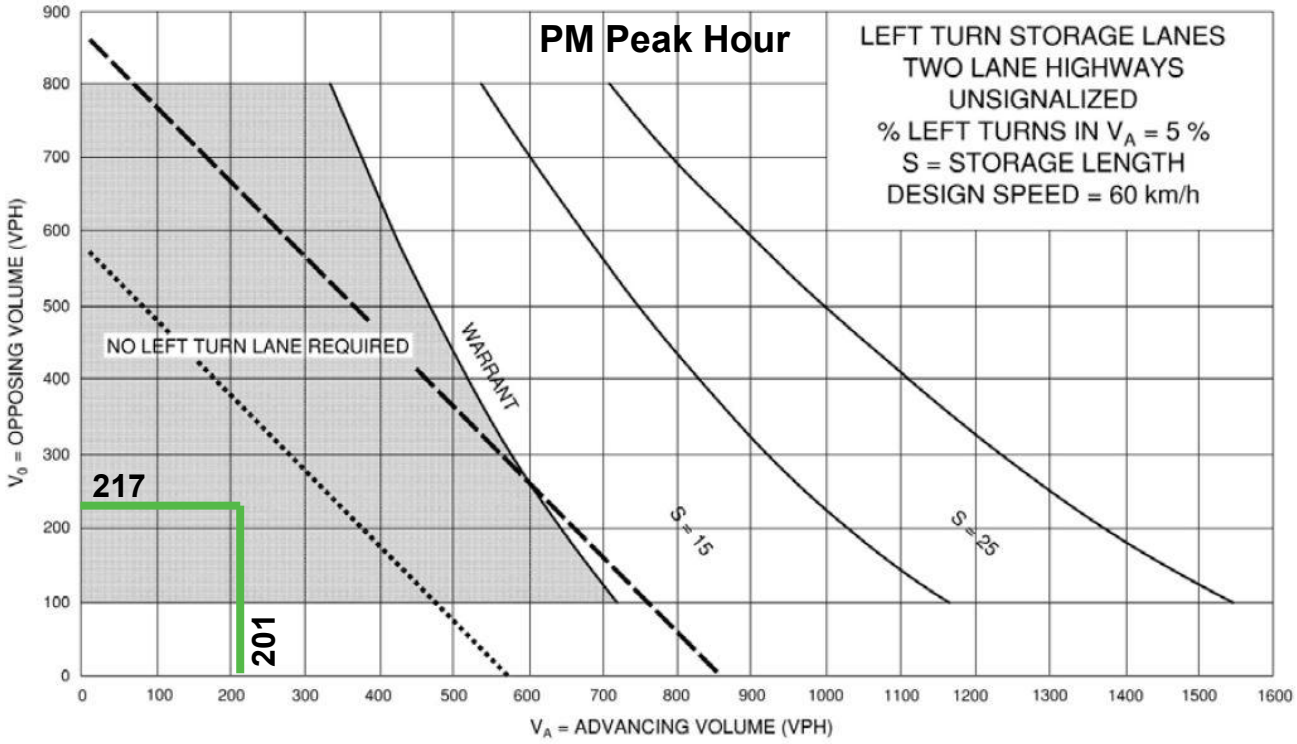
| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 0.3 | 11.2 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | 609 | - | - | 1343 | - |
| HCM Lane V/C Ratio | 0.043 | - | - | 0.007 | - |
| HCM Control Delay (s) | 11.2 | - | - | 7.7 | 0 |
| HCM Lane LOS | B | - | - | A | A |
| HCM 95th %tile Q(veh) | 0.1 | - | - | 0 | - |

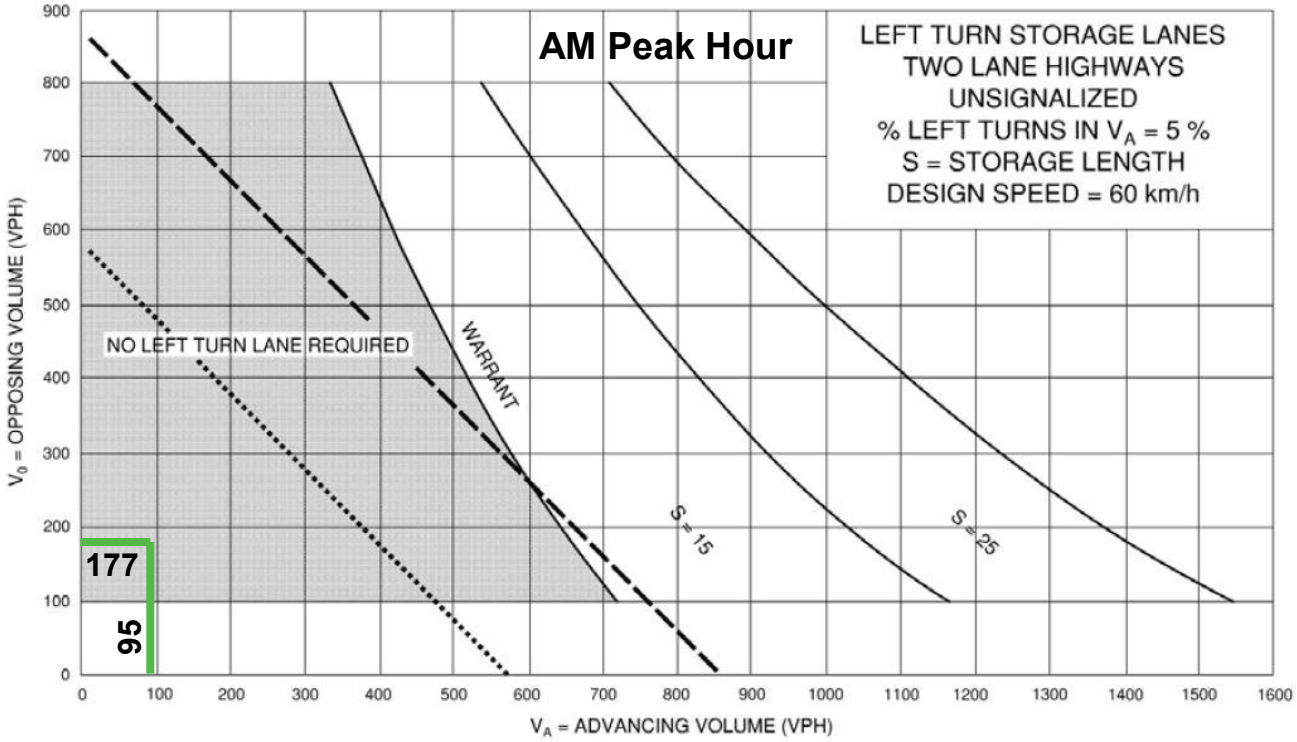
# Appendix F

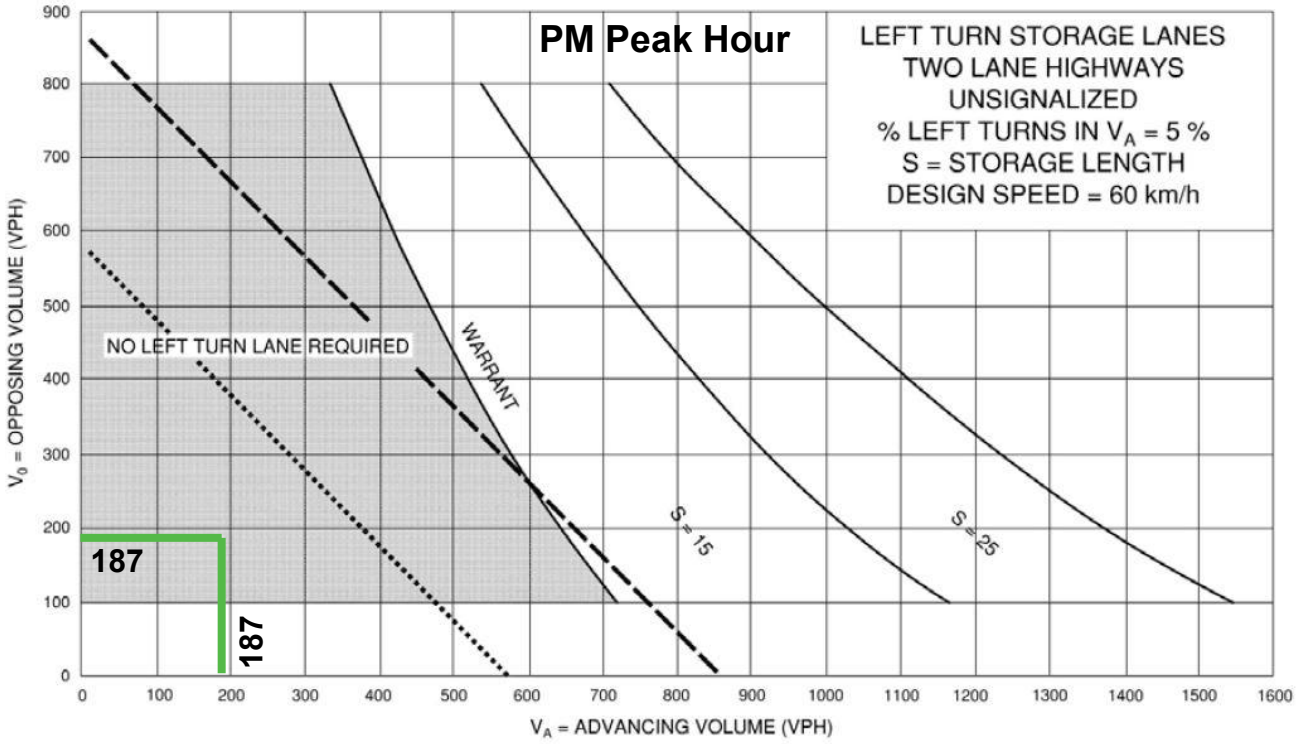
## Left-Turn Lane Warrants



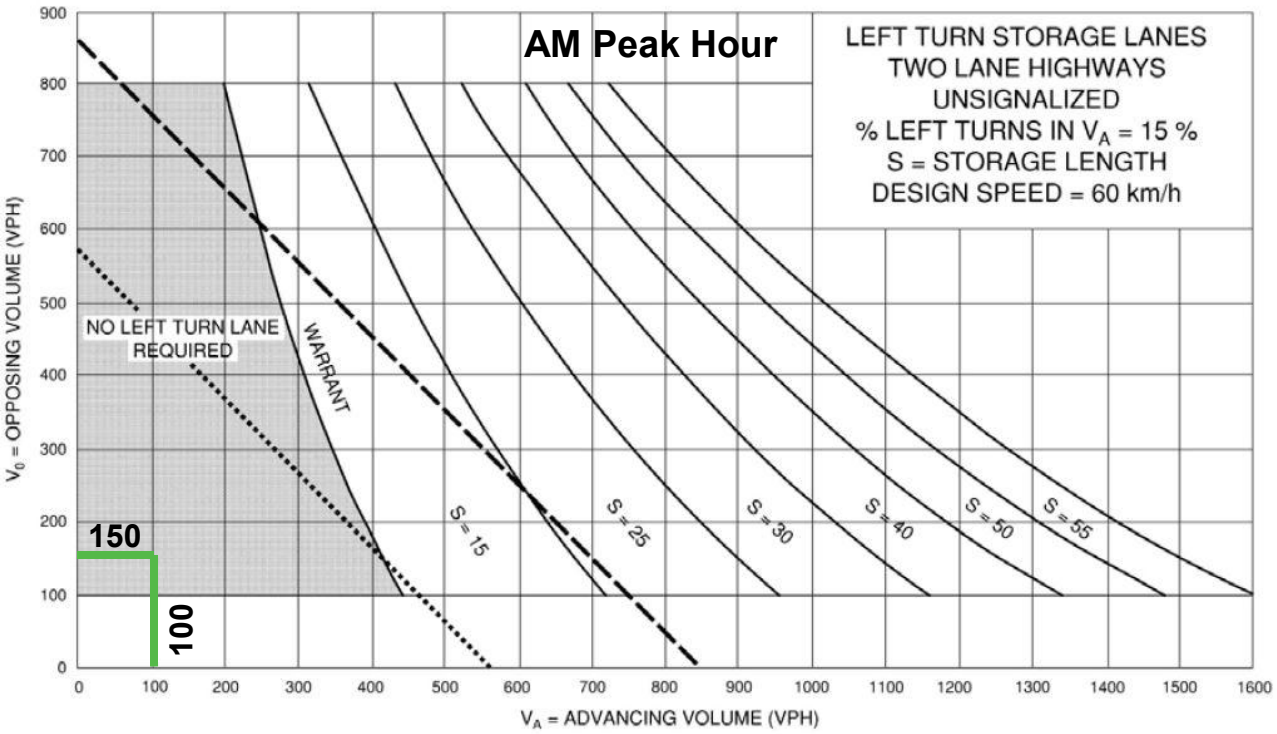



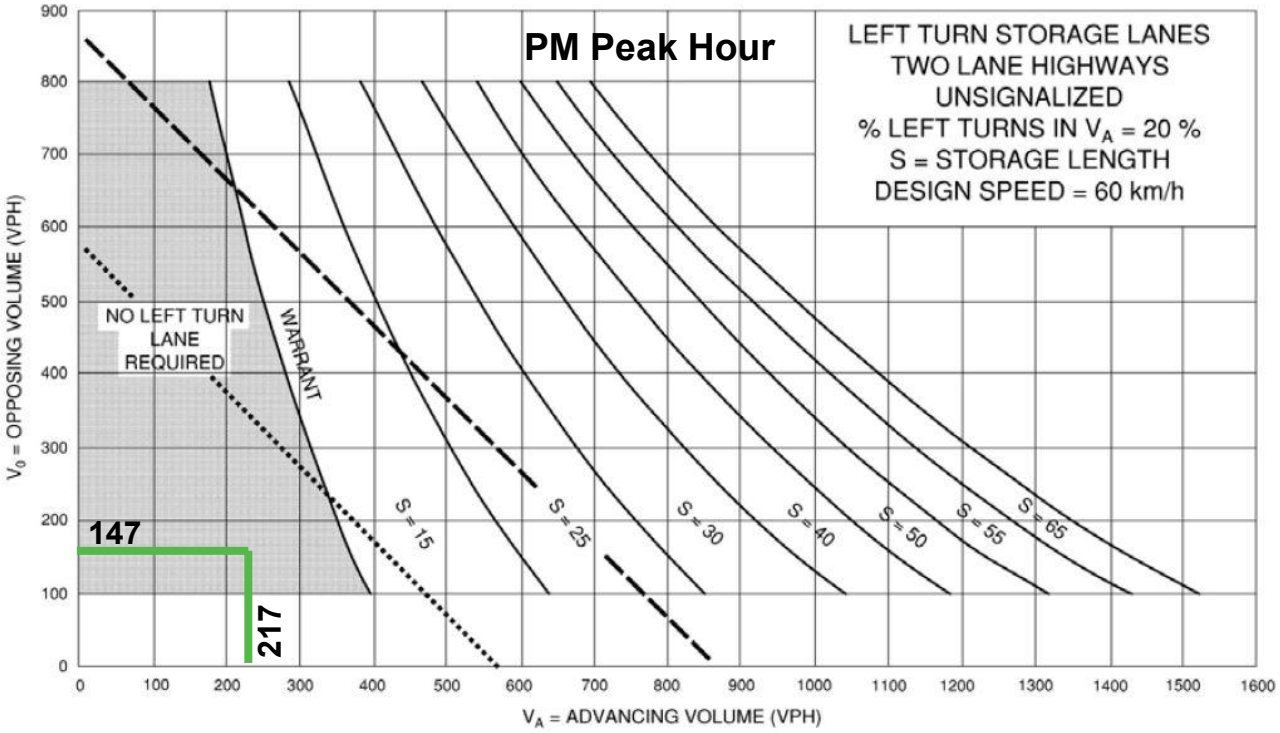

# Left Turn Warrant
# West Street at Driveway (Apartment)
# 2035 Total Traffic Conditions



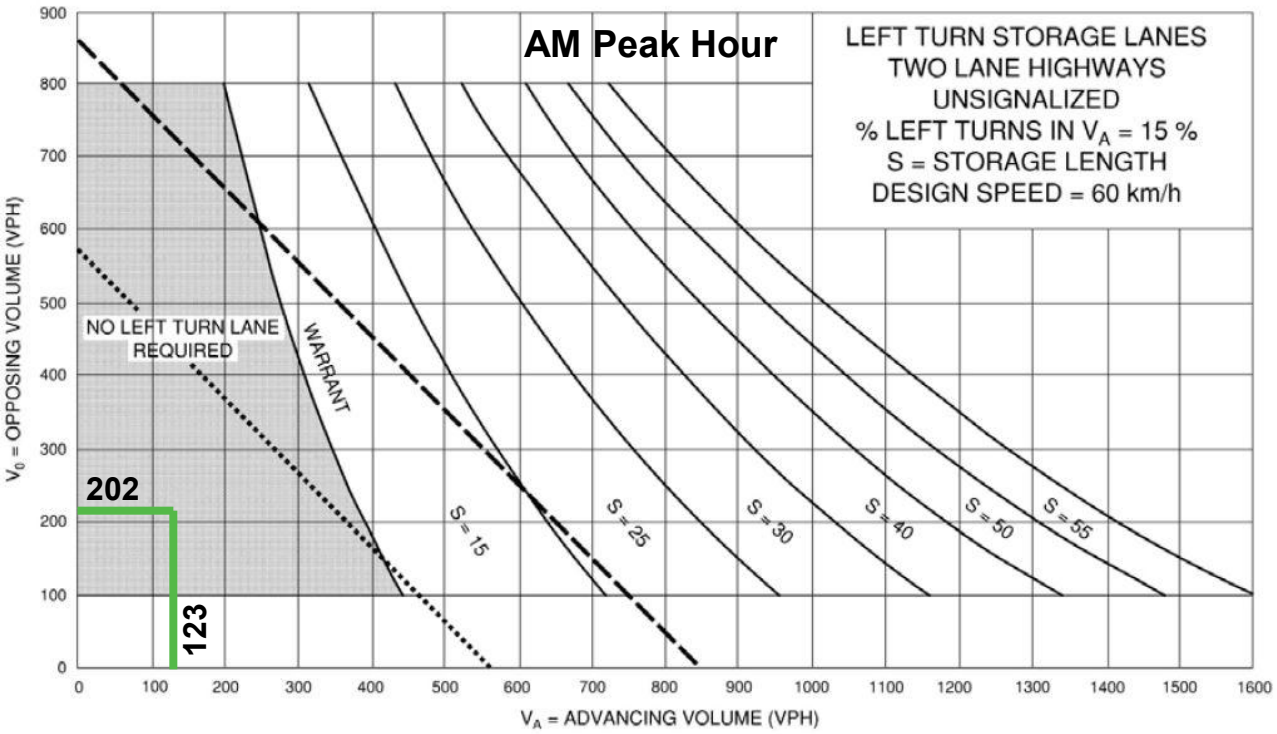



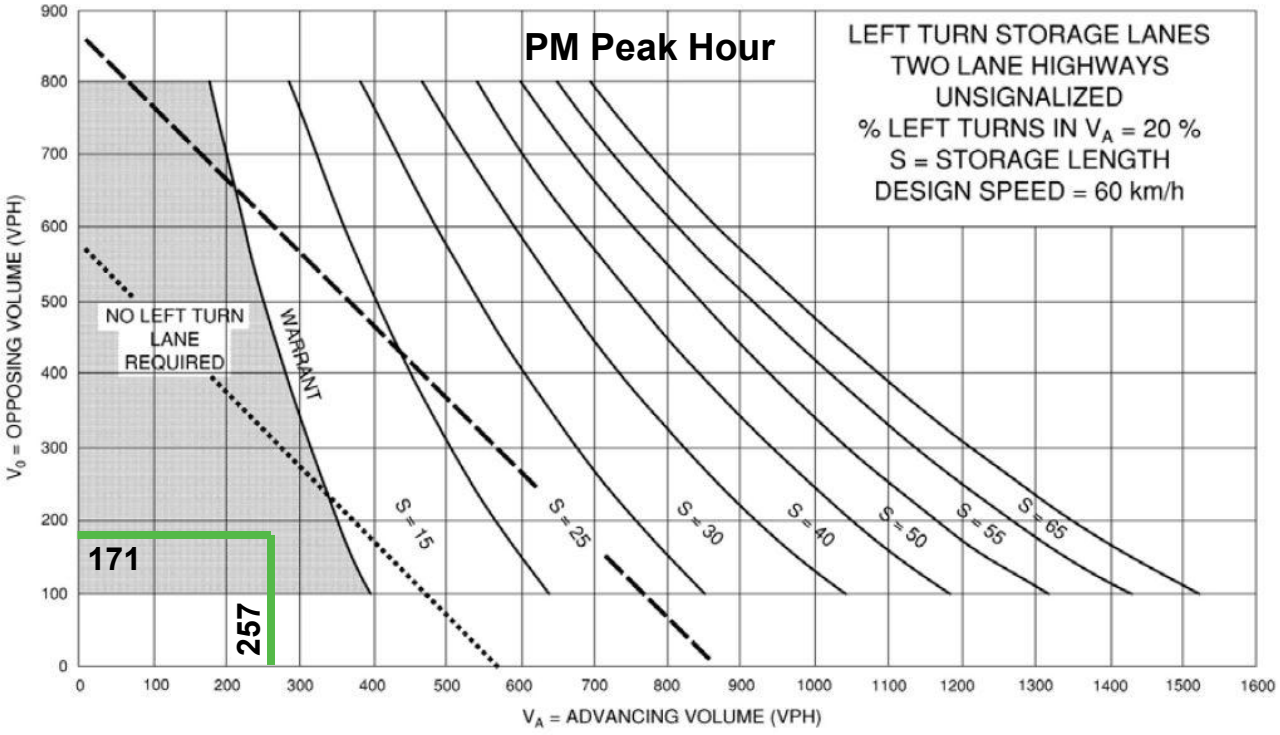

# Left Turn Warrant
# West Street at Street A
# 2035 Total Traffic Conditions



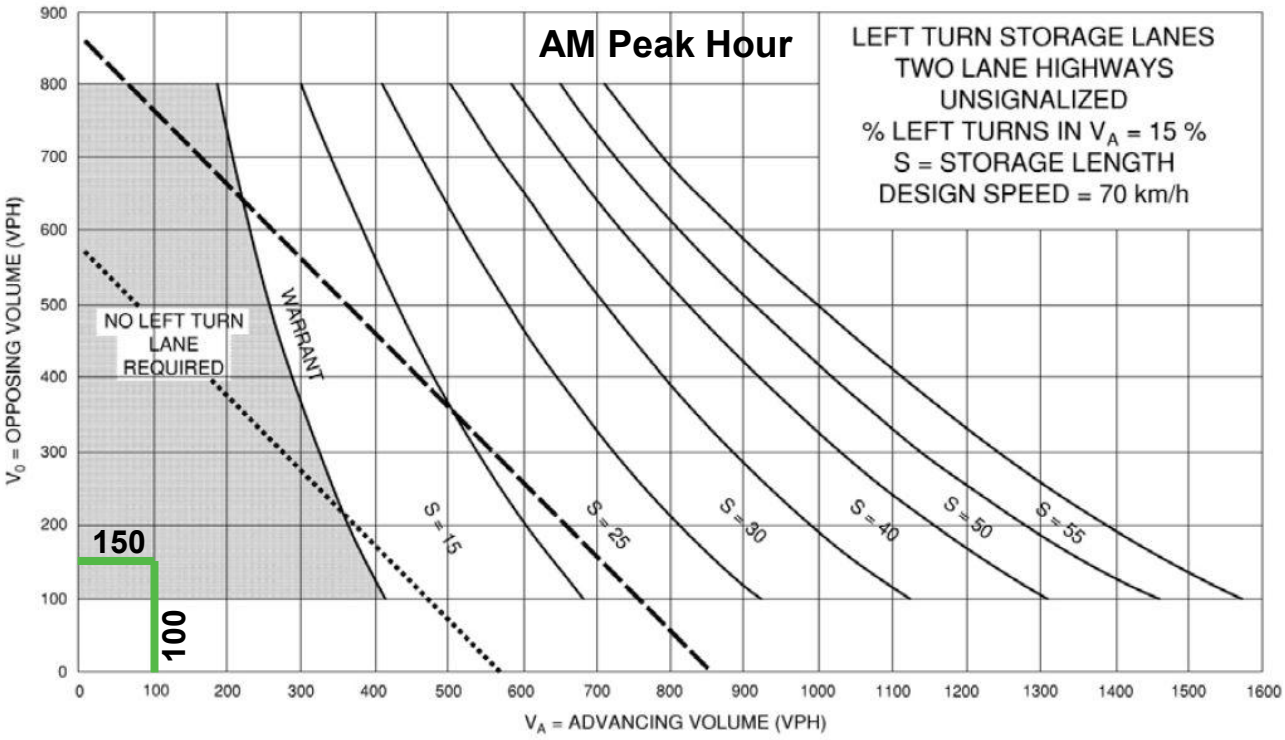



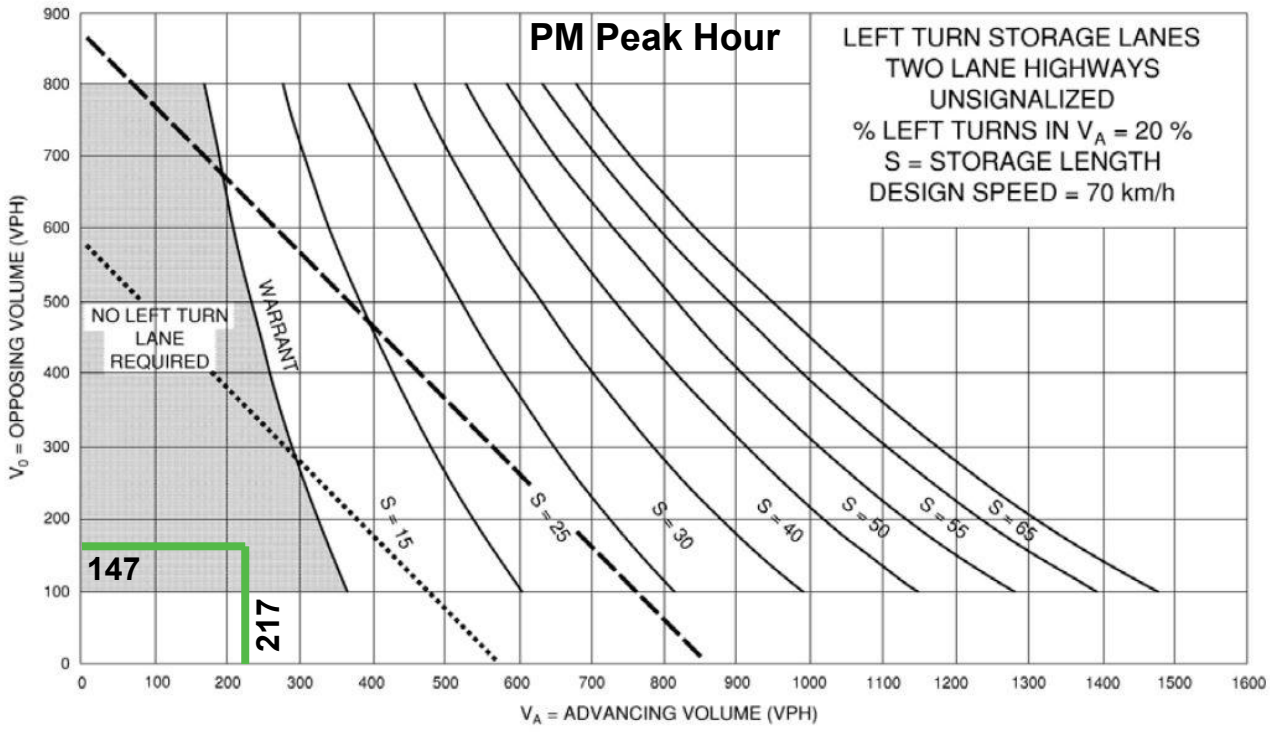

# Left Turn Warrant
# West Street at Driveway (Apartment)
# 2035 Total Traffic – Sensitivity Analysis



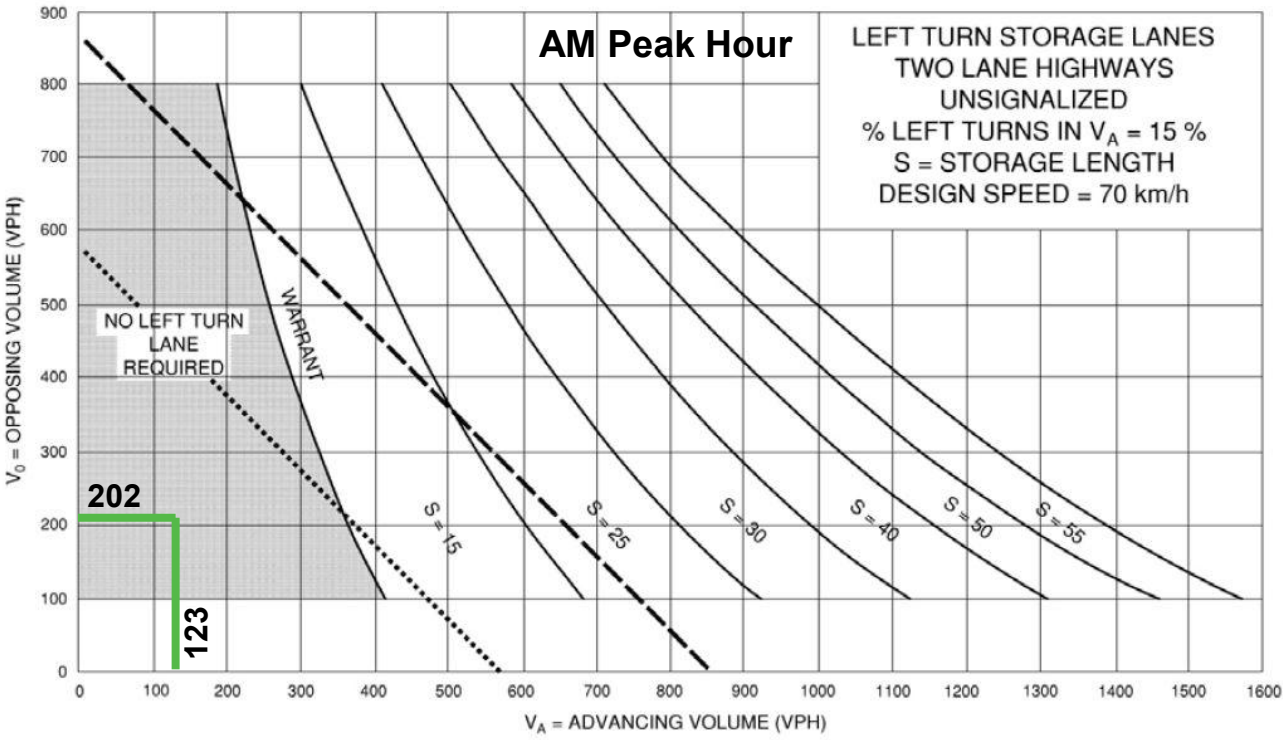



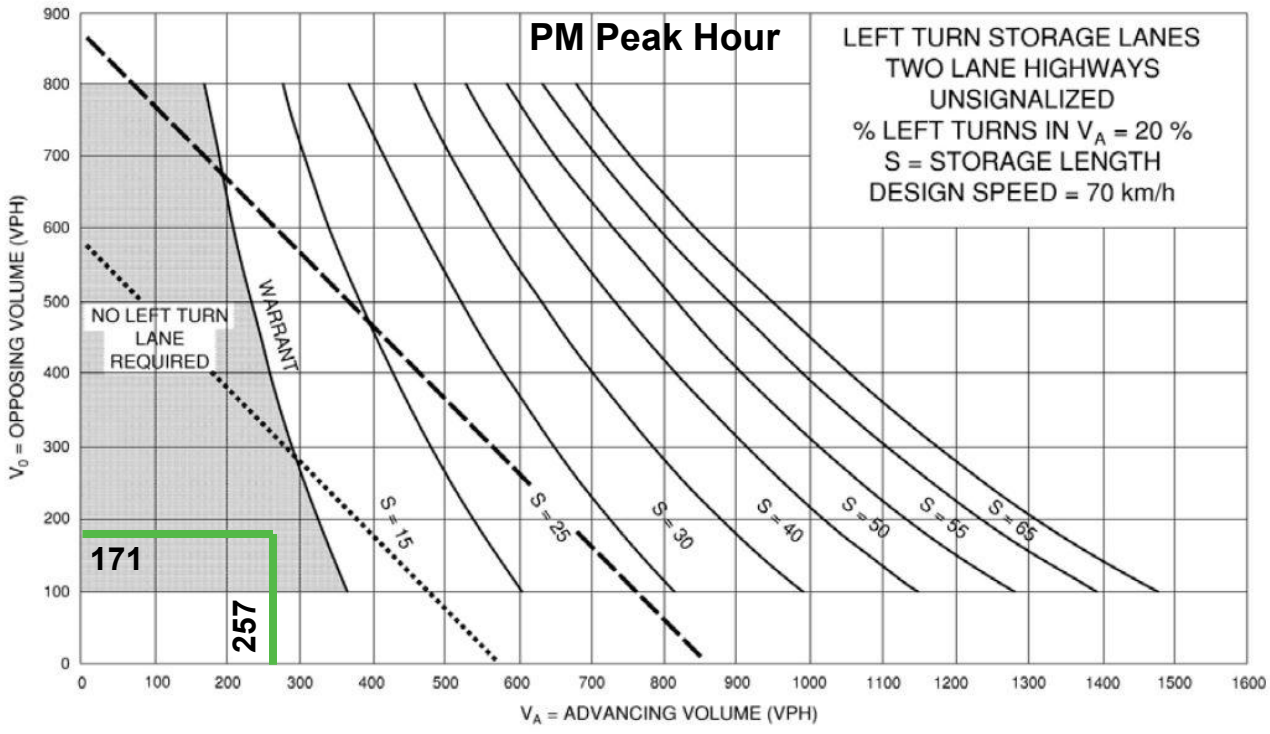

# Left Turn Warrant
# West Street at Street A
# 2035 Total Traffic – Sensitivity Analysis




# Left Turn Warrant
# West Street at Driveway (Apartment)
# 2035 Total Traffic – Sensitivity Analysis




# Left Turn Warrant
# West Street at Street A
# 2035 Total Traffic – Sensitivity Analysis

# DOCUMENT TRANSMITTAL

| | | | |
|---|---|---|---|
| Document: | **AGRICULTURAL IMPACT ASSESSMENT (AIA)**<br>**34 VIRGINIA AVENUE**<br>**SIMCOE, ON**<br>**N3Y 5M4**<br>**ROLL# 331040201003500** | | |
| Prepared for: | Mr. John Ariens, MCIP, RPP<br>15 Loganville Lane,<br>New Hamburg, ON<br>N3A 0G3 | Date<br>Our Ref. No.<br>Your Ref. No. | December 12, 2025<br>2026-05 |
| Attention: | Mr. Ariens | DRAFT | FINAL ☑ |

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| 1 pdf file via email | Mr. Ariens |
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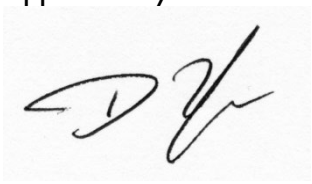
Approved by:



President

**DBH Soil Services Inc.**

# AGRICULTURAL IMPACT ASSESSMENT (AIA)
# 34 VIRGINIA AVENUE
# SIMCOE, ON
# N3Y 5M4
# ROLL# 3310402010035000

## DBH Soil Services Inc.

**December 12, 2025**

**AGRICULTURAL IMPACT ASSESSMENT (AIA)**
**34 VIRGINIA AVENUE**
**SIMCOE, ON**
**N3Y 5M4**
**ROLL# 331040201003500**

Prepared for:

Mr. John Ariens, MCIP, RPP
15 Loganville Lane,
New Hamburg, ON
N3A 0G3

December 12, 2025

Prepared by:

**DBH Soil Services Inc.**

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# 1 INTRODUCTION

DBH Soil Services Inc. was retained to complete an Agricultural Impact Assessment (AIA) Report including Minimum Distance Separation (MDS1) calculations for:

34 Virginia Avenue
Simcoe, ON
N3Y 5M4
Roll #331040201003500

It is understood that OPA 163 was a *Norfolk County Official Plan (Consolidated to January 1, 2023)* update, and several parcels have been added to the urban boundaries by Norfolk council. This request for an AIA and MDS1 calculations was triggered by the Province's request for additional justification for this expansion.

This AIA identifies and assesses agricultural impacts based on roadside reconnaissance surveys and review of online resources, and provides avoidance or mitigative measures as necessary to offset or lessen any impacts.

The above-mentioned lands are henceforth referred to as the Primary Study Area (PSA). Figure 1 (from the Ontario Ministry of Agriculture, Food, and Agribusiness (OMAFA) AgMaps online mapping) illustrates the relative size and shape of the PSA (shaded and outlined in blue). The PSA comprises approximately 9.13 ha (22.56 acres).

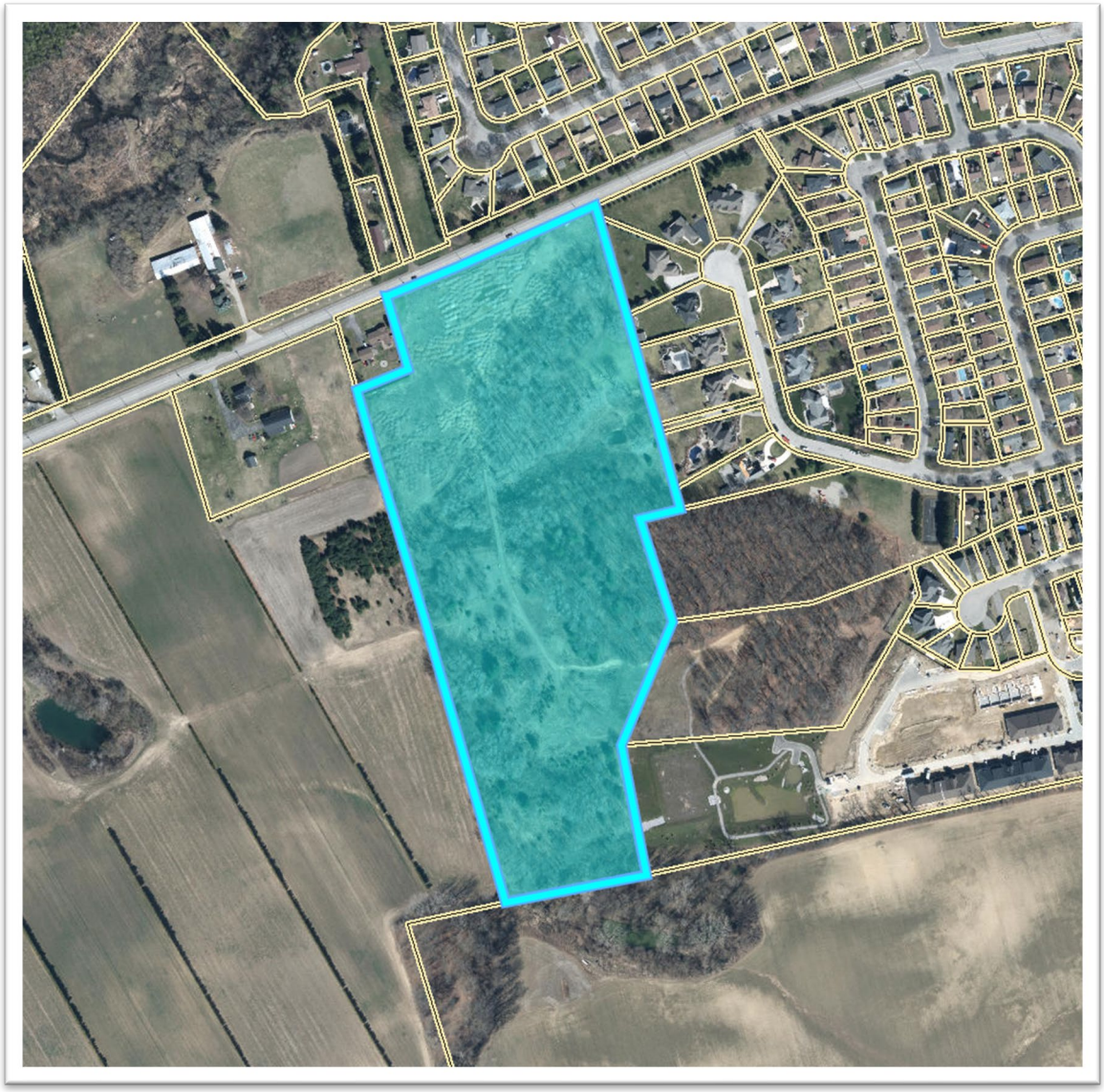
In the regional/city context, the PSA is bordered to the west by agricultural lands, woodlands and rural residential properties while its northern boundary is defined by West Street. To the south, the property is bordered by woodlands and agricultural lands, while to the east, it is adjacent to the urban boundary of Simcoe and other areas defined in OPA 163.

A Secondary Study Area (SSA) of 1500 m beyond the boundaries of the PSA was used for the characterization of the agricultural community and the assessment of potential impacts both on and in the immediate vicinity of the PSA. The 1500 m SSA was defined in the Ontario Ministry of Agriculture, Food, and Rural Affairs (OMAFRA) *Draft Agricultural Impact Assessment Guidance Document (March 2018)* as required for a Settlement Area Boundary Expansion (SABE).

The PSA and the SSA comprise a mix of land uses including rural residential uses, agricultural lands, scrublands, transportation corridors, and woodlands.

Figure 2 illustrates the relative location and shape of the PSA and SSA with respect to the above-mentioned geographical and community features.

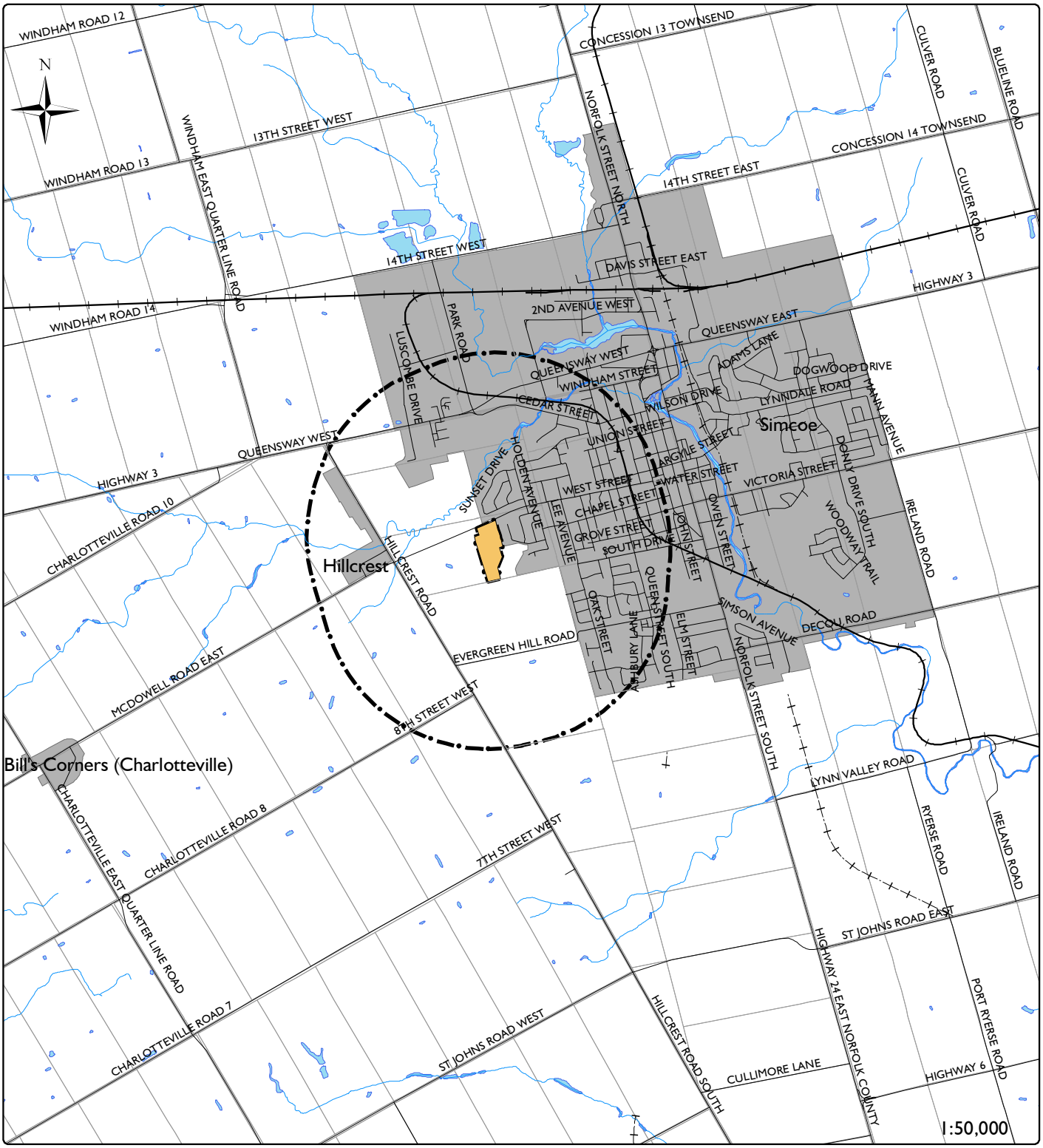
Figure 1 PSA



Source: Agmaps

This AIA report documents the methodology, findings, conclusions, and mapping completed for this study.

It is noted that OMAFRA has recently been renamed OMAFA which has led to some confusion as to referencing documents and/or data. The references in this report relate to the particular reference identified in the respective document/data set.




## Legend

- Abandoned Railway
- Active Railway
- Roads (MNR)
- Watercourse (MNR)
- Community Boundaries (NC)
- Lot Lines (MNR)
- Primary Study Area (PSA)
- Secondary Study Area (SSA) (1.5 km)
- Waterbody (MNR)

Figure 2

# Location

DBH Soil Services Inc.

December 2025

MNR - Ministry of Natural Resources, NC - Norfolk County

# 2 METHODOLOGY

A variety of data sources were evaluated to characterize the extent of agriculture resources and to assess any potential existing (or future) impacts to agriculture within the PSA and the surrounding SSA that may occur as a result of the proposed future development of the PSA.

In an effort to determine the requirements for completion of an AIA, a review of the *Norfolk County Official Plan (Consolidated to January 1, 2023)* and associated schedules was completed. The review of the *Norfolk County Official Plan (Consolidated to January 1, 2023)* identified the need to complete an AIA for a SABE in Section 9.5.1.1f. The *Norfolk County Official Plan (Consolidated to January 1, 2023)* does not provide further directions on how to complete an AIA.

The review on the existence and use of AIA Guidelines in Ontario was also completed. This review of the existence and use of AIA Guidelines in Ontario revealed that the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) had released draft AIA guidelines in a document titled *Draft Agricultural Impact Assessment (AIA) Guidance Document, March 2018*. This OMAFRA document is considered as "Draft for Discussion Purposes" and does not have status but is the basis for how OMAFRA addresses agricultural impacts and mitigation.

As a result of the review on the existence and use of AIA guidelines in Ontario, this AIA report has been completed with regard to the review/reference and requirements of the OMAFRA "*Draft Agricultural Impact Assessment (AIA) Guidance Document, March 2018*" and with regard to the requirements of the *Norfolk County Official Plan (Consolidated to January 1, 2023)*.

## 2.1 CONSULTATION

Agriculture is an important component of the economy in the Norfolk County. As such, consultation with various agencies, provincial and municipal offices was completed.

Preconsultation meetings with staff from Norfolk County were initiated at the earliest stage of this project, when the County was preparing an Official Plan update in 2023. Presentations were made to staff and Council at that time.

A further preconsultation meeting with County staff was held in July 2025 as part of a formal Official Plan Amendment application.

This AIA (including a Minimum Distance Separation (MDS1)) study was completed as a requirement of those meetings.

## 2.2 DATA COLLECTION

A variety of data sources were utilized in the assessment of agriculture in the PSA and SSA. Data was collected in a variety of formats including digital (shapefiles and imagery), paper copy, and through correspondence (telephone, meetings, email, etc.), as necessary. A synopsis of the type of data and the collection of the applicable data is provided below.

### 2.2.1 POLICY

Relevant policy, by-laws and guidelines related to agriculture and infrastructure development were reviewed for this study.

The review included an examination of provincial and municipal policy as is presented in the *Provincial Planning Statement, 2024 (*PPS 2024*),* the *Greenbelt Plan (2017),* the *Oak Ridges Moraine Conservation Plan (2017),* and the *Norfolk County Official Plan (Consolidated to January 1, 2023)*.

The review also included a review of *The Zoning By-Law of Norfolk County 1-A-2014*.

Further, the review included an assessment of *the Minimum Distance Separation (MDS) Document – Formulae and Guidelines for Livestock Facility and Anaerobic Digester Odour Setbacks. Publication 853. Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA, 2016)*. The MDS document was reviewed to determine the applicability of the document's use for this study.

An assessment of online data resources included OMAFA, Geospatial Ontario (Ontario.ca), and the Norfolk County website. Further, this assessment included telephone, email and in person communication/correspondence to derive a list of relevant policy, by-laws and guidelines. Each relevant policy, by-law and guideline was collected in digital or paper format for examination for this study.

### 2.2.2 PHYSIOGRAPHY

A review of the *Physiography of Southern Ontario 3rd Edition, Ontario Geological Survey Special Volume 2, Ministry of Natural Resources (1984)* and the associated digital GIS shapefiles was completed to document the type(s) and depth of bedrock and soil parent materials, and how these materials, in conjunction with glacial landforming processes, have led to the development of the existing soil resources.

### 2.2.3 TOPOGRAPHY AND CLIMATE

Topographic information was reviewed from the 1:10000 scale Ontario Base Mapping, Ontario GeoHub (Ontario.ca) digital contour mapping and windshield surveys.

Climate data was taken from the OMAFRA document titled *Agronomy Guide for Field Crops –*

*Publication 811 (June 2017)* and online OMAFRA data sources. The use of this climate information is consistent with the description within the *Draft OMAFRA Agricultural Impact Assessment (AIA) Guidance Document (March 2018)* where there is a requirement to provide a general description of climatic features (crop heat units, frost free days, and general climatic patterns of the area).

The *Draft OMAFRA Agricultural Impact Assessment (AIA) Guidance Document (March 2018)* indicates the need to provide greater detail on climate only in specialty crop areas.

### 2.2.4 AGRICULTURAL LAND USE

Agricultural land use data was collected through observations made during roadside reconnaissance surveys and field surveys conducted on November 25, 2025. Data collected included the identification of land use (both agricultural and non-agricultural), the documentation of the location and type of agricultural facilities/services, the location of non-farm residential units and the location of non-farm buildings (businesses, storage facilities, industrial, commercial, and institutional usage).

Agricultural land use designations were correlated to the *Agricultural Resource Inventory 1983* (ARI), the Agriculture and Agri-Food Canada (AAFC) Annual Crop Inventory (ACI), and the information provided in the Agricultural System Portal (OMAFA) for the purpose of updating the OMAFA *Agricultural Resource Inventory 1983* mapping for both the PSA and SSA.

### 2.2.5 MINIMUM DISTANCE SEPARATION

Minimum Distance Separation (MDS) formulae were developed by OMAFRA to reduce and minimize nuisance complaints due to odour from livestock facilities and to reduce land use incompatibility. Further, the PPS 2024 section 2.3.2.1(e) requires an assessment of MDS.

A review of the OMAFRA document titled *The Minimum Distance Separation (MDS) Document: Formulae and Guidelines for Livestock Facility and Anaerobic Digester Odour Setbacks* (Publication 853, Ontario Ministry of Agriculture, Food and Rural Affairs. 2016) was completed.

It is stated under guideline #1:

> "In accordance with the Provincial Planning Statement, 2014, this MDS Document shall apply in prime agricultural areas and on rural lands."

This AIA is based on a proposed SABE in an agricultural area. Therefore, an assessment of MDS1 is required.

Agricultural buildings in the PSA and SSA were assessed during a roadside reconnaissance survey and through a review of online imagery. Agricultural buildings housing livestock or having the capability to house livestock were identified and require MDS1 assessment and calculations.

### 2.2.6 LAND FRAGMENTATION/SEVERANCE

Land fragmentation data was collected through a review of online interactive mapping on the Agmaps (OMAFRA) website, the Agricultural System Portal (OMAFRA), and Norfolk County websites. This data was used to determine the extent, location, and relative shape of each parcel/property within both the PSA and the SSA.

Land fragmentation can be defined as the increase in the number of smaller parcels, which are generally non-agricultural uses, within a predominantly agricultural area. Over time the increase in smaller non-agricultural land uses creates a patchwork-like distribution of rural land uses, resulting in lands lost to agricultural production. Generally, good productive areas of farmland are comprised of larger parcels with few (if any) smaller parcels interspersed.

The assessment of fragmentation looked at the size, shape and number of parcels within a given area, and provided comments on the potential effect on agriculture.

Land severance is the severing or dividing of a parcel into multiple sections. An assessment of land severance was completed to determine the extent of parcels that may be severed as a result of the proposed future development of the PSA.

### 2.2.7 SOIL SURVEY

Soil survey data and Canada Land Inventory (CLI) data was provided by OMAFA in digital format through the Ontario Geohub Land Information Ontario (LIO) Warehouse Open Data website. The soils/CLI data is considered the most recent iteration of the soil information from OMAFA.

The digital soil survey data was also correlated to the printed soil survey reports and maps (*Soils of the Regional Municipality of Haldimand-Norfolk (Volumes 1 and 2), Report No. 57 of the Ontario Institute of Pedology (Presant, E.W., and C.J. Acton, 1984*) to determine if the digital soils data has been modified from the original soil survey data.

Further, discussions with OMAFA indicated that the provincial soil database had been updated in the 1980's and 1990's to include some slope information in an effort to provide provincial wide digital soil data at a scale of 1:50000. Typically, the original provincial soil reports and associated mapping were completed to a scale of 1:63360 or 1 inch to 1 mile.

### 2.2.8 ALTERNATIVE LOCATIONS

The PPS 2024 policy 2.3.2.1(d)identifies the requirement to complete an "*evaluation of alternative locations which avoid prime agricultural areas and, where avoidance is not possible, consider reasonable alternatives on lower priority agricultural lands in prime agricultural areas*." Of particular importance is the term "reasonable alternatives".

The PPS 2024 does not specifically define lower priority agricultural lands but provides a number of considerations to determine the agricultural priority of an area. These criteria include

consideration of existing land use, capital investment in agriculture, degree of fragmentation, and proximity to non-agricultural lands uses (incompatibility).

Specific to this AIA, the request from the province was to complete an AIA on the PSA. As such, no alternative locations assessment was required nor completed.

### 2.2.9 AGRICULTURAL SYSTEM

The OMAFA online Agricultural Systems mapping was reviewed to determine the extent of agriculture in the PSA, in the SSA, and Norfolk County in general.

OMAFA identifies that the Agricultural System comprises two parts: Agricultural Land Base; and the Agri-Food Network.

The Agricultural Land Base illustrates the Prime Agricultural Areas (including specialty crop areas), while the Agri-Food Network illustrates regional infrastructure/transportation networks, buildings, services, markets, distributors, primary processing, and agriculture communities.

The review of the Agricultural Network included a visual assessment of any agricultural services and transportation networks identified during the roadside reconnaissance survey within the PSA and the SSA, and a review of the OMAFA Agricultural Systems Portal mapping.

### 2.2.10 AGRICULTURAL STATISTICS

Agricultural statistics were provided by Statistics Canada and downloaded from the OMAFA website for the Norfolk County. The data sets provide information up to (and including) the 2021 Census.

The OMAFRA draft AIA Guidelines indicates that the background data collection and review should include:

- "Agricultural crop statistics, over several recent census periods (Statistics Canada, Census of Agriculture)."

It is understood that the Census of Agriculture data is very extensive and detailed. This AIA utilized the Census of Agriculture data to provide a review of basic crop statistics over a minimum of three census periods extending from 2011 to 2021.

It is noted that the Census of Agriculture data does not always provide the most recent or updated municipality name. For the purposes of this AIA the review and assessment of the Census of Agriculture made use of the municipality nomenclature as was stated in the Census of Agriculture data sets.

# 3 POLICY REVIEW

Clearly defined and organized environmental practices are necessary for the conservation of land and resources. The long-term protection of quality agricultural lands is a priority of the Province of Ontario and has been addressed in the PPS 2024. Further, in an effort to protect agricultural lands, the Province of Ontario has adopted policy and guidelines to provide a framework for managing growth. These three provincial land use plans: *the Greenbelt Plan (2017); the Niagara Escarpment Plan (2017), and the Oak Ridges Moraine Conservation Plan (2017)* support the long-term protection of farmland. The provincial land use plans have policies that require the completion of AIA studies for changes in agricultural land use.

With this in mind, the PPS 2024*; the Greenbelt Plan (2017); the Niagara Escarpment Plan (2017); and the Oak Ridges Moraine Conservation Plan (2017)* were reviewed.

With respect to this AIA and the three provincial land use plans, a review of the boundaries of the Greenbelt Plan Area, the Niagara Escarpment Plan Area and the Oak Ridges Moraine Conservation Area was completed.

It was determined that the PSA and the SSA were located outside the boundaries of the *Greenbelt Plan (2017)* mapping, the *Niagara Escarpment Plan (2017)* mapping and the *Oak Ridges Moraine Conservation Plan (2017)* mapping, therefore those policy plans do not apply to this AIA.

Municipal Governments have similar regard for the protection and preservation of agricultural lands and address their specific concerns within their respective official plans on county/regional level and township level.

A review of municipal policy was based on an examination of the *Norfolk County Official Plan (Consolidated to January 1, 2023)*.

The review also included *The Zoning By-Law of Norfolk County 1-A-2014*.

It was determined through these reviews that no portions of the PSA or the SSA were located in a provincially or municipally designated specialty crop areas.

The relevant policies from the above-mentioned documents are presented as follows.

## 3.1 PROVINCIAL AGRICULTURAL POLICY

The PPS 2024 was enacted to document the Ontario Provincial Government's development and land use planning strategies. The PPS 2024 provides the policy foundation for regulating the development and use of land. Agricultural policies in PPS 2024 are addressed within Section 4.3 (Agriculture), while Section 2.3 provides policy related to SABE. With respect to the potential future SABE development of the PSA, select agricultural policies are provided below:

"4.3.4 Removal of Land from Prime Agricultural Areas

1. Planning authorities may only exclude land from prime agricultural areas for expansions of or identification of settlement areas in accordance with policy 2.3.2."

Further, the PPS 2024 policy 2.3.2 provides context for settlement areas and SABEs. Select agricultural policies are provided as follows:

"2.3.2 New Settlement Areas and Settlement Area Boundary Expansions

1. In identifying a new settlement area or allowing a settlement area boundary expansion, planning authorities shall consider the following:
   a) the need to designate and plan for additional land to accommodate an appropriate range and mix of land uses;
   b) if there is sufficient capacity in existing or planned infrastructure and public service facilities;
   c) whether the applicable lands comprise specialty crop areas;
   d) the evaluation of alternative locations which avoid prime agricultural areas and, where avoidance is not possible, consider reasonable alternatives on lower priority agricultural lands in prime agricultural areas;
   e) whether the new or expanded settlement area complies with the minimum distance separation formulae;
   f) whether impacts on the agricultural system are avoided, or where avoidance is not possible, minimized and mitigated to the extent feasible as determined through an agricultural impact assessment or equivalent analysis, based on provincial guidance; and
   g) the new or expanded settlement area provides for the phased progression of urban development.

2. Notwithstanding policy 2.3.2.1.b), planning authorities may identify a new settlement area only where it has been demonstrated that the infrastructure and public service facilities to support development are planned or available."

This AIA does not provide an assessment of need, or an assessment of capacity of infrastructure and public services facilities. It is assumed that the assessment of the need and capacity of infrastructure has been addressed in other planning documents.

This AIA will address policies 2.3.2.1(c), (d), (e), and (f).

## 3.2 PROVINCIAL AGRICULTURAL LAND BASE LEGACY MAPPING

Provincial policy requires that prime agricultural areas be protected for long-term use for agriculture. The province identified the agricultural land base through a Land Evaluation and Area Review (LEAR) assessment for the Greater Golden Horseshoe area to assist municipalities in making informed land-use planning decisions. Municipalities were required to review the agricultural land base mapping and provide refinements to the agricultural land base as part of Official Plan updates.

It is noted that neither the PSA nor the SSA are located within the boundaries of the Provincial Agricultural Land Base Legacy Mapping.

It is also noted that the Provincial Land Base mapping is now considered a legacy map and is not being updated by the province. Further, the province has indicated on the Agricultural Systems Portal website that "For the most up-to-date prime agricultural area mapping, check the applicable, approved municipal official plan."

## 3.3 THE GREENBELT PLAN

As stated previously in this AIA, a review of the *Greenbelt Plan (2017)* mapping indicated that no portions of the PSA nor the SSA are located within the boundaries of the Greenbelt Plan Area. Therefore, the *Greenbelt Plan (2017)* policies do not apply to this AIA.

## 3.4 THE NIAGARA ESCARPMENT PLAN

Similarly, as stated previously in this AIA, a review of the boundaries of the *Niagara Escarpment Plan (2017)* and associated digital mapping was completed. The review indicated that no portions of the PSA or the SSA are located within the Niagara Escarpment Plan Area. Therefore, the policies of the *Niagara Escarpment Plan (2017)* do not apply to this AIA.

## 3.5 THE OAK RIDGES MORAINE CONSERVATION PLAN

Finally, as stated previously in this AIA, a review of the boundaries of the *Oak Ridges Moraine Conservation Plan (2017)* and associated digital mapping was completed. The review indicated that no portions of the PSA or the SSA are located within the Oak Ridges Moraine Conservation Plan Area. Therefore, the policies of the *Oak Ridges Moraine Conservation Plan (2017)* do not apply to this project.

## 3.6 OFFICIAL PLAN POLICY

Official plan policies are prepared under the Planning Act, as amended, of the Province of Ontario. Official plans generally provide policy comments for land use planning while taking into consideration the economic, social, and environmental impacts of land use and development concerns.

For the purposes of this AIA, the *Norfolk County Official Plan (Consolidated to January 1, 2023)* was reviewed. This review revealed that Norfolk County functions as a single-tier municipality, carrying both upper and lower tier responsibilities. Norfolk County oversees all local planning, servicing, infrastructure and administrative functions.

### 3.6.1 NORFOLK COUNTY OFFICIAL PLAN

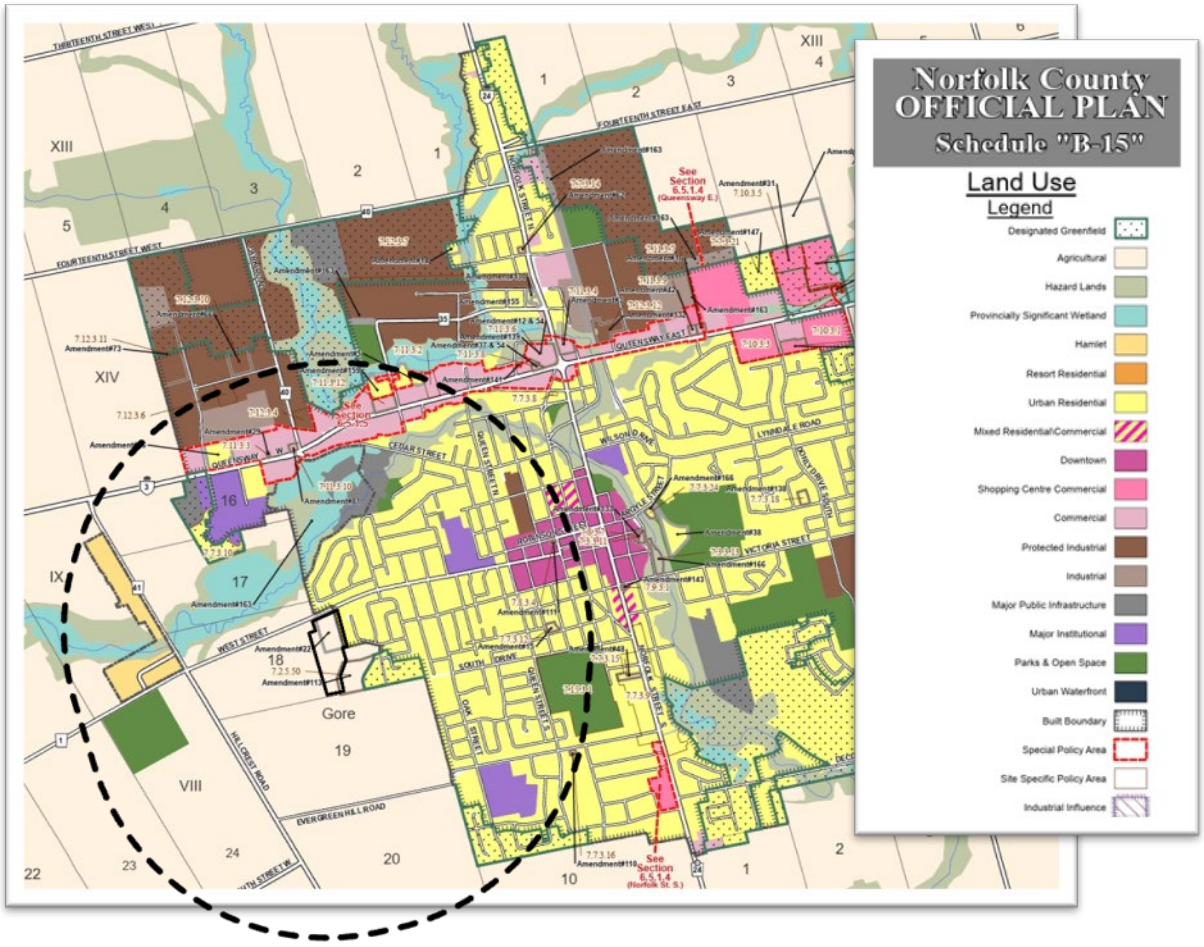
The review of the Norfolk County Official Plan Schedule B-15 Land Use revealed that the PSA was comprised of lands designated as Agricultural. The SSA was comprised of lands designated as Agriculture, Hazard Lands, Provincially Significant Wetland, Hamlet, Urban Residential, Mixed Residential/Commercial, Downtown, Commercial, Protected Industrial, Industrial, Major Public Infrastructure, Major Institutional, and Parks & Open Space.

Figure 3 illustrates a select portion of Schedule B-15 showing the land use designations for the PSA and SSA. The PSA is illustrated as a solid black line, while the SSA is illustrated as a dashed black line.

The review of the *Norfolk County Official Plan (Consolidated to January 1, 2023)* identified agricultural policies in Section 4.4 Promoting Agriculture, Section 6.7.1 Agricultural Land and in Section 7.2 Agricultural Designation. Select agricultural policies are provided as follows:

> "Policy 4.4 Promoting Agriculture states:
>
> It is the policy of this Plan to promote the further development of Norfolk County's agricultural industry and to provide support to local farmers. To support this policy, the County may undertake the following measures:
>
> > a) Protect the agricultural land base and discourage or prohibit those uses that unnecessarily take agricultural land out of production or which may conflict with farm operations;
> >
> > b) Prohibit the expansion of urban, hamlet and resort areas on to prime agricultural lands without a comprehensive review indicating the need for such expansion and demonstrating that lower quality lands are not available or practical for such expansion;
> >
> > r) The County will minimize the impact of non-agricultural related uses on farm operations and may require an Agricultural Impact Assessment (AIA) in accordance with provincial guidelines, including appropriate mitigation measures, in support of applications for non-agricultural related developments on sites near farm operations;"
>
> "Policy 6.7.1 Agricultural Land states:
>
> The agricultural land in the County is predominately Class 1 to 3, or prime agricultural land. These classifications of agricultural land are fundamentally important in considering possible future expansions of the Urban Areas and Hamlet Areas.

Figure 3 Norfolk County Official Plan Land Use Schedule B-15




Source: Norfolk County Official Plan Land Use Schedule B-15

The agricultural land in the County is predominately Class 1 to 3, or prime agricultural land. These classifications of agricultural land are fundamentally important in considering possible future expansions of the Urban Areas and Hamlet Areas.

The following shall be the policy of the County:

a) The County is committed to the protection of prime agricultural land. The County recognizes, however, that where growth and development occur, it is likely that land with significant agricultural productivity will need to be utilized. Priority shall be given to less productive agricultural land for non-agricultural development, where it is feasible and practical to do so.

b) Unless otherwise designated, use of prime agricultural land shall be subject to the policies of Section 7.2 (Agricultural Designation) of this Plan. New non-agricultural related uses on prime agricultural land shall not be permitted, unless otherwise specifically permitted by this Plan.

c) New lots shall only be permitted in accordance with the agricultural consent and consolidation policies of Section 7.2.3 (Lot Creation and Lot Adjustment Policies).

d) The County will undertake an evaluation of its agricultural lands in accordance with guidelines established by the Province, and in consultation with the community, to determine the appropriateness of designating specialty crop areas. The designation of any specialty crop areas and the addition of any associated policies will be through an amendment to this Official Plan once Provincial Guidelines are available.

e) Where a new settlement area or the expansion of an existing settlement area or the development of a non-agricultural use in the Agricultural Designation is proposed, the impact on agricultural operations shall be assessed and appropriate mitigation measures identified. Such assessments shall include a description of the agricultural areas and uses, identify agricultural operations that may be impacted including potential limitations on future farming options, identify mitigation measures to avoid or reduce impacts and identify the potential net impact on agriculture."

Policy 7.2 Agricultural Designation in part states:

> "The Agricultural Designation is intended to strengthen the agricultural community in the County. The policies are designed to protect agriculture from the intrusion of incompatible uses, such as non-farm related residential dwellings and other uses that are sensitive to agricultural practices."

Policy 7.2.4 states:

> " a)The minimum agricultural lot size shall generally be 40 hectares. Assembly and disassembly of agricultural lots to sizes that are generally 40 hectares or larger shall be permitted and encouraged by the County."

It is noted that the proposed SABE is not permitted in the Agricultural policies and therefore requires an official plan amendment, hence OPA 163 which as part of a long-term growth strategy provided an update to land use including amendment to Simcoe's urban boundary.

It is also noted that there are no designated Specialty Crop Areas identified on Schedule B. Therefore, the project is consistent with the PPS 2024 policy 2.3.2.1c.

## 3.7 ZONING BY-LAW

Official plans set out a municipality's general policies for existing and future land use. Zoning bylaws specify permitted uses and standards for each municipally designated zone. The specific requirements identified within a zoning bylaw are legally enforceable. Local municipalities are

the approval authority for zoning bylaws. As such, this AIA study reviewed *The Zoning By-Law of Norfolk County 1-A-2014*.

### 3.7.1 NORFOLK COUNTY ZONING BY-LAW

The review of *The Zoning By-Law of Norfolk County 1-A-2014* identified that the zoning for the PSA was provided on Schedule A Map No. 25. The respective zones in the PSA were identified as A - Agricultural.

The SSA review identified that the SSA comprised portions of Maps A-23, A-25 and A-27. The SSA comprised areas zoned as Agricultural (A), Residential (R1-R6), Service Commercial (CS), General Industrial (MG), Hazard Land (HL), Provincially Significant Wetland (PSW), Open Space (OS), Neighbourhood Commericial (CN), Neighbourhood Institutional (IN), Central Business District (CBD), Community Institutional (IC), Rural Commercial (CR), and Hamlet Residential (RH).

Zone standards for Agriculture were provided in Section 12.0 – Agricultural *Zones*. Select Agricultural *Zone* (A) permitted uses and zone standards are provided below.

Section 12.1.1 Permitted Uses states in part:

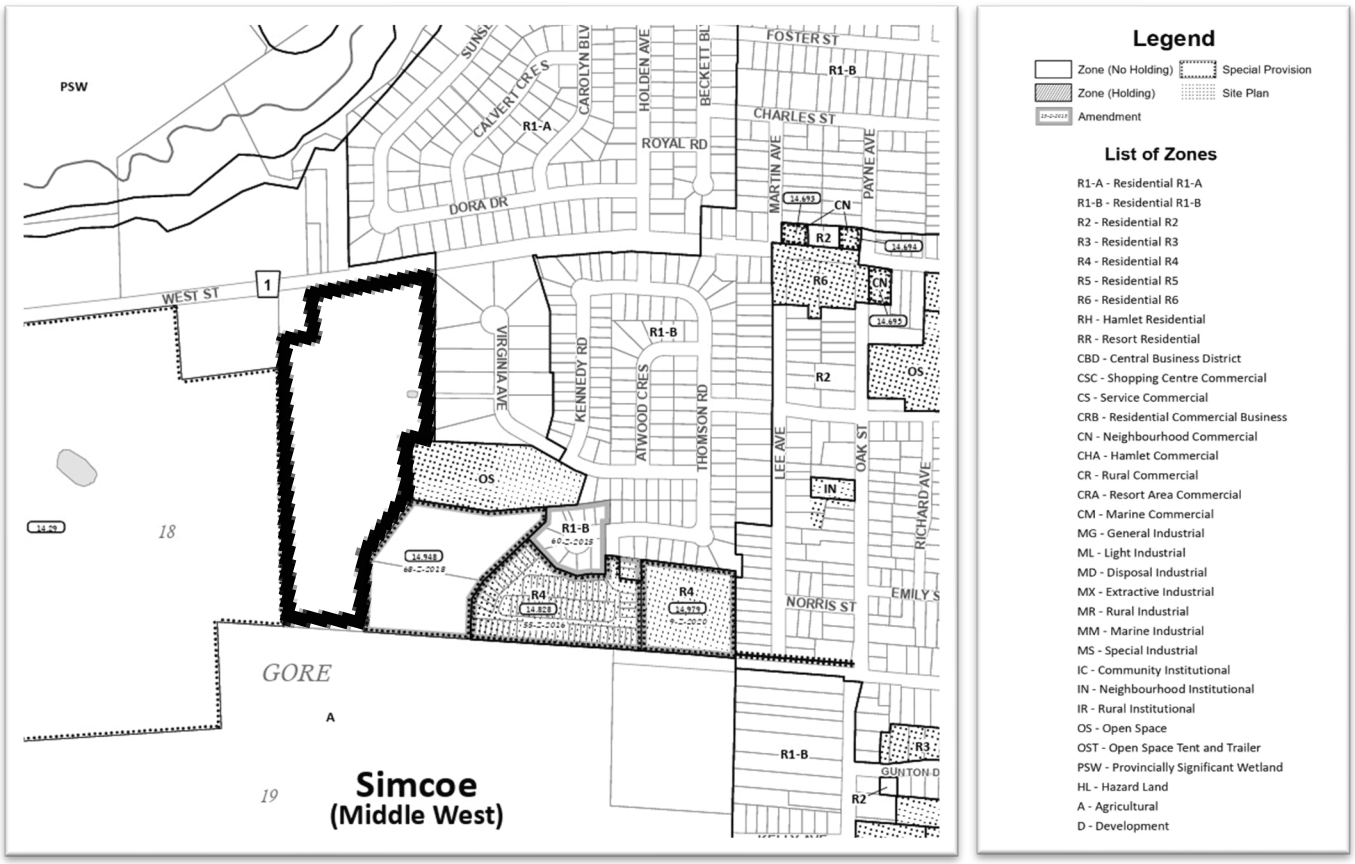
> "In an A Zone, no land, *building or structure* shall be used except in accordance with the following uses:
>
> a) *animal kennel*, subject to Subsection 12.1.4
> b) *bed & breakfast*, subject to Subsection 3.4
> c) *bunk house*
> d) *Cannabis Production and Processing*, subject to General Provisions 3.21 *[25Z-2018]*
> e) *dwelling, single detached*
> f) *farm*
> g) *farm brewery*, subject to Subsection 12.2.3 *[34-Z-2019]*
> h) *farm distillery*, subject to Subsection 12.2.3 *[34-Z-2019]*
> i) *farm experience activity*, subject to Subsection 12.2.2
> j) *farm processing*, accessory to a *farm*
> k) *farm processing-value added*, subject to Subsection 12.2.1
> l) *farm produce outlet*, accessory to a *farm*
> m) farm winery, subject to Subsection 12.2.3
> n) *home industry*
> o) *home occupation*
> p) *on-farm diversified use*, subject to Subsection 12.3 *[34-Z-2019]*
> q) seasonal storage of *recreational vehicles* and recreational equipment as a secondary use to a *farm*.
> r) *accessory residential dwelling unit*, subject to Subsection 3.2.3 *[7-Z-2020]"*

Section 12.1.2 *Zone* Provisions states in part:

*a)* Minimum *lot area*:
i) *Lot* 40 hectares

Figure 4 illustrates the zoning for the PSA from Schedule A Map 25. The approximate location of the PSA is identified as a solid black line.

Figure 4 The Zoning By-Law of Norfolk County – Schedule A Map 25




Source: The Zoning By-Law of Norfolk County – Schedule A Map 25

# 4 AGRICULTURAL RESOURCE POTENTIAL

## 4.1 PHYSICAL CHARACTERISTICS

The physiographic resources within the PSA and the SSA are described in this section. The physiographic resources identify the overall large area physical characteristics documented as background to the soils and landform features. These characteristics are used to support the description of the soils and agricultural potential of an area.

### 4.1.1 PHYSIOGRAPHY

On review of the Geohub digital physiographic region data, and *The Physiography of Southern Ontario 3rd Edition*, (Ontario Geological Survey Special Volume 2, Ministry of Natural Resources, 1984), it was determined that the PSA and the SSA were located within the Norfolk Sand Plains physiographic region.

The Norfolk Sand Plains physiographic region is described as a wedge-shaped area with a broad curved base along the Lake Erie shoreline, tapering to the north to a point near Brantford. The sand and silt materials were deposited as a delta in the glacial Lake Whittlesey and Warren. The drainage of this physiographic region is through small rivers flowing to Lake Erie, with the exception of a small area to the north that leads to the Grand River. These small streams and rivers have created deeply incised channels/valleys. Groundwater is abundant in this physiographic region.

Figure 5 illustrates the geographic location and shape of the respective physiographic region as compared to the location and shape of the PSA and SSA.

### 4.1.2 TOPOGRAPHY AND CLIMATE

Topographic information was reviewed and correlated to the 1:10000 scale Ontario Base Mapping, Land Information Ontario digital contour mapping, and aerial photo interpretation.

The PSA and the SSA are a complex mix of topography with gently undulating areas generally used for agricultural production, and steeper slopes along incised stream channels.

Climate data was taken from the OMAFRA document titled *Agronomy Guide for Field Crops – Publication 811 (June 2017)* and the *Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) Factsheet – Crop Heat Units for Corn and Other Warm Season Crops in Ontario, 1993.*

The PSA and SSA are located between the 3100 and 3300 Crop Heat Units isolines (CHU-M1) available for corn production in Ontario. The Crop Heat Units (CHU) index was originally developed for field corn and has been in use in Ontario for 30 years. The CHU ratings are based on the total accumulated crop heat units for the frost-free growing season in each area of the province. CHU averages range between 2500 near North Bay to over 3500 near Windsor.

## Legend

- Abandoned Railway
- Active Railway
- Roads (MNR)
- Watercourse (MNR)
- Community Boundaries (NC)
- Lot Lines (MNR)
- Primary Study Area (PSA)
- Secondary Study Area (SSA) (1.5 km)
- Waterbody (MNR)

**Physiographic Regions**

- Haldimand Clay Plain
- Norfolk Sand Plain

Figure 5

# Physiography

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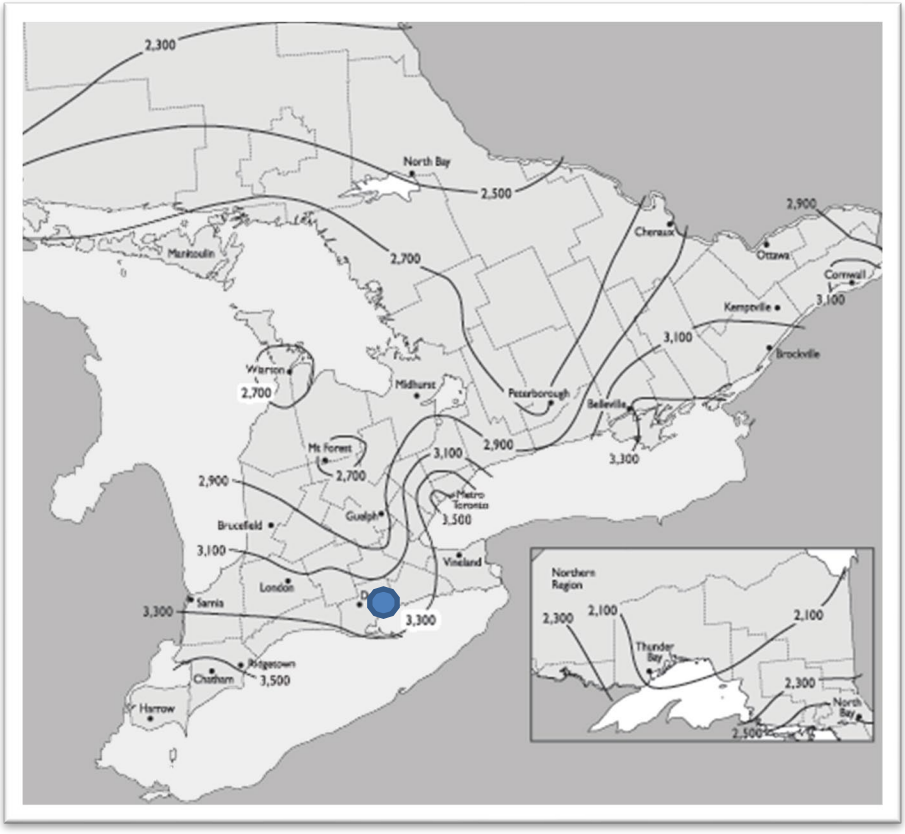
The higher the CHU value, the longer the growing season and greater are the opportunities for growing value crops.

Crop Heat Units for corn (based on 1971-2000 observed daily minimum and maximum temperature (OMAFRA, 2017)) map is illustrated on Figure 6. The approximate location of the PSA and SSA was marked with a blue circle.

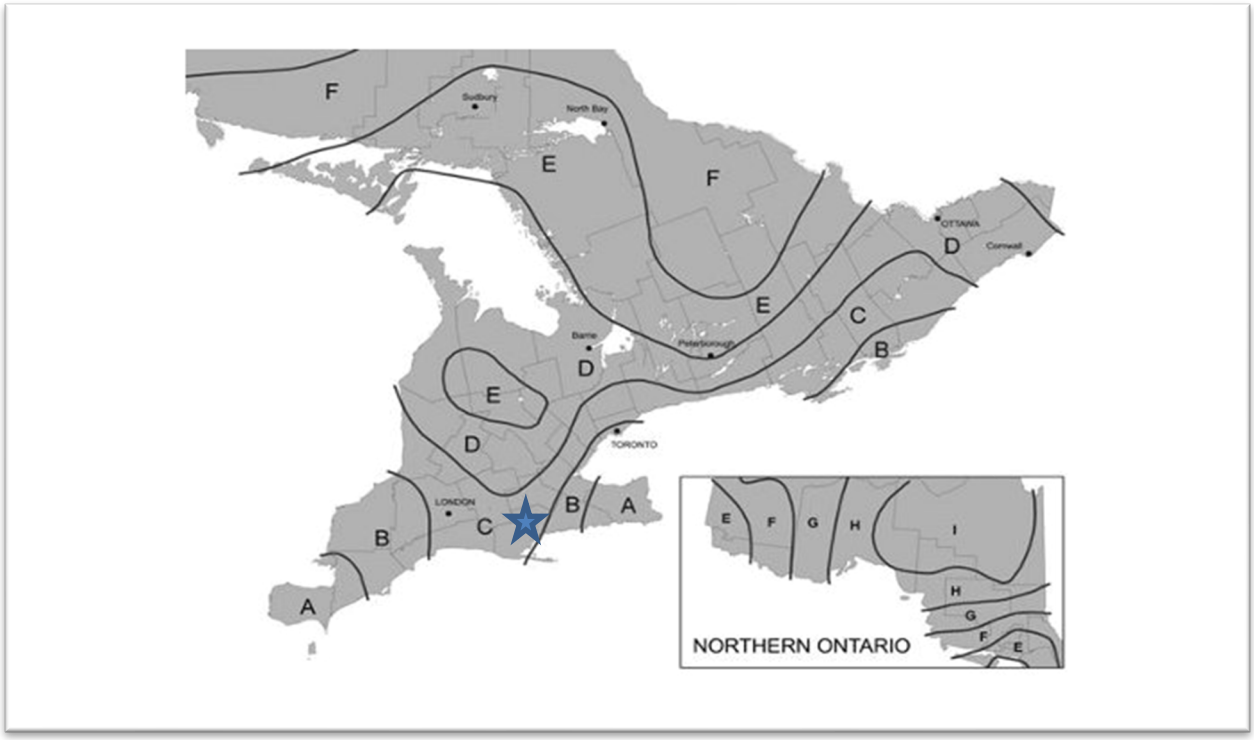
A review of OMAFRA Climate Zone Mapping revealed that the PSA and the SSA are located in Zone C. Figure 7 from the OMAFRA website illustrates the Climate Zone Map of Ontario. The approximate location of the PSA and SSA was marked with a blue star.

Figure 6 Crop Heat Units Map




Source: Figure 1-1 Crop Heat Units – Agronomy Guide for Field Crops (Publication 811)

Figure 7 OMAFRA Climate Zone Map




Source: OMAFRA Climate Zone Mapping

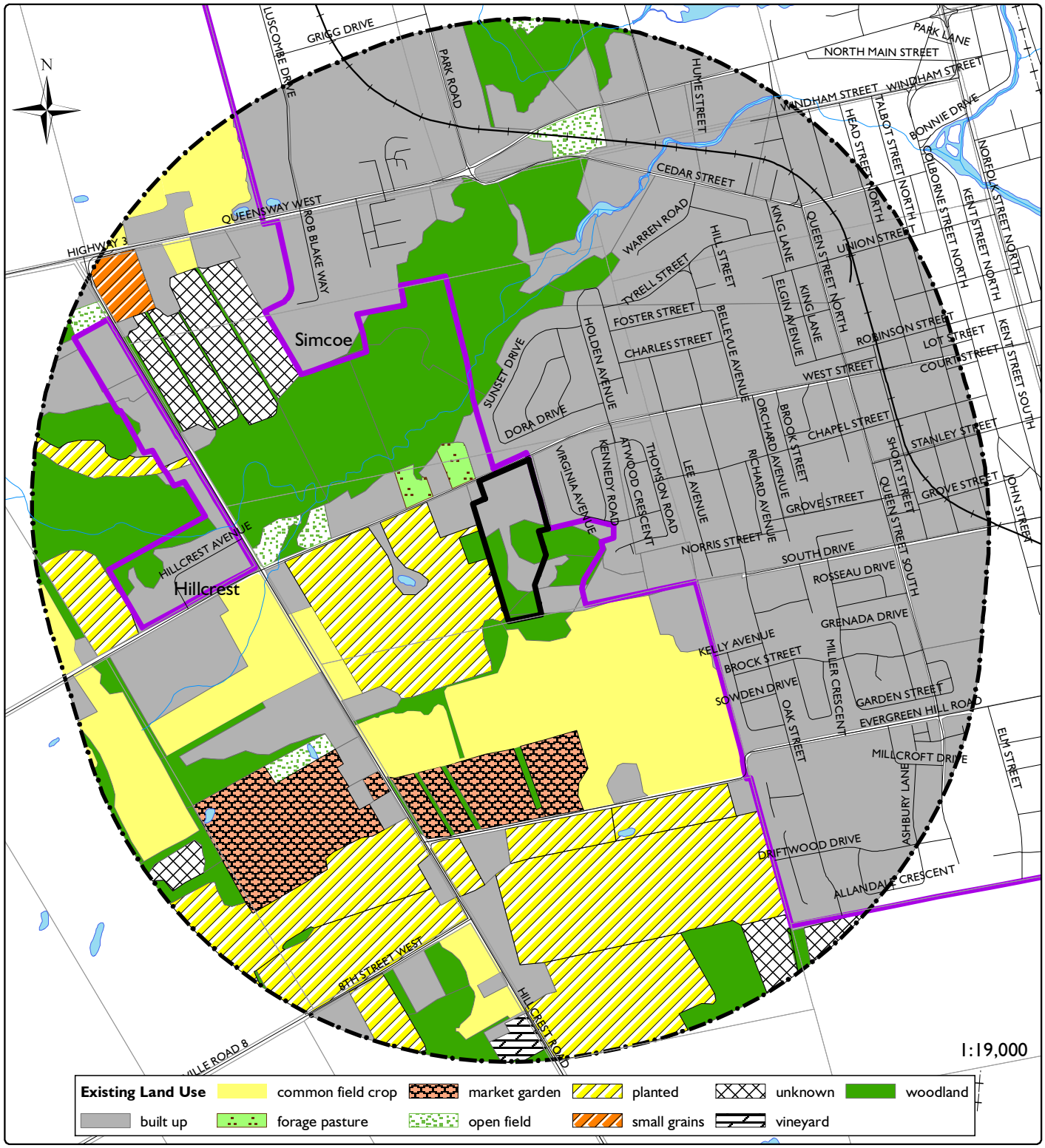
Zone C has an average Frost-Free period of 150-170 days, an Average Date of Last Spring Frost of May 3, and an Average Date of First Fall Frost of October 8.

## 4.2 LAND USE

The land use for both the PSA and the SSA was completed through a roadside reconnaissance survey (October 31, 2025), and a review of recent aerial photography, Google Earth Imagery, Bing Imagery, Birdseye Imagery, Norfolk County online imagery, *Agricultural Resource Inventory 1983* (ARI), and the Agriculture and Agri-Food Canada (AAFC) *Annual Crop Inventory (ACI)*. Agricultural and non-agricultural land uses are illustrated in Figure 8.

The terms used in the Agricultural Land Use assessment were derived from the OMAFRA Agricultural Resource Inventory (ARI) 1983 Coverage. It should be noted that not all terms were relevant or used. Only the terms that were appropriate for this area were utilized. For the purposes of this AIA additional terms or more relevant terms such as 'common field crop' were used. As an example, 'common field crop' indicates crop production that includes corn and soybean. The ARI 1983 Coverage land use terms include:

- Built up
- Cherries
- Corn System




## Legend

- Abandoned Railway
- Active Railway
- Roads (MNR)
- Watercourse (MNR)
- Community Boundaries (NC)
- Lot Lines (MNR)
- Primary Study Area (PSA)
- Secondary Study Area (SSA) (1.5 km)
- Waterbody (MNR)

Figure 8

# Existing Land Use

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- Extraction Pits and Quarries
- Grazing System
- Hay System
- Idle Agricultural Land (5 - 10 years)
- Idle Agricultural Land (> 10 years)
- Market Gardens/Truck Farms
- Mixed System
- Nursery
- Orchard
- Pasture System
- Recreation
- Reforestation
- Sod Farm
- Swamp/Marsh/Bog
- Unknown
- Vineyard
- Vineyard-Orchard
- Water
- Woodlands

Agricultural cropping patterns were identified and mapped. Corn and soybean crops were mapped as common field crops. Small grains are typically characterized as including winter wheat, barley, spring wheat, oats and rye. Forage/pasture crops may include mixed grasses, clovers and alfalfa as well as other areas used for pasture, haylage or hay.

The roadside reconnaissance survey identified these types of land uses including farm and non-farm uses (built-up areas, commercial, and roads).

Non-farm (built-up or disturbed areas) uses may include non-farm residential units, commercial, recreational, estate lots, services (utilities), industrial development and any areas that have been man-modified and are unsuitable for agricultural land uses (cropping).

It should be noted that the roadside reconnaissance survey is based on a line-of-sight assessment process. Therefore, dense brush, woodlands, and topography can prevent an accurate assessment of some fields. In those instances, measures are taken to try to identify the crop through conversations with landowners (if applicable) or review of aerial photography and online imagery. In some instances, no information is available. In those instances, the field polygon will be identified as 'unknown crop'.

Land use information was digitized in Geographic Information System (GIS – Arcmap/ARCGIS Pro) to illustrate the character and extent of the existing land use in both the PSA and the SSA. Area calculations for each land use polygon (area) were calculated within the GIS software and exported as tabular data. The data is presented as follows. Land use designations and land use definitions are provided in Table 1.

Table 1 Typical Land Use Designations

| Land Use Designation | Land Use Definitions |
|---|---|
| Built-Up/Disturbed Areas | non-farm residential units, commercial, recreational, estate lots, services (utilities), industrial development, areas that have been man-modified and are unsuitable for cropping |
| Common Field Crop | field crops grown on a large scale (corn, soybean) |
| Forage/Pasture | mixed grasses, clovers, alfalfa, pasture, haylage, hay, paddocks, outdoor riding area |
| Market Garden | small scale production of fruit, vegetables, and flowers |
| Open Field | unused field (<5 years) |
| Planted | field recently planted |
| Small Grains | winter wheat, barley, spring wheat, oats, rye |
| Unknown | no information available |
| Vineyard | planting of grapevines for grape production |
| Woodland | natural forested areas |

### 4.2.1 EXISTING LAND USE – PSA

The PSA consisted of built-up/disturbed areas and woodland areas. The disturbed areas were determined through a review of online imagery whereby it was noted that much of the open area of the PSA appeared to consist of numerous truckloads of imported fill material.

The PSA comprised land use of approximately 74.4 percent as built-up/disturbed areas and 25.6 percent as woodland.

On review of the existing land use data, it was observed that the predominant land use in the PSA was built-up/disturbed areas.

The proposed future development of the PSA will result in the loss of these lands for agricultural production.

### 4.2.2 EXISTING LAND USE – SSA

The SSA consisted of a variety of land uses including built-up/disturbed areas, common field crops, forage/pasture lands, market garden, open field, planted, small grains, unknown, vineyard, water, and woodland areas.

The SSA comprised land use of approximately 51.1 percent built-up/disturbed areas (including portions of Simcoe), 10.0 percent as common field crop, 0.3 percent as forage/pasture lands, 3.7 percent market garden, 0.9 percent as open field, 15.3 percent as planted, 0.4 percent as small grains, 3.0 percent as unknown, 0.2 percent as vineyard and 15.1 percent as woodland areas.

On review of the existing land use data, it was observed that the predominant land uses in the SSA include built-up/disturbed areas, planted areas, woodland areas and common field crop.

Table 2 illustrates the percentage occurrence of the land uses for both the PSA and SSA.

Table 2 Land Use – PSA and SSA

| Land Use Designation | PSA Percent Occurrence | SSA Percent Occurrence |
|---|---|---|
| Built-Up/Disturbed Areas | 74.4 | 51.1 |
| Common Field Crop | - | 10.0 |
| Forage/Pasture | - | 0.3 |
| Market Garden | - | 3.7 |
| Open Field | - | 0.9 |
| Planted | - | 15.3 |
| Small Grains | - | 0.4 |
| Unknown | - | 3.0 |
| Vineyard | - | 0.2 |
| Woodland | 25.6 | 15.1 |
| Totals | 100.0 | 100.0 |

The relatively high amount of land in non-agricultural land use in the SSA is typical of areas in close proximity to urban spaces (settlement area of Simcoe and Hillcrest).

There will be no loss of agricultural land in the SSA as a result of the proposed future development of the PSA.

## 4.3 AGRICULTURAL INVESTMENT

Agricultural investment is directly associated with the increase in capital investment to agricultural lands and facilities/buildings. In short, the investment in agriculture is directly related to the money used for the improvement of land through tile drainage or irrigation equipment, and through the improvements to the agricultural facilities/buildings (barns, silos, manure storage, sheds, processing, and storage).

As a result, the lands and facilities that have increased capital investment are often considered as having greater affinity for preservation than similar capability lands and facilities that are undergoing degradation and decline. Investment in agriculture is often readily identifiable through observations of the condition and type of the facilities, field observations and a review of OMAFA artificial tile drainage mapping.

### 4.3.1 AGRICULTURAL BUILDINGS

Agricultural buildings (including buildings that may be capable of housing livestock), barns, storage and processing facilities were identified through a combination of aerial photographic

interpretation, a review of online digital imagery (Google Earth Pro, Bing Mapping, Provincial and municipal online imagery, and Birds Eye Imagery), a review of Ontario Base Mapping and a roadside reconnaissance survey. The agricultural facilities or potential livestock facilities that were identified on mapping and imagery prior to conducting the roadside reconnaissance survey included buildings used for the active housing of livestock, barns that were empty and not used to house livestock, barns in poor structural condition, barns used for storage and any other large building that had the potential to house livestock.

Field investigations revealed the extent of the capability of the existing agricultural buildings and assisted in the determination of the use of buildings for livestock, cash crops, commercial or other activities. The roadside reconnaissance survey also revealed that some of the buildings identified from the preliminary mapping and imagery no longer existed (torn down), or were not agricultural, and used for other purposes (commercial/industrial) operations or activities. Further, the roadside reconnaissance survey identified a new barn building not available on aerial photography.

Farms were identified as livestock or cash crop. Livestock operations were further differentiated to the type of livestock based on the livestock seen at the time of the roadside reconnaissance survey, through a review of on-farm infrastructure (type of buildings, manure system, feed (bins, bales), and types of equipment) or through any signage associated with the respective agricultural operation.

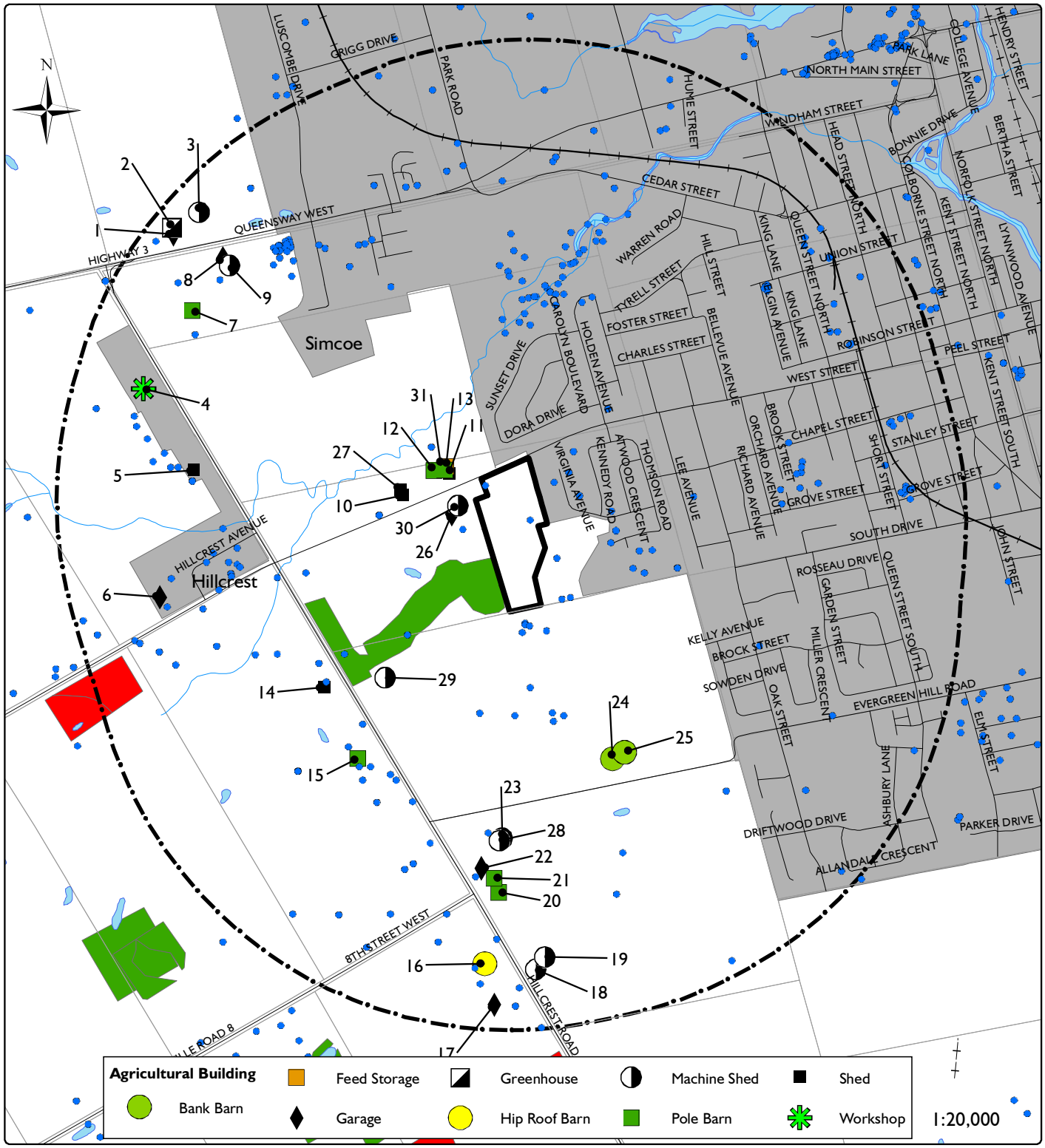
It should be noted that the roadside survey is based on a line-of-sight assessment process. Therefore, dense brush, woodlands, and topography can prevent an accurate assessment of some buildings. In those instances, measures are taken to try to identify buildings through conversations with landowners (if applicable) or review of aerial photography and online imagery. In some instances, no information is available. In those instances, the building will be identified as 'unknown building use or type'.

Agricultural activities such as livestock rearing usually involve investment in agricultural facilities. Dairy operations require extensive facilities for the production of milk. Poultry and hog operations require facilities specific to those operations. Beef production, hobby horse operations and sheep operations usually require less investment capital (when compared to dairy operations or other high valve operations).

Some cash crop operations are considered as having a large investment in agriculture if they have facilities that include grain handling equipment such as storage, grain driers and mixing equipment that is used to support ongoing agricultural activities.

For the purposes of this AIA, all agricultural buildings that were identified in the PSA and the SSA were illustrated in Figure 9.

A total of 31 agricultural buildings were identified. There were no agricultural buildings within the PSA, with all 31 agricultural buildings observed in the SSA.




## Legend

- Water Wells (MOECP)
- Abandoned Railway
- Active Railway
- Roads (MNR)
- Watercourse (MNR)
- Community Boundaries (NC)
- Lot Lines (MNR)
- Primary Study Area (PSA)
- Secondary Study Area (SSA) (1.5 km)
- Waterbody (MNR)

**Tile Drainage System Type (OMAFA)**

- Random
- Systematic

Figure 9

# Agricultural Investment

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MNR - Ministry of Natural Resources, NC - Norfolk County, OMAFA - Ontario Ministry of Agriculture, Food, and Agribusiness

A listing of the agricultural buildings is provided in Appendix A.

Photographs and/or aerial photography/satellite imagery of the respective agricultural buildings is provided in Appendix B.

### 4.3.2 ARTIFICIAL DRAINAGE

An evaluation of artificial drainage in the PSA and within the SSA was completed through a review of online aerial photographic/aerial imagery interpretation and a review of the OMAFA Artificial Drainage System Mapping.

Visual evidence supporting the use of subsurface tile drains included observations of drain outlets to roadside ditches or surface waterways, and surface inlet structures (hickenbottom or French drain inlets).

Evidence in support of subsurface tile drainage on aerial photographs would be based on the visual pattern of tile drainage lines as identified by linear features in the agricultural lands and by the respective light and dark tones on the aerial photographs, often referred to as a 'herring bone' pattern. The light and dark tones relate to the moisture content in the surface soils at the time the aerial photograph was taken.

OMAFA Artificial Drainage System Maps were downloaded from the Geohub website in November 2025 and were reviewed to determine if an agricultural tile drainage system had been registered anywhere in the PSA, or in the SSA. The OMAFA Artificial Drainage System data illustrates the location and type of tile drainage systems. The type of tile drainage system is defined as either 'random' or 'systematic'. A random tile drainage system is installed to drain only the low areas or areas of poor drainage within a field. A systematic tile drainage system refers to a method of installing drain tiles at specific intervals across a field, in an effort to drain the entire field area. From a cost perspective, a systematic tile drainage system would be a greater cost, or investment in agriculture when compared to a random tile drainage system.

Figure 9 illustrates the OMAFA Artificial Drainage Systems mapping for the PSA, SSA, and adjacent surrounding areas.

The review of the OMAFA Artificial Tile Drainage revealed that there are no tile drainage systems registered for the PSA.

The review of the OMAFA Artificial Tile Drainage revealed that two small areas (west of the PSA) in the SSA comprised both random and systematic tile drainage systems. There will be no loss of or impact to the tile drainage systems in the SSA as a result of the proposed development of the PSA.

### 4.3.3 WATER WELLS

A review was completed of the MECP Water Well records to determine the extent of water wells in the PSA and the SSA. The review of water well records involved a download of the latest version of the Water Well Records for Ontario. The water well locations are identified in Figure 9. As illustrated in Figure 9, a single water well was observed in the PSA, while numerous water wells are located within the SSA.

The review of water well records was completed to determine the location and extent of water wells in the area, and to identify any potential concerns or impacts that may occur as a result of the proposed future development of the PSA. Generally, many livestock operations and some crop farms (nursery stock farms) use groundwater for their livestock or crops, and any disruption to the water in terms of quality and/or quantity could have a significant impact on the operation.

There appears to be capital investment in water wells in the PSA and the SSA, as based on the review of the online water well record data. It is unknown if these wells are used in livestock production, or possibly for irrigation purposes.

### 4.3.4 IRRIGATION

A review of online data and roadside reconnaissance survey noted that there were no irrigation systems on the PSA. Many areas of irrigation were noted in the southern portions of the SSA.

Visual evidence supporting the use of irrigation equipment would include the presence of the irrigation equipment (piping, water guns, sprayers, tubing/piping, etc), the presence of a body of water (pond, lake, water course) capable of sustaining the irrigation operation and lands that are appropriate for the use of such equipment (large open and level fields).

There will be no loss of irrigation systems as a result of the proposed future development of the PSA.

### 4.3.5 LANDFORMING

Landforming is the physical movement of soil materials to create more uniformly sloped lands for the ease of mechanized operations. The costs associated with landforming can be exorbitant, depending on the volume of soils moved.

No landforming for the purposes of enhancing an agricultural operation was noted in the review of online imagery or during the roadside reconnaissance survey for the PSA or the SSA.

## 4.4 MINIMUM DISTANCE SEPARATION (MDS1)

The Minimum Distance Separation formulae and implementation guidelines are a planning tool developed by OMAFRA to prevent land use conflicts and minimize nuisance complaints related

to odour and to reduce land use incompatibility. MDS1 setbacks are calculated to separate uses so as to reduce incompatibility concerns about odour from livestock facilities. The OMAFRA document titled *The Minimum Distance Separation (MDS) Document: Formulae and Guidelines for Livestock Facility and Anaerobic Digester Odour Setbacks* (Publication 853, Ontario Ministry of Agriculture, Food and Rural Affairs. 2016) was utilized for this MDS1 assessment.

Typically, the need for an MDS1 assessment is triggered by the PPS 2024 Section 2.3.2.1(e) whereby new land uses in prime agricultural areas and in rural areas shall comply with the Minimum Distance Separation formulae. There is a requirement that the MDS1 guidelines shall be referenced in municipal official plans and zoning by-laws such that MDS1 setbacks are required in all designations and zones where livestock facilities and anaerobic digesters are permitted.

In order to confirm/establish the need for an MDS1 assessment, a review was completed of various provincial and municipal policies and documents. For this assessment the review included the PPS 2024, and the *Norfolk County Official Plan (Consolidated to January 1, 2023)*.

A review of the OMAFRA document titled *The Minimum Distance Separation (MDS) Document: Formulae and Guidelines for Livestock Facility and Anaerobic Digester Odour Setbacks* (Publication 853, Ontario Ministry of Agriculture, Food and Rural Affairs. 2016) was completed.

It is stated under guideline #1:

> "In accordance with the Provincial Policy Statement, 2014, this MDS Document shall apply in prime agricultural areas and on rural lands."

It is stated under guideline #2:

> "The MDS I setback distances shall be met prior to the approval of: proposed lot creation in accordance with Implementation Guidelines #8 and #9; rezonings or re-designations in accordance with Implementation Guideline #10; building permits on a lot which exists prior to March 1, 2017 in accordance with Implementation Guideline #7; and as directed by municipalities for local approvals for agriculture related uses or on-farm diversified uses in accordance with Implementation Guideline #35."

It is stated under guideline #34:

> "For the purposes of MDS I, proposed Type B land uses are characterized by a higher density of
> human occupancy, habitation or activity including, but not limited to:
> - new or expanded settlement area boundaries;
> - an official plan amendment to permit development, excluding industrial uses, on land outside a settlement area;
> - a zoning by-law amendment to permit development, excluding industrial uses or dwellings, on land outside a settlement area; and

- the creation of one or more lots for development on land outside a settlement area, that results in four or more lots for development, which are in immediate proximity to one another (e.g., sharing a common contiguous boundary, across the road from one another, etc.), regardless of whether any of the lots are vacant.

Because of the increased sensitivity of these uses, a new or expanding Type B land use will generate an MDS I setback that is twice the distance as the MDS I setback for a Type A land use. This is reflected in the value of Factor E which is 2.2 for Type B versus 1.1 for Type A."

The proposed future development of the PSA would be characterized as a higher density of human occupancy, habitation or activity and would be considered as a Type B land use.

It is stated under guideline #6:

"A separate MDS I setback shall be required to be measured from all existing livestock facilities and anaerobic digesters on lots in the surrounding area that are reasonably expected by an approval authority to be impacted by the proposed application.

As part of municipal consideration of planning or building permit applications, all existing livestock facilities or anaerobic digesters within a 750 m distance of a proposed Type A land use and within a 1,500 m distance of a proposed Type B land use shall be investigated and MDS I setback calculations undertaken where warranted."

This AIA is based on the proposed future development of the PSA for a SABE (higher density of human occupation); therefore, it is a Type B land use and requires an assessment of barns out to a distance of 1500 m from the PSA.

As required in the MDS1 Guidelines (MDS Guideline # 16 – Obtaining Required Information to Calculate the MDS Setbacks) every effort is to be made to contact landowners in an attempt to collect accurate and site-specific data for each of the agricultural buildings that have the potential to house livestock within the 1500 m buffer. In the instances where the landowner was not available or unwilling to participate, data was collected through alternate means including the use of online imagery (Google Earth, Bing Imagery, Birdseye Imagery), the County of Norfolk online mapping, and internet searches (including Facebook, business data sources, real-estate listings).

In instances where landowners could not be contacted, the livestock potential was based on the most appropriate livestock for that particular livestock facility (ie: based on observed signage, manure piles, feed storage, building type/style, review of online data sources including historical imagery). The respective size of each farm property was determined from Municipal Assessment data (or the OMAFA Agricultural Information Atlas website), further, the relative size of the potential livestock buildings (in sq m) was measured from online imagery sources. The use of these data sources will provide a potentially greater MDS1 calculated distance than if the data is collected from the landowner, due to the measurement of the entire building roof

area (including eaves/overhang) and that the entire area measured is considered as potential livestock space (ie. assumes that the entire building area is only used for livestock and that there is no area for feed rooms, offices, tack rooms, etc).

MDS1 data was collected through observations made during a roadside reconnaissance survey completed on October 31, 2025. Data collected in this survey assisted with the visual assessment of any buildings capable of housing livestock, identification of animal types and number (if observed on the property or noted on signage on the property), and manure storage location. It should be noted that reconnaissance surveys are often limited by 'line of sight' restrictions. Topography and vegetation (density and/or height) may preclude an accurate assessment of individual agricultural buildings. With this in mind, recent aerial photography and online digital imagery were used to assist in the identification and assessment of any partially or totally concealed agricultural building.

MDS1 calculations are based on a cumulative design capacity of livestock buildings on a lot. MDS Guideline #19 states:

> "MDS calculations shall be based on the combined design capacity for all livestock barns on a lot, even if they are unoccupied livestock barns or separated by a substantial distance on the lot.
>
> Where there are no livestock barns on a lot, MDS calculations shall be based on the combined design capacity for all manure storages on a lot, even if they are unused manure storages or separated by a substantial distance on the lot."

MDS Guideline #19 indicates that the calculated MDS1 arc should be based on a combined design capacity of all livestock barns, even if unoccupied, on a property. The combined MDS1 calculation is then measured from the closest point of the PSA to the closest point of the livestock occupied portion of the agricultural building.

MDS1 calculations are completed for the agricultural buildings individually, or as a cumulative calculation of livestock for farms with more than one building capable of housing livestock. MDS1 calculations were completed based on the information provided by the landowner, or through the assessment of collected data. MDS1 calculations were completed using the OMAFRA online AgriSuite software.

The AgriSuite software calculates MDS1 based on the inputs for each agricultural building. Data input includes the respective farm location information, size of farm parcel, type of manure storage, type of livestock, numbers of livestock or barn area. The AgriSuite software completes an MDS1 calculation for an agricultural operation (single agricultural building (barn), or cumulative (agricultural buildings). The Agrisuite calculation defines a distance which is to be measured from the closest point of the agricultural building (and the manure storage) toward the closest point of the PSA. Each AgriSuite software agricultural building data sheet and calculated MDS1 value are presented in Appendix C.

Table 3 provides an overview of the agricultural building number, type of building, building use, potential livestock, and the calculated MDS1 value from barn and manure storage.

Figure 11 illustrates the location of all agricultural buildings, the calculated MDS1 arcs for individual agricultural buildings, or the calculated cumulative design capacity MDS1 arc for lots with more than one agricultural building capable of housing livestock.

MDS1 distances from the manure storages were not illustrated on Figure 11. In some instances, there is no permanent manure storage or the barns are unoccupied. The Agrisuite software does not calculate a distance from the manure storage for barns that are unoccupied.

As mentioned previously in this AIA, the proposed development of the PSA is based on a SABE. MDS1 calculations were completed for agricultural buildings within the SSA as a best practice to protect lands for agricultural use as long as possible during the development phases. A total of 2 buildings were identified in the SSA that housed livestock or had the potential to house livestock. The two buildings were located on the same parcel resulting in the need to complete MDS1 as a cumulative or combined design capacity.

Table 3 provides the Agrisuite calculated MDS1 value for the 2 agricultural buildings (agricultural buildings 12 and 31). Table 3 provides a cumulative design capacity calculated MDS1 value for these buildings as they are located on the same property.

Table 3 Minimum Distance Separation (MDS1)

| Agricultural Building Number | Type of Building | Building Use | Potential Livestock | MDS1 Barn (m) | MDS1 Manure Storage (m) |
|---|---|---|---|---|---|
| 12 | Pole Barn | Livestock | Horses | 289* | 289* |
| 31 | Pole Barn | Livestock | Horses | | |

* Measurement based on (MDS Guideline #19 Cumulative design capacity of all livestock barns, even if unoccupied on a property)

As observed in Figure 11, and taking MDS Guideline #19 – Cumulative Design Capacity of Livestock Facilities on a Lot into consideration, Agrisuite calculated an MDS1 setback of 289m (black circle) from agricultural buildings 12 and 31.

Agricultural buildings 12 and 31 are also subject to MDS Guideline #12 – Existing uses that do not conform to MDS.

MDS Guideline # 12 states:

> "However, a reduced MDS I setback may be permitted provided there are four, or more, *nonagricultural uses*, *residential uses* and/or *dwellings* closer to the subject *livestock*

*facility* than the proposed *development* or *dwellings* and those four or more *non-agricultural uses*, *residential uses* and/or *dwellings* are:

- located within the intervening area (120° field of view shown in Figure 4 in Section 7 of this MDS Document) between the closest part of the proposed *development* or *dwelling* and the nearest *livestock facility* or *anaerobic digester*;
- located on separate *lots*; and
- of the same or greater sensitivity (i.e., Type A or Type B in accordance with Implementation Guidelines #33 and #34) as the proposed *development* or *dwelling*.

If ALL of the above conditions are met, the MDS I setback for the proposed *development* or *dwelling* may be reduced such that it is located no closer to the *livestock facility* or *anaerobic digester* than the furthest of the four *non-agricultural uses*, *residential uses* and/or *dwellings* as shown in Figure 4."

Figure 10 Figure 4 - MDS Implementation Guideline #12

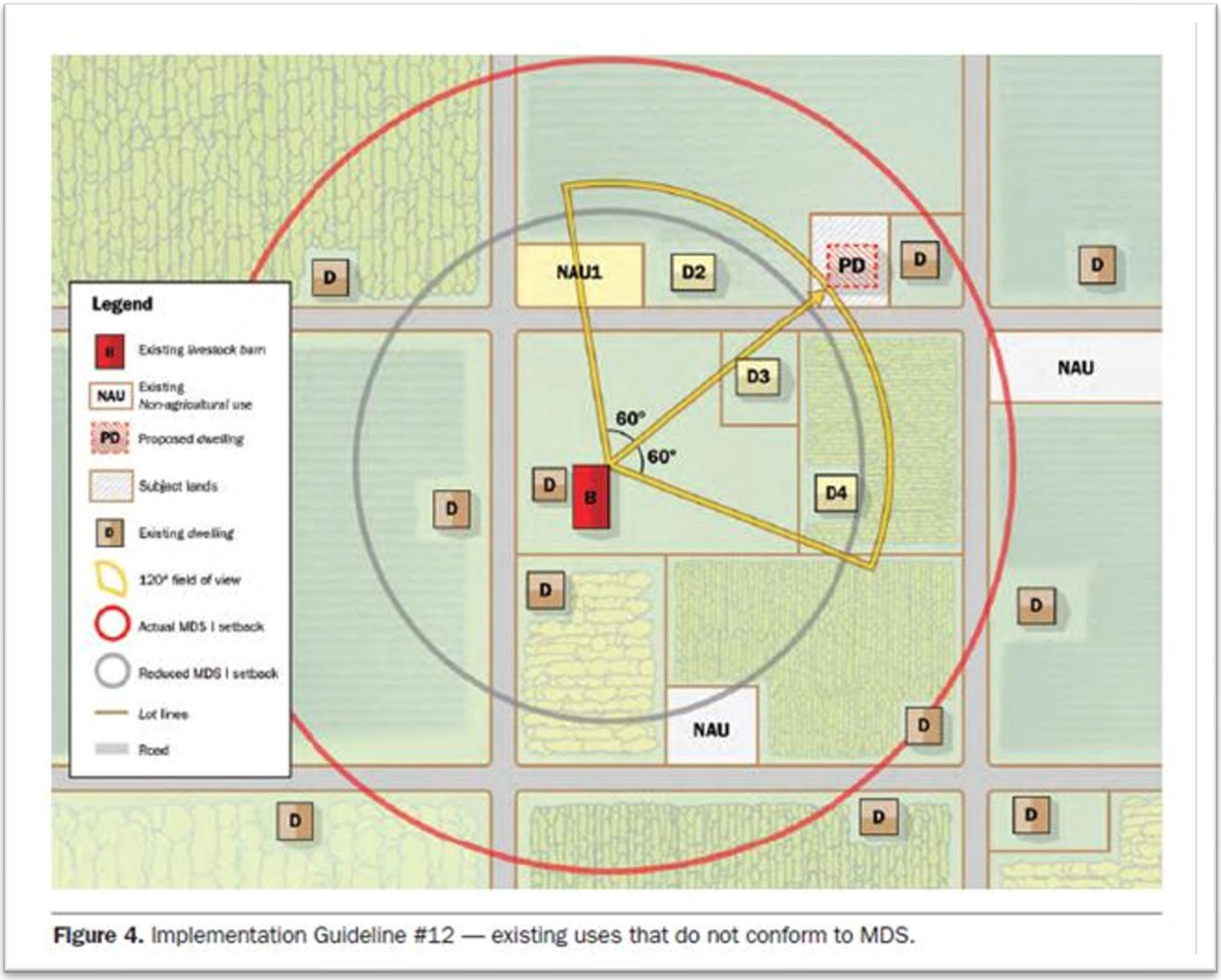
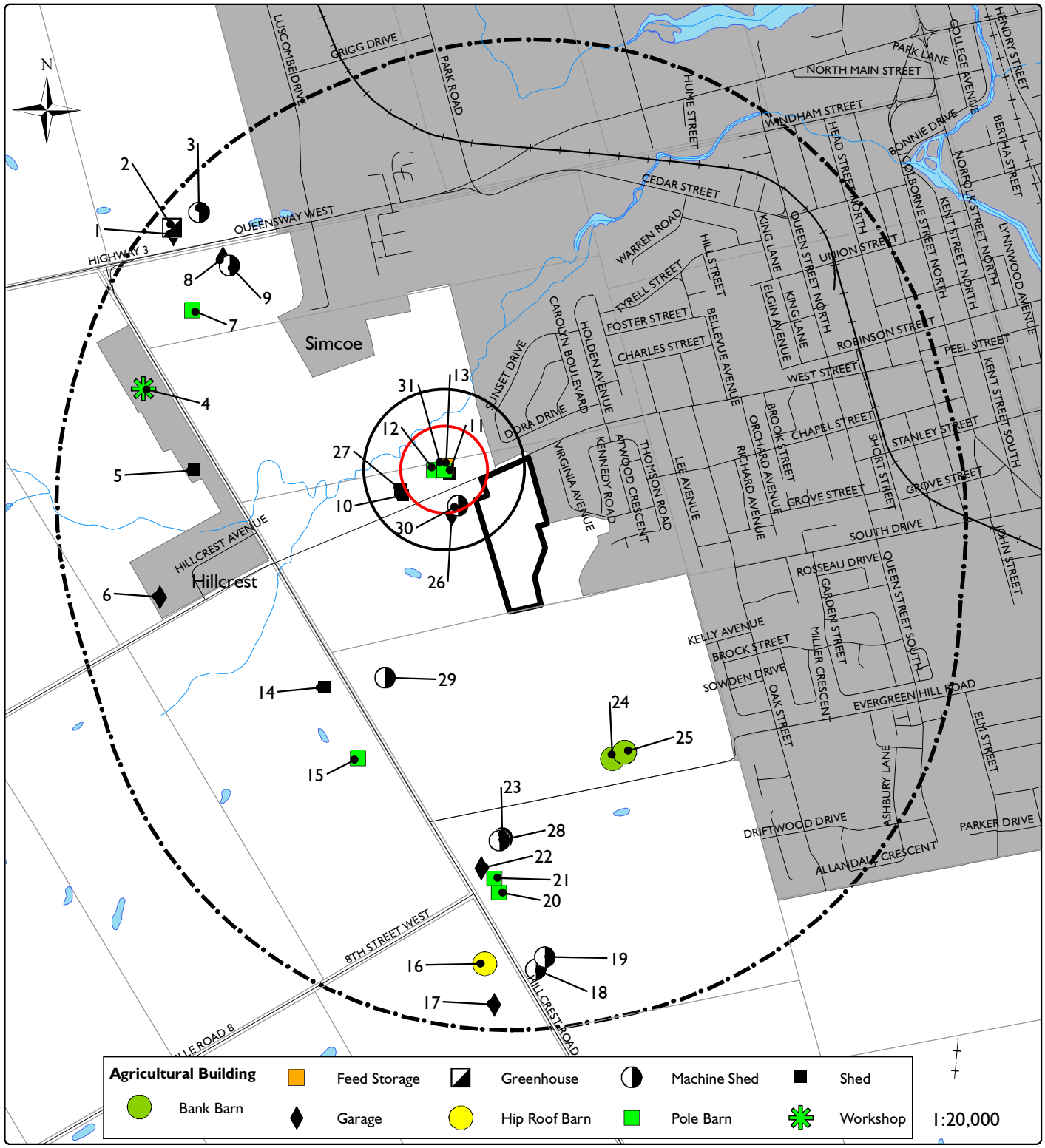



**Figure 4.** Implementation Guideline #12 — existing uses that do not conform to MDS.




## Legend

- Abandoned Railway
- Active Railway
- Roads (MNR)
- Watercourse (MNR)
- Community Boundaries (NC)
- Lot Lines (MNR)
- Primary Study Area (PSA)
- Secondary Study Area (SSA) (1.5 km)
- Waterbody (MNR)
- Calculated MDS1 arc (289 m)
- Measureed MDS1 arc (156 m) *

* - Based on MDS Guideline 12

Figure 11

Minimum Distance Separation (MDS1)

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December 2025

MNR - Ministry of Naturual Resources, NC - Norfolk County

Taking MDS1 Guideline #12 into consideration, Figure 12 illustrates agricultural buildings 12 and 31, the four or more residential or non-agricultural uses (three residential dwellings and one garage) that are closer to agricultural buildings 12 and 31, the boundary of the PSA, and the modified MDS1 arc (red circle) for building 31. Agrisuite calculated the MDS1 setback as 156 m in accordance with guideline #12. The resulting MDS1 arc extends into the north and northeast corners of the PSA.

Therefore, this AIA is consistent with PPS 2024 Section 2.3.2.1(e).

The use of MDS1 in this instance is a best management practice for the purposes of identifying areas within the PSA where the use of phasing of development (develop the MDS1 arc impact areas last), or to identify areas where passive land uses could be considered (parks, infrastructure (storm water management ponds, roads, parking areas)).

## 4.5 FRAGMENTATION

Assessment data was evaluated to determine the characteristics and the degree of land fragmentation in the PSA and the SSA.

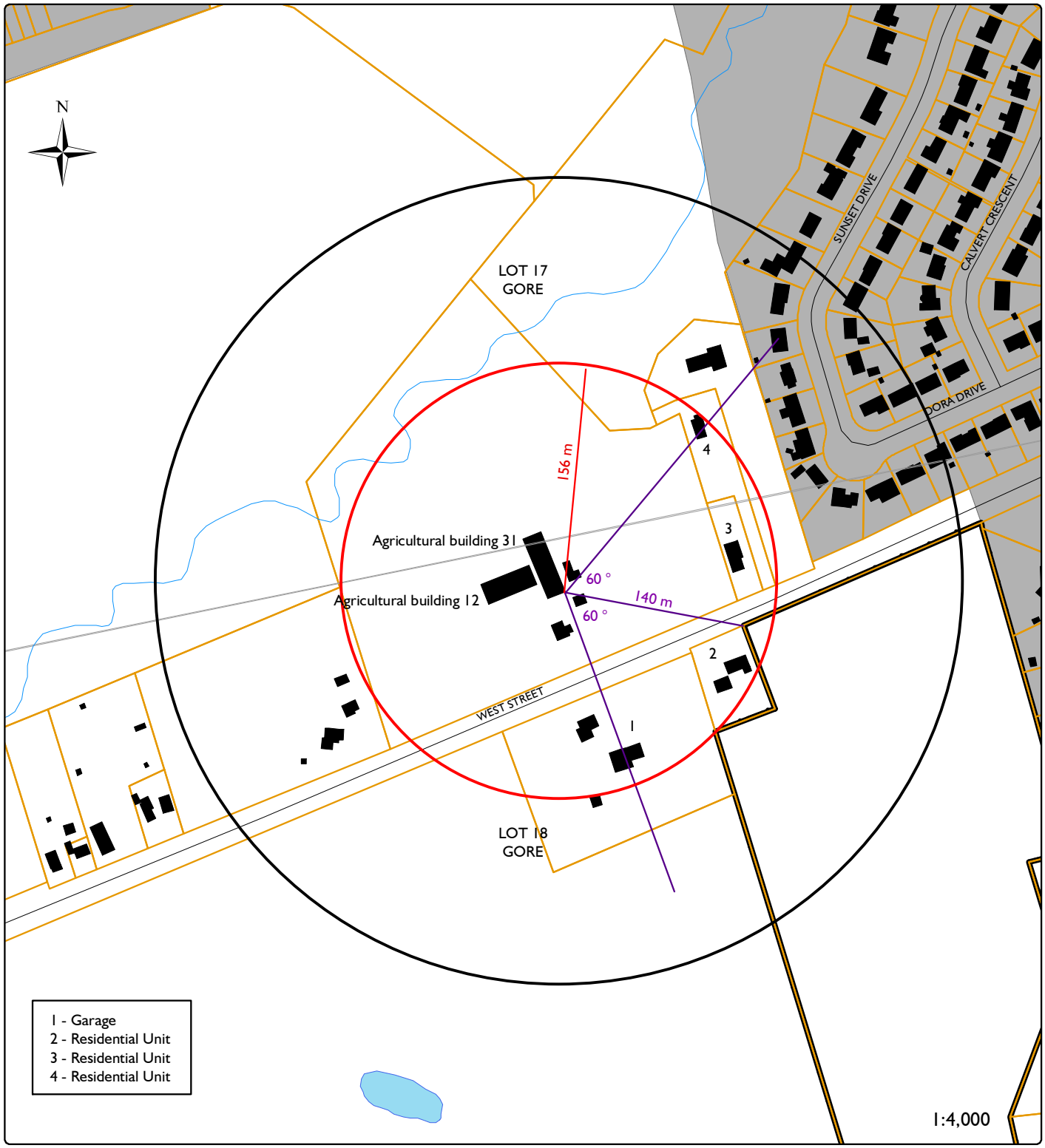
In order to evaluate land fragmentation, the most recent Assessment Roll mapping and Assessment Roll information from the Norfolk County was referenced on a property-by-property basis (for the PSA and the SSA) to determine the approximate location, shape and size of each parcel. The assessment of fragmentation looked at the numbers of and proximity of properties within the PSA and the SSA. It was noted that the Norfolk County parcel data was a shapefile layer that could not be edited. As such, a calculation of numbers of parcels of a range of sizes could not be completed.

While a minimum size for an agricultural property is not specified in the PPS 2024, the PPS 2024 does state in section 4.3.2.2 that:

> "In prime agricultural areas, all types, sizes and intensities of agricultural uses and normal farm practices shall be promoted and protected in accordance with provincial standards."

A review of the *Norfolk County Official Plan (Consolidated to January 1, 2023)* identifies a minimum agricultural lot size of 40 hectares (100.0 acres). The review of *The Zoning By-Law of Norfolk County 1-A-2014* identified a minimum lot area of 40.0 ha (100.0 acres) for an Agricultural *Zone*.

Historically, Statistics Canada Census of Agriculture (2011) indicated that the average farm size in Ontario was 98.7 ha (244 acres). This average size is based on the number of Census farms divided by the acreage of those Census farms (Total Farm Area). The Total Farm Area is land owned or operated by an agricultural operation and includes cropland, summer fallow, improved and unimproved pasture, woodlands and wetlands, and all other lands (including idle land, and land on which farm buildings are located) (Statistics Canada, 2017). It should be noted that the average farm size is based on farmland holdings, which may include more than one parcel




## Legend

- Abandoned Railway
- Active Railway
- Roads (MNR)
- Watercourse (MNR)
- Community Boundaries (NC)
- Lot Lines (MNR)
- Parcels (NC)
- Primary Study Area (PSA)
- Secondary Study Area (SSA) (1.5 km)
- Waterbody (MNR)
- Calculated MDS1 arc (289 m)
- Measured MDS1 arc (156 m) *

* - Based on MDS Guideline 12

Figure 12

Minimum Distance Separation (MDS1) Detail

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(property). Further, the Census of Agriculture (2011) indicated that the average farm size in Norfolk County is 89.2 ha (220.3 acres).

Further, the historical Census of Agriculture (2016) data indicated that the average farm size in Ontario (for Census farms) was 100.8 ha (249) acres. Again, the Census of Agriculture (2016) average farm size is based on farmland holdings, which may include more than one parcel (property). The Census of Agriculture (2016) indicated that the average farm size in Norfolk County is 87.1 ha (215.3 acres).

The more recent Census of Agriculture (2021) data indicated that the average farm size in Ontario (for Census farms) was 98.3 ha (243 acres). Again, the Census of Agriculture (2021) average farm size is based on farmland holdings, which may include more than one parcel (property). Further, the Census of Agriculture (2021) indicates that the average farm size in Norfolk County is 88.5 ha (218.7 acres).

Figure 13 illustrates the complexity of the land fragmentation within the PSA and SSA.

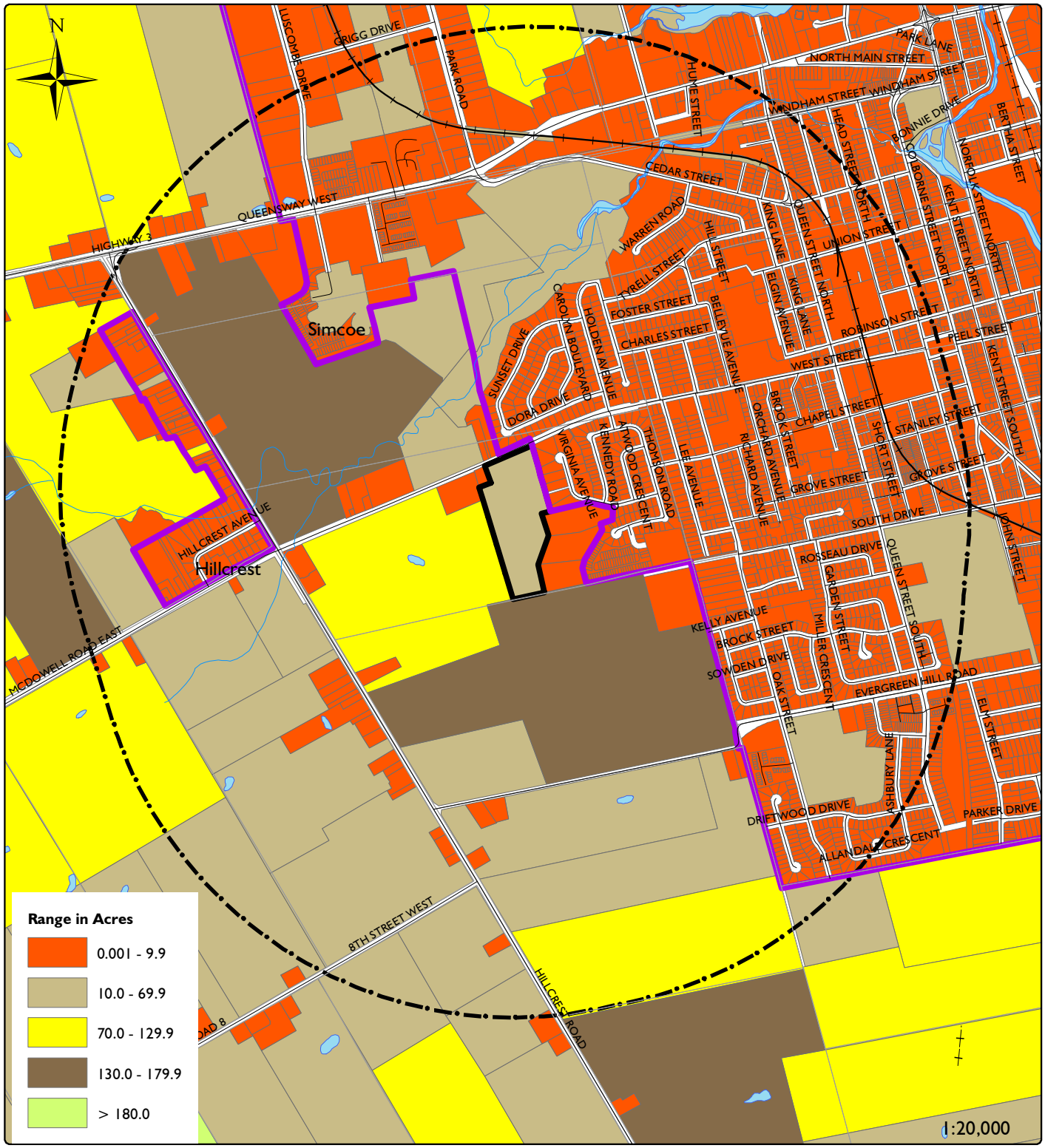
The Census data provides detailed information on Census farms (farms which provided census data). Census data is provided in the unit format of acres, with the splits in the data at 0.0 – 9.9, 10.0 – 69.9, 70.0 – 129.9, 130.0 – 179.9 and greater than 180.0 acres. For the purposes of this AIA, similar splits in acre data were used for the comparison.

Statistics Canada defines a Census Farm as:

> "a unit that produces agricultural products and reports revenues or expenses for tax purposes to the Canada Revenue Agency.
> - Agricultural products include the following:
>   - crops: grains, oilseeds, leguminous crops, potatoes, vegetables, fruits, berries, greenhouse products, mushrooms, sod, nursery products, Christmas trees, maple tree taps, hay and fodder crops, hemp, and other crops
>   - livestock: dairy and beef cattle (including feedlots), pigs, poultry and eggs (including hatcheries), turkeys, ducks, geese, sheep, goats, horses and other equines, bison (buffalo), elk (wapiti), deer, llamas and alpacas, rabbits, mink, bees, and other animals.
> - Not included are forestry and logging, hunting and trapping, fishing and aquaculture, support activities for agriculture and post-harvest activities, horse boarding and riding lessons, and operations making products that are not for human consumption (e.g., genetic operations, insect farms for pet food)."

As illustrated in Figure 13, the PSA comprised a single parcel in the range of 10.0 – 69.9 acres.

The SSA comprised numerous small parcels associated with the urban area of Simcoe (and Hillcrest) and linear development along Highway 3 and Hillcrest Road. Smaller parcels were also noted to the north and west of the PSA.




## Legend

- Abandoned Railway
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- Roads (MNR)
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- Community Boundaries (NC)
- Lot Lines (MNR)
- Primary Study Area (PSA)
- Secondary Study Area (SSA) (1.5 km)
- Waterbody (MNR)

Figure 13

# Fragmentation

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The visual assessment of parcel data as a means of determining the existing fragmentation of the PSA and the SSA revealed that the SSA comprised numerous parcels of varying sizes. Table 4 provides a comparison between the parcel count of the PSA, and the Census farm data. The parcel count for Norfolk County reflects the Census Farms from the 2021, 2016, and 2011 census.

As illustrated in Figure 13, the parcel data for the SSA indicates the presence of numerous small parcels (including the urban area of Simcoe and Hillcrest, and linear development) that are intermixed with the surrounding agricultural area. This type of fragmentation pattern is common in areas near urban boundaries.

Table 4 Parcel Size and Parcel Count

| Parcel Size Range (Acre) | PSA | Norfolk County (2021 Census) | Norfolk County (2016 Census) | Norfolk County (2011 Census) |
|---|---|---|---|---|
| 0.0 – 9.9 | - | 158 | 126 | 117 |
| 10.0 – 69.9 | 1 | 602 | 697 | 651 |
| 70.0 – 129.9 | - | 444 | 470 | 529 |
| 130.0 – 179.9 | - | 162 | 181 | 198 |
| >180 | - | 585 | 674 | 685 |

The proposed development of the PSA will result in an increase in fragmentation in the PSA (related to the SABE) and will not result in an increase in fragmentation in the SSA.

## 4.6 SOILS AND CANADA LAND INVENTORY (CLI)

A review was completed of the soils and Canada Land Inventory (CLI) data base for the PSA and the SSA. The review was completed to determine the extent and location of the high capability soils. Digital soils data was retrieved from Ontario Geohub in November 2025. It should be noted that the original soils report and mapping was created for *The Soils of Regional Municipality of Haldimand-Norfolk Volumes 1 & 2 (Report No. 57 of the Ontario Institute of Pedology, 1984. Presant, E.W., and C.J. Acton)*. The Soils of Haldimand-Norfolk report and mapping were reviewed as part of this AIA. The data within the original soils report (including mapping) has since been digitized by OMAFA and was available through the Land Information Ontario Website.

The review included a download of the latest version of the soils data from the Ontario Geohub website and discussions with OMAFA staff to determine if the downloaded data set is the latest iteration of the soils data.

Due to the continual updates to the soil survey complex datasets, it is prudent to verify or at least confirm that the soil series data and Canada Land Inventory (CLI) information within the datasets is accurate across Haldimand-Norfolk. In an effort to confirm the correctness of the

soils and the Canada Land Inventory data on a soil series basis, the digital data file that is associated with the Haldimand-Norfolk soil survey complex file was examined create a unique symbols list based on Soil Series, topography (slope), CLI class and CLI subclass.

The soils database for Haldimand-Norfolk comprised approximately 1238 individual soil polygons.

The unique symbols list (based on the SYMBOL1 column) provided 121 unique symbols combined with the associated slope and CLI class and CLI subclass (CLI_1 and CLI_2). The unique symbols list is provided in Appendix D. A review of this list indicated that there were a few minor issues with the soils and the respective CLI class and/or subclass. In some cases, the CLI Class differed by one class, while in other cases only the CLI subclass differed.

For the purposes of this AIA, the soil and CLI data presented on Figure 14 is considered appropriate in soil code and CLI rating.

### 4.6.1 SOIL CAPABILITY FOR AGRICULTURE

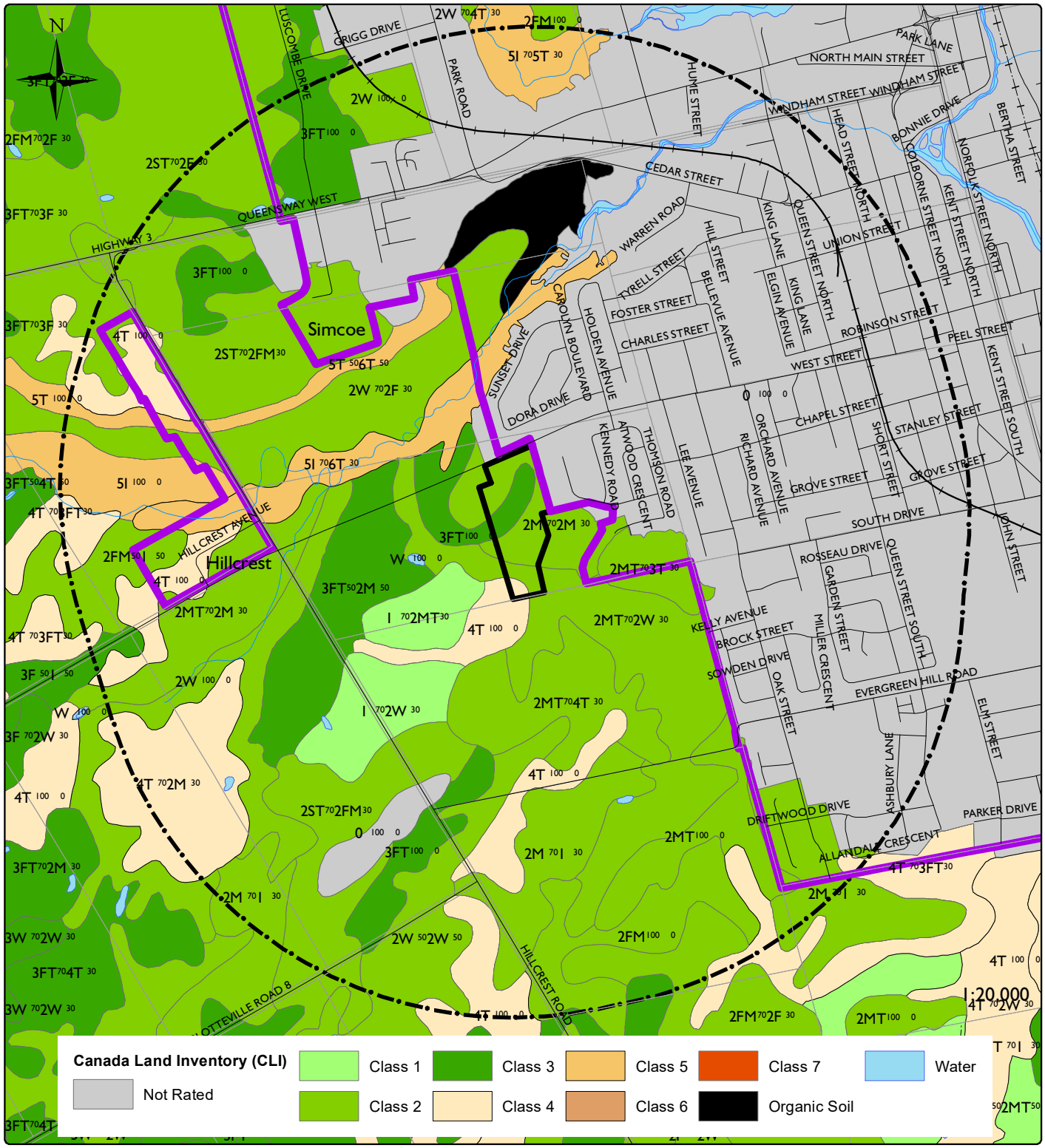
Basic information about the soils of Ontario is made more useful by providing an interpretation of the agricultural capability of the soil for various crops. The Canada Land Inventory (CLI) system combines attributes of the soil to place the soils into a seven-class system of land use capabilities. The CLI soil capability classification system groups mineral soils according to their potentialities and limitations for agricultural use. The first three classes are considered capable of sustained production of common field crops, the fourth is marginal for sustained agriculture, the fifth is capable for use of permanent pasture and hay, the sixth for wild pasture and the seventh class is for soils or landforms incapable for use for arable culture or permanent pasture.

Organic (O) or Muck (M) soils are not classified under this system. Disturbed Soil Areas are not rated under this system.

#### 4.6.1.1 Canada Land Inventory (CLI) Class

The Ontario Ministry of Agriculture, Food and Rural Affairs document *Classifying Prime and Marginal Agricultural Soils and Landscapes: Guidelines for Application of the Canada Land Inventory in Ontario* defines the Canada Land Inventory (CLI) classification as follows:

> "Class 1 - Soils in this class have no significant limitations in use for crops. Soils in Class 1 are level to nearly level, deep, well to imperfectly drained and have good nutrient and water holding capacity. They can be managed and cropped without difficulty. Under good management they are moderately high to high in productivity for the full range of common field crops
>
> Class 2 - Soils in this class have moderate limitations that reduce the choice of crops, or require moderate conservation practices. These soils are deep and may not hold moisture and nutrients as well as Class 1 soils. The limitations are moderate and the soils can be managed and cropped with little difficulty. Under good




## Legend

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- Secondary Study Area (SSA) (1.5 km)
- Waterbody (MNR)

Figure 14

# Canada Land Inventory (CLI)

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MNR - Ministry of Natural Resources, NC - Norfolk County

management they are moderately high to high in productivity for a wide range of common field crops.

Class 3 - Soils in this class have moderately severe limitations that reduce the choice of crops or require special conservation practices. The limitations are more severe than for Class 2 soils. They affect one or more of the following practices: timing and ease of tillage; planting and harvesting; choice of crops; and methods of conservation. Under good management these soils are fair to moderately high in productivity for a wide range of common field crops.

Class 4 - Soils in this class have severe limitations that restrict the choice of crops, or require special conservation practices and very careful management, or both. The severe limitations seriously affect one or more of the following practices: timing and ease of tillage; planting and harvesting; choice of crops; and methods of conservation. These soils are low to medium in productivity for a narrow to wide range of common field crops, but may have higher productivity for a specially adapted crop.

Class 5 - Soils in this class have very severe limitations that restrict their capability to producing perennial forage crops, and improvement practices are feasible. The limitations are so severe that the soils are not capable of use for sustained production of annual field crops. The soils are capable of producing native or tame species of perennial forage plants and may be improved through the use of farm machinery. Feasible improvement practices may include clearing of bush, cultivation, seeding, fertilizing or water control.

Class 6 - Soils in this class are unsuited for cultivation, but are capable of use for unimproved permanent pasture. These soils may provide some sustained grazing for farm animals, but the limitations are so severe that improvement through the use of farm machinery is impractical. The terrain may be unsuitable for the use of farm machinery, or the soils may not respond to improvement, or the grazing season may be very short.

Class 7 - Soils in this class have no capability for arable culture or permanent pasture. This class includes marsh, rockland and soil on very steep slopes."

#### 4.6.1.2 Canada Land Inventory (CLI) Subclass

With respect to the soils and Canada Land Inventory (CLI) identified in the PSA and SSA, The Ontario Ministry of Agriculture, Food and Rural Affairs document *Classifying Prime and Marginal Agricultural Soils and Landscapes: Guidelines for Application of the Canada Land Inventory in Ontario* defines the Canada Land Inventory (CLI) subclassification as follows:

"Subclass E – Erosion

Subclass E is applied to soils which have been badly damaged by erosion. The productivity of
such soils is therefore reduced. Organic matter, topsoil and subsoil losses in these soils reduce yields. In extreme situations, where erosion has caused deep gullies, farm machinery use is obstructed.

Subclass F - Low Natural Fertility

Subclass F denotes soils having low fertility that is either correctable through fertility management or is difficult to correct in a feasible way. Low fertility may be due to low cation exchange capacity, low pH, presence of elements in toxic concentrations (primarily iron and aluminum), or a combination of these factors.

Subclass I – Inundation by Streams or Lakes

This subclass limitation is applicable to soils subject to periodic flooding by streams and lakes
which causes crop damage or restricts agricultural use.

Subclass M – Moisture Deficiency

Subclass M denotes soils which have low moisture holding capacities and are more prone to
droughtiness.

Subclass T - Topography

The steepness of the surface slope and the pattern or frequency of slopes in different directions are considered topographic limitations if they: 1) increase the cost of farming the land over that of level or less sloping land; 2) decrease the uniformity of growth and maturity of crops; and 3) increase the potential of water and tillage erosion.

Subclass W – Excess Water

The presence of excess soil moisture (other than that from inundation) may result from inadequate soil drainage, a high water table, seepage, or runoff from surrounding areas. This limitation only applies to soils classified as poorly drained or very poorly drained."

Disturbed soil areas (built-up or developed areas) are considered as Not Rated within the Canada Land Inventory (CLI) classification system. Muck (organic soils) are not rated in the Canada Land Inventory (CLI) classification system.

Figure 14 – Canada Land Inventory (CLI) illustrates the OMAFA digital soils data for the PSA and the SSA. The OMAFA soils database has not removed or discounted soils from roads, railways, urban or developed areas.

Table 5 illustrates the soils data as derived by percent occurrence within the respective polygons and summarizes the relative percent area occupied by each capability class for the PSA and SSA.

Based on the OMAFA soils data the PSA comprised approximately 95.5 percent Canada Land Inventory (CLI) capability Class 1 – 3, with approximately 71.9 percent as Class 2 and 23.6 percent as Class 3. The remaining lands (4.5 percent) were considered as CLI Class 4. It was noted previously in this AIA that much of the PSA was considered as disturbed land due to the piles of imported fill materials noted on the property.

Table 5 Canada Land Inventory – Percent Occurrence

| Canada Land Inventory Class (CLI) | PSA Percent Occurrence | SSA Percent Occurrence |
|---|---|---|
| Class 1 | - | 3.5 |
| Class 2 | 71.9 | 37.8 |
| Class 3 | 23.6 | 6.0 |
| Class 4 | 4.5 | 7.2 |
| Class 5 | - | 4.5 |
| Class 6 | - | 1.0 |
| Class 7 | - | - |
| Not Rated | - | 38.6 |
| Organic Soil | - | 1.4 |
| Water | - | 0.0 |
| Totals | 100.0 | 100.0 |

Further, based on the OMAFA soils data the SSA comprised approximately 47.3 percent Canada Land Inventory (CLI) capability Class 1 – 3, with approximately 3.5 percent as Class 1, 37.8 percent as Class 2, 6.0 percent as Class 3. The remaining lands included approximately 7.2 percent as Class 4, 4.5 percent as Class 5, 1.0 percent as Class 6, 38.4 percent as Not Rated, and 1.4 percent as Organic Soils.

The proposed development will result in the loss of the use of the PSA for agricultural production. The proposed development will not alter the soils or soil capability in the SSA.

## 4.7 PARCEL OR LAND SEVERANCE

A parcel or land severance is defined as an authorized separation of a piece of land to form a new lot or parcel of land.

The PSA is bound by the local road system on the north, on the east by the urban area of Simcoe, on the south by a parcel boundary, woodlands and agricultural fields, and on the west by a parcel boundary, agricultural lands and woodlands.

As a result, the PSA has well defined limits that do not cross parcel boundaries. Therefore, there is no opportunity for land severance beyond the boundaries of the PSA. No parcels will be severed in the SSA as a result of the proposed future development of the PSA.

## 4.8 AGRICULTURAL SYSTEMS PORTAL

A review of the OMAFA Agricultural System Portal online resource for agricultural services/agricultural network (markets, abattoirs, renderers, livestock auctions, investment, warehousing and storage, wineries and breweries) was completed for the PSA and SSA.

The review of the online Agricultural System Portal indicated that there were no registered farmers markets, pick your own operations, nurseries, frozen food manufacturing, refrigerated warehousing/storage, livestock assets, abattoirs, or other agricultural services in the PSA.

Figure 15 provides an illustration of the agricultural resources (OMAFA Livestock, Fish and Poultry) for the PSA and the SSA. Figure 16 provides an illustration of the agricultural resources (OMAFA Field Crop). Figure 17 provides an illustration of the Food and Beverage Manufacturing for the PSA and SSA.

The closest transportation network (major roadway) is Highway 3 which is located to the north of the PSA.

As noted in Figures 15, 16 and 17, there were no agricultural services or food manufactures identified in the PSA based on the OMAFA Agricultural Systems Portal mapping and online data.

## 4.9 AGRICULTURAL SYSTEM AND AGRICULTURAL NETWORK

The PPS 2024 required the implementation of an agricultural system. The Agricultural System comprises two parts: Agricultural Land Base; and the Agri-Food Network. The Agricultural Land Base was evaluated through a review of Canada Land Inventory (CLI) in Section 4.6 of this AIA.

This AIA has determined that both the PSA and the SSA comprised portions of Prime Agricultural Area and were comprised of portions of high capability soil resources as based on the OMAFA digital soils data.

The Agricultural Network includes the services and infrastructure that are important components of the agricultural industry. Section 4.6 of this AIA provided comments on the agricultural services and infrastructure in the surrounding area. It was noted that there are no services or infrastructure in the PSA.

Figure 15 OMAFRA Agricultural Systems Mapping Livestock, Fish and Poultry

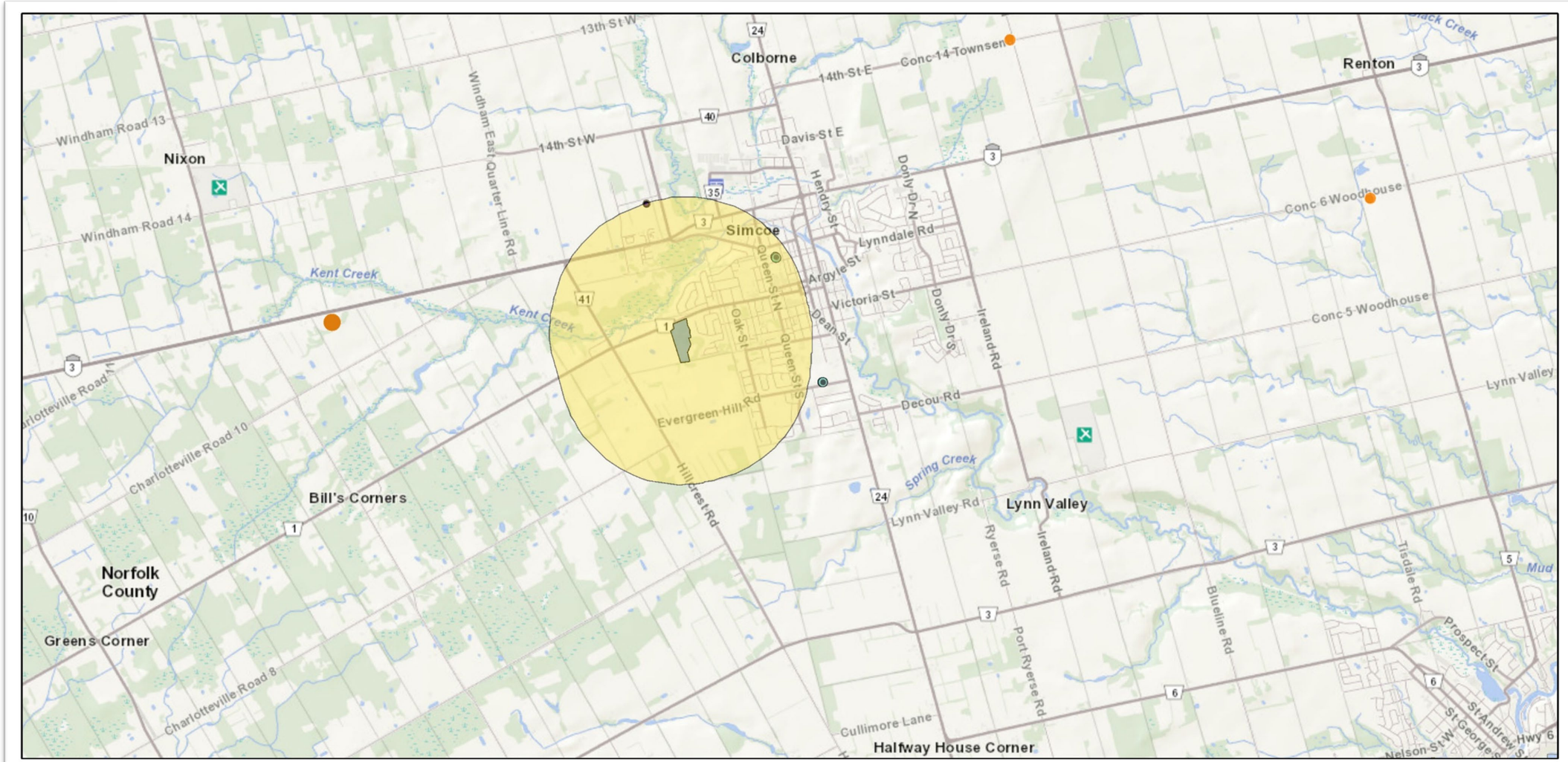


Figure 16 Agricultural Systems Field Crops

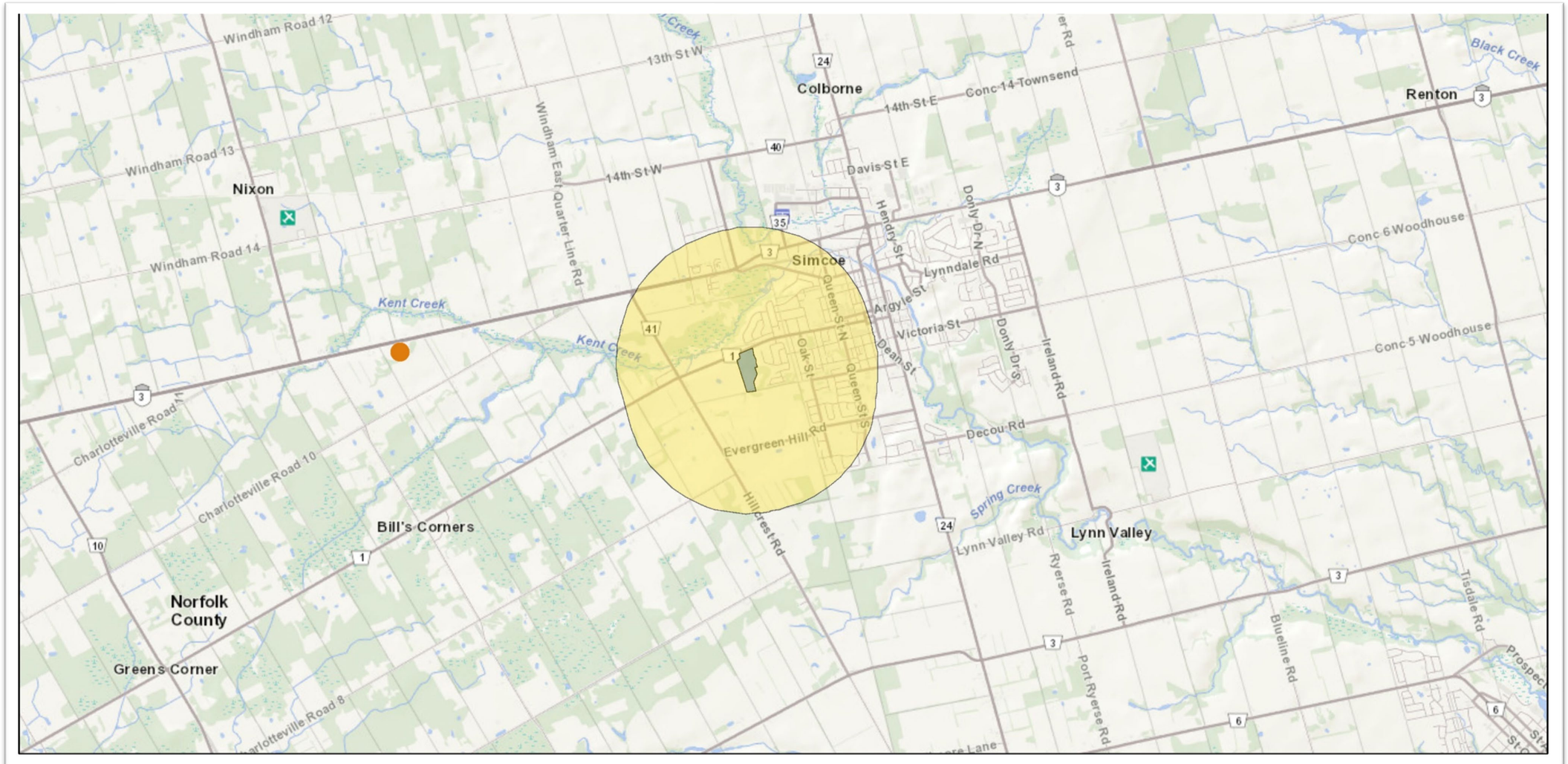
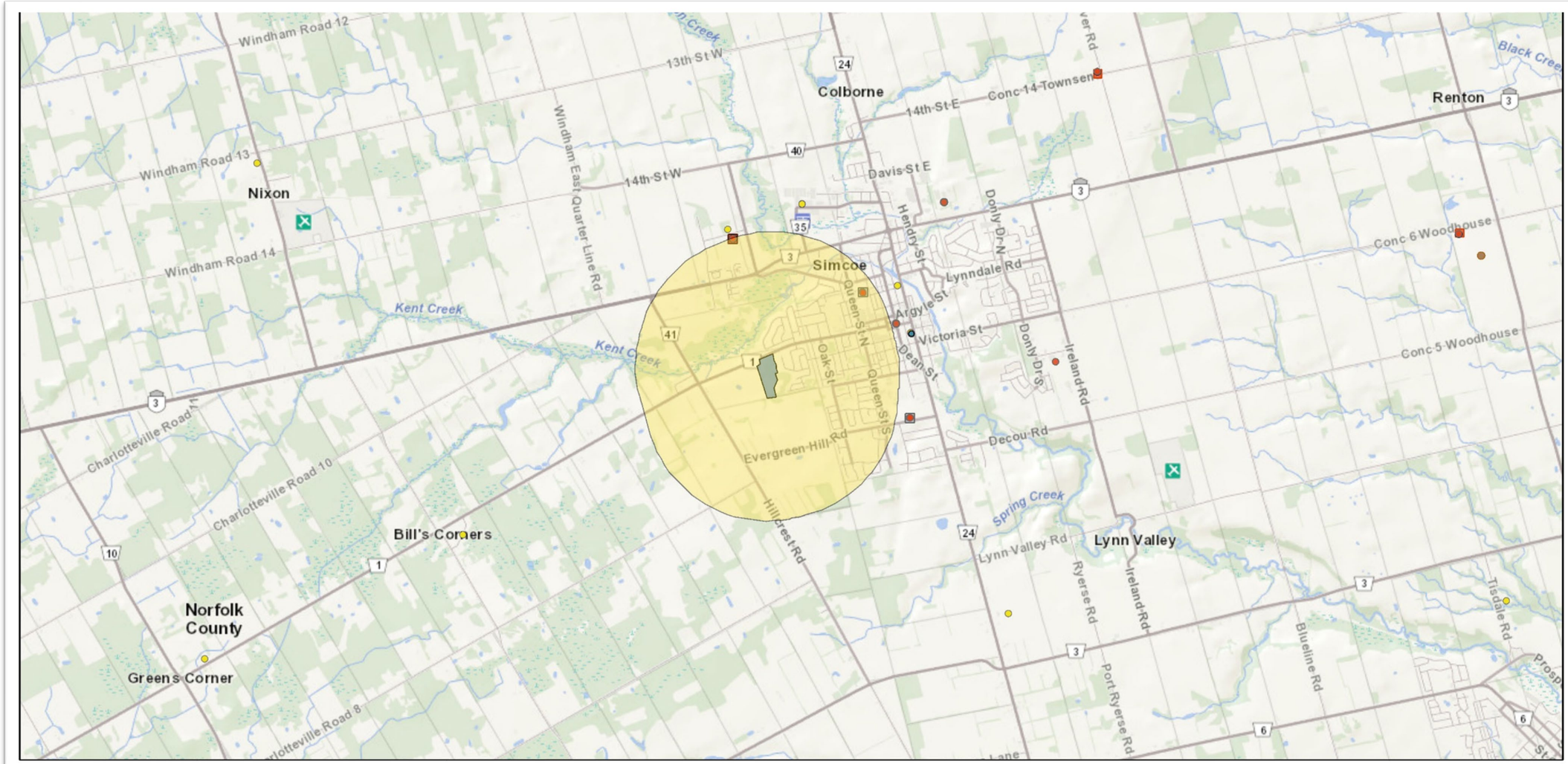


Figure 17 Agricultural Systems Food and Beverage Manufacturing

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- Secondary Study Area (SSA) (1.5 km)
- Primary Study Area (PSA)
- Animal Food Manufacturing NAICS 3111 (ConnectON)
- Beverage and Tobacco Manufacturing NAICS 312 (ConnectON)
- Food Manufacturing NAICS 311 (ConnectON)
- Frozen Food Manufacturing NAICS 3114 (ConnectON)
- Maple Syrup and Products Production NAICS 111994 (ConnectON)
- Meat Product Manufacturing NAICS 3116 (ConnectON)
- Federally Regulated Meat Plants (Canadian Food Inspection Agency)
- Provincially Licensed Dairy Plants (OMAFRA)
- Provincially Licensed Meat Plants (OMAFRA)
- province_extent

1:63,713

0 0.5 1 2 mi

0 0.75 1.5 3 km

## 4.10 EVALUATION OF ALTERNATIVE LOCATIONS

PPS 2024 policy 2.3.2.1(d) states that:

> "the evaluation of alternative locations which avoid prime agricultural areas and, where avoidance is not possible, consider reasonable alternatives on lower priority agricultural lands in prime agricultural areas;"

The PPS 2024 also provides the definition for Prime Agricultural Area:

> "agricultural lands and associated Canada Land Inventory Class 4 through 7 lands, and additional areas with a local concentration of farms which exhibit characteristics of ongoing agriculture. Prime agricultural areas may be identified by a planning authority based on provincial guidance or informed by mapping obtained from the Ontario Ministry of Agriculture, Food and Agribusiness and the Ontario Ministry of Rural Affairs or any successor to those ministries."

The PPS 2024 also provides a definition for Prime Agricultural Land:

> "means specialty crop areas and/or Canada Land Inventory Class 1, 2, and 3 lands, as amended from time to time, in this order of priority for protection."

The PPS 2024 does not provide any additional methodology to assess the order of priority. Discussions with staff from OMAFA provide additional direction by referencing the OMAFA document *Guidelines on Permitted Uses in Ontario's Prime Agricultural Areas (Publication 851)*.

As mentioned previously, this AIA was requested by the province/municipality for this specific location to assist in future land development decisions. No alternative locations were assessed as part of this AIA.

## 4.11 AGRICULTURAL CENSUS DATA

A review of the Census of Agriculture data (Census 2021 including 2016 and 2011) was completed to determine the agricultural characteristics of Norfolk County.

### 4.11.1 NORFOLK COUNTY

Table 6 provides Census 2021 data for agricultural land use in Norfolk County and provides a comparison from the Provincial Census 2021 agricultural data to the 2016 and 2011 agricultural data. As indicated in the Census data, Norfolk County comprised approximately 1.85 percent of the total area of farms in Ontario (Census 2021).

A review of Census 2021 data for Norfolk County revealed that the total area in farms is 218,100 acres (Census Farms). Much of the farmed land is in crops with a total of 180,466 acres. The remaining lands are listed as summerfallow land, tame or seeded pasture, natural land for pasture, Christmas trees, woodland and wetland and all other land.

Table 6 Norfolk County Census 2021 Data – Land Use

| Item | Norfolk County | Province | Percent of Province 2021 | Percent of Province 2016 | Percent of Province 2011 |
|---|---|---|---|---|---|
| **Land Use, 2021 Census (acres)** | | | | | |
| Land in crops | 180.466 | 9,051,011 | 1.99 | 2.18 | 2.36 |
| Summerfallow land | 696 | 13,964 | 4.98 | 7.16 | 3.77 |
| Tame or seeded pasture | 2,202 | 400,480 | 0.55 | 0.59 | 0.54 |
| Natural land for pasture | 1,891 | 626,366 | 0.30 | 0.41 | 0.42 |
| Christmas trees, woodland & wetland | 23,759 | 1,269,535 | 1.87 | 2.01 | 2.08 |
| All other land | 9,086 | 404,714 | 2.25 | 2.72 | 2.91 |
| Total area of farms | 218,100 | 11,766,071 | 1.85 | 2.01 | 2.10 |

Table 6 shows fluctuations in summerfallow land and tame and seeded pasture acreage in Norfolk County over the past 15 years, alongside decreases of acreage for land in crops, natural land for pasture, Christmas trees, woodland and wetland, and all other land. Overall, the trend over the last 5 years reflects an decrease in Norfolk County' contribution to provincial crop production.

Table 7 provides a more detailed inventory of agricultural lands and a percent of Province for Norfolk County and provides a comparison from Provincial Census 2021 to the Provincial Census 2016 and 2011.

Table 7 Norfolk County Census 2021 Data – Crops

| Item | Norfolk County | Province | Percent of Province 2021 | Percent of Province 2016 | Percent of Province 2011 |
|---|---|---|---|---|---|
| **Major Field Crops, 2021 Census (acres)** | | | | | |
| Winter wheat | 9,832 | 1,144,406 | 0.86 | 0.70 | 1.13 |
| Oats for grain | 242 | 84,320 | 0.29 | 0.93 | 0.45 |
| Barley for grain | 66 | 68,756 | 0.10 | 0.24 | 0.00 |
| Mixed grains | 65 | 59,961 | 0.11 | 0.34 | 0.25 |
| Corn for grain | 51,148 | 2,202,465 | 2.32 | 2.39 | 3.22 |
| Corn for silage | 701 | 289,678 | 0.24 | 0.57 | 0.71 |
| Hay | 8,724 | 1,704,017 | 0.51 | 0.49 | 0.37 |
| Soybeans | 51,508 | 2,806,255 | 1.84 | 2.04 | 2.70 |
| Potatoes | 3,340 | 39,193 | 8.52 | 7.55 | 7.20 |
| **Major Fruit Crops, 2021 Census (acres)** | | | | | |
| Total fruit crops | 3,763 | 48,661 | 7.73 | 8.36 | 7.94 |

| Item | Norfolk County | Province | Percent of Province 2021 | Percent of Province 2016 | Percent of Province 2011 |
|---|---|---|---|---|---|
| Apples | 2,069 | 16,008 | 12.92 | 14.71 | 14.06 |
| Sour Cherries | 927 | 1,383 | 67.03 | 53.65 | - |
| Peaches | 15 | 4,608 | 0.33 | - | - |
| Grapes | 133 | 18,432 | 0.72 | - | 0.39 |
| Strawberries | 270 | 2,633 | 10.25 | 12.42 | 14.16 |
| Raspberries | 25 | 438 | 5.71 | 4.41 | 4.55 |
| **Major Vegetable Crops, 2021 Census (acres)** | | | | | |
| Total vegetables | 18,229 | 127,893 | 14.25 | 12.80 | 12.89 |
| Sweet Corn | 2,702 | 20,518 | 13.17 | 15.62 | 17.74 |
| Tomatoes | 956 | 14,614 | 6.54 | 6.77 | 6.39 |
| Green Peas | 67 | 14,044 | 0.48 | 1.62 | 0.76 |
| Green or Wax Beans | 612 | 8,709 | 7.03 | 5.19 | 1.75 |

From 2011 to 2021, fluctuations were noted for Norfolk County in its share of provincial acreage for winter wheat, oats and barley for grain, and mixed grains. Crops such as hay and potatoes have experienced moderate increases in their proportional representation over the last 15 years. Decreases in acreage were noted in corn for grain and silage and soybeans

Norfolk County's contribution to major fruit crops shows several positive trends, with growth in crops like sour cherries, which rose from 53.65% in 2016 to 67.03% in 2021. While some crops, such as apples, experienced modest decreases over time, Norfolk continues to maintain strong provincial shares that highlight its importance in the Province's fruit sector.

Norfolk County's major vegetable crops continue to make a strong contribution to Ontario's production, with total vegetable acreage increasing its provincial share from 12.80% in 2016 to 14.25% in 2021. Although some individual crops—such as sweet corn and green peas—experienced decreases over time, others like tomatoes and green or wax beans remained stable or improved, helping to sustain Norfolk's overall contribution. Despite these fluctuations, the county's vegetable sector remains robust, demonstrating continued strength. Norfolk County contributes 18,229 acres of vegetables to the provincial totals. It is worth noting that Norfolk County produced 3393 acres of pumpkins and 1161 acres of squash and zucchini and 1830 acres of asparagus in 2021.

Table 8 illustrates that Norfolk County's livestock sector shows several positive contributions, particularly in sheep and lambs, where its provincial share grew from 0.52% in 2011 to 0.84% in 2021. While some categories, such as steers, beef cows, dairy cows and hens and chickens, show fluctuations over time, others—like total cattle and calves—demonstrated slight but steady improvements in their provincial percentages.

In 2021, Norfolk County reported a contribution of 41,950 total pigs, 741,801 total hens and chickens and 49 total turkeys to the provincial totals.

Table 8 Norfolk County Census 2021 Data – Livestock

| Item | Norfolk County | Province | Percent of Province 2021 | Percent of Province 2016 | Percent of Province 2011 |
|---|---|---|---|---|---|
| **Livestock Inventories, 2021 Census(number)** | | | | | |
| Total cattle and calves | 5,789 | 1,604,810 | 0.36 | 0.35 | 0.31 |
| Steers | 581 | 299,540 | 0.19 | 0.28 | 0.15 |
| Beef Cows | 1,076 | 224,194 | 0.48 | 0.54 | 0.43 |
| Dairy Cows | 1,174 | 327,272 | 0.36 | 0.28 | 0.34 |
| Total Pigs | 41,950 | 4,071,902 | 1.03 | 1.84 | 1.86 |
| Total sheep and lambs | 2,723 | 322,508 | 0.84 | 0.75 | 0.52 |
| **Poultry Inventories, 2021 Census (number)** | | | | | |
| Total hens and chickens | 741,801 | 53,802,772 | 1.38 | 2.72 | 1.80 |
| Total turkeys | 49 | 2,453,126 | 0.00 | 1.33 | - |

According to the Census of Agriculture data, Norfolk County remains a significant contributor to the provincial agricultural sector, particularly in major fruit and major vegetable crop inventories.

As stated previously in this AIA, the PSA a significant portion of the PSA was comprised of disturbed soil materials and is not utilized for agricultural production. As a result, the proposed development of the PSA will have minimal impact on the overall agricultural production in Norfolk County.

# 5 RESOURCE ALLOCATION AND CONFLICT POTENTIAL

Land use planning decisions involve trade-offs among the competing demands for land. The fundamental base used for the evaluation of agricultural lands is land quality, i.e. CLI soil capability ratings. Within the rural/urban interface, there are a number of other factors which contribute to the long-term uncertainty of the economic viability of the industry and these, in turn, are reflected in the lack of investments in agricultural facilities, land and infrastructure and changes to agricultural land use patterns in these areas. Several of these factors include, but are not limited to, the presence of rural non-farm residents, land fragmentation, intrusions of non-agriculture land uses, non-resident ownership of lands and inflated land values. This section summarizes the impact of these factors on agriculture in the area.

## 5.1 IMPACTS, ASSESSMENT AND COMPATIBILITY WITH SURROUNDING LAND USES

The identification and assessment of potential impacts is paramount to determining potential mitigation measures to either eliminate or offset the impact to the extent feasible. The following list includes potential impacts to agriculture that were identified in the OMAFRA 2018 draft AIA Guidance Document, and includes other impacts identified by farmers and landowners. This list is a basis for documenting potential impacts within AIAs and can be modified as necessary to suit the local agricultural community, operations, and services. The determination of impacts due to the proposed future development of the PSA related to this list of potential impacts to infrastructure development projects on agricultural lands may include the following:

- Interim or permanent loss of agricultural lands
- Fragmentation of agricultural lands and operations
- The loss of existing and future farming opportunities
- The loss of infrastructure, services, or assets
- The loss of investments in structures and land improvements
- Disruption or loss of functional drainage systems
- Disruption or loss of irrigation systems
- Changes to soil drainage
- Changes to surface drainage
- Changes to landforms
- Changes to hydrogeological conditions
- Disruption to surrounding farm operations
- Effects of noise, vibration, dust
- Potential interim compatibility concerns
- Traffic concerns
- Changes to adjacent cropping due to light pollution

It should be noted that this AIA report should be read in conjunction with any and all other discipline reports in an effort to provide an adequate evaluation of the above-mentioned potential impacts.

The agricultural character of both the PSA and the SSA have been documented in this AIA. It has been determined that the PSA comprised portions of built-up/disturbed land uses, and woodland areas. It was also determined that the SSA comprised portions of built-up/disturbed areas, common field crops, forage/pasture lands, market garden, open field, planted, small grains, unknown, vineyard, water, and woodland areas.

It has been documented in this AIA that the SSA included portions of the built-up area of Simcoe and Hillcrest.

These types of fragmentation and business/commercial intrusions are a clear indication of an area impacted by non-agricultural uses. These types of uses provide an indication of land that is in transition from an agricultural land base to a more rural environment. The large number of small parcels and commercial/industrial lands provide an indication as to the lack of long-term intensions for agriculture in those portions of the SSA.

With respect to the potential impacts as listed on the previous page of this report, and the proposed future development of the PSA lands, Table 9 provides some context as to the extent of the potential impacts.

Table 9 Potential Impacts

| Potential Impact | Impacts Associated with the Proposed Future Development of the PSA Lands Before Mitigation |
|---|---|
| Interim or permanent loss of agricultural lands | There will be a permanent loss of the use of agricultural lands within the PSA as a result of the development of the proposed SABE. There will be no loss of agricultural lands in the SSA. The impact is applicable for both the construction and normal activities of the proposed SABE. |
| Fragmentation, severing or land locking of agricultural lands and operations | There will be fragmentation of agricultural lands in the PSA as a result of the development of the proposed SABE. There will be no severing or land locking of agricultural lands in the PSA as it is assumed that the entire PSA will be utilized for the proposed SABE. |
| The loss of existing and future farming opportunities | There will be a loss of existing and future farming opportunities on the PSA lands due to the proposed development of the SABE. The impact is applicable |

| Potential Impact | Impacts Associated with the Proposed Future Development of the PSA Lands Before Mitigation |
|---|---|
| | for both the construction and the normal activities of the proposed SABE. |
| The loss of infrastructure, services or assets | There will be no loss of infrastructure or services as a result of the proposed SABE. |
| The loss of investments in structures and land improvements | There is no net loss of investment in agriculture (buildings, tile drainage) in the PSA as a result of the proposed SABE. There will be no loss of investment in the SSA. |
| The loss of use of ground water wells | There exists the potential for impact from the loss of the use of a ground water well on the PSA due to proposed SABE. There should be no impact to ground water wells in the SSA. |
| Disruption or loss of functional drainage systems | There will be no net loss of artificial tile drainage on the PSA, and there is no net loss or disruption to artificial tile drainage systems in the SSA. |
| Disruption or loss of irrigation systems | There will be no loss of investment in irrigation systems in the PSA or the SSA. |
| Changes to soil drainage | There will be a net change in surface drainage in the PSA . The impact is applicable for the proposed development of the SABE. There will be no net change in surface drainage within the SSA as a result of the proposed SABE. |
| Changes to surface drainage | There will be a net change in surface drainage in the PSA . The impact is applicable for the proposed development of the SABE. There will be no net change in surface drainage within the SSA as a result of the proposed SABE. |
| Changes to landforms | There will be changes to landforms in the PSA as a result of the proposed SABE. The changes in landforms would be related to the installation of utilities and grading. There will be no changes to landforms (with respect to agriculture) in the SSA. |

| Potential Impact | Impacts Associated with the Proposed Future Development of the PSA Lands Before Mitigation |
|---|---|
| Changes to hydrogeological conditions | Any potential changes in hydrogeological conditions would need to be addressed under separate cover by a hydrogeological consultant. |
| Disruption to surrounding farm operations | There will be limited disruption for surrounding/adjacent farms as the PSA is located immediately adjacent to the urban area of Simcoe. |
| Effects of noise, vibration, dust | There will be potential for additional vibration and dust in the SSA during the development of the proposed SABE. There is a potential for noise, vibration and dust during the initial construction phase, and the potential for increased noise from the proposed SABE. |
| Potential compatibility concerns | There should be limited potential for compatibility concerns with the proposed future development of the PSA and the adjacent agricultural lands in the SSA as the PSA will be an expansion of an urban area. |
| Traffic concerns | It is noted that this project is the future development of the PSA lands which will result in an increase in human occupancy. Increased traffic will occur as a result of an increase in human occupancy.<br>A traffic study will address those concerns. |
| Changes to adjacent cropping due to light pollution | There is potential for changes in cropping due to light pollution, as it is assumed that the proposed future development of the PSA will include lighting. Any use of lighting should take into consideration the impact on adjacent agricultural lands. The impact is applicable for both the construction and the future use of the PSA. |

## 5.2 TRAFFIC, TRESPASS AND VANDALISM

Specific to agriculture, increased vehicle traffic along roadways can lead to safety issues with respect to the movement of slow moving, long, wide farm machinery and, as well, interrupt or alter farm traffic flow patterns.

It may be necessary to reduce conflicts by designing roads and traffic controls to accommodate the heavy, wide, slow-moving farm equipment (e.g. wide shoulders, no curbs, reduced speed limits, and if traffic circles (roundabouts) are to be used, then they need to accommodate large slow moving farm equipment. Discussions with farm groups in various parts of Ontario have indicated that roundabouts in agricultural areas are a poor consideration due to difficulties maneuvering large tractors pulling multiple trailers through tight turns. Further, due to the slow speed of farm equipment, roundabouts do not allow adequate time for the equipment to move with the flow of traffic. Comments from the farm groups suggest that traffic lights or stop signs (hard stops) would better serve the farm community and farm traffic by forcing traffic to stop and allowing controlled access to the local road system.

Trespassing and vandalism are more often a concern with specialty crop operations and livestock operations. The location of the proposed future development of the PSA is not located in a provincially or municipally designated specialty crop area. The Minimum Distance Separation (MDS1) assessment identified the location of potential livestock facilities in the SSA. A review of the MDS1 data indicated that the one livestock operation was located across Highway 3 (a separation feature).

Therefore, the proposed development of the PSA lands will have limited impact with respect to trespassing and vandalism on adjacent agricultural operations.

## 5.3 AGRICULTURAL INFRASTRUCTURE

The review of the OMAFRA Agricultural System Portal was completed to identify the presence of any registered livestock assets and services (renderers, meat plants, abattoirs), refrigerated warehousing and storage, frozen food manufacturing, farm markets, wineries, or cideries within the PSA. None of these features were identified within the PSA.

The proposed development of the PSA will not impact any registered agricultural assets and services (renderers, meat plants, abattoirs), refrigerated warehousing and storage, frozen food manufacturing, farm markets, wineries, or cideries.

## 5.4 MITIGATION MEASURES

The PPS 2024 defines an AIA as:

> "Agricultural impact assessment: means the evaluation of potential impacts of nonagricultural uses on the agricultural system. An assessment recommends ways to avoid or if avoidance is not possible, minimize and mitigate adverse impacts".

With respect to this AIA, the following sections provide comments with regard to the avoidance, minimization, and mitigation of any potential adverse impacts.

### 5.4.1 AVOIDANCE

Any change in land use within or adjacent to an identified or designated prime agricultural area will result in the potential for impacts to the adjacent agricultural area. The severity of the potential impacts is related to the type and size of the change in land use, and the degree of agricultural activities and operations in the surrounding area.

The first method of addressing potential impacts is to avoid the potential impact. The proposed future development of the PSA will be a permanent use in an agricultural area. As a result, there will be designated agricultural lands lost. This cannot be avoided.

### 5.4.2 MINIMIZING IMPACTS

When avoidance is not possible, the next priority would be to minimize impacts to the extent feasible. Mitigation measures should be developed to lessen the potential impacts. The minimization of impacts can often be achieved during the design process and through proactive planning measures that provide for the separation of incompatible land uses.

### 5.4.3 MITIGATING IMPACTS

Potential mitigation measures may include:

- The use of berms, vegetated features, or fencing, where feasible, between the different types and intensities of land uses to reduce the potential for trespassing and potential vandalism. These types of buffers reduce impacts by preventing trespassing and associated problems such as litter and vandalism.
- The use of buffers between agriculture and transportation/urban uses may combine a separation of uses, vegetation/plantings, windbreaks, and berms. Vegetated buffers should include the use of deciduous and coniferous plants, with foliage from base to crown to mitigate against dust, light trespass, and litter.
- The use of salt management plans to reduce the amount of salt required for de-icing (liquid de-icers, broad casting and selective broad casting).
- The use of plantings/vegetation as screens and buffers to reduce visual impacts. Consideration of plantings/vegetation barriers within the PSA as visual screening where appropriate.
- Design new structures and side road improvements to be compatible with farm equipment.
- Further assessment of potential impacts to existing groundwater and surface water monitoring and providing new well or water access to those potentially impacted by groundwater disruption in future stages of the development of the PSA.
- Create a traffic plan that identifies closures and open routes to minimize impacts to local traffic during construction.

- Maintain local roads to allow access for the movement of oversized agricultural equipment.
- Due to the locations and numbers of water wells in the PSA and the SSA, it will be important to either preserve the existing well or properly engineer the closing/capping of any water well, where necessary, to prevent potential groundwater contamination.
- Place lower impact development (low occupancy uses) adjacent to farmland and operations.
- Design principles which accommodate agriculture to reduce negative impacts can minimize conflicts, noise, dust and odours through consideration of barriers, setbacks, buffers, road design and reduced speed limits.
- Increase depth of lots along the urban-agricultural boundary to create greater separation distances.

This AIA has provided comments on avoidance, minimization of, and mitigation of potential impacts. Therefore, the project is consistent with the PPS 2024 policy 2.3.2.1(f).

# 6 SUMMARY AND CONCLUSIONS

DBH Soil Services Inc was retained to complete an AIA including MDS1 calculations for:

34 Virginia Avenue
Simcoe, ON
N3Y 5M4
Roll #3310402010035 00

It is understood that OPA 163 was a *Norfolk County Official Plan (Consolidated to January 1, 2023)* update, and several parcels have been added to the urban boundaries by Norfolk council. This request for an AIA and MDS1 calculations was triggered by the Province's request for additional justification for this expansion.

This AIA identified and assessed agricultural impacts based on roadside reconnaissance surveys and online resources and provides avoidance or mitigative measures as necessary to offset or lessen any impacts.

In the regional/city context, the PSA is bordered to the west by agricultural lands, woodlands and rural residential properties while its northern boundary is defined by West Street (Highway 3). To the south, the property is bordered by woodlands and agricultural lands, while to the east, it is adjacent to the urban boundary of Simcoe and other areas defined in OPA 163.

A summary of the results of this AIA are presented below:

- **Geographical Limits**

  The PSA and the SSA were located within the Norfolk Sand Plains physiographic region.

  The Norfolk Sand Plains physiographic region is described as a wedge-shaped area with a broad curved base along the Lake Erie shoreline, tapering to the north to a point near Brantford.

  The PSA and the SSA are a complex mix of topography with gently undulating areas generally used for agricultural production, and steeper slopes along incised stream channels.

  The PSA and SSA are located between the 3100 and 3300 Crop Heat Units isolines (CHU-M1) available for corn production in Ontario.

  A review of OMAFRA Climate Zone Mapping revealed that the PSA and the SSA are located in Zones C. Zone C has an average Frost-Free period of 150-170 days,

an Average Date of Last Spring Frost of May 3, and an Average Date of First Fall Frost of October 8.

Based on the OMAFA soils data the PSA comprised approximately 95.5 percent Canada Land Inventory (CLI) capability Class 1 – 3, with approximately 71.9 percent as Class 2 and 23.6 percent as Class 3. The remaining lands (4.5 percent) were considered as CLI Class 4. It was noted previously in this AIA that much of the PSA was considered as disturbed land due to the piles of imported fill materials noted on the property.

Again, based on the OMAFRA soils data the SSA comprised approximately 47.3 percent Canada Land Inventory (CLI) capability Class 1 – 3, with approximately 3.5 percent as Class 1, 37.8 percent as Class 2, 6.0 percent as Class 3. The remaining lands included approximately 7.2 percent as Class 4, 4.5 percent as Class 5, 1.0 percent as Class 6, 38.4 percent as Not Rated, and 1.4 percent as Organic Soils.

- **Agricultural Policy**

A review of the *Greenbelt Plan (2017)* mapping indicated that no portions of the PSA or the SSA were located in the Greenbelt Plan Area. No portions of the PSA or the SSA were located in the Oak Ridges Moraine Conservation Plan Area or the Niagara Escarpment Plan Area.

The review of the *Norfolk County Official Plan (Consolidated to January 1, 2023)* Schedule B-15 revealed that the PSA comprised lands designated as Agricultural. The SSA was comprised of lands designated as Agriculture, Hazard Lands, Provincially Significant Wetland, Hamlet, Urban Residential, Mixed Residential/Commercial,Downtown, Commercial, Protected Industrial, Industrial, Major Public Infrastructure, Major Institutional, and Parks & Open Space.

No portions of the PSA or the SSA were within any provincially or municipally designated specialty crop area.

- **Agricultural Land Use**

The PSA comprised land use of approximately 74.4 percent as built-up/disturbed areas, and 25.6 percent as woodlands.

The SSA comprised land use of approximately 51.1 percent as built-up/disturbed areas (including portions of Simcoe and Hillcrest), 10.0 percent as common field crop, 0.3 percent as forage/pasture lands, 3.7 percent market garden, 0.9 percent open field, 15.3 percent planted, 0.4 percent as small grains, 3.0 percent unknown, 0.2 percent as vineyard, and 15.1 percent as woodland areas.

The predominant land use in the PSA was determined to be built-up/disturbed.

- **Agricultural Investment**

  A total of 31 agricultural buildings were identified. There were no agricultural buildings within the PSA and 31 agricultural buildings observed in the SSA.

  There is no investment in systematic artificial tile drainage in the PSA.

  Systematic and random tile drainage were noted on various lands within the SSA.

  There is no investment in landforming for agricultural purposes in either the PSA or the SSA.

  Minimum Distance Separation 1 (MDS1) calculations were completed for this AIA, MDS1 calculations were completed as a best practice to protect lands for agricultural use as long as possible during the development phases. There is one MDS1 arc impinging on the north and northeast portion of the PSA, which impacts the proposed roadway into the proposed development. Therefore, this AIA has identified that the proposed SABE is consistent with PPS 2024 Section 2.3.2.1(e).

  A review of the online Agricultural System Portal (OMAFA) indicated that there were no registered nurseries, specialty farms (crop or livestock), frozen food manufacturing, refrigerated warehousing/storage, livestock assets or abattoirs in the PSA.

  There are no registered agricultural services within the PSA.

  The closest transportation network (major roadway) is Highway 3 located to the North of the PSA.

- **Land Fragmentation**

  A review of parcel data for property size within the PSA revealed that the PSA comprised one parcel in the range of 10.0 - 69.9 acres.

  The SSA comprised numerous small parcels of varying size associated with the urban area of Simcoe and Hillcrest, and linear development to the north and west of the PSA.

The foregoing represents a comprehensive AIA with the purpose of evaluating the PSA and SSA to document the existing agricultural character and to determine any potential impacts to agriculture as a result of the proposed future development of the PSA.

This AIA has identified that the PSA is located in a Prime Agricultural Area, as are most lands surrounding the urban area of Simcoe. Any SABE for Simcoe will result in the loss of prime agricultural land.

The County of Norfolk is characterised by its large agricultural community and amount of prime agricultural land. The expansion of urban boundaries will have an impact on prime agricultural lands. This cannot be avoided. A potential impact for the proposed SABE lands is the interface between urban development and abutting farms. Consideration needs to be taken to ensure that urban development does not impact the operations of abutting farms particularly where MDS1 setbacks have been identified.

It has been illustrated in this AIA that the project is consistent with the PPS 2024 policies 2.3.2.1(c) (not in a designated specialty crop area), e (complies with MDS1), and f (whether impacts on the agricultural system are avoided, minimized or mitigated to the extent feasible).

The subsequent planning processes will be a key mechanism to ensure impacts on the agricultural community are minimized and mitigated. The phasing of development will also be key to minimizing and mitigating the impact on the agricultural community and land base.

Given the geographical location of the PSA lands, it is the conclusion of this study that the proposed future development of the PSA would have minimal impact on the surrounding agricultural activities within the SSA.

Sincerely
**DBH Soil Services Inc.**

Dave Hodgson, P. Ag
President

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# APPENDIX A

**Agricultural Building List**

| Property Information: 2026-05 Field Work Date: | | | 11/25/25 | Online Imagery Survey | | | | | | | Roadside Reconnaissance Survey | | | | | Assumptions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Agricultural Building Number | Address | Roll Number | Residential Unit | Type of Building | "Line of Sight" Restriction | Additional Details | Evidence of Livestock | Type of Livestock | Evidence of Feed Storage | Evidence of Manure Storage | Findings | Visual Evidence of Livestock | Type of Livestock | Visual Evidence of Feed Storage | Visual Evidence of Manure Storage | Type of Operation | MDS1 Considerations |
| 1 | 613 Queensway W, Norfolk County, ON, N3Y 4J9, CAN | 40302505500 | Yes | Garage | No | | No | | No | No | | No | | No | No | N/A | No MDS1 calculation required |
| 2 | 613 Queensway W, Norfolk County, ON, N3Y 4J9, CAN | 40302505500 | Yes | Greenhouse | No | | No | | No | No | | No | | No | No | N/A | No MDS1 calculation required |
| 3 | 601 Queensway W, Norfolk County, ON, N3Y 4J9, CAN | 40302505300 | Yes | Machine Shed | No | With extension/extensions, 3 bay shop | No | | No | No | | No | | No | No | N/A | No MDS1 calculation required |
| 4 | 58 Hillcrest Rd, Norfolk County, ON, N3Y 4K6, CAN | 40502025450 | Yes | Workshop | No | 3 bay shop | No | | No | No | | No | | No | No | N/A | No MDS1 calculation required |
| 5 | 106 Hillcrest Rd, Norfolk County, ON, N3Y 4K6, CAN | 40502023800 | Yes | Shed | No | | No | | No | No | | No | | No | No | N/A | No MDS1 calculation required |
| 6 | 677 West St, Norfolk County, ON, N3Y 4K5, CAN | 405502019000 | Yes | Garage | Yes | | No | | No | No | | No | | No | No | N/A | No MDS1 calculation required |
| 7 | No address | 40201001100 | No | Pole Barn | No | | No | | No | No | | No | | No | No | N/A | No MDS1 calculation required |
| 8 | 594 Queensway W, Norfolk | 40201000800 | Yes | Garage | Yes | | No | | No | No | Line of sight restriction | No | | No | No | N/A | No MDS1 calculation required |

| Property Information: 2026-05 Field Work Date: | | | 11/25/25 | Online Imagery Survey | | | | | | | Roadside Reconnaissance Survey | | | | | Assumptions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Agricultural Building Number | Address | Roll Number | Residential Unit | Type of Building | "Line of Sight" Restriction | Additional Details | Evidence of Livestock | Type of Livestock | Evidence of Feed Storage | Evidence of Manure Storage | Findings | Visual Evidence of Livestock | Type of Livestock | Visual Evidence of Feed Storage | Visual Evidence of Manure Storage | Type of Operation | MDS1 Considerations |
| | County, ON, N3Y 4J9, CAN | | | | | | | | | | | | | | | | |
| 9 | 594 Queensway W, Norfolk County, ON, N3Y 4J9, CAN | 4020100800 | Yes | Assumed Machine Shed | Yes | | No | | No | No | Line of sight restriction | No | | No | No | N/A | No MDS1 calculation required |
| 10 | 565 West St, Norfolk County, ON, N3Y 4K5, CAN | 40201002500 | Yes | Shed | No | With extension/extensions | No | | No | No | | No | | No | No | N/A | No MDS1 calculation required |
| 11 | 535 West St, Norfolk County, ON, N3Y 4K5, CAN | 40201002900 | Yes | Shed | No | | No | | No | No | Guard dogs | Yes | Chickens for personal use | No | No | N/A | No MDS1 calculation required |
| 12 | 535 West St, Norfolk County, ON, N3Y 4K5, CAN | 40201002900 | Yes | Pole Barn | No | with extension/extensions, fencing designed for livestock | Yes | Horses | No | No | | No | | No | No | Horse | Yes, MDS1 calculation required |
| 13 | 535 West St, Norfolk County, ON, N3Y 4K5, CAN | 40201002900 | Yes | Feed Storage | No | | No | | Yes | | Remnant | No | | No | No | N/A | No MDS1 calculation required |
| 14 | 228 Hillcrest Rd, Norfolk County, ON, N3Y 4K5, CAN | 40504009500 | Yes | Shed | Yes | | No | | No | No | | No | | No | No | N/A | No MDS1 calculation required |
| 15 | 270 Hillcrest Rd, Norfolk County, | 40504010000 | No | Pole Barn | No | with extension/extensions, run-in shed/sheds, fencing designed for | Yes | Horses | No | Yes | Apple orchards not in the paddocks at the front of the property | No | | No | No | N/A | No MDS1 calculation required |

| Property Information: 2026-05 Field Work Date: | | | 11/25/25 | Online Imagery Survey | | | | | | | Roadside Reconnaissance Survey | | | | | Assumptions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Agricultural Building Number | Address | Roll Number | Residential Unit | Type of Building | "Line of Sight" Restriction | Additional Details | Evidence of Livestock | Type of Livestock | Evidence of Feed Storage | Evidence of Manure Storage | Findings | Visual Evidence of Livestock | Type of Livestock | Visual Evidence of Feed Storage | Visual Evidence of Manure Storage | Type of Operation | MDS1 Considerations |
| | ON, N3Y 4K5, CAN | | | | | livestock, paddock/paddocks, riding ring | | | | | | | | | | | |
| 16 | 382 Hillcrest Rd, Norfolk County, ON, N3Y 4K1, CAN | 40504017750 | Yes | Hip Roof Barn | | with extension/extensions | No | | No | No | | No | | No | No | N/A | No MDS1 calculation required |
| 17 | 400 Hillcrest Rd, Norfolk County, ON, N3Y 4K1, CAN | 40504017800 | Yes | Garage | Yes | | No | | No | No | | No | | No | No | N/A | No MDS1 calculation required |
| 18 | 393 Hillcrest Rd, Norfolk County, ON, N3Y 4K1, CAN | 40201005500 | Yes | Machine Shed | No | | No | | No | No | | No | | No | No | N/A | No MDS1 calculation required |
| 19 | 393 Hillcrest Rd, Norfolk County, ON, N3Y 4K1, CAN | 40201005500 | Yes | Machine Shed | | with extension/extensions | No | | No | No | | No | | No | No | N/A | No MDS1 calculation required |
| 20 | 359 Hillcrest Rd, Norfolk County, ON, N3Y 4K1, CAN | 40201005400 | Yes | Pole Barn | No | with extension/extensions, dryers | No | | No | No | | No | | No | No | Assumed cash crop (tobacco) | No MDS1 calculation required |
| 21 | 300 Evergreen Hill Rd, Norfolk County, | 40201005400 | Yes | Pole Barn | No | | No | | No | No | | No | | No | No | Assumed cash crop | No MDS1 calculation required |

| Property Information: 2026-05 Field Work Date: | | | 11/25/25 | Online Imagery Survey | | | | | | | Roadside Reconnaissance Survey | | | | | Assumptions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Agricultural Building Number | Address | Roll Number | Residential Unit | Type of Building | "Line of Sight" Restriction | Additional Details | Evidence of Livestock | Type of Livestock | Evidence of Feed Storage | Evidence of Manure Storage | Findings | Visual Evidence of Livestock | Type of Livestock | Visual Evidence of Feed Storage | Visual Evidence of Manure Storage | Type of Operation | MDS1 Considerations |
| | ON, N3Y 4K1, CAN | | | | | | | | | | | | | | | | |
| 22 | 345 Hillcrest Rd, Norfolk County, ON, N3Y 4K1, CAN | 40201005302 | Yes | Garage | No | | No | | No | No | | No | | No | No | N/A | No MDS1 calculation required |
| 23 | 300 Evergreen Hill Rd, Norfolk County, ON, N3Y 4K1, CAN | 40201005300 | No | Machine Shed | Yes | | No | | No | No | | No | | No | No | N/A | No MDS1 calculation required |
| 24 | 207 Evergreen Hill Rd, Norfolk County, ON, N3Y 4K1, CAN | 40201004500 | Yes | Bank Barn | No | | No | | No | No | Assumed retired, poor condition, missing wall boards | No | | No | No | N/A | No MDS1 calculation required |
| 25 | 207 Evergreen Hill Rd, Norfolk County, ON, N3Y 4K1, CAN | 40201004500 | Yes | Bank Barn | No | with extension/extensions, uncapped silo/silos | No | | No | No | Assumed retired, poor condition, missing wall boards | No | | No | No | N/A | No MDS1 calculation required |
| 26 | 534 West St, Norfolk County, ON, N3Y 4K5, CAN | 40201003775 | Yes | Garage | No | | No | | No | No | | No | | No | No | N/A | No MDS1 calculation required |
| 27 | 565 West St, Norfolk County, ON, N3Y 4K5, CAN | 40201002500 | Yes | Shed | No | | No | | No | No | | No | | No | No | N/A | No MDS1 calculation required |

| Property Information: 2026-05 Field Work Date: | | | 11/25/25 | Online Imagery Survey | | | | | | | Roadside Reconnaissance Survey | | | | | Assumptions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Agricultural Building Number | Address | Roll Number | Residential Unit | Type of Building | "Line of Sight" Restriction | Additional Details | Evidence of Livestock | Type of Livestock | Evidence of Feed Storage | Evidence of Manure Storage | Findings | Visual Evidence of Livestock | Type of Livestock | Visual Evidence of Feed Storage | Visual Evidence of Manure Storage | Type of Operation | MDS1 Considerations |
| 28 | 300 Evergreen Hill Rd, Norfolk County, ON, N3Y 4K1, CAN | 40201005300 | No | Machine Shed | Yes | | No | | No | No | | No | | No | No | N/A | No MDS1 calculation required |
| 29 | 249 Hillcrest Road, Norfolk County, ON, | 33104020100381 | Yes | Machine Shed | No | | No | | No | No | | No | | No | No | N/A | No MDS1 calculation required |
| 30 | 534 West St, Norfolk County, ON, N3Y 4K5, CAN | 40201003775 | Yes | Machine Shed | No | | No | | No | No | | No | | No | No | N/A | No MDS1 calculation required |
| 31 | 535 West St, Norfolk County, ON, N3Y 4K5, CAN | 40201002900 | Yes | Pole Barn | No | with extension/extensions, fencing designed for livestock | Yes | Horses | No | No | | No | | No | No | Horse | Yes, MDS1 calculation required |

# APPENDIX B

**Agricultural Building Photographs**

Agricultural Buildings 1 and 2

Agricultural Building 3

Agricultural Building 4

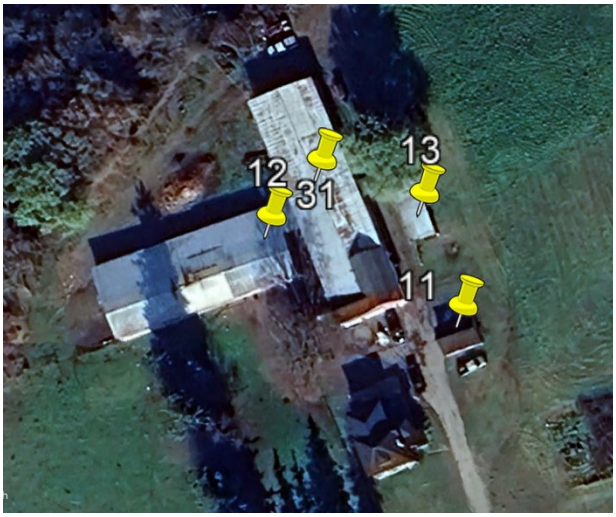
Agricultural Building 5

Agricultural Building 6

Agricultural Building 7

Agricultural Buildings 8 and 9

Agricultural Buildings 10 and 27




Agricultural Buildings 11, 12, 13 and 31

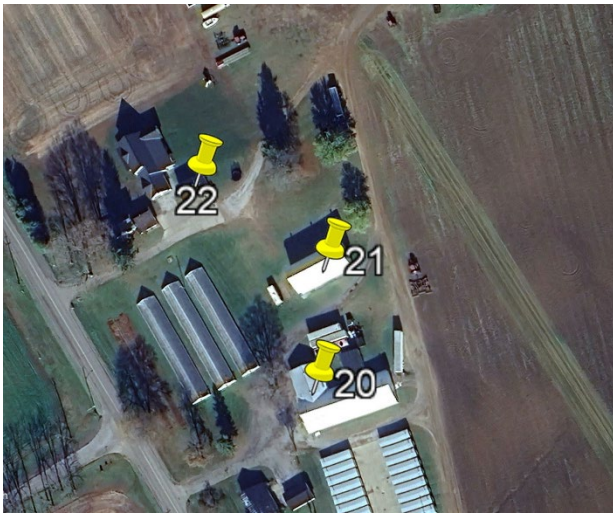
Agricultural Building 14

Agricultural Building 15

Agricultural Building 16

Agricultural Building 17

Agricultural Buildings 18 and 19




Agricultural Buildings 20, 21 and 22

Agricultural Buildings 23 and 28

Agricultural Buildings 24 and 25

Agricultural Buildings 26 and 30

Agricultural Building 29

# APPENDIX C

**Minimum Distance Separation (MDS 1) Agrisuite Sheets**

Ontario

AgriSuite

# 2026-05 Simcoe SABE AIA

## General information

**Application date**
Nov 28, 2025

**Municipal file number**

**Proposed application**
New or expanding settlement area boundary

**Applicant contact information**
John Ariens
15 Loganville Lane
New Hamburg, ON
N3A 0G3

**Location of subject lands**
County of Norfolk
County of Norfolk
WOODHOUSE
Concession GORE , Lot 18
Roll number: 33100402010035

## Calculations

### Buildings 12 and 31

**Farm contact information**

535 West Street
Norfolk County, ON
N3Y 4K5

**Location of existing livestock facility or anaerobic digestor**
County of Norfolk
County of Norfolk
WOODHOUSE
Concession GORE , Lot 18
Roll number: 3310402010029

**Total lot size**
5.5 ha

**Notes**
cumulative design capacity

### Livestock/manure summary

| Manure Form | Type of livestock/manure | Existing maximum number | Existing maximum number (NU) | Estimated livestock barn area |
|---|---|---|---|---|
| Solid | Horses, Medium-framed, mature; 227 - 680 kg (including unweaned offspring) | 25 | 25 NU | 581 m² |
| Solid | Horses, Medium-framed, mature; 227 - 680 kg (including unweaned offspring) | 29 | 29 NU | 674 m² |

**Confirm Livestock/Manure Information (Buildings 12 and 31)**
The livestock/manure information has not been confirmed with the property owner and/or farm operator.

### Setback summary

| | |
|---|---|
| Existing manure storage | V3. Solid, outside, no cover, >= 30% DM |
| Design capacity | 54 NU |
| Potential design capacity | 54 NU |

Factor A (odour potential) 0.7
Factor D (manure type) 0.7
Factor B (design capacity) 268
Factor E (encroaching land use) 2.2

| | |
|---|---|
| Building base distance 'F' (A x B x D x E) (minimum distance from livestock barn) | 289 m (948 ft) |
| Actual distance from livestock barn | NA |
| Storage base distance 'S' (minimum distance from manure storage) | 289 m (948 ft) |
| Actual distance from manure storage | NA |

## Preparer signoff & disclaimer

**Preparer contact information**
David Hodgson
DBH Soil Services Inc.
ON
dhodgson@dbhsoilservices.ca

Signature of preparer

David Hodgson , President

Date (mmm-dd-yyyy)

Note to the user

The Ontario Ministry of Agriculture, Food and Agribusiness (OMAFA) has developed this software program for distribution and use with the Minimum Distance Separation (MDS) Formulae as a public service to assist farmers, consultants, and the general public. This version of the software distributed by OMAFA will be considered to be the official version for purposes of calculating MDS. OMAFA is not responsible for errors due to inaccurate or incorrect data or information; mistakes in calculation; errors arising out of modification of the software, or errors arising out of incorrect inputting of data. All data and calculations should be verified before acting on them.

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# APPENDIX D

## Unique Soil Symbols and Canada Land Inventory (CLI) List

| SYMBOL1 | RANGE1 | STONINESS1 | CLI1 | CLI1_1 | CLI1_2 |
|---|---|---|---|---|---|
| 1-ALU | 0 - 2 | 0 | 5 | I | |
| 1-ALU | 0 - 2 | 0 | 5 | I | |
| BAY | 0 - 2 | 0 | 2 | F | |
| BAY | 2 - 5 | 0 | 2 | F | |
| BFO | 15 - 30 | 0 | 5 | T | |
| BFO | 2 - 5 | 0 | 2 | D | |
| BFO | 30 - 45 | 0 | 6 | T | |
| BFO | 5 - 9 | 0 | 3 | T | |
| BFO | 9 - 15 | 0 | 4 | T | |
| BFO | 9 - 15 | 0 | 5 | T | |
| BFO.C | 0 - 2 | 0 | 1 | | |
| BFO.C | 2 - 5 | 0 | 1 | | |
| BFO.C | 2 - 5 | 0 | 2 | T | |
| BFO.L | 0 - 2 | 0 | 2 | D | |
| BFO.L | 2 - 5 | 0 | 2 | D | |
| BFO.S | 0 - 2 | 0 | 3 | T | |
| BOO | 0 - 2 | 0 | 2 | M | |
| BOO | 2 - 5 | 0 | 2 | M | |
| BOO | 5 - 9 | 0 | 3 | T | |
| BRR | 0 - 2 | 0 | 1 | | |
| BRR | 2 - 5 | 0 | 2 | T | |
| BRT | 0 - 2 | 0 | 1 | | |
| BRT | 15 - 30 | 0 | 5 | T | |
| BRT | 2 - 5 | 0 | 2 | E | |
| BRT | 2 - 5 | 0 | 2 | T | |
| BRT | 30 - 45 | 0 | 6 | T | |
| BRT | 5 - 9 | 0 | 3 | T | |
| BRT | 9 - 15 | 0 | 4 | T | |
| BRT.C | 0 - 2 | 0 | 1 | | |
| BRT.C | 2 - 5 | 0 | 2 | E | |
| BRT.C | 2 - 5 | 0 | 2 | T | |
| BRT.C | 5 - 9 | 0 | 3 | T | |
| BVY | 0 - 2 | 0 | 2 | D | |
| BVY | 15 - 30 | 0 | 5 | T | |
| BVY | 2 - 5 | 0 | 2 | D | |
| BVY.C | 0 - 2 | 0 | 1 | | |
| BVY.C | 2 - 5 | 0 | 1 | | |
| BVY.C | 2 - 5 | 0 | 2 | T | |
| CPX1 | 0.5 - 2 | 0 | 6 | E | |
| CWO | 0 - 2 | 0 | 2 | W | |
| CWO.C | 0 - 2 | 0 | 2 | W | |
| FOX | 0 - 2 | 0 | 2 | F | |
| FOX | 15 - 30 | 0 | 5 | T | |
| FOX | 2 - 5 | 0 | 2 | F | |

| | | | | |
|---|---|---|---|---|
| FOX | 2 - 5 | 0 | 2 | S |
| FOX | 30 - 45 | 0 | 6 | T |
| FOX | 5 - 9 | 0 | 2 | S |
| FOX | 5 - 9 | 0 | 3 | T |
| FOX | 9 - 15 | 0 | 3 | T |
| FOX | 9 - 15 | 0 | 4 | T |
| GNY | 0 - 2 | 0 | 2 | W |
| GNY.P | 0 - 2 | 0 | 4 | W |
| GP | N | N | 0 | |
| HIM | 0 - 2 | 0 | 3 | D |
| HIM.C | 0 - 2 | 0 | 3 | D |
| HMP | 0 - 2 | 0 | O | |
| LIC | 0 - 2 | 0 | 3 | W |
| LIC.C | 0 - 2 | 0 | 3 | W |
| LIC.L | 0 - 2 | 0 | 3 | W |
| MPW | 0 - 2 | 0 | 2 | W |
| NDE | 0 - 2 | 0 | 1 | |
| OKL | 0 - 2 | 0 | 2 | F |
| OVW | 0 - 2 | 0 | O | |
| PFD | 0 - 2 | 0 | 3 | F |
| PFD | 2 - 5 | 0 | 3 | F |
| PFD | 30 - 45 | 0 | 6 | T |
| PFD | 5 - 9 | 0 | 3 | F |
| PFD | 9 - 15 | 0 | 4 | T |
| PFD.D | 0 - 2 | 0 | 3 | F |
| PFD.D | 15 - 30 | 0 | 5 | T |
| PFD.D | 2 - 5 | 0 | 3 | F |
| PFD.D | 30 - 45 | 0 | 6 | T |
| PFD.D | 5 - 9 | 0 | 3 | F |
| PFD.D | 9 - 15 | 0 | 3 | F |
| PFD.D | 9 - 15 | 0 | 4 | T |
| SHV | 5 - 9 | 0 | 3 | D |
| SIH | 0 - 2 | 0 | 2 | W |
| SLI | 0 - 2 | 0 | 2 | W |
| SLI | 2 - 5 | 0 | 2 | W |
| STD | 0 - 2 | 0 | 2 | F |
| STD | 2 - 5 | 0 | 2 | F |
| STD | 2 - 5 | 0 | 2 | S |
| STD | 5 - 9 | 0 | 2 | S |
| STD | 5 - 9 | 0 | 3 | T |
| STD | 9 - 15 | 0 | 4 | T |
| SYMBOL1 | RANGE1 | STONINESS1 | CLI1 | CLI1_1 |
| TLD | 0 - 2 | 0 | 3 | W |
| TLD.C | 0 - 2 | 0 | 3 | W |
| TUC | 0 - 2 | 0 | 1 | |

| | | | | |
|---|---|---|---|---|
| TUC | 2 - 5 | 0 | 2 | E |
| TUC.C | 0 - 2 | 0 | 1 | |
| TVK | 0 - 2 | 0 | 1 | |
| TVK | 2 - 5 | 0 | 2 | E |
| TVK | 2 - 5 | 0 | 2 | T |
| UL | N | N | 0 | |
| VIT | 0 - 2 | 0 | 1 | |
| VIT | 2 - 5 | 0 | 1 | |
| VIT | 2 - 5 | 0 | 2 | T |
| VSS | 0 - 2 | 0 | 2 | W |
| VSS.P | 0 - 2 | 0 | 4 | W |
| WAM | 0 - 2 | 0 | 3 | F |
| WAM | 2 - 5 | 0 | 3 | F |
| WAT | 0 - 2 | 0 | 2 | M |
| WAT | 2 - 5 | 0 | 2 | M |
| WAT | 30 - 45 | 0 | 6 | T |
| WAT | 5 - 9 | 0 | 3 | T |
| WAT | 9 - 15 | 0 | 4 | T |
| WIL | 0 - 2 | 0 | 2 | F |
| WIL | 5 - 9 | 0 | 2 | S |
| WIL | 5 - 9 | 0 | 3 | T |
| WIL | 9 - 15 | 0 | 3 | T |
| WIL | 9 - 15 | 0 | 4 | T |
| WIL.C | 0 - 2 | 0 | 2 | F |
| WRN | 0 - 2 | 0 | 3 | W |
| WSH | 0 - 2 | 0 | 2 | M |
| WSH | 2 - 5 | 0 | 2 | M |
| WSH | 5 - 9 | 0 | 2 | M |
| WSH | 5 - 9 | 0 | 3 | T |
| WUS | 0 - 2 | 0 | 2 | W |
| WUS.P | 0 - 2 | 0 | 4 | W |
| ZZ | N | N | W | |

# APPENDIX E

DAVE HODGSON CURRICULUM VITAE

DBH Soil Services Inc
217 Highgate Court
Kitchener Ontario N2N 3N9

phone: (519) 578-9226
email: dhodgson@dbhsoilservices.ca

**DAVID B. HODGSON, B.Sc., P. Ag.**
**PRESIDENT – Senior Pedologist/Agrologist**

## EDUCATION

- B.Sc. (Agriculture), 1983-1987; University of Guelph, Major in Soil Science
- Agricultural Engineering, 1982-1983; University of Guelph.
- Materials Science Technology, 1981-1982; Northern Alberta Institute of Technology (NAIT), Edmonton, Alberta.

## AREAS OF PROFESSIONAL EXPERIENCE

2000 to Present — **Senior Pedologist/President. DBH Soil Services Inc., Kitchener, Ontario.**
Mr. Hodgson provides expertise in the investigation, assessment and resource evaluation of agricultural operations/facilities and soil materials. Dave is directly responsible for the field and office operations of DBH Soil Services and for providing advanced problem-solving skills as required on an individual client/project basis. Dave is skilled at assessing soil and agricultural resources, determining potential impacts and is responsible for providing the analysis of and recommendations for the remediation of impacts to soil/agricultural/environmental systems in both rural and urban environments.

1992 to 2000 — **Pedologist/Project Scientist. Ecologistics Limited, Waterloo, Ontario.**
As pedologist (soil scientist), Mr. Hodgson provided expertise in the morphological, chemical and physical characterization of insitu soils. As such, Mr. Hodgson was involved in a variety of environmental assessments, waste management, agricultural research and site/route selection studies.
Dave was directly responsible for compiling, analysis and management of the environmental resource information. Dave is skilled at evaluating the resource information utilizing Geographic Information System (GIS) applications.

Dave was also involved in the firm's Environmental Audit and Remediation Division in the capacity of: asbestos identification; an inspector for the remediation of a pesticide contaminated site; and an investigator for Phase I and Phase II Audits.

## SELECT PROJECT EXPERIENCE

### Municipal Comprehensive Review and Mapping Studies (MCR)

- City of Markham Official Plan Review, 2025 – ongoing.
- Town of New Tecumseth Municipal AIA and MDS1 review, 2024 – 2025.
- Bruce County Official Plan Review, Agriculture, 2022 – 2023.
- Simcoe County Official Plan Review, Agriculture, 2020 - ongoing.
- City of Vaughan Official Plan Review, Agriculture, 2020 – 2021.
- Northumberland County, Agriculture, 2020 - ongoing.
- Halton Region, PSA Mapping, Agriculture, 2022.
- Halton Region Official Plan Review, Agriculture, 2019 - 2022.

### Environmental Assessment Studies

- Agricultural Component of the Highway 401 Widening Milton to Wellington County Boundary, 2023 – ongoing.
- Agricultural Component of the Highway 6 Widening Hamilton 2022 – 2024.
- Agricultural Component of the Bradford Bypass (Highway 400 to 404 link) 2021 – 2024.

- Agricultural Component of the Green for Life (GFL) Environmental, Moose Creek, Eastern Ontario Waste Handling Facility (EOWHF) Expansion, 2020 – 2023.
- Agricultural Component of the Greater Toronto Area West (GTAW) Highway 413 Corridor Assessment, 2019 – ongoing.
- Peer Review of the Walker Environmental Group (WEG) Inc. Southwestern Landfill Proposal, Ingersoll, 2013 – 2021.
- Agricultural Component for the High-Speed Rail Kitchener to London –Terms of Reference, 2018,
- Agricultural Component of the Mount Nemo Heritage District Conservation Study – City of Burlington, 2014 – 2015.
- Agricultural Component of the Greater Toronto Area West (GTAW) Highway Corridor Assessment – Phase 2, 2014 – 2016.
- Peer Review of the Agricultural Component of the Walker Group Landfill – Ingersoll, 2013 – 2015.
- Agricultural Component of the Highway 407 East Extension Design and Build Phase, 2012 – 2013.
- Agricultural Component of the Beechwood Road Environmental Centre (Landfill/Recycling) – Napanee, 2012 – 2013.
- Agricultural Component of the Clean Harbors Hazardous Waste Landfill Lambton County 2009 – 2015.
- Agricultural Component of the Highway 401 widening Cambridge to Halton Region 2009 – 2012.
- Agricultural Component of the Upper York Sanitary Sewer Study, York Region, 2009 – 2013.
- Agricultural Component of the Greater Toronto Area West Corridor Environmental Assessment Study 2007 – 2013 (Phase 1).
- Agricultural Component of the Niagara to GTA Planning and Environmental Assessment Study, 2007 – 2013.
- Agricultural Component of Highway 401 widening, Chatham, 2006 - 2007.
- Agricultural Component of the Trafalgar Road study, Halton Region, 2005.
- Agricultural Component of Highway 404 Extension North, 2004.
- Agricultural Component of the Highway 404 – 400 Bradford Bypass, 2004.
- Agricultural Component of the Highway 407 East Extension, 2002 – 2010.

**Transportation Design/Build Projects**

- Bradford Bypass (Highway 400 to Highway 404 link) Agricultural Component – West Section, 2025 – ongoing.
- Bradford Bypass (Highway 400 to Highway 404 link) Agricultural Component – Central Section, 2025 – ongoing.
- Bradford Bypass (Highway 400 to Highway 404 link) Agricultural Component – East Section, 2025 – ongoing.
- Highway 407 East Extension Agricultural Component, 2012.

**Agricultural Impact Assessment (AIA)/Minimum Distance Separation Studies**

- Treasure Hill – Markham AIA (including MDS1), 2025
- City of Niagara Falls Mewburn Road AIA (including MDS1), 2025.
- Land Use Change, Soccer Recreation Facility, Burlington, Scoped AIA (including MDS1), 2025.
- King's Christian Collegiate Oakville, Scoped AIA (including MDS1), 2025.
- Scotts Canada, Talbot Road AIA (including MDS1), 2025.
- Eden Mills Settlement Area Boundary Expansion AIA (including MDS1), 2025.
- Tremble Pit Grey County AIA, 2025.
- Capstone Wind Project (Chatham) AIA Component One, 2025.
- Cedar Flats Wind Project (Oxford County) AIA Component One, 2025.
- Bower Hill Wind Project (Oxford County) AIA Component One, 2025.
- Temiskaming Shores Wind Project AIA Component One, 2025.
- Atura Power Gas Generating Stations (four) AIA's, 2025.
- Agerton AIA Update, 2025.
- Dorchester Settlement Area Boundary Expansion AIA (including MDS1), 2025.
- Beatty Line Settlement Area Boundary Expansion AIA (including MDS1), 2025.
- Cambridge South AIA, (including MDS1), 2024.

- AECOM Peel Sewer AIA, 2024 - 2025.
- Port Hope North Settlement Area Boundary Expansion AIA, (including MDS1) 2024
- Fergus Oaks, Fergus Settlement Area Boundary Expansion AIA (including MDS1), 2024.
- Jordan Settlement Area Boundary Expansion AIA (including MDS1), 2024.
- Town of New Tecumseth AIA Assistance, 2024
- Whistle Bare Road, North Dumfries Minimum Distance Separation (MDS1 Assessment), 2024.
- Balsam Road, Pickering Minimum Distances Separation (MDS1) Assessment, 2024.
- Port Hope West Urban Boundary Expansion Scoped AIA (including MDS1), 2023.
- Port Hope East Urban Boundary Expansion Scoped AIA (including MDS1), 2023.
- Town of King Battery Energy Storage System (BESS) AIA, 2023.
- City of London Emergency Services AIA (including MDS1), 2023.
- Caledonia Secondary Plan Scoped AIA (including MDS), 2023.
- Inglewood Municipal Well AIA, 2023.
- Orangeville Battery Energy Storage System (BESS) AIA, 2023.
- County Road 109 Realignment AIA, 2023.
- Thornbury Acres AIA (including MDS1), 2022 – 2023.
- Highway 6 Widening Hamilton AIA, 2022 – 2024.
- Whistle Bare Aggregate Pit AIA, 2022.
- Middletown Road Vacuum Truck Services AIA (including MDS1), 2022.
- Claremont, Durham Region Minimum Distance Separation (MDS1), 2022.
- Grand Valley Settlement Area Boundary Expansion 2022 - 2024.
- Hagersville Minimum Distance Separation (MDS1), 2022.
- East River Road Minimum Distance Separation (MDS1), County of Brant, 2022.
- Brampton Brick Norval Quarry AIA, 2022 – 2024.
- Northfield Drive Minimum Distance Separation (MDS1), Waterloo Region, 2021
- Bradford Bypass Highway 400- 404 Link AIA, 2021 – 2024.
- Wilfrid Laurier Milton Campus AIA (including MDS1), 2021 – 2023.
- Town of Lincoln Road Realignment AIA, 2021 – 2023.
- Britannia Secondary Plan, AIA (including MDS1), Milton, 2021 – 2023.
- Reesor Road Minimum Distance Separation (MDS1), Markham, 2021.
- Maclean School Road Minimum Distance Separation (MDS1), County of Brant, 2021.
- Petersburgh Sand Pit AIA, 2021 – 2022.
- Milton CRH Quarry Expansion AIA, 2020 – 2022.
- Grimsby, Specialty Crop Area Redesignation AIA, 2020 - 2022.
- Halton Hills, Premier Gateway Phase 2 Employment Lands Secondary Plan, AIA (including MDS1), 2020 - 2021.
- Milton Education Village Secondary Plan AIA (including MDS1), 2020 - 2021.
- Woodstock, Pattullo Avenue Realignment AIA, 2020 - 2021.
- Smithville, West Lincoln Master Community Plan AIA (including MDS1), AECOM, 2019 – 2022.
- Kirby Road AIA, HDR, Vaughan, 2019 – 2021.
- Elfrida Lands, City of Hamilton, AIA Update, WSP, 2019 – 2021.
- Dorsay Development – Durham Region High Level Agricultural Assessment, 2019.
- Stoney Creek Landfill AIA Update – GHD, 2019.
- Town of Wilmot, Aggregate Pit Study (Hallman Pit) AIA, 2018 - 2019.
- Courtice Area Southeast Secondary Plan (Clarington) AIA (including MDS1), 2019,
- Town of Halton Hills, Minimum Distance Separation (MDS 1), August 2018,
- Cedar Creek Pit/Alps Pit (North Dumfries) AIA, 2018 – 2021,
- Belle Aire Road (Simcoe County) AIA (including MDS1), 2019,
- Vinemount Quarry Extension (Niagara) AIA, December 2017.
- Rivera Fine Homes, Caledon – Minimum Distance Separation (MDS 1), 2014.

- Town of Milton PanAm Velodrome – Minimum Distance Separation (MDS) 2012 – 2013.

**Soil Surveys/Soil Evaluations**

- Soil Survey and Canada Land Inventory Evaluation, Bye Construction Grey County, 2025.
- Soil Assessment and Sampling, Trussler Road Kitchener, 2024.
- Soil Survey and Canada Land Inventory Evaluation, Mount Hope, 2024.
- Soil Survey and Canada Land Inventory Evaluation, Peterborough, 2024.
- Soil Survey and Canada Land Inventory Evaluation, Essex, 2024.
- Mississippi Mills Soil Survey Peer Reviews (4 parcels), 2024.
- Ontario Stone, Sand & Gravel Association Case Study Rehabilitated Pits, 2023 – ongoing.
- Soil Survey and Canada Land Inventory Evaluation, Neubauer Pit, 2023.
- Soil Survey and Canada Land Inventory Evaluation, David Pit, 2023.
- Soil Survey and Canada Land Inventory Evaluation, Pinehurst Road, 2023.
- Soil Survey and Canada Land Inventory Evaluation, Paris Plains Church Road Site, 2022.
- Soil Survey and Canada Land Inventory Evaluation, Mulmur Site, 2022.
- Soil Survey and Canada Land Inventory Evaluation, Port Colborne Site, 2022.
- Soil Survey and Canada Land Inventory Evaluation, Pike Site, 2022.
- Soil Survey and Canada Land Inventory Evaluation, New Dundee Road Site, 2022.
- Soil Survey and Canada Land Inventory Evaluation, Gehl Farm, 2022
- Soil Sampling, City of Kitchener, 2021 – 2022.
- Soybean Cyst Nematode Soil Sampling, Enbridge, 2021.
- Soil Survey and Canada Land Inventory Evaluation, Max Becker Enterprises, City of Kitchener, 2021
- Soil Survey and Canada Land Inventory Evaluation, Max Beck Enterprises, City of Kitchener, 2021 – 2022.
- Soil Survey and Canada Land Inventory Evaluation, Burlington, Nelson Quarry, 2020-2021.
- City of Kitchener, City Wide Soil Studies, 2020-ongoing.
- Soil Survey, Fallowfield Drive, City of Kitchener Development Manual Study, 2020 - ongoing.
- Soil Survey, Williamsburg Estates, City of Kitchener Development Manual Study, 2020 - 2021.
- Soil Survey, South Estates, City of Kitchener Development Manual Study, 2020 - 2021.
- Soil Survey and Canada Land Inventory Evaluation, Burlington, Nelson Quarry, 2019.
- Soil Survey and Canada Land Inventory Evaluation, Maryhill Pit, 2019.
- Soil Survey and Canada Land Inventory Evaluation, Glen Morris Pit, Lafarge Canada, 2018,
- Soil Survey and Canada Land Inventory Evaluation, Brantford Pit Extension, Lafarge Canada, 2018,
- Soil Survey and Canada Land Inventory Evaluation, Pinkney Pit Extension, Lafarge Canada, May 2018,
- Soil evaluation and opinion, King-Vaughan Road, March 2018,

**Land Evaluation and Area Review Studies (LEAR)**

- Land Evaluation and Area Review (LEAR) presentation for Lanark County Council, 2024.
- Land Evaluation and Area Review (LEAR) Town of Amaranth, 2023 – ongoing.
- Mapping Audit Bruce County. Assessment of Prime and Non-Prime Agricultural Lands, 2022.
- Mapping Audit Northumberland County. Comparison of Regional and Provincial Prime Agricultural Area Mapping – 2021 - ongoing.
- Mapping Audit Simcoe County. Comparison of Regional and Provincial Prime Agricultural Area Mapping – 2021 - ongoing.
- Mapping Audit Halton Region. Comparison of Regional and Provincial Prime Agricultural Area Mapping – 2019 - 2022.
- Land Evaluation and Area Review (LEAR) – Soils Component, in Association with AgPlan Ltd, Kanata/Munster. December 2017 – July 2018.
- Land Evaluation and Area Review (LEAR) – Soils Component, Prince Edward County, 2016 – 2017.
- Land Evaluation and Area Review (LEAR) – Soils Component, Peel Region, 2013 - 2014.
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# LOT 18 GORE, COUNTY OF NORFOLK

## Final

## Phase I Environmental Site Assessment

**Project Location:**
Lot 18 Gore
Simcoe, ON

**Prepared for:**

Westwood Trail Developments Inc.
c/o M.McArthur and Dave Pond
34 Virginia Avenue
Simcoe, ON
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**February 28, 2014**

**MTE File No.: 38750-600**

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## EXECUTIVE SUMMARY

MTE Consultants Inc. (MTE) was retained by Westwood Trail Developments Inc. to conduct a due diligence Phase I Environmental Site Assessment (ESA) of an undeveloped property known as Lot 18 Gore in Simcoe, Ontario ("the Phase I Site" or "Site"). Refer to **Figure 1** for the Phase I Site Location and Limits. The Phase I Site is vacant with mature trees and unmaintained vegetation. There is no vehicle access to the Site and there are no structures on the property.

The Phase I Site is bounded by residential dwellings to the north, agricultural farmland to the south and woodlot to the east and west. Refer to **Figure 2** for the Site Layout and Features.

Authorization to proceed with the project was received from Mr. Mike McArthur of Westwood Trail Development Inc. following acceptance of our proposal for services dated January 9, 2014. The assignment was completed by MTE according to Reference Number 38750-600. The report has been issued to Westwood Trail Development Inc. in advance of potential financing.

The Phase I ESA meets the requirements of CSA Z768-01 and was completed with consideration toward the methodology of Regulation 153/04 (as amended). The purpose of a Phase I ESA is to identify actual or potential contamination on a property, based on the evaluation of information collected through records review, site visits, and interviews. The report has been prepared under the direct supervision of a Qualified Person ($QP_{ESA}$).

MTE reviewed available records for properties within 250 metres of the Phase I Site (representing the "Study Area") - including available aerial photographs; fire insurance mapping; municipal directories; geology and hydrogeological records and mapping; and Ministry of the Environment (MOE) database records. MTE also contacted County of Norfolk and provincial regulatory agencies including the MOE and Technical Standards and Safety Authority (TSSA) for information related to the Phase I Site and surrounding area.

According to aerial photographs the Phase I Site was agricultural farmland from 1945 to 1983. There are no records to indicate the development of any structures on the Phase I Site. The Site is currently vacant.

The Property is located within the broad physiographic region known as the Norfolk Sand Plain. This region is wedge-shaped with a base along Lake Erie and tapering north to Brantford. The region comprises approximately 3,134 $km^2$ (1,210 square miles) within the western half of Norfolk County, eastern end of Elgin County, southern Brant County and a small corner of Oxford County. The region consists of various sands and silts overlying silty clay or beds of boulder clays (*Chapman and Putnam*, 1984).

According to the Hydrogeological Investigation completed by Peto MacCallum for the Virginia Avenue subdivision northwest of the Phase I Site (July 1996), bedrock exists at a depth of about 45 m and consists of limestone of the Onodaga Formation. Peto MacCallum reports that "*local maps of quaternary geology indicate that the overburden primarily consists of Late Wisconsinan deposits of glaciolacustrine shallow water sand overlying deep water silt deposits*".

The estimated direction of groundwater flow based on the ground surface elevations on the Ontario Base Map is in an easterly direction towards Lynn River.

An inspection of the Phase I Site was performed by MTE on February 12, 2014. The weather was clear and the temperature was approximately -10°C. There was heavy snow cover across the Site. All areas of the Property were inspected.

The boundary of the Phase I Site is irregular in shape and comprises approximately 3.7 hectares (9.1 acres) in size and is currently undeveloped. The Phase I Site is located at the end of Fernwood Drive and Thomson Road, south of Virginia Avenue in Simcoe, Ontario. The Phase I Site is bounded by residential dwellings to the north, agricultural farmland to the south and woodlot to the east and west.

There are no structures and there is no vehicle access to the Phase I Site. Pedestrian access is available from Thomson Road. The Site is undeveloped and covered with mature shrubs and trees. At the time of the inspection there was evidence of cross country ski trails through the Site.

MTE did not observe any evidence of spills, stained soil, stressed vegetation, fill piles or obvious unidentified substances; and there was no indication of fuel storage tanks, former water wells, septic systems, foundations or utilities. There are residential dwellings north of the Phase I Site therefore, hydro, gas, sanitary and water utilities are anticipated along Thomson Road.

Topography across the Site appears to slope slightly from north to south and there is a berm separating the Site from the agricultural farmland to the south.

Norfolk County provided information pertaining to an MOE investigation (report dated February 18, 1981) of the property directly adjacent to the Phase I Site east boundary. The information identifies this adjacent parcel as formerly belonging to Canadian Canners Limited (CCL) and used by CCL as a waste disposal site.

There is a park including a woodlot, tennis court and playground adjacent to the northwest corner of the Phase I Site. The woodlot that is part of the park appears to be at a higher elevation than the surrounding properties. MTE did not observe storage tanks at any of the surrounding residential dwellings and there was no evidence of fill piles or obvious unidentified substances on the properties adjacent to the Phase I Site.

Conclusions and Recommendations

The information compiled in this report has revealed the following historical and/or current Potentially Contaminating Activities (PCAs) within the Phase I Site:

- Pesticides Manufacturing, Processing, Bulk Storage and large-scale Applications (PCA #40).

The information compiled in this report has revealed the following historical and/or current Potentially Contaminating Activities (PCAs) within the Phase I Study Area:

- Potential importation of fill of unknown quality (PCA # 30); and
- Waste Disposal and Waste Management (PCA # 58).

Based on the above information, a Phase II ESA is recommended. This should include, but not be limited to, the advancement of multiple boreholes, some completed as permanent monitoring wells, to investigate the potentially contaminating activities.

# 1.0 INTRODUCTION

## 1.1 Purpose of Study

MTE Consultants Inc. (MTE) was retained by Westwood Trail Developments Inc. to conduct a due diligence Phase I Environmental Site Assessment (ESA) of an undeveloped property known as Lot 18 Gore in Simcoe, Ontario ("the Phase I Site" or "Site"). Refer to **Figure 1** for the Phase I Site Location and Limits. The Phase I Site is vacant with mature trees and unmaintained vegetation. There is no vehicle access to the Site and there are no structures on the property.

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Authorization to proceed with the project was received from Mr. Mike McArthur of Westwood Trail Development Inc. following acceptance of our proposal for services dated January 9, 2014. The assignment was completed by MTE according to Reference Number 38750-600. The report has been issued to Westwood Trail Development Inc. in advance of potential financing.

## 1.2 Scope of Work

The Phase I ESA meets the requirements of CSA Z768-01 and was completed with consideration toward the methodology of Regulation 153/04 (as amended). Tasks performed for this assignment included:

- Review of environmental information including published and online records from the Ministry of the Environment (MOE), Ministry of Natural Resources (MNR), Environment Canada (EC), Technical Standards and Safety Authority (TSSA), and Norfolk County for information related to the Phase I Site and the Study Area;
- Review of physical setting information including: Aerial photographs, topography, Hydrology and Geology information and maps related to the Study Area;
- Interview with the property owner, for information about the property and uses;
- Detailed inspection and review of available engineering drawings related to the Phase I Site;
- Review of available environmental reports related to the property or surrounding area;
- Assessment of information collected for the Phase I Site and Potentially Contaminating Activities (PCA) within the Phase I Site and Study Area;
- Photographic log of the Phase I Site; and
- Preparation of this summary report of findings and recommendations.

This report does not address compliance with municipal by-laws or permits.

## 1.3 Methodology

The Study Area includes properties located wholly or partially, within 250 metres from the nearest point on a boundary of the Phase I Site. The $QP_{ESA}$ has determined from the inspection and records review that there are no properties that are located further than 250 metres from the property boundary that should be included in the Study Area, as shown on **Figure 2**.

MTE conducted research and collected available information that was reasonably accessible for the Phase I Site and properties within a distance of 250 metres, through the following methods:

- Written correspondence with regulatory agencies;
- Interviews by MTE staff with persons knowledgeable about the property;
- In person inspection of the property by MTE staff;
- In person inspection of perimeters of surrounding properties by MTE staff; and
- Review of available written records, maps, figures and reports.

MTE has compiled a written report of findings including figures and appendices for use by Westwood Trail Development Inc. that has been prepared under the direct supervision of Ms. Carol Mitchell, P. Eng., a Qualified Person ($QP_{ESA}$). The qualifications of Ms. Mitchell and Ms. Jennifer Kato, B.A., C.Tech. (who completed the inspection on February 12, 2014 and compiled this report) are included in Section 6.0.

# 2.0 SITE HISTORY AND RECORDS REVIEW

## 2.1 Aerial Photographs

Aerial photographs and maps were reviewed for information pertaining to the Phase I Site and Study Area. Aerial photographs were provided by the National Air Photo Library, Norfolk County on-line GIS and Google Earth. Summaries of the available aerial images are described as below. Copies of the aerial photographs and a 1983 Ontario Base Map are provided in **Appendix A**.

### *2.1.1 1945 Aerial Photograph*

The 1945 Aerial Photograph shows the Phase I Site and the immediate surrounding areas as agricultural lands. There does not appear to be any structures on the Site and there are no roads developed within the Study Area. There are no obvious environmental concerns within the Study Area.

### *2.1.2 1966 Aerial Photograph*

The 1966 aerial photograph depicts the Site as agricultural farmland bordered by trees to the east and south. Surrounding properties are agricultural farmland with four residential dwellings north of the Site. There does not appear to be any water bodies within 30 m the Site.

### *2.1.3 1983 Ontario Base Map*

The 1983 Ontario Base Map depicts the Phase I Site developed as undeveloped.

Surrounding streets in the area include Thomson Road to the north, Lee Avenue to the east and Evergreen Hill to the south are depicted in their current alignments. The areas to the north and east are developed as residential and lands to the south and west are undeveloped. Elevations in proximity to the Site are approximately 235 metres above sea level. There are no bodies of water in the Phase I Study Area.

### *2.1.4 1995 Aerial Photograph*

The 1995 aerial photograph depicts the Site as undeveloped. Directly north are residential dwellings; lands to the east are undeveloped (reportedly the former Fernwood Landfill, closed in 1950); lands to the south are agricultural; and lands to the west are parkland. There are no obvious environmental concerns within the Phase I Study Area that can be seen on the 1995 aerial photograph.

### *2.1.5 2006 Aerial Photograph*

There are no changes to the Phase I Site. Virginia Avenue to the northwest appears to be under development with residential dwellings. There are no other significant changes within the Phase I Study Area.

### *2.1.6 2013 Aerial Photograph*

There are no changes to the Phase I Site. Virginia Avenue is fully developed with residential dwellings. There are no other significant changes within the Phase I Study Area.

## 2.2 Municipal Directories

Municipal Directories were available for the period 1974 to 1987. The following summarizes information pertinent to the immediately surrounding properties.

**The Site – Lot 18 Gore**

| | |
|---|---|
| 1974-1987 | No municipal address, therefore no listings |

**58-62 Thomson Road**

| | |
|---|---|
| 1974 | No listing for Thomson Road |
| 1981 | No listings |
| 1985-1987 | Residential |

**63-65 Thomson Road**

| | |
|---|---|
| 1974 | No listing for Thomson Road |
| 1981-1987 | Residential |

**12-18 Virginia Avenue**

| | |
|---|---|
| 1974 | No listing for Virginia Avenue |
| 1981 | No listings |
| 1985-1987 | Residential |

## 2.3 Fire Insurance Plans

Fire insurance plans were developed between 1908 and 1947 and were revised in some areas until the 1970's. Fire insurance plans illustrate building construction, occupancy and potential fire hazards, as well as provide detailed information regarding storage tanks, transformers, boilers and electrical rooms.

The 1899 Fire Insurance Map was available for review on-line through the Toronto Public Library. The Town of Simcoe limits extended to the western limit of Queen Street, therefore, the Phase I Site was not within the developed area and was not depicted on the FIP.

MTE also reviewed the 1913 and 1949 Fire Insurance Plan at the Toronto Reference Library. The Phase I Site was not depicted on either FIP.

## 2.4 Technical Standards and Safety Authority - Fuel Safety Division

An email request was filed with Customer Services at the Technical Standards and Safety Authority (TSSA) - Fuel Safety Branch on January 17, 2014, for information concerning any underground storage tanks (UST's) or aboveground storage tanks (AST's) on the Site or surrounding properties. It was noted that the TSSA Fuel Safety Division did not maintain these records prior to 1990.

Customer Services responded via e-mail to MTE on January 20, 2014 indicating that there are no records for the Phase I Site or adjacent properties. A copy of the response is provided in **Appendix B**.

## 2.5 Ministry of the Environment (MOE)

### *2.5.1 Freedom of Information Request*

A formal, written Freedom of Information Request was filed with the Ministry of Environment, Freedom of Information and Protection of Privacy Office, on January 21, 2014, for any information regarding environmental concerns on file for the Phase I Site.

No response has been received from the MOE at this time. Any substantive information that may alter the conclusions of this report will be discussed with the client upon receipt.

### *2.5.2 Published Records*

A review of the "Waste Disposal Site Inventory" (MOE, June 1991) indicated that:

- The closest active landfill, MOE No. A110107 is located approximately 5.4 km southeast from the Phase I Site; and
- The closest closed landfill, MOE No. X8001 is located approximately 1.06 km northeast from the Phase I Site and was closed in 1958.

Norfolk County provided information pertaining to an MOE investigation (report dated February 18, 1981) of the property directly adjacent to the Phase I Site east boundary. The information identifies this adjacent parcel as formerly belonging to Canadian Canners Limited (CCL) and used by CCL as a waste disposal site. Further details are provided herein under section 2.7.1 and 2.11.

A complete listing of all active and closed landfills that are registered in the MOE's 1991 Waste Disposal Site Inventory in the West Central Region of Ontario and their distance from the Property is included in **Appendix B**.

MTE completed a review of the "Inventory of Coal Gasification Plant Waste Sites in Ontario" (MOE, April 1987, Reprinted February 1989) and a review of the Inventory of Industrial Sites Producing or Using Coal tar and Related Tars in Ontario, Volume 1" (MOE, November 1988). There are no former coal gasification or coal tar distillation plants listed on the Property. The nearest former coal gasification plant is located approximately 1.8 km from the Property at the southeast corner of Pond and Water Streets (Simcoe Gas and Water Co. Ltd., Dominion Natural Gas Co. Ltd.) which was closed in 1910. A complete listing of the Inventory of former Coal Gasification Plants in the West Central Region of Ontario and their distance from the Property is included in **Appendix B**.

The MOE, 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 MOE. This database contains information on PCB Sites including: 1) Site ID number; 2) Location; and 3) major and minor sites.

A review of the "Ontario Inventory of PCB Storage Sites" (MOE, April 1995) indicated that the Phase I Site is not a registered PCB storage site. The nearest PCB storage site is the Simcoe Sewage Treatment Plant located approximately 1.98 km northeast of the Site. A copy of the PCB storage sites is included in **Appendix B**.

### *2.5.3 Environmental Registry*

The Environmental Registry was created in 1994 to provide residents of Ontario access to environmentally significant decisions that the Government of Ontario is considering. The Registry contains a collection of notices about environmental matters being proposed by all government ministries covered by the Environmental Bill of Rights. The public notices may contain information about proposed new laws, regulations, policies and programs or about proposals to change or eliminate existing one.

These notices include decisions on Environmental Compliance Approvals, Certificates of Approval (C of A), Permits to take Water, Certificates of Property Use and similar instruments related to the environmental conditions of properties in Ontario. The Registry also contains a list of court actions that have been initiated under the Environmental Bill of Rights.

There were no records within the Phase I Study Area. A copy of the search is included in **Appendix B**.

### *2.5.4 Brownfield Environmental Site Registry*

Brownfields are lands on which industrial or commercial activity took place in the past and may need to be cleaned up before they can be redeveloped. New protections from environmental liability, together with new clean-up standards, came into effect October 1, 2004.

Protection from environmental clean-up orders for property owners is contingent upon 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 proposed to take place on the property. The Brownfield Environmental Site Registry allows public access to information contained in RSC that have been filed since October 1, 2004.

MTE searched the Brownfield Environmental Site Registry for any RSC filed within 0.5 km of the Phase I Site. No records were found for the Phase I Site or the search area. A copy of the search record is provided in **Appendix B**.

### *2.5.5 Hazardous Waste Information Network (HWIN)*

The Hazardous Waste Information Network (HWIN) is a web-based system that, since 2004, allows generators, carriers and receivers of hazardous waste to register their activities with the Ministry of the Environment online.

HWIN has been designed specifically to serve as an implementing tool for Ontario Regulation 347, allowing for the efficient integration of Regulation 347's fee collection requirements with the business processes associated with the manifesting of hazardous waste. Moreover, it provides immediate up-to-date information on the generation, movement and disposal of hazardous waste in Ontario. On-line registration of hazardous waste generators began on January 2, 2002. On-line manifesting and tracking through HWIN began on February 25, 2002.

A review of the HWIN online database revealed there were no listings for the Phase I Site or within the Study Area.

## 2.6 MOE Well Record Database

The MOE Well Record database is a web-based system that provides water well information including depth of well, date of completion and location. There were no wells located within the Phase I Study Area.

The nearest wells are summarized as follows:

- Water well #7101388: located at 38 Virginia Avenue, was completed on July 16, 2007 to a depth of 21.3 m. Stratigraphy was described as sand to 1.9 m underlain by clay to 6.5 m and sand to the maximum depth explored. Bedrock was not encountered. The standing water level was reported at 16.7 m.
- Water Well #4408530: located at 46 Virginia Avenue, was completed on July 7, 2006 to a depth of 21.85 m. Stratigraphy was described as loam and sand to 1.85 m underlain by clay to 11.38 m and sand to the maximum depth explored. Bedrock was not encountered. The standing water level was reported at 17.5 m.
- Water Well #4401169: located northeast of the Site, was completed on November 18, 1955 to a depth of 5.9 m. Stratigraphy was described as sand to 1.8 m underlain by gravel to 3.0m and fine sand to the maximum depth explored. Bedrock was not encountered. The standing water level was reported at 3.35 m.

MTE did not observe the wells during the Site Inspection. Copies of select well records are included in **Appendix B**.

## 2.7 Norfolk County

### *2.7.1 Norfolk County*

MTE submitted a request for information to Mr. Terrence Hall, Public Works & Environmental Services with Norfolk County on January 21, 2014. Mr. Hall provided the following pertinent information pertaining to the Phase I Site:

- The Environmental Services Division has not owned, operated or maintained a public waste disposal on the Phase I Site since January 1, 2001;
- Reportedly there is a former private disposal site within 1 km of the Phase I Site;
- There were no reported spills within the Phase I Study Area;
- The Phase I Site may require a risk management plan under the new Norfolk County Source Protection Plans and Policies (yet to be enacted); and
- The north portion of the Phase I Site appears to be within Wellhead Protection Area WHPA B and WHPA C.

Mr. Hall also provided a copy of a MOE investigation report dated February 18, 1981 that pertains to the property directly adjacent to the Phase I Site east boundary. The investigation report identifies this adjacent parcel as formerly belonging to Canadian Canners Limited (CCL) and used by CCL as a waste disposal site. The investigation included testing for the presence of gas and leachate and documenting any potential impacts arising from the production and migration of these contaminants. The investigation concluded that the majority of the refuse was removed with only a small area containing refuse remaining. The refuse consists mainly of tin and other metal, to a maximum depth of 1.5 m. There were no combustible gases detected in the refuse, surrounding soils or the adjacent homes. The MOE did not recommend any further monitoring or investigations.

A copy of the correspondence is included in **Appendix B**.

### *2.7.2 Norfolk County Official Plan*

MTE reviewed the Norfolk County Official Plan (January 2011 Consolidation).

The Official Plan is a public document which establishes a policy framework for public and private sector decisions regarding immediate and long term land use, servicing, transportation, infrastructure investment and economic matters within Norfolk County. It was developed in consultation with the Ministry of Municipal Affairs.

Information pertaining to the Site and surrounding areas is as follows:

- The Site is located with an Urban Residential Area that was accepted by Norfolk Council on December 18, 2008 under Amendment #22 (Schedule B-15);

- The Site is not located near a Pit or Quarry, Bedrock Resource Area or Sand & Gravel Resource Area (Schedule C-4);
- The Site is not located within a Provincially Significant Wetland, Locally Significant Wetland, Significant Woodland, Significant Natural Area, Area of Natural Scientific Interest (Schedule C-4);
- The Site is located directly east of a Significant Woodland (Schedule C-4);
- The Site appears to be located approximately 1.0 km west of a waste disposal site (Schedule C-4);
- The north portion of the Site may be located within a Wellhead Protection Area - 5 Year Capture Zone (Schedule D-4); and
- There is a potential road through the Site (Schedule E-2).

No other information reviewed in the Official Plan should limit the proposed development of the Site. However, density, zoning, and official plan related matters according to the Planning Act are beyond the scope of this assignment.

## 2.8 Environment Canada

The National Pollutant Release Inventory (NPRI) was established in 1992 and is legislated under the Canadian Environmental Protection Act (CEPA, 1999). The NPRI requires companies to report information on releases and transfers of pollutants to the Government of Canada on an annual basis.

Only facilities that meet established reporting criteria are required to report to the NPRI. Pollutants from mobile sources such as cars and trucks, households, facilities that release pollutants on a smaller scale and certain sector activities, such as agriculture and education and some mining activities, are not included in the NPRI.

MTE reviewed the National Pollutant Release Inventory (NPRI) for information pertaining to the Phase I Site and the surrounding properties. There were no NPRI listings for the Phase I Site or surrounding properties for the reporting years 1993-2010.

Environment Canada makes the information available to Canadians in an annual public report and maintains an inventory that can be accessed and searched through an online database.

On July 1, 2000, the Government of Canada introduced the Federal Contaminated Sites and Solid Waste Landfills Inventory Policy that states that departments and agencies that hold property must establish and maintain a database of their contaminated sites and solid waste landfills and that this information must be submitted to the Treasury Board Secretariat for inclusion in a central inventory.

The inventory includes all known Federal Contaminated Sites for which departments and agencies are accountable. The inventory also includes non-federal contaminated sites for which the Government of Canada has accepted some or all financial

responsibility. Based on a review of the inventory, neither the Phase I Site nor the surrounding properties were listed.

## 2.9 EcoLog Environmental Risk Information Services Report

MTE contacted EcoLog Environmental Risk Information Services Ltd. (EcoLog ERIS), an environmental database and information service company, to request a search of government and private records for information pertaining to the Phase I Site. EcoLog searched 15 Federal databases, 23 Provincial databases and 11 private databases. A total of 9 records were found within the Phase I Study Area. None of the records were listed for the Phase I Site. A copy of the EcoLog Report is provided in **Appendix C**.

The records within the Phase I Study Area are summarized as:

*North*

18 Kennedy Road

- **Pesticide Register** listing for as Operator.

*East*

Lee Avenue/Norris Street

- **Certificate of Approval** listing for the Doug Hunt – Hunt Subdivision for Municipal Water and Municipal Sewage dated November 7, 1989.

South Drive

- **ERIS Historical Searches** listing for a custom report dated August 30, 2012.

*West*

Various Locations West of the Phase I Site:

- **Water Well Information System**
  - Well ID # 7101388: Constructed July 16, 2007. Stratigraphy described as brown sand to 1.9 m, brown clay to 4.5 m, grey clay to 6.5 m, brown sand and gravel to 16.7 m and coarse sad to 21.3 m. Well depth was reported to be 6.5 m and the static water level was reported at 16.7 m.
  - Well ID # 7048300: Constructed May 30, 2007. Stratigraphy described as brown coarse sand to a maximum depth of 20.68 m. Well depth reported to be 20. 68 m and the static water level was reported at 16.49 m.
  - Well ID # 7110031: Constructed July 8, 2008. Stratigraphy described as brown sand and clay to 9.7 m, sand and gravel to 21.4. Well depth reported to 20.68 m and the static water level was reported at 16.49 m.

- Well ID # 4408530: Constructed June 7, 2006. Stratigraphy described as topsoil underlain by brown sand to 1.85 m, clay to 11.38 m and sand and gravel to 21.85 m. Well depth was reported at 5.23 m and the static water level was reported at 17.54 m.
- Well ID # 4408451: Constructed October 19, 2005. Stratigraphy described as loose brown sand to 4 m, clay to 15.8 m, sand to 24.1 m and clay to 31 m. Well depth was reported at 7.9 m and the static water level was reported at 21.3 m.

## 2.10 Geologic and Hydrogeologic Setting

The Ministry of Natural Resources Ontario Base Map (OBM) was published in 2002 and based on 1983 aerial photography. The approximate UTM Coordinates for the Site are 555,555 metres east and 4,742,100 metres north.

A review of the OBM indicated the following:

- There are no structures on the Phase I Site;
- Elevation at the Property is approximately 235 metres above sea level;
- There are no waterbodies depicted within the Study Area; and
- The Property appears to be bordered by residential properties to the north and vacant land to the east, south and west.

The Property is located within the broad physiographic region known as the Norfolk Sand Plain. This region is wedge-shaped with a base along Lake Erie and tapering north to Brantford. The region comprises approximately 3,134 $km^2$ (1,210 square miles) within the western half of Norfolk County, eastern end of Elgin County, southern Brant County and a small corner of Oxford County. The region consists of various sands and silts overlying silty clay or beds of boulder clays (*Chapman and Putnam*, 1984).

According to the Hydrogeological Investigation completed by Peto MacCallum for the Virginia Avenue subdivision northwest of the Phase I Site (July 1996), bedrock exists at a depth of about 45 m and consists of limestone of the Onodaga Formation. Peto MacCallum reports that "*local maps of quaternary geology indicate that the overburden primarily consists of Late Wisconsinan deposits of glaciolacustrine shallow water sand overlying deep water silt deposits*".

The estimated direction of groundwater flow based on the ground surface elevations on the Ontario Base Map is in an easterly direction towards Lynn River.

A copy of the OBM, with the site location depicted, is included in **Appendix A**.

## 2.11 Previous Environmental Reports Related to the Phase I Site

MTE reviewed the following available reports pertaining to projects completed within the Study Area. Copies of the reports are maintained on file with MTE.

**"Fernwood Drive Landfill Site Investigation" dated February 18, 1981, completed by the Ministry of the Environment, West Central Region for Mr. W. Smith.**

This report was completed to investigate a potential former waste disposal site at Lot 18, Gore assessment number 3310 402 010 048 00. The study area was described as the parcel of land south of Thomson Road and east of Oak Street North in the Town of Simcoe, which is adjacent to and east of the Phase I Site. The following summarizes the pertinent information provided in the report:

- The parcel is 5.0 acres in size and zoned as agricultural;
- The disposal site was reportedly owned by Canadian Canners who claimed to have removed the waste in the 1940s;
- Test holes on the parcel and gas tests in the residential dwellings along Thomson Road were completed to investigate potential impacts of the former disposal site; and
- Only a small area contained refuse, consisting primarily of tin and other metals, to a maximum depth of 1.5 m and the gas tests did not report any impacts to the surrounding dwellings. No other investigation was required by the MOE.

**"Hydrogeological Investigation McArthur Subdivision, West Street, Simcoe, Ontario" dated July 23, 1996, completed by Peto MacCallum Ltd. for Mr. Michael D. McArthur c/o G. Douglas Vallee Limited.**

This report was completed to investigate potential impacts to the local groundwater quality due to stormwater runoff from the residential development which is now developed as Virginia Avenue. The study area was described as the parcel of land on the south side of West Street, west of Kennedy Road in the Town of Simcoe. The following summarizes the pertinent information provided in the report:

- Investigation included a site visit, the advancement of four boreholes (maximum depths between 4.6 to 9.6 m), installation of four piezometers and one observation well and the collection of a groundwater sample for laboratory testing to determine the existing water quality in the local groundwater aquifer.
- Stratigraphy was described as a surficial topsoil layer overlying a discontinuous sand/silty sand layer which is underlain by layers of clay and silt.
- Groundwater levels were approximately 1.3 m in the southeast and 3.2 m in the northeast; and 1.1 m in the west and 1.7 m in the east. Based on stratigraphy and surface topography, Peto MacCallum determined the direction of shallow

groundwater flow is toward the northwest, consistent with the surface topography, with discharge into a tributary of Kent Creek (reported as Kettle Creek in the report) located on the north side of West Street. The site is located within the Lake Erie drainage basin and regional groundwater flow is generally southwards towards Lake Erie.
- The study concluded that the development would not have a significant impact on the quality of the groundwater or on the water quality at the downstream Cedar Street Municipal Water Wells.

**"Westwood Trails Subdivision Storm Water Management Report" dated November 9, 2012, completed by G. Douglas Vallee Limited for Mr. Jim Speelziek c/o Brant Terra Homes Ltd.**

This report was completed to summarize the stormwater management (SWM) design for the Westwood Trails residential subdivision, which is the Phase I Site, for submission to Norfolk County and the Long Point Region Conservation Authority. The following summarizes the pertinent information provided in the report:

- The receiver for the discharge from the development is ultimately Kent Creek through a system of swales, wetland and the road side ditch along West Street.
- A wetland is proposed for the SWM with an emergency overflow into a standard ditch inlet catch basin. The proposed wetland would be owned by Westwood Trails Development Inc. and not transferred to the municipality until after the residential development is registered.

## 3.0 CURRENT SITE CONDITIONS AND INTERVIEWS

An inspection of the Phase I Site was completed by Ms. Jennifer Kato, B.A., C.Tech of MTE on February 12, 2014. The weather was clear and the temperature was approximately -10°C. There was heavy snow cover across the Site. All areas of the Property were inspected. The Inspection Report is included in **Appendix D**. Photographs were taken of the Phase I Site and adjacent properties at the time of the inspection and are included in **Appendix E**.

### 3.1 Location and Description

The Phase I Site is irregular in shape and is approximately 3.7 hectares (9.1 acres) in size and is currently undeveloped. The Phase I Site is located at the end of Fernwood Drive and Thomson Road, south of Virginia Avenue in Simcoe, Ontario. The Phase I Site is bounded by residential dwellings to the north, agricultural farmland to the south and woodlot to the east and west.

A copy of the Draft Plan of Subdivision prepared by G. Douglas Vallee Limited dated December 2010 is included in **Appendix D**.

## 3.2 Site Characteristics

There are no structures and there is no vehicle access to the Phase I Site. Pedestrian access is available from Thomson Road. The Site is undeveloped and covered with mature shrubs and trees. At the time of the inspection there was evidence of cross country ski trails through the Site.

MTE did not observe any evidence of spills, stained soil, stressed vegetation, fill piles or obvious unidentified substances; and there was no indication of fuel storage tanks, former water wells, septic systems, foundations or utilities. There are residential dwellings north of the Phase I Site therefore, hydro, gas, sanitary and water utilities are anticipated along Thomson Road.

There is a park including a woodlot, tennis court and playground adjacent to the northwest corner of the Phase I Site. The woodlot that is part of the park appears to be at a higher elevation than the surrounding properties. MTE did not observe storage tanks at any of the surrounding residential dwellings and there was no evidence of obvious fill piles or obvious unidentified substances on the properties adjacent to the Phase I Site, however, there was heavy snow cover on the Site and surrounding properties during the Site inspection.

Topography across the Site appears to slope slightly from north to south and there is a berm separating the Site from the agricultural farmland to the south.

## 3.3 Interviews

A Phase I ESA interview questionnaire was completed by Mr. Mike McArthur, Officer/Director with Westwood Trails Developments Inc. Mr. McArthur was selected as the interview candidate as he is the most knowledgeable person with respect to the property and the current and historic Site operations. A copy of the completed interview questionnaire is included in **Appendix D**.

1. **Current Owner:** The Site is currently owned by Westwood Trails Developments Inc.
2. **Previous Owner:** Rosart Properties Inc. (Oakville)
3. **Major Renovations:** No.
4. **Water Wells/Septic Beds:** According to Mr. McArthur, there are no water wells or septic beds on the Site. There are water wells on the adjacent lands to the northwest.
5. **Site Drainage:** According to Mr. McArthur, there are no issues pertaining to site drainage.
6. **Easements:** Mr. McArthur is not aware of any easements on the Phase I Site.

7. **Dust Control:** Mr. McArthur is not aware of any dust control measures used on the Site.

8. **Transformers:** Mr. McArthur is not aware of any transformers on the Site.

9. **Aboveground Storage Tanks:** Mr. McArthur is not aware of any current or historic tanks that have been removed.

10. **Underground Storage Tanks:** Mr. McArthur is not aware of any current or historic tanks that have been removed.

11. **Fuel Pumps:** Mr. McArthur is not aware of any fuel pumps on the Phase I Site.

12. **Pesticides/Herbicides/Sludges:** Mr. McArthur reported that the Phase I Site was part of a tobacco farm over 40 years ago and therefore pesticides and herbicides were likely applied.

13. **Noise/Odours:** Mr. McArthur is not aware of any noise or odour issues from the surrounding properties.

14. **Chemical/Solvent Storage:** Mr. McArthur is not aware of any chemical or solvent storage on the Phase I Site.

15. **Vehicle Maintenance:** Mr. McArthur is not aware of any vehicle maintenance that has been performed on the Phase I Site.

16. **Wash Down:** Not applicable.

17. **Agricultural Use:** According to Mr. McArthur the property was used for growing tobacco, wheat and agricultural food crops over 40 years ago.

18. **Furnace Oil:** Mr. McArthur stated there was a former farm but not on the current Phase I Site. Therefore Mr. McArthur is not aware of any buildings or furnace oil sources on the Phase I Site.

19. **Spills:** Mr. McArthur is not aware of any spills that may have occurred on the Phase I Site.

20. **Joint Health and Safety Committee:** Not applicable.

21. **Safety Data Sheets (SDS):** According to Mr. McArthur there are no SDS related to operations at the Site (Site remains vacant).

22. **Outstanding Regulatory Compliance Issues:** Mr. McArthur is not aware of any compliance issues.

23. **Batteries:** Mr. McArthur is not aware of any batteries stored on the Site.

24. **Other Inspections:** Mr. McArthur reported that municipal and governmental inspections were completed prior to zoning and official plan approvals.

25. **Neighbouring Properties:** According to Mr. McArthur there is an approximately 4 acre block adjacent to the east of the Phase I Site that was owned by Canadian Canners and used for the disposal of waste solids from food processing. The current owner is Doug Smith and reportedly the MOE provided a report pertaining to the cleanup of the former disposal grounds.

26. **Waste Oils:** According to Mr. McArthur there are no waste oils generated or stored at the Phase I Site.
27. **Hoists:** According to Mr. McArthur there are no hoists on the Phase I Site.
28. **Fires:** Mr. McArthur is not aware of any fires on the Site.
29. **Mould/Water Damage:** Mr. McArthur is not aware of any mould/water damage on the Site.
30. **Waste Deposits:** Mr. McArthur is not aware of any wastes deposited on the Site.
31. **Indoor Air Quality:** Not applicable.
32. **Emissions:** Not applicable.
33. **Other Contact:** Mr. McArthur did not recommend a secondary interview candidate.

### 3.4 Sensitive Site Determination

Based upon a review of the conditions outlined in Part IX Sections 41 and 43.1 of Ontario Regulation 153/04 (as amended), the Property is not to be in proximity to a water body or a shallow soil condition. The Site is adjacent to a Norfolk County designated Significant Woodland. In addition, the north portion of the Phase I Site appears to be within a Wellhead Protection Area (WHPA B and WHPA C). The closest municipal well (Chapel Street Well) is located approximately 0.7 km to the northeast. Therefore, the Site would very likely qualify as a "Sensitive Site" under the Regulation (this could be confirmed with the County if necessary) and the Table 1 Site Condition Standards included in the *MOE Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* (April 15, 2011) would apply to the Phase I Site.

### 3.5 Surrounding Areas

The Phase I Site is located within a partially developed residential area. Specifically, surrounding areas include:

**North**
Directly north of the Phase I Site is Thomson Road and residential dwellings along Virginia Avenue.

**East**
Directly east of the Phase I Site is woodlot. Beyond are residential dwellings along Lee Avenue.

**South**
Directly south of the Phase I Site is agricultural farmland. Beyond is Evergreen Hill Road.

**West**
Directly west of the Phase I Site is woodlot. Beyond is agricultural farmland and Hillcrest Road.

## 4.0 DISCUSSION AND SUMMARY

### 4.1 Materials of Environmental Concern

#### *4.1.1 Asbestos Containing Materials (ACMs)*

Asbestos is defined as a designated substance under the Ontario Occupational Health and Safety Act (OHSA). Asbestos containing materials (ACM) were discontinued from use in the early 1980's. As there are no buildings on the Phase I Site, ACMs are not anticipated to be on the property.

#### *4.1.2 Lead Based Paint*

Lead can typically be found in paint in older buildings. Lead was banned from products in the early 1970's and is considered a designated substance under the OHSA. As there are no buildings on the Phase I Site, lead based paint is not anticipated to be on the property.

#### *4.1.3 Mercury*

There were no obvious sources of mercury on the Phase I Site.

#### *4.1.4 Polychlorinated Chlorinated Biphenyls (PCBs)*

The use of PCB's was phased out in 1978. As there are no buildings on the Phase I Site, PCBs are not anticipated to be found on the property.

#### *4.1.5 Chlorofluorocarbons (CFCs) and Hydrochlorofluorocarbons (HCFCs)*

As there are no buildings on the Phase I Site, CFCs and HCFCs are not anticipated to be found on the property.

#### *4.1.6 Urea Formaldehyde Foam Insulation (UFFI)*

No UFFI was observed during the Site Inspection.

#### *4.1.7 Water Staining/Mould*

As there are no buildings on the Phase I Site, there was no water staining or mould.

## 4.2 Site Drainage

Surface drainage appears to be directed overland from north to south across the property.

## 4.3 Geotechnical Soils

MTE reviewed a geotechnical investigation completed by Peto MacCallum for a property in the Phase I Study Area. Stratigraphy was described as a surficial topsoil layer overlying a discontinuous sand/silty sand layer which is underlain by layers of clay and silt.

No opinion regarding the geotechnical suitability of the soils is presented in this Phase I ESA report.

## 4.4 Past/Current Use of the Site

The Phase I Site was used as agricultural farmland from approximately 1945 to 1983. There are no records to indicate the development of any structures on the Phase I Site. The Site is currently vacant.

## 4.5 Previous Environmental Reports

The “Fernwood Drive Landfill Investigation” completed by the MOE and dated February 18, 1981 reported a former waste disposal site on the property east of the Phase I Site. The investigation concluded there was only a small area of refuse remaining on the property and gas tests confirmed there were no impacts on the surrounding dwellings.

The “Hydrogeological Investigation, McArthur Subdivision, West Street, Simcoe, Ontario” completed by Peto MacCallum Ltd. and dated July 23, 1996 reported the shallow groundwater flow for the Virginia Avenue residential subdivision (northwest of the Phase I Site) was towards the northwest.

The “Westwood Trails Subdivision Storm Water Management Report” completed by G. Douglas Vallee Limited dated November 9, 2012 report that the ultimate receiver for the storm water from the proposed development of the Phase I Site is Kent Creek.

## 4.6 Aboveground/Underground Storage Tanks

There are no records of aboveground or underground storage tanks on the Phase I Property. No tanks were observed during the Phase I Site Inspection.

## 4.7 Chemical Storage

There are no records of chemical storage on the Phase I Property. No chemicals were observed during the Phase I Site Inspection.

## 4.8 Debris & Solid Waste

There are no records of waste disposal. There were no obvious waste disposal sites observed during the Phase I Site Inspection.

## 4.9 Importation of Fill and Site Grading

There appears to be a berm along the south property boundary and the woodlot adjacent to the northwest property boundary also appears to be at a significantly higher grade than the surrounding properties. Based on the presence of mature trees and shrubs, the berm and adjacent woodlot are most likely associated with the historic development of the Site as agricultural farmland and not the result of recent importation of fill.

Reportedly the property east of the Phase I Site was used for waste disposal but it is believed that the majority of the waste was removed in the 1940s. An MOE report from 1981 confirmed that there is still some waste and possibly fill of unknown quality on the adjacent property.

## 4.10 Back-Up Generator

There are no records of back-up generators on the Phase I Site. No generators were observed during the Phase I Site Inspection.

## 4.11 Air Emissions

There are no records of industrial air emissions for the Phase I Site. No sources of industrial air emissions were observed during the Phase I Site Inspection.

## 4.12 Fires

No fires at the Phase I Site have been reported to MTE.

## 4.13 Floods

No floods at the Phase I Site have been reported to MTE.

## 4.14 Radon Gas

Radon is a naturally occurring radioactive gas that is odourless, colourless and tasteless. It is formed by the natural breakdown of uranium in soil and bedrock containing deposits of uranium, granite, coal or black shale.

Radon produces solid radioactive products called radon daughters, which when inhaled, release a radiation dose that increases the risk of lung cancer. The increase in risk is dependent on the concentration of radon gas, level of exposure, individual sensitivity and compounding factors.

A major source of radon gas in buildings is radium in soil beneath and adjacent to the foundation. Cracks and penetrations in concrete foundations, earth floors, wall-slab joints, and drains, sumps and sewers can create pathways for radon to enter a building. In enclosed indoor spaces, such as a basements and crawlspaces radon gas can accumulate.

Radon is measured in units of Becquerel's per cubic metre of air ($Bq/m^3$). There is no regulation in Canada that governs what is considered to be an acceptable radon level in a dwelling. Health Canada recommends remedial actions for dwellings and public buildings where the average annual radon concentration exceeds 200 $Bq/m^3$ in the occupancy area.

In workplaces, exposures to radon gas are given in the Canadian Guidelines for Management of Naturally Occurring Radioactive Materials (NORM) which is available through Health Canada.

As radon is colourless, odourless, and affects buildings of any age, it is not possible to detect radon gas issues through a site inspection alone. Therefore, the only way to confirm radon levels within a building is to perform air sampling within the area of concern. No testing for radon gas products has been completed for the Site.

## 4.15 Surrounding Areas

The Phase I Site is located within a partially developed residential area, adjacent to woodlot and agricultural farmland.

# 5.0 CONCLUSIONS AND RECOMMENDATIONS

The Phase I ESA was completed in accordance with CSA document Z768-01 for due diligence. The purpose of a Phase I ESA is to identify actual or potential contamination on a property, based on the evaluation of information collected through records review, site visits, and interviews. The report has been prepared under the direct supervision of a Qualified Person ($QP_{ESA}$) for use by Westwood Trail Development Inc.

MTE reviewed available records for properties within 250 metres of the Phase I Site (representing the "Study Area") - including available aerial photographs; fire insurance mapping; municipal directories; geology and hydrogeological records and mapping; and Ministry of the Environment (MOE) database records. MTE also contacted Norfolk County and provincial regulatory agencies including the MOE and Technical Standards and Safety Authority (TSSA) for information related to the Phase I Site and surrounding area.

Conclusions and Recommendations

The information compiled in this report has revealed the following historical and/or current Potentially Contaminating Activities (PCAs) within the Phase I Site:

- Pesticides Manufacturing, Processing, Bulk Storage and large-scale Applications (PCA #40).

The information compiled in this report has revealed the following historical and/or current Potentially Contaminating Activities (PCAs) within the Phase I Study Area:

- Potential importation of fill of unknown quality (PCA # 30); and
- Waste Disposal and Waste Management (PCA # 58).

Based on the above information, a Phase II ESA is recommended. This should include, but not be limited to, the advancement of multiple boreholes, some completed as permanent monitoring wells, to investigate the potentially contaminating activities.

Refer to **Appendix F** for a complete list of PCAs.

## 6.0 QUALIFICATIONS OF ASSESSORS

As required by CSA Standard Z768-01, Clause 3.4, an appropriate combination of formal education, skills, experience and training is required in order to provide a technically sound and rational Phase I ESA. The key participants involved in performing the components of the Phase I ESA are Ms. Carol Mitchell, P. Eng., $QP_{ESA}$ and Ms. Jennifer Kato, B.A., C.Tech.

Ms. Mitchell is a Licensed Professional Engineer (Ontario and Alberta) with 25 years of experience in the environmental engineering industry. She is a graduate of Queen's University in Engineering Chemistry. She has provided clients with solutions to various environmental challenges and has gained extensive experience in: Multi-Site Phase I & II Environmental Site Assessments (ESA); Soil and Groundwater Remediation, Property Decommissioning, Designated Substance Surveys. Her specific roles have included Senior Environmental Engineer, Division (Environmental) Manager for a

geotechnical firm; Corporate Environmental Engineer (operations and decommissioning for large chemical manufacturer), Corporate Chemical Emergency Responder and Safety Leader. Ms. Mitchell is registered as a Qualified Person with the MOE.

Ms. Kato is a Certified Technologist with experience conducting Phase I ESA's. She is a graduate of the Honours Environmental Economics Program at Brock University and the Civil Engineering - Environmental Program at Conestoga College. Ms. Kato has completed the Hazardous Wastes Operations and Emergency Response (29 CFR 1910) training (40 hour course, with annual 8-hour refresher courses) in accordance with the US Department of Labour's Occupational Safety & Health Administration (OSHA).

## 7.0 LIMITATIONS

Services performed by **MTE Consultants Inc.** (MTE) were conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the Environmental Engineering & Consulting profession. No other warranty or representation expressed or implied as to the accuracy of the information, conclusions or recommendations is included or intended in this report.

This report was completed for the sole use of MTE and the client. It was completed in accordance with the Scope of Work referred to in Section 1.2 and meets the mandatory requirements of CAN/CSA-Z768-01. As such, this report may not deal with all issues potentially applicable to the site and may omit issues, which are or may be of interest to the reader. MTE makes no representation that the present report has dealt with any and all of the important features, including any or all important environmental features, except as provided in the Scope of Work. All findings and conclusions presented in this report are based on site conditions as they existed during the time period of the investigation. In addition, MTE has relied on information provided by the persons interviewed as part of this study (identified herein) as being accurate and representative. This report is not intended to be exhaustive in scope or to imply a risk-free facility.

Any use which a third party makes of this report, or any reliance on, or decisions to be made based upon it, are the responsibility of such third parties. MTE accepts no responsibility for liabilities incurred by or damages, if any, suffered by any third party as a result of decisions made or actions taken, based upon this report. Others with interest in the site should undertake their own investigations and studies to determine how or if the condition affects them or their plans.

It should be recognized that the passage of time may affect the views, conclusions and recommendations (if any) provided in this report because environmental conditions of a property can change. Should additional or new information become available, MTE recommends that it be brought to our attention in order that we may re-assess the contents of this report.

Respectfully Submitted,

**MTE CONSULTANTS INC.**

Carol Mitchell, P. Eng., $QP_{ESA}$
Senior Environmental Engineer

Jennifer Kato, B.A., C.Tech.
Environmental Scientist

JYK:plw

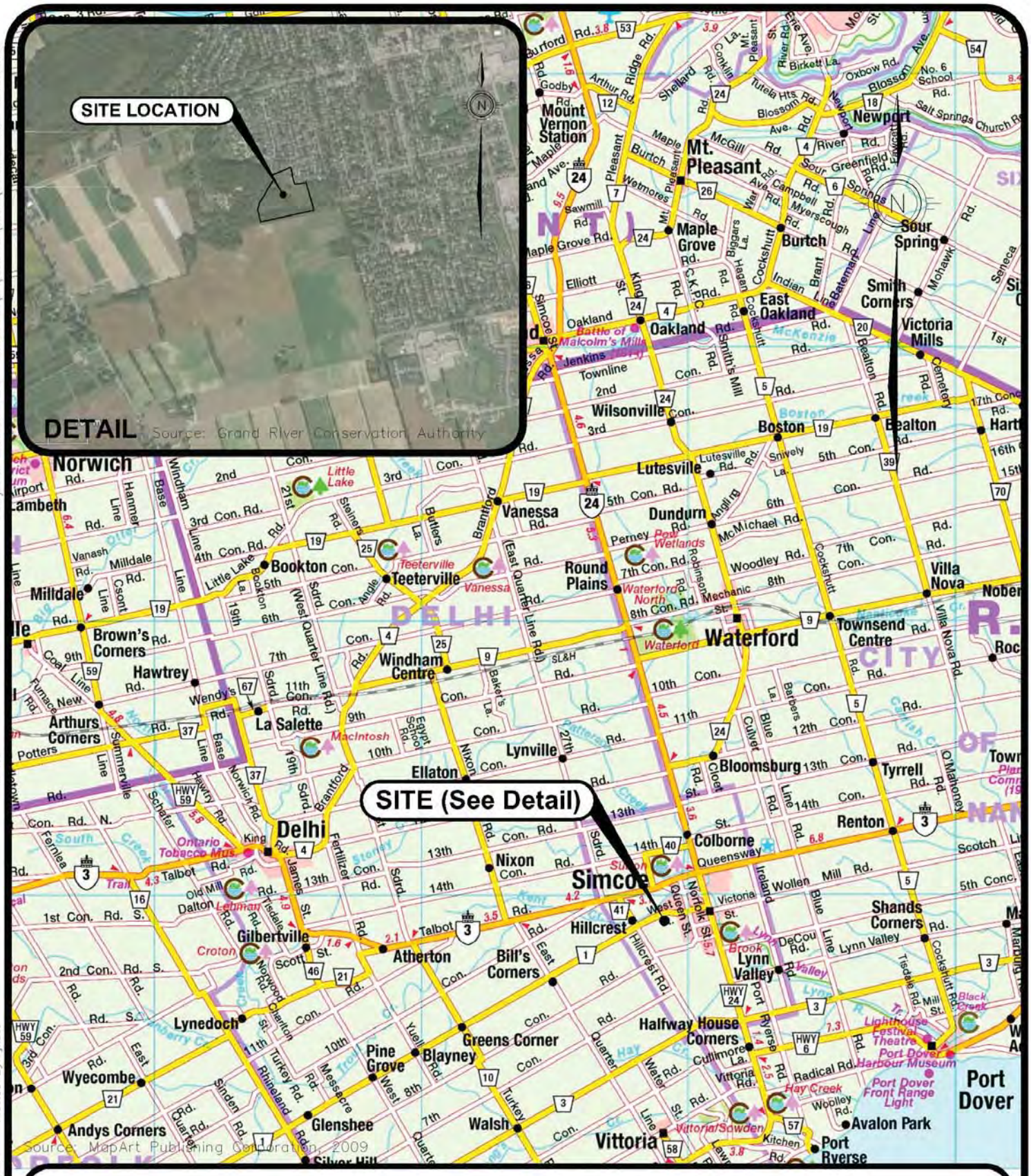
## 8.0 REFERNCES

The following list of references and sources were reviewed for the purposes of preparing the report:

| Applicable Section | Reference / Source | Date |
|---|---|---|
| All | Canadian Standards Association Z768-01 “Phase I – Environmental Site Assessments” | November 2001 Updated April 2003 |
| 2.1 | Aerial images, Google Earth | 2005, 2009 |
| 2.1 | National Air Photo Library | 1945, 1966, 1995 |
| 2.1 | Ontario Base Map, Ministry of Natural Resources | 1994 |
| 2.3 | Fire Insurance Plan of Simcoe, Norfolk County Ont 1899. Goad, Chas. E Toronto Public Library (www.torontopubliclibrary.ca) | January 15, 2014 (date of review) |
| 2.4 | Technical Standards and Safety Authority – Fuel Safety Division inquiry | January 20, 2014 (date of response) |
| 2.5.1 | Ministry of the Environment, Freedom of Information | January 21, 2014 (date of request) |
| 2.5.3 | Ontario Ministry of the Environment, “Inventory of Coal Gasification Plant Waste Sites in Ontario” | April 1987, Reprinted February 1989 |
| 2.5.3 | Ministry of the Environment, Inventory of Industrial Sites Producing or Using Coal Tar and Related Tars in Ontario | November 14, 1988 |
| 2.5.3 | Ontario Ministry of the Environment, “PCB Site Inventory System 2000” | July 2000 |
| 2.5.3 | Ontario Ministry of the Environment, “Waste Disposal Site Inventory” | June 1991 |
| 2.5.5 | Ontario Ministry of the Environment, Brownfields Environmental Site Registry | January 14, 2014 (date of search) |
| 2.5.6 | Ontario Ministry of the Environment Hazardous Waste Information Network | January 20, 2014 (date of search) |
| 2.6 | MOE Well Record Database | January 14, 2014 (date of search) |
| 2.7 | Norfolk County Official Plan | January 2011 (consolidation) |
| 2.8 | Environment Canada National Pollutant Release Inventory | January 14, 2014 (date of search) |
| 2.8 | Federally Contaminated Sites, Treasury Board of Canada | January 14, 2014 (date of search) |
| 2.9 | EcoLog ERIS Report Number 20140128008 | February 5, 2014 (date of report) |
| 2.11 | Fernwood Drive Landfill Site Investigation Ministry of the Environment, West Central Region | February 18, 1981 (date of report) |
| 2.11 | Hydrogeological Investigation McArthur Subdivision, West Street, Simcoe, Ontario. Peto MacCallum Ltd. | July 23, 1996 (date of report) |

| Applicable Section | Reference / Source | Date |
|---|---|---|
| 2.11 | Westwood Trails Subdivision Storm Water Management Report.<br>G. Douglas Vallee Limited | November 9, 2012<br>(date of report) |
| 3.1 | Draft Plan of Subdivision of Part of Lot 18 Gore, Geographic Township of Woodhouse, Simcoe in Norfolk County<br>G. Douglas Vallee Limited | December 2010<br>(date of plan) |

# FIGURES




# SITE LOCATION MAP

| | |
|---|---|
| Project Name | Phase I Environmental Site Assessment |
| Site | Lot 18 Gore, Simcoe, Ontario |
| Client | Westwood Trail Developments Inc. |
| Scale (8.5x11) | 1:200,000 |
| MTE Project No. | 38750-600 |
| Date | February 2014 |
| Figure No. | 1 |

MTE 25 YEARS 1985-2010
ENVIRONMENTAL DIVISION

February 18, 2014 — 1:35 p.m. — Plotted By: jkato
Project: 38750-200 CAD: P:\P\38750\600\38750-600-EV1.DWG
EV1.1

# SITE LAYOUT & FEATURES

MTE 25 YEARS 1985-2010
ENVIRONMENTAL DIVISION

| Project Name | |
|---|---|
| **Phase I Environmental Site Assessment** | |
| Site: Lot 18 Gore, Simcoe, Ontario | Client: Westwood Trail Developments Inc. |

| Scale, (8.5x11) | MTE Project No. | Date | Figure No. |
|---|---|---|---|
| 1:2000 | 38750-600 | February 2014 | **2** |

LEGEND

(2) Environmental Concerns

30. Importation of Fill Material of Unknown Quality
40. Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-scale Applications
58. Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners

# POTENTIALLY CONTAMINATING ACTIVITIES

MTE 25 YEARS 1985-2010
ENVIRONMENTAL DIVISION

| Project Name | | | |
|---|---|---|---|
| **Phase I Environmental Site Assessment** | | | |
| Site: Lot 18 Gore, Simcoe, Ontario | | Client: Westwood Trail Developments Inc. | |
| Scale (8.5x11): 1:5000 | MTE Project No.: 38750-600 | Date: February 2014 | Figure No.: 3 |

February 26, 2014 — 4:47 p.m. — Plotted By: jkato
Project: 38750-200 CAD: P:\P\38750\600\38750-600-EV1.DWG
EV1.3

# APPENDIX A

# MAPS AND AERIAL PHOTOGRAPHS

# 1945 AERIAL PHOTOGRAPH

| Project Name | | | |
|---|---|---|---|
| **Phase I Environmental Site Assessment** | | | |
| Site: Lot 18 Gore, Simcoe, Ontario | | Client: Westwood Trail Developments Inc. | |
| Scale (8.5x11): 1:15,000 | MTE Project No.: 38750-600 | Date: February 2014 | Appendix: **A** |

MTE 25 YEARS 1985-2010
ENVIRONMENTAL DIVISION

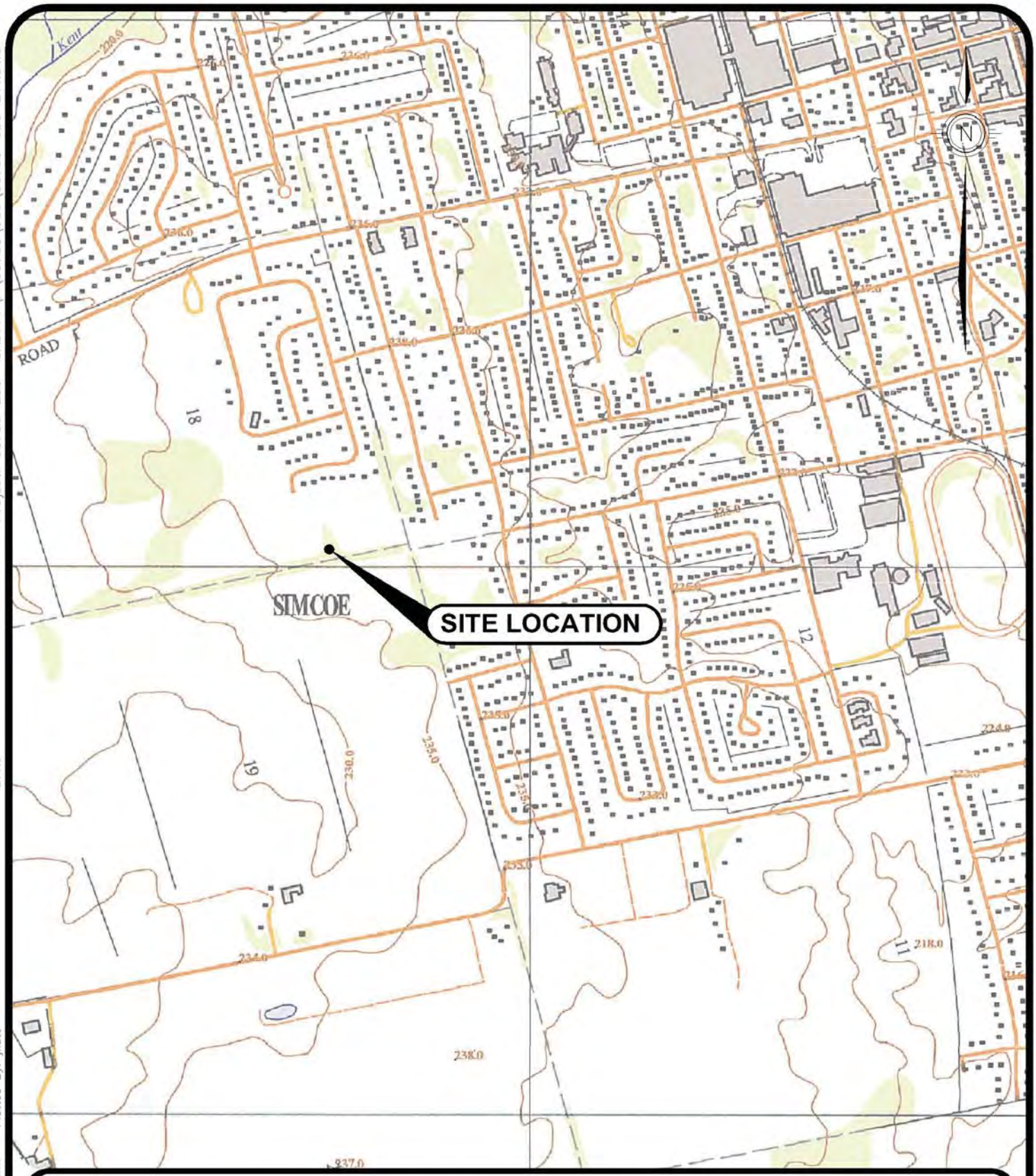
February 18, 2014 — 1:35 p.m. — Plotted By: jkato
Project: 38750-200 CAD: P:\P\38750\600\38750-600-EV1.DWG
EV1.4

# 1966 AERIAL PHOTOGRAPH

| Project Name | | | |
|---|---|---|---|
| **Phase I Environmental Site Assessment** | | | |
| Site: Lot 18 Gore, Simcoe, Ontario | | Client: Westwood Trail Developments Inc. | |
| Scale (8.5x11): 1:3000 | MTE Project No.: 38750-600 | Date: February 2014 | Appendix: **A** |

MTE 25 YEARS 1985-2010
ENVIRONMENTAL DIVISION

February 18, 2014 — 1:35 p.m. — Plotted By: jkato
Project: 38750-200 CAD: P:\P\38750\600\38750-600-EV1.DWG
EV1.5




# 1983 ONTARIO BASE MAP (10 17 5550 47400)

MTE 25 YEARS 1985-2010
ENVIRONMENTAL DIVISION

| Project Name | |
|---|---|
| Phase I Environmental Site Assessment | |
| Site: Lot 18 Gore, Simcoe, Ontario | Client: Westwood Trail Developments Inc. |

| Scale (8.5x11) | MTE Project No. | Date | Appendix |
|---|---|---|---|
| 1:10,000 | 38750-600 | February 2014 | A |

February 18, 2014 — 1:35 p.m. — Plotted By: jkato EV1.9 Project: 38750-200 CAD: P:\P\38750\600\38750-600-EV1.DWG

# 1995 AERIAL PHOTOGRAPH

| Project Name | | | |
|---|---|---|---|
| **Phase I Environmental Site Assessment** | | | |
| Site: Lot 18 Gore, Simcoe, Ontario | | Client: Westwood Trail Developments Inc. | |
| Scale (8.5x11): 1:10,000 | MTE Project No.: 38750-600 | Date: February 2014 | Appendix: **A** |

MTE 25 YEARS 1985-2010
ENVIRONMENTAL DIVISION

February 18, 2014 — 1:35 p.m. — Plotted By: jkato
EV1.6
Project: 38750-200 CAD: P:\P\38750\600\38750-600-EV1.DWG

# 2006 AERIAL PHOTOGRAPH

MTE 25 YEARS 1985-2010
ENVIRONMENTAL DIVISION

| Project Name | | | |
|---|---|---|---|
| **Phase I Environmental Site Assessment** | | | |
| Site | | Client | |
| Lot 18 Gore, Simcoe, Ontario | | Westwood Trail Developments Inc. | |
| Scale (8.5x11) | MTE Project No. | Date | Appendix |
| 1:10,000 | 38750-600 | February 2014 | **A** |

February 18, 2014 — 1:35 p.m. — Plotted By: jkato
Project: 38750-200 CAD: P:\P\38750\600\38750-600-EV1.DWG
EV1.7

# 2013 AERIAL PHOTOGRAPH

MTE 25 YEARS 1985-2010
ENVIRONMENTAL DIVISION

| Project Name | | | |
|---|---|---|---|
| Phase I Environmental Site Assessment | | | |
| Site | | Client | |
| Lot 18 Gore, Simcoe, Ontario | | Westwood Trail Developments Inc. | |
| Scale (8.5x11) | MTE Project No. | Date | Appendix |
| 1:10,000 | 38750-600 | February 2014 | A |

February 18, 2014 — 1:35 p.m. — Plotted By: jkato
Project: 38750-200 CAD: P:\P\38750\600\38750-600-EV1.DWG
EV1.8

# APPENDIX B

# GOVERNMENT RECORDS

**Jennifer Y. Kato**

**From:** plal@tssa.org on behalf of Public Information Services <publicinformationservices@tssa.org>
**Sent:** Monday, January 20, 2014 8:18 AM
**To:** Jennifer Y. Kato
**Subject:** Re: 38750 Phase I ESA, Simcoe

Hi Jennifer:

Thank you for your inquiry.

We have no record in our database of any fuel storage tanks at the subject address (addresses).

For a further search in our archives please submit your request in writing to Public Information Services via e-mail (publicinformationservices@tssa.org) or through mail along with a fee of $56.50 (including HST) per location. The fee is payable with credit card (Visa or MasterCard) or with a Cheque made payable to TSSA.

Thank you and have a great day!

Prem
Public Information Services

"Putting Public Safety First"

Technical Standards and Safety Authority
14th Floor, Centre Tower
3300 Bloor Street West
Toronto, ON M8X 2X4

Toll-Free: 1-877-682-8772
Email: publicinformationservices@tssa.org
Web Site: www.tssa.org

On Fri, Jan 17, 2014 at 4:46 PM, Jennifer Y. Kato <JKato@mte85.com> wrote:

Good Afternoon,
We would appreciate any information you may have pertaining to the following addresses in Simcoe, Norfolk County, Ontario:

58, 60 ,62 ,61, 63, 65 Thompson Road

12, 14, 16, 18 Virginia Avenue

Thank you,
Jennifer

**MTE Consultants Inc.**

**Jennifer Kato**, C.Tech., B.A. (Hon.)
*Environmental Scientist*
520 Bingemans Centre Drive, Kitchener, Ontario N2B 3X9
Phone: 519-743-6500 x1356  Fax: 519-743-6513
www.mte85.com

Notice: The electronic information provided is confidential and privileged, and may not be used for purposes other than work related to the subject project. Redistribution or copies to others made without written permission from MTE Consultants Inc. is strictly prohibited. MTE assumes no liability or responsibility, and makes no guarantee or warranty with respect to the data contained, either expressed or implied.

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Ontario Ministry of the Environment

FAXED 01/21/14

# Freedom of Information Request

This form is for requesting documents which are in the Ministry's files on environmental concerns related to properties. Please refer to the guide on the completion and use of this form. Our fax no. is (416) 314-4285.

| Requester Data | | | For Ministry Use Only | |
|---|---|---|---|---|
| Name, Title, Company Name and Mailing Address of Requester<br>Jennifer Kato<br>MTE Consultants Inc.<br>520 Bingemans Centre Drive<br>Kitchener, Ontario<br>N2B 3X9<br>Email Address: jkato@mte85.com | | | FOI Request No. | FOI Co-ordinator Review date |
| | | | Date Request Received | Fee Paid<br>ACCT-CHQ-VISA-MC-CASH |
| | | | Response Due Date | |
| Telephone/Fax Nos.<br>Tel : 519-743-6500<br>Fax : 519-743-6513 | Your Project/Reference No.<br>38750 | Signature of Requester | ☐ CNR ☐ ER ☐ NOR ☐ SWR ☐ WCR<br>☐ SAC ☐ IEB ☐ EAA ☐ | |

## Request Parameters

Municipal Address / Lot, Concession, Geographic Township (Municipal address essential for cities, towns or regions)

LOT 16, CONCESSION GORE, GEOGRAPHIC TOWNSHIP WOODHOUSE GORE (CURRENTLY NORFOLK COUNTY)

Present Property Owner(s) and Date(s) of Ownership

Westwood Trail Developments Inc.

Previous Property Owner(s) and Date(s) of Ownership

Unknown

Present/Previous Tenant(s),(if applicable)

| Search Parameters<br>Files older than 2 years may require $60.00 retrieval cost.<br>There is no guarantee that records responsive to your request will be located. | Specify Year(s) Requested |
|---|---|
| Environmental concerns (General correspondence, occurrence reports, abatement) | Current + 2 years |
| Orders | Current + 2 years |
| Spills | Current + 2 years |
| Investigations/prosecutions ▸ Owner/tenant information must be provided | **Current + 2 years** |
| Waste Generator number/classes | **Current + 2 years** |

**Certificates of Approval** ▸ Proponent information must be provided

1985 and prior records are searched manually. **Search fees in excess of $300.00** could be incurred, depending on the types and years to be searched. Specify Certificates of Approval number (s) (if known). **If supporting documents are also required, mark SD box** and specify type e.g. maps, plans, hydrogeological reports, etc.

| | | SD | Specify Year(s) Requested |
|---|---|---|---|
| air - *emissions* | | | 1986 – Present |
| water - *mains, treatment, ground level, standpipes & elevated storage, pumping stations (local & booster)* | | | 1986 – Present |
| sewage - *sanitary, storm, treatment, stormwater, leachate & leachate treatment & sewage pump stations* | | | 1986 – Present |
| waste water - *industrial discharge* | | | 1986 – Present |
| waste sites - *disposal, landfill sites, transfer stations, processing sites, incinerator sites* | | | 1986 – Present |
| waste systems | *- haulers: sewage, non-hazardous & hazardous waste* | | 1986 – Present |
| | *- mobile waste processing units* | | 1986 – Present |
| | *- PCB destruction* | | 1986 – Present |
| pesticides - *licenses* | | | 1986 – Present |

**A $5.00 non-refundable application fee, payable to the Minister of Finance, is mandatory. The cost of locating on-site and/or preparing any record is $30.00/hour and 20 cents/page for photocopying and you will be contacted for approval for fees in excess of $30.00.**

## MINISTRY OF ENVIRONMENT WASTE DISPOSAL SITE INVENTORY, JUNE 1991
## REGIONAL INVENTORY OF ACTIVE WASTE DISPOSAL SITES
## REGION: WEST CENTRAL

**SITE EASTING** 555,555 m E
**SITE NORTHING** 4,742,100 m N

| SITES < 10 Km | DISTANCE AWAY FROM SITE (km) | | SITE NO | *** | COUNTY | MUNICIPALITY | LOT OR STREET NO | CONCESSION | NTS | UTM COORDINATES ZONE | EAST | NORTH | D | C | O | H | L | MH | SS | STAT'S | CLASS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 11.224 | A | 100101 | | BRANT | CITY OF BRANTFORD | PT of Love Joy Grant | | 40P01 | 17 | 563000 | 4750500 | 70 | 15 | 5 | 0 | 0 | 5 | 5 | 1 | A3 |
| | 33.956 | A | 100110 | | BRANT | BRANTFORD | PT 23-24 | 4 | 40P01 | 17 | 557110 | 4776020 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 1 | A3 |
| | 41.258 | A | 100201 | | BRANT | PARIS | 31; in town of Paris | | 40P01 | 17 | 548500 | 4782750 | 40 | 6 | 0 | 0 | 4 | 15 | 35 | 1 | A3 |
| | 24.209 | A | 100301 | | BRANT | BRANTFORD | PT 1 | 2ND RANGE | 40P01 | 17 | 558240 | 4766160 | 70 | 30 | 0 | 0 | 0 | 0 | 0 | 1 | A4 |
| | 31.632 | A | 100402 | | BRANT | BURFORD | PT 7 | 7 | 40P01 | 17 | 544270 | 4771650 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 1 | A3 |
| | 128.718 | A | 180403 | | DUFFERIN | AMARANTH | PT 16 NE1/2 | 4 | 40P16 | 17 | 563850 | 4870550 | 95 | 3 | 0 | 0 | 0 | 2 | 0 | 1 | B4 |
| | 119.100 | A | 180601 | | DUFFERIN | LUTHER, EAST | PT 21 | 4 | 40P16 | 17 | 549190 | 4861030 | 90 | 5 | 5 | 0 | 0 | 0 | 0 | 1 | A4 |
| | 141.990 | A | 180702 | | DUFFERIN | MELANCTHON | PT 5 E1/2 | 1 | 41A01 | 17 | 565370 | 4883750 | 90 | 5 | 5 | 0 | 0 | 0 | 0 | 1 | A4 |
| | 147.366 | A | 180703 | | DUFFERIN | MELANCTHON | PT 12 | 4 | 41A01 | 17 | 557750 | 4889450 | 95 | 4 | 0 | 0 | 0 | 1 | 0 | 1 | A4 |
| | 138.215 | A | 180801 | | DUFFERIN | MONO | PT 24 | 4 | 41A01 | 17 | 575140 | 4878920 | 90 | 5 | 0 | 0 | 0 | 5 | 0 | 1 | A4 |
| | 152.754 | A | 180903 | | DUFFERIN | MULMUR | PT 18 | 2 | 41A01 | 17 | 570810 | 4894090 | 99 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | A4 |
| | 23.370 | A | 110104 | | HALDIMAND | NANTICOKE | 7 | 16 | 40116 | 17 | 571100 | 4759550 | 85 | 15 | 0 | 0 | 0 | 0 | 0 | 1 | A1 |
| TRUE | 5.419 | A | 110107 | | HALDIMAND | NANTICOKE | PT 4 | 3 | 40116 | 17 | 560000 | 4739000 | 50 | 10 | 15 | 0 | 0 | 25 | 0 | 1 | A4 |
| | 17.789 | A | 110115 | | HALDIMAND | NANTICOKE | PT 24 | 1 | 40116 | 17 | 573000 | 4738620 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 1 | B4 |
| | 22.887 | A | 110117 | | HALDIMAND | NANTICOKE | PT 10 N1/2 | 2 | 40116 | 17 | 578440 | 4741830 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 1 | B4 |
| | 55.834 | A | 110202 | | HALDIMAND | DUNNVILLE | PT 6 | 3 | 3OL13 | 17 | 609350 | 4757050 | 85 | 5 | 5 | 0 | 0 | 5 | 0 | 1 | A4 |
| | 42.932 | A | 110302 | | HALDIMAND | HALDIMAND | PT 24 | 1 NTR | 3OL13 | 17 | 595560 | 4757680 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | A4 |
| | 33.049 | A | 110304 | | HALDIMAND | HALDIMAND | 21 | 3 SOUTH | 30113 | 17 | 584500 | 4758050 | 80 | 5 | 15 | 0 | 0 | 0 | 0 | 1 | A4 |
| | 32.234 | A | 110305 | | HALDIMAND | HALDIMAND | PT 14-15 | RANGE W | 40P01 | 17 | 580180 | 4762900 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 1 | B4 |
| | 40.959 | A | 110309 | | HALDIMAND | HALDIMAND | PT 9-10 | 1 WPR | 30M04 | 17 | 585060 | 4770510 | 0 | 0 | 1 | 0 | 0 | 99 | 0 | 1 | B3 |
| | 11.862 | A | 110503 | | HALDIMAND | DELHI | PT 14 NE1/4 | 1 | 40109 | 17 | 553790 | 4730370 | 85 | 5 | 10 | 0 | 0 | 0 | 0 | 1 | A4 |
| | 22.971 | A | 110605 | | HALDIMAND | NORFOLK | PT 13 | 10 | 40110 | 17 | 535870 | 4730260 | 75 | 15 | 5 | 0 | 0 | 5 | 0 | 1 | A4 |
| | 23.989 | A | 110606 | | HALDIMAND | NORFOLK | PT 15 | 2 | 40110 | 17 | 542460 | 4722000 | 85 | 10 | 5 | 0 | 0 | 0 | 0 | 1 | B4 |
| | 64.428 | A | 130122 | | HAMILTON-W | HAMILTON | PT 1-9 | R.P. 8090 | 30M05 | 17 | 595500 | 4792650 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 1 | A3 |
| | 64.780 | A | 130123 | | HAMILTON-W | HAMILTON | PT 2 | R.P. 8091 | 30M05 | 17 | 598100 | 4790950 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 1 | A3 |
| | 65.023 | A | 130124 | | HAMILTON-W | HAMILTON | PT 1 | R.P. 8091 | 30M05 | 17 | 598125 | 4791250 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 1 | A3 |
| | 59.576 | A | 130404 | | HAMILTON-W | STONEY CREEK | 27, PT 26-28 | 6 | 30M04 | 17 | 598760 | 4783120 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 1 | A3 |
| | 50.291 | A | 130510 | | HAMILTON-W | FLAMBOROUGH | PT 17 N1/2 | 2 | 40P08 | 17 | 570400 | 4790150 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 1 | A4 |
| | 57.164 | A | 130511 | | HAMILTON-W | FLAMBOROUGH | PT 513-516 | 1 | 30M05 | 17 | 583780 | 4791810 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 1 | A3 |
| | 50.485 | A | 130604 | | HAMILTON-W | GLANBROOK | 26-28 | 9 | 30M04 | 17 | 598150 | 4769200 | 29 | 13 | 0 | 0 | 0 | 58 | 0 | 1 | A4 |
| | 93.916 | A | 120106 | | NIAGARA | ST. CATHARINES | PT 16-17 (Glenridge) | 10 | 30M03 | 17 | 643350 | 4775450 | 60 | 20 | 0 | 0 | 0 | 20 | 0 | 1 | A3 |
| | 103.374 | A | 120201 | | NIAGARA | NIAGARA FALLS | PT 6,15,26.C of N Twp Standford | | 30M03 | 17 | 652550 | 4777850 | 63 | 13 | 8 | 0 | 0 | 16 | 0 | 1 | A3 |
| | 97.523 | A | 120203 | *** | NIAGARA | NIAGARA FALLS | PT 202-225; in city of Niagara Falls | | 30M03 | 17 | 649420 | 4768560 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 1 | A3 |
| | 98.071 | A | 120206 | *** | NIAGARA | NIAGARA FALLS | PT 203-204; in city of Niagara Falls | | 30M03 | 17 | 650000 | 4768520 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 1 | A3 |
| | 99.178 | A | 120211 | | NIAGARA | NIAGARA FALLS | PT 11,30-31,49-50,66; | Thorold Tow | 30M03 | 17 | 648650 | 4776300 | 5 | 10 | 0 | 0 | 0 | 85 | 0 | 1 | A3 |
| | 87.382 | A | 120302 | | NIAGARA | PORT COLBORNE | 29 | 3 | 30L14 | 17 | 642150 | 4753800 | 0 | 0 | 94 | 0 | 0 | 1 | 5 | 1 | A3 |
| | 88.775 | A | 120310 | | NIAGARA | PORT COLBORNE | PT 24-25 | 1 | 30L14 | 17 | 644050 | 4749150 | 0 | 0 | 95 | 0 | 2 | 3 | 0 | 1 | A1 |
| | 86.528 | A | 120401 | | NIAGARA | WELLAND | Feeder Rd. W. of Townl'e | Rd.RP 14 | 30L14 | 17 | 640600 | 4758050 | 60 | 15 | 12 | 0 | 5 | 1 | 7 | 1 | A1 |
| | 90.911 | A | 120409 | *** | NIAGARA | WELLAND | PT 21-22 PT 223 | 2 | 30M03 | 17 | 643850 | 4763750 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 1 | A1 |
| | 91.732 | A | 120410 | | NIAGARA | WELLAND | PT 18 | 7 | 30L14 | 17 | 645800 | 4758550 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 1 | A3 |
| | 89.170 | A | 120412 | *** | NIAGARA | WELLAND | 24 | 7 | 30L14 | 17 | 643250 | 4758250 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 1 | A4 |
| | 111.559 | A | 120501 | | NIAGARA | FORT ERIE | 7 (Bridge St. Fort Erie) | 4 NR | 30L15 | 17 | 666400 | 4754700 | 50 | 30 | 10 | 0 | 0 | 5 | 5 | 1 | A4 |
| | 72.307 | A | 120601 | | NIAGARA | GRIMSBY | NW PT 2 | 6 | 30M04 | 17 | 618400 | 4777860 | 75 | 15 | 0 | 0 | 0 | 10 | 0 | 1 | A3 |
| | 78.050 | A | 120702 | | NIAGARA | LINCOLN | PT 14-15 | 6 | 30M03 | 17 | 625100 | 4777530 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 1 | A3 |
| | 105.726 | A | 120802 | | NIAGARA | NIAGARA-ON-THE-LAKE | PT 106 | 5 | 30M03 | 17 | 652550 | 4784170 | 80 | 10 | 5 | 0 | 0 | 5 | 0 | 1 | A4 |
| | 107.381 | A | 120803 | | NIAGARA | NIAGARA-ON-THE-LAKE | PT 45,NE PT 47 (Queens'n Quarries) | | 30M03 | 17 | 656250 | 4779400 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 1 | A3 |
| | 96.631 | A | 121007 | *** | NIAGARA | THOROLD | PT 29 (Ormond St. & C.N.R.tracks) | | 30M03 | 17 | 646510 | 4774730 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 1 | A3 |
| | 95.578 | A | 121016 | *** | NIAGARA | THOROLD | PT 31; in city of Thorold | | 30M03 | 17 | 645510 | 4774400 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 1 | A3 |
| | 77.158 | A | 121101 | | NIAGARA | WAINFLEET | 20 (Station Rd) | 1 | 30L14 | 17 | 632440 | 4748590 | 80 | 5 | 15 | 0 | 0 | 0 | 0 | 1 | A4 |
| | 75.374 | A | 121102 | | NIAGARA | WAINFLEET | PT 26 (Perry Rd) | 6 | 30L14 | 17 | 629280 | 4757780 | 85 | 10 | 5 | 0 | 0 | 0 | 0 | 1 | A4 |
| | 58.493 | A | 121201 | | NIAGARA | LINCOLN, WEST | PT 14 (Caistor Rd) | 3 | 30M04 | 17 | 607650 | 4768700 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 1 | A4 |
| | 60.040 | A | 140104 | | WATERLOO | CAMBRIDGE | PT 2 N1/2 | 11 | 40P08 | 17 | 558850 | 4802050 | 44 | 2 | 2 | 0 | 0 | 52 | 0 | 1 | A3 |
| | 70.341 | A | 140301 | | WATERLOO | WATERLOO | Erb St.; 40 GCT | | 40P07 | 17 | 534450 | 4809200 | 52 | 22 | 11 | 0 | 0 | 15 | 0 | 1 | A3 |
| | 83.346 | A | 170101 | | WELLINGTON | GUELPH | PT 4-5 S1/2 | 5 DIV C | 40P09 | 17 | 561950 | 4825200 | 15 | 7 | 22 | 0 | 2 | 54 | 0 | 1 | AI |
| | 105.885 | A | 171001 | | WELLINGTON | ERIN | PT 15 E1/2 | 9 | 40P16 | 17 | 574700 | 4846240 | 80 | 15 | 1 | 0 | 0 | 4 | 0 | 1 | A3 |
| | 124.515 | A | 171101 | | WELLINGTON | ARTHUR | PT 13 | W OF 0S | 40P15 | 17 | 525770 | 4863000 | 75 | 10 | 10 | 0 | 0 | 5 | 0 | 1 | A4 |
| | 105.580 | A | 171401 | | WELLINGTON | GARAFRAXA, WEST | PT 11 | 6 | 40P16 | 17 | 553480 | 4847660 | 80 | 10 | 10 | 0 | 0 | 0 | 0 | 1 | A4 |

## MINISTRY OF ENVIRONMENT WASTE DISPOSAL SITE INVENTORY, JUNE 1991
## REGIONAL INVENTORY OF ACTIVE WASTE DISPOSAL SITES
## REGION: WEST CENTRAL

**********

**SITE EASTING** **555,555 m E**
**SITE NORTHING** **4,742,100 m N**

| SITES < 10 Km | DISTANCE AWAY FROM SITE (km) | SITE NO | *** | COUNTY | MUNICIPALITY | LOT OR STREET NO | CONCESSION | UTM COORDINATES NTS | ZONE | EAST | NORTH | D | C | O | H | L | MH | SS | STAT'S | CLASS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 106.331 | A 171701 | | WELLINGTON | MARYBOROUGH | 7 | 4 | 40P15 | 17 | 516250 | 4840900 | 75 | 20 | 0 | 0 | 0 | 5 | 0 | 1 | A4 |
| | 114.934 | A 171702 | | WELLINGTON | MARYBOROUGH | PT 6 E1/2 | 14 | 40P15 | 17 | 521750 | 4851950 | 75 | 20 | 0 | 0 | 0 | 5 | 0 | 1 | A4 |
| | 126.501 | A 171801 | | WELLINGTON | MINTO | PT 26 | 7 | 40P15 | 17 | 509220 | 4859810 | 75 | 5 | 15 | 0 | 0 | 5 | 0 | 1 | A4 |
| | 108.359 | A 172001 | | WELLINGTON | DRAYTON | PT 12 E1/2 | 13 | 40P15 | 17 | 529380 | 4847250 | 88 | 10 | 2 | 0 | 0 | 0 | 0 | 1 | A4 |
| | 71.521 | A 172201 | | WELLINGTON | PUSLINCH | PT 17 S1/2 | FRONT O | 40P08 | 17 | 563300 | 4813200 | 84 | 10 | 5 | 0 | 0 | 1 | 0 | 1 | A4 |

REGION TOTAL = 61

*** industrial sites.

LIST OF ALL ACTIVE WASTE DISPOSAL SITES
THAT ARE LISTED IN THE 1988 INVENTORY BUT NOT
IN THE 1990 INVENTORY

| SITE NUMBER | REASON |
|---|---|
| A180102 | REPORTED CLOSED SINCE 1988 |
| A110403 | REPORTED CLOSED SINCE 1988 |
| A110502 | REPORTED CLOSED SINCE 1988 |
| A120901 | REPORTED CLOSED SINCE 1988 |
| A121002 | REPORTED CLOSED SINCE 1988 |
| A121008 | REPORTED CLOSED SINCE 1988 |
| A140401 | REPORTED CLOSED SINCE 1988 |
| A140403 | REPORTED CLOSED SINCE 1988 |
| A140601 | REPORTED CLOSED SINCE 1988 |
| A140701 | REPORTED CLOSED SINCE 1988 |
| A140105 | REPORTED CLOSED SINCE 1988 |
| A171301 | REPORTED CLOSED SINCE 1988 |
| A171901 | REPORTED CLOSED SINCE 1988 |

LIST OF ALL ACTIVE WASTE DISPOSAL SITES
THAT ARE LISTED IN THE 1990 INVENTORY BUT NOT
IN THE 1988 INVENTORY

| SITE NUMBER | REASON |
|---|---|
| NONE | |

# MINISTRY OF ENVIRONMENT WASTE DISPOSAL SITE INVENTORY, JUNE 1991
## REGIONAL INVENTORY OF CLOSED WASTE DISPOSAL SITES
## REGION: WEST CENTRAL

**SITE EASTING** 555,555 m E
**SITE NORTHING** 4,742,100 m N

| SITES < 10 Km | DISTANCE AWAY FROM SITE (km) | SITE NO | COUNTY | MUNICIPALITY | LOT OR STREET NO | CONCESSION | NTS | UTM COORDINATES ZONE | EAST | NORTH | DATE CLOSED YEAR | MONTH | DAY | CLASS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 33.983 | A 100101 | BRANT | BRANTFORD | Lovejoy & 20; Eagle's Nest tract | | 40P01 | 17 | 563120 | 4775230 | * | * | * | A3 |
| | 33.731 | A 100102 | BRANT | BRANTFORD | Brantford Exp. & Grand R. | | 40P01 | 17 | 559320 | 4775620 | 1979 | 11 | 1 | A4 |
| | 32.569 | A 100103 | BRANT | BRANTFORD | S. side of Birkett Lane | | 40P01 | 17 | 561925 | 4774040 | 1980 | 11 | 27 | A3 |
| | 32.071 | A 100404 | BRANT | BURFORD | PT 7 | 6 | 40P01 | 17 | 544150 | 4772075 | 1979 | 12 | 19 | A6 |
| | 32.001 | A 100405 | BRANT | BURFORD | PT 7 | 6 | 40P01 | 17 | 544150 | 4772000 | 1983 | 4 | 25 | A4 |
| | 21.092 | A 100601 | BRANT | OAKLAND | PT 7 | 1 | 40P01 | 17 | 554850 | 4763180 | 1980 | 10 | 1 | A3 |
| | 40.051 | X 0069 | BRANT | PARIS | Willow & Dundas | | 40P01 | 17 | 550650 | 4781850 | 1940 | * | * | A7 |
| | 41.429 | X 0070 | BRANT | PARIS | Ayer & C.N.R. | | 40P01 | 17 | 549275 | 4783050 | 1950 | * | * | A7 |
| | 41.490 | X 0071 | BRANT | PARIS | Railway St. | | 40P01 | 17 | 549200 | 4783100 | 1950 | * | * | A7 |
| | 34.362 | X 0072 | BRANT | BRANTFORD | Wharf & Market | | 40P01 | 17 | 560250 | 4776140 | 1950 | * | * | NP |
| | 32.849 | X 0073 | BRANT | BRANTFORD | Harriet & Tom | | 40P01 | 17 | 561400 | 4774425 | 1950 | * | * | A7 |
| | 32.441 | X 0074 | BRANT | BRANTFORD | Edge St. | | 40P01 | 17 | 559500 | 4774300 | 1920 | * | * | NP |
| | 33.883 | X 0075 | BRANT | BRANTFORD | Gilkinson St. | | 40P01 | 17 | 559300 | 4775775 | 1920 | * | * | NP |
| | 33.884 | X 0076 | BRANT | BRANTFORD | Market & Eagle | | 40P01 | 17 | 560300 | 4775650 | 1920 | * | * | A7 |
| | 35.371 | X 0077 | BRANT | BRANTFORD | Bunrley Ave. | | 40P01 | 17 | 559500 | 4777250 | 1955 | * | * | A7 |
| | 31.904 | X 0078 | BRANT | BRANTFORD | River & Birketts | | 40P01 | 17 | 559800 | 4773720 | 1955 | * | * | A7 |
| | 49.822 | X 0079 | BRANT | DUMFRIES, SOUTH | 21 | 6 | 40P08 | 17 | 552075 | 4791800 | 1952 | * | * | A8 |
| | 46.569 | X 0080 | BRANT | DUMFRIES, SOUTH | 14 | 3 | 40P08 | 17 | 556900 | 4788650 | 1970 | * | * | A8 |
| | 49.027 | X 0081 | BRANT | DUMFRIES, SOUTH | 20 | 6 | 40P08 | 17 | 552800 | 4791050 | 1952 | * | * | A8 |
| | 34.264 | X 8059 | BRANT | BRANTFORD | Mohawk St. | | 40P01 | 17 | 562750 | 4775600 | 1955 | * | * | A7 |
| | 34.257 | X 8060 | BRANT | BRANTFORD | Greenwich St. | | 40P01 | 17 | 562600 | 4775625 | 1955 | * | * | A7 |
| | 32.555 | X 8061 | BRANT | BRANTFORD | Birkett's Lane | | 40P01 | 17 | 561800 | 4774050 | 1955 | * | * | A7 |
| | 35.062 | X 8062 | BRANT | BRANTFORD | Beach Rd. | | 40P01 | 17 | 563500 | 4776250 | 1955 | * | * | A7 |
| | 36.972 | X 8063 | BRANT | BRANTFORD | Charing Cross | | 40P01 | 17 | 561125 | 4778650 | 1955 | * | * | A7 |
| | 36.702 | X 8064 | BRANT | BRANTFORD | Bruce St. | | 40P01 | 17 | 561450 | 4778325 | 1950 | * | * | A7 |
| | 30.547 | X 8065 | BRANT | BURFORD | Maple Ave. S. | | 40P01 | 17 | 546750 | 4771350 | 1940 | * | * | A7 |
| | 31.826 | X 8066 | BRANT | BURFORD | 7 | 6 | 40P01 | 17 | 544380 | 4771900 | 1945 | * | * | A8 |
| | 23.273 | X 8067 | BRANT | OAKLAND | 1 | 2 | 40P01 | 17 | 550650 | 4764850 | 1949 | * | * | NP |
| | 38.152 | X 8068 | BRANT | BRANTFORD TWP | 16 | 2 | 40P01 | 17 | 552640 | 4780140 | 1969 | * | * | A8 |
| | 28.556 | X 8069 | BRANT | BRANTFORD TWP | 7 | 1RW MT. | 40P01 | 17 | 554950 | 4770650 | 1969 | * | * | A8 |
| | 122.909 | A 180101 | DUFFERIN | ORANGEVILLE | East end of Second Ave. | | 40P16 | 17 | 573100 | 4863750 | 1974 | 7 | 31 | A4 |
| | 127.234 | A 180401 | DUFFERIN | AMARANTH | PT 16 W1/2 | 7 | 40P16 | 17 | 560450 | 4869240 | 1979 | 12 | 31 | B7 |
| | 130.900 | A 180402 | DUFFERIN | AMARANTH | PT 23 W1/2 | 9 | 41A01 | 17 | 555900 | 4873000 | 1971 | 7 | 15 | A6 |
| | 117.139 | A 180501 | DUFFERIN | GARAFRAXA, EAST | PT 13 SW1/2 | 16 | 40P16 | 17 | 560840 | 4859120 | 1972 | 6 | 30 | B7 |
| | 118.167 | A 180502 | DUFFERIN | GARAFRAXA, EAST | PT 7 SW | 19 | 40P16 | 17 | 569000 | 4859500 | 1973 | 8 | 31 | A6 |
| | 147.025 | A 180701 | DUFFERIN | MELANCTHON | PT 12 | 4 | 41A01 | 17 | 557620 | 4889110 | 1973 | 4 | 30 | B7 |
| | 153.181 | A 180901 | DUFFERIN | MULMUR | PT 20 W1/2 | 2 W.H.S | 41A01 | 17 | 569880 | 4894610 | 1975 | 1 | 28 | B7 |
| | 148.929 | A 180902 | DUFFERIN | MULMUR | PT 9 E1/2 | 5 | 41A01 | 17 | 575410 | 4889700 | 1975 | 1 | 28 | B7 |
| | 140.846 | A 180904 | DUFFERIN | MULMUR | PT 1 E1/2 | 2 | 41A01 | 17 | 568500 | 4882350 | 1974 | 4 | 30 | A7 |
| | 117.566 | X 0107 | DUFFERIN | GARAFRAXA, EAST | 14 | 16 | 40P16 | 17 | 561000 | 4859540 | 1975 | * | * | B7 |
| | 127.219 | X 0108 | DUFFERIN | AMARANTH | 16 | 17 | 40P16 | 17 | 560450 | 4869225 | 1968 | * | * | B7 |
| | 136.744 | X 8112 | DUFFERIN | MONO | 25 | 1W | 41A01 | 17 | 570360 | 4878040 | 1968 | * | * | B7 |
| | 139.118 | X 8115 | DUFFERIN | SHELBURNE | Greenwood St. | | 41A01 | 17 | 564350 | 4880940 | 1962 | * | * | A7 |
| | 139.584 | X 8116 | DUFFERIN | SHELBURNE | Greenwood St. & Robert | | 40P16 | 17 | 564300 | 4881410 | 1971 | * | * | A4 |
| | 18.449 | A 110102 | HALDIMAND | NANTICOKE | 4-5 | 8 | 40I16 | 17 | 572600 | 4749160 | 1975 | 1 | 1 | A4 |
| | 22.597 | A 110103 | HALDIMAND | NANTICOKE | 11 | 6 | 40I16 | 17 | 577560 | 4747240 | 1979 | 12 | 31 | A4 |
| | 15.223 | A 110106 | HALDIMAND | NANTICOKE | 1 S.P | 8 | 40I16 | 17 | 544300 | 4752350 | 1971 | 7 | 15 | A6 |
| | 17.356 | A 110119 | HALDIMAND | NANTICOKE | PT 24 | 1 | 40I16 | 17 | 572700 | 4739400 | 1984 | 8 | 22 | B4 |
| | 59.064 | A 110201 | HALDIMAND | DUNNVILLE | PT 2 E; in town of Dunnville | | 30L13 | 17 | 613850 | 4751600 | 1979 | 12 | 31 | B5 |
| | 64.516 | A 110205 | HALDIMAND | DUNNVILLE | PT 8 W | 2 | 30L13 | 17 | 619900 | 4746800 | 1979 | 12 | 31 | B5 |
| | 39.453 | A 110301 | HALDIMAND | HALDIMAND | Peeble St. | | 30L13 | 17 | 584600 | 4768800 | 1979 | 12 | 31 | A3 |
| | 43.517 | A 110306 | HALDIMAND | HANTICOKE | PT 20 N | 1 | 30L13 | 17 | 599000 | 4744600 | 1976 | 9 | 30 | A6 |
| | 44.704 | A 110307 | HALDIMAND | HALDIMAND | PT 22 9 | 4 | 30L13 | 17 | 599500 | 4750300 | 1979 | 12 | 31 | A6 |
| | 54.330 | A 110308 | HALDIMAND | HALDIMAND | 2nd line, Richard Martin tract | | 30M04 | 17 | 593350 | 4703070 | 1976 | 3 | 1 | B7 |
| TRUE | 2.443 | A 110402 | HALDIMAND | SIMCOE | PT 2-3 | 14 | 40I16 | 17 | 555125 | 4744505 | 1975 | 1 | 1 | A6 |
| TRUE | 9.681 | A 110504 | HALDIMAND | SIMCOE | 11 | 7 | 40I16 | 17 | 548120 | 4735900 | 1974 | 7 | 31 | A6 |

# MINISTRY OF ENVIRONMENT WASTE DISPOSAL SITE INVENTORY, JUNE 1991
## REGIONAL INVENTORY OF CLOSED WASTE DISPOSAL SITES
## REGION: WEST CENTRAL

**SITE EASTING** 555,555 m E
**SITE NORTHING** 4,742,100 m N

| SITES < 10 Km | DISTANCE AWAY FROM SITE (km) | SITE NO | COUNTY | MUNICIPALITY | LOT OR STREET NO | CONCESSION | NTS | UTM COORDINATES ZONE | EAST | NORTH | DATE CLOSED YEAR | MONTH | DAY | CLASS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TRUE | 2.143 | A 110507 | HALDIMAND | DELHI | PT 4 N | 14 | 40I15 | 17 | 554250 | 4743800 | 1971 | 5 | 15 | A6 |
| | 16.966 | A 110508 | HALDIMAND | DELHI | PT 12 N | 4 | 40I15 | 17 | 545700 | 4755910 | 1971 | 5 | 15 | A6 |
| | 24.057 | A 110603 | HALDIMAND | DELHI | 20 | STR | 40I15 | 17 | 531850 | 4738000 | 1973 | 9 | 30 | A6 |
| | 34.881 | A 110608 | HALDIMAND | NORFOLK | 1 | 6 | 40I10 | 17 | 532275 | 4716125 | 1971 | 9 | 15 | A6 |
| | 36.908 | A 110609 | HALDIMAND | NORFOLK | PT 16 | W NORTH | 40I10 | 17 | 523590 | 4723650 | 1971 | 9 | 15 | A6 |
| TRUE | 2.345 | X 0001 | HALDIMAND | SIMCOE | 2 | 14 | 40I16 | 17 | 555050 | 4744390 | 1974 | * | * | A4 |
| TRUE | 1.060 | X 0004 | HALDIMAND | SIMCOE | 18 | 5 | 40I16 | 17 | 556490 | 4742600 | 1950 | * | * | B7 |
| | 14.972 | X 0006 | HALDIMAND | DELHI | 3 | 11 | 40I16 | 17 | 541100 | 4738200 | * | * | * | B8 |
| TRUE | 9.525 | X 0007 | HALDIMAND | DELHI | 11 | 7 | 40I16 | 17 | 547850 | 4736500 | * | * | * | B8 |
| TRUE | 4.077 | X 0008 | HALDIMAND | DELHI | 20 | 7 | 40I16 | 17 | 552650 | 4739240 | * | * | * | B8 |
| TRUE | 9.449 | X 0009 | HALDIMAND | DELHI | 2 | 8 | 40I16 | 17 | 553750 | 4751375 | * | * | * | B8 |
| | 15.087 | X 0010 | HALDIMAND | DELHI | 21 | 10 | 40I16 | 17 | 542050 | 4748825 | 1968 | * | * | B8 |
| | 14.605 | X 0011 | HALDIMAND | DELHI | 22 | 10 | 40I16 | 17 | 541900 | 4747280 | 1945 | * | * | B8 |
| | 15.070 | X 0012 | HALDIMAND | DELHI | 47 | 1 | 40I15 | 17 | 540740 | 4744860 | 1951 | * | * | A7 |
| | 14.868 | X 0013 | HALDIMAND | DELHI | 44 | 2 | 40I15 | 17 | 540700 | 4742725 | 1955 | * | * | B8 |
| | 24.213 | X 0014 | HALDIMAND | DELHI | 18 | 1 | 40I10 | 17 | 535925 | 4727925 | 1957 | * | * | B8 |
| | 26.309 | X 0015 | HALDIMAND | NORFOLK | 19-20 | 2 | 40I15 | 17 | 529250 | 4741650 | 1974 | * | * | B7 |
| | 26.309 | X 0016 | HALDIMAND | NORFOLK | 11 | 9 | 40I15 | 17 | 529250 | 4741650 | 1967 | * | * | NP |
| | 36.183 | X 0017 | HALDIMAND | NORFOLK | 1 | 6 | 40I10 | 17 | 526270 | 4720850 | 1971 | * | * | B6 |
| | 39.464 | X 0018 | HALDIMAND | NORFOLK | 6; W. of North Rd. | | 40I10 | 17 | 523450 | 4719150 | 1971 | * | * | B6 |
| | 33.049 | X 0019 | HALDIMAND | NORFOLK | 5 | 7 | 40I10 | 17 | 531200 | 4719760 | * | * | * | B8 |
| | 34.181 | X 0020 | HALDIMAND | HALDIMAND | 46-47 | 1 | 30L13 | 17 | 586875 | 4755790 | 1968 | * | * | B8 |
| | 59.308 | X 0021 | HALDIMAND | DUNNVILLE | 4 | 1 | 30L13 | 17 | 614175 | 4751110 | 1971 | * | * | B7 |
| | 58.130 | X 0024 | HALDIMAND | DUNNVILLE | IMC Ltd. | | 30L13 | 17 | 613000 | 4751000 | * | * | * | A6 |
| | 58.130 | X 0025 | HALDIMAND | DUNNVILLE | ERCO Industries | | 30L13 | 17 | 613000 | 4751000 | * | * | * | A6 |
| TRUE | 1.060 | X 8001 | HAIDIMAND | SIMCOE | Windham & Queen | | 40I16 | 17 | 556490 | 4742600 | 1958 | * | * | A7 |
| TRUE | 1.880 | X 8002 | HALDIMAND | SIMCOE | 34, 37, 39 | | 40I16 | 17 | 555525 | 4743980 | 1954 | * | * | A7 |
| TRUE | 1.060 | X 8003 | HALDIMAND | SIMCOE | 4 | 14 | 40I16 | 17 | 556490 | 4742600 | * | * | * | A7 |
| TRUE | 1.060 | X 8004 | HALDIMAND | SIMCOE | Windham & Talbot | | 40I16 | 17 | 556490 | 4742600 | 1920 | * | * | A7 |
| TRUE | 1.060 | X 8005 | HALDIMAND | SIMCOE | 19 | 14 | 40I16 | 17 | 556490 | 4742600 | 1945 | * | * | B8 |
| | 11.342 | X 8006 | HALDIMAND | NANTICOKE | 4 | 7 | 40I16 | 17 | 555325 | 4753440 | 1968 | * | * | NP |
| TRUE | 7.339 | X 8007 | HALDIMAND | NANTICOKE | 5 | 1 | 40I16 | 17 | 560610 | 4736780 | 1968 | * | * | B8 |
| | 20.401 | X 8008 | HALDIMAND | NANTICOKE | 6 | 2 | 40I16 | 17 | 575940 | 4741300 | 1955 | * | * | A7 |
| | 23.860 | X 8009 | HALDIMAND | NANTICOKE | 13 | 4 | 40I16 | 17 | 579275 | 4744680 | 1970 | * | * | A7 |
| | 24.969 | X 8010 | HALDIMAND | NANTICOKE | 4 | 1 | 40I16 | 17 | 580490 | 4740800 | 1965 | * | * | B8 |
| | 28.286 | X 8011 | HALDIMAND | NANTICOKE | 19 | 2 | 40I16 | 17 | 583840 | 4742375 | * | * | * | B8 |
| | 11.822 | X 8012 | HALDIMAND | NANTICOKE | 14 | 1 | 40I16 | 17 | 566770 | 4738360 | 1958 | * | * | NP |
| | 21.721 | X 8013 | HALDIMAND | NANTICOKE | 1 | 8 | 40I16 | 17 | 554850 | 4763810 | 1972 | * | * | NP |
| | 58.130 | X 8014 | HALDIMAND | DUNNVILLE | 6 | 2 | 30L13 | 17 | 613000 | 4751000 | 1943 | * | * | B8 |
| | 58.130 | X 8015 | HALDIMAND | DUNNVILLE | 6 | 2 | 30L13 | 17 | 613000 | 4751000 | 1945 | * | * | B8 |
| | 39.819 | X 8016 | HALDIMAND | HALDIMAND | Ouse St. | | 30L14 | 17 | 592990 | 4755670 | * | * | * | A7 |
| | 40.398 | X 8017 | HALDIMAND | HALDIMAND | Princess St. | | 30L13 | 17 | 593620 | 4755630 | * | * | * | A7 |
| | 40.794 | X 8018 | HALDIMAND | HALDIMAND | Domtar Caledonia | | 30M04 | 17 | 585400 | 4769910 | * | * | * | A7 |
| | 21.265 | X 8019 | HALDIMAND | NANTICOKE | 7-9 | 1 | 30L13 | 17 | 576760 | 4740500 | * | * | * | NP |
| | 65.602 | A 130102 | HAMILTON-W | HAMILTON | PT 19-20 | 1-2 | 30M04 | 17 | 603720 | 4786640 | 1975 | 4 | 1 | A5 |
| | 63.263 | A 130103 | HAMILTOW-W | HAMILTON | 3, 4, 8 | 7 | 30M04 | 17 | 508290 | 4784150 | 1980 | 10 | * | A1 |
| | 64.878 | A 130104 | HAMILTOW-W | HAMILTON | 29 BF | 1 | 30M05 | 17 | 599800 | 4789550 | 1975 | 4 | 1 | A7 |
| | 54.943 | A 130202 | HAMILTON-W | HAMILTON | 35 | 3 | 30M05 | 17 | 582000 | 4790260 | 1982 | 10 | 15 | A3 |
| | 58.149 | A 130301 | HAMILTON-W | DUNDAS | PT 19-20 | 1 | 30M05 | 17 | 586150 | 4791550 | 1976 | 12 | 1 | A5 |
| | 64.582 | A 130401 | HAMILTON-W | STONEY CREEK | PT 12 NW | 5 | 30M04 | 17 | 605650 | 4782860 | 1978 | 11 | 1 | A4 |
| | 70.680 | A 130502 | HAMILTON-W | FLAMBOROUGH | 22 | 6 | 30M05 | 17 | 583550 | 4807000 | 1979 | 12 | 31 | A4 |
| | 66.747 | A 130503 | HAMILTON-W | FLAMBOROUGH | PT 2 | 9 | 40P08 | 17 | 575650 | 4805750 | 1975 | 6 | 30 | A6 |
| | 69.465 | A 130504 | HAMILTON-W | FLAMBOROUGH | 2 | 6 | 30M05 | 17 | 587450 | 4803810 | 1978 | 6 | 1 | A6 |
| | 49.813 | A 130602 | HAMILTON-W | GLANBROOK | PT 5, BLOCK 4 | 4 | 30M04 | 17 | 588740 | 4779250 | 1980 | 7 | 7 | A4 |
| | 47.011 | A 130603 | HAMILTON-W | GLANBROOK | 6 | 6 | 30M04 | 17 | 587890 | 4776225 | 1980 | 7 | 15 | A4 |
| | 59.214 | X 0027 | HAMILTOW-W | HAMILTON | King opposite Basilica | | 30M05 | 17 | 589950 | 4790300 | 1927 | * | * | A7 |

# MINISTRY OF ENVIRONMENT WASTE DISPOSAL SITE INVENTORY, JUNE 1991
## REGIONAL INVENTORY OF CLOSED WASTE DISPOSAL SITES
## REGION: WEST CENTRAL

**SITE EASTING** 555,555 m E
**SITE NORTHING** 4,742,100 m N

| SITES < 10 Km | DISTANCE AWAY FROM SITE (km) | SITE NO | COUNTY | MUNICIPALITY | LOT OR STREET NO | CONCESSION | NTS | UTM COORDINATES ZONE | EAST | NORTH | DATE CLOSED YEAR | MONTH | DAY | CLASS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 58.910 | X 0028 | HAMILTON-W | HAMILTON | Hill St. yard | | 30M05 | 17 | 590160 | 4789775 | 1929 | * | * | A7 |
| | 58.534 | X 0029 | HAMILTON-W | HAMILTON | Chatham near THB | | 30M05 | 17 | 589725 | 4789625 | 1930 | * | * | A7 |
| | 59.440 | X 0030 | HAMILTON-W | HAMILTON | King & C.P.R. | | 30M05 | 17 | 589975 | 4790560 | 1948 | * | * | A7 |
| | 59.642 | X 0031 | HAMILTON-W | HAMILTON | Chedoke & Hearnes | | 30M05 | 17 | 589950 | 4790825 | 1974 | * | * | A4 |
| | 61.976 | X 0032 | HAMILTON-W | HAMILTON | Eastwood Park | | 30M05 | 17 | 592875 | 4791580 | 1922 | * | * | A7 |
| | 62.026 | X 0033 | HAMILTOW-W | HAMILTON | Burlington St. | | 30M05 | 17 | 593520 | 4791150 | 1940 | * | * | A7 |
| | 62.365 | X 0034 | HAMILTON-W | HAMILTON | Burlington & Birch | | 30M05 | 17 | 594450 | 4790850 | 1942 | * | * | A7 |
| | 62.889 | X 0035 | HAMILTON-W | HAMILTON | Burlington & Depew | | 30M05 | 17 | 595950 | 4790300 | 1945 | * | * | A7 |
| | 63.412 | X 0036 | HAMILTON-W | HAMILTON | Burlington & Kenilworth | | 30M05 | 17 | 597050 | 4790050 | 1948 | * | * | A7 |
| | 61.607 | X 0040 | HAMILTOW-W | HAMILTON | King & Pottruff | | 30M04 | 17 | 598625 | 4786150 | 1965 | * | * | B7 |
| | 59.255 | X 0041 | HAMILTON-W | HAMILTON | Main & Dundurn | | 30M05 | 17 | 590160 | 4790200 | 1948 | * | * | A7 |
| | 50.543 | X 8022 | HAMILTON-W | ANCASTER | 40 | 2 | 30M04 | 17 | 581460 | 4785500 | 1952 | * | * | A7 |
| | 57.495 | X 8023 | HAMILTOM-W | DUNDAS | 19 | 1 | 30M05 | 17 | 585875 | 4790950 | 1966 | * | * | B7 |
| | 60.731 | X 8024 | HAMILTOM-W | STONEY CREEK | 26 | 5 | 30M04 | 17 | 599825 | 4783675 | 1957 | * | * | B8 |
| | 67.319 | X 8025 | HAMILTON-W | FLAMBOROUGH | 1-2 | 10 | 40P08 | 17 | 575000 | 4806550 | 1962 | * | * | B8 |
| | 56.709 | X 8026 | HAMILTON-W | DUNDAS | Olympic Dr. W. | | 30M05 | 17 | 584610 | 4790800 | 1973 | * | * | B5 |
| | 57.296 | X 8028 | HAMILTON-W | DUNDAS | King St. E. | | 30M05 | 17 | 585700 | 4790825 | 1952 | * | * | B7 |
| | 57.223 | X 8029 | HAMILTON-W | FLAMBOROUGH | 12-13 | 5 | 40P08 | 17 | 570450 | 4797350 | * | * | * | B8 |
| | 65.000 | X 8030 | HAMILTON-W | FLAMBOROUGH | 12 | 6 | 30M05 | 17 | 584600 | 4800250 | 1977 | * | * | B8 |
| | 45.365 | X 8031 | HAMILTON-W | GLANBROOK | 26-28 | 9 | 30M04 | 17 | 586200 | 4775550 | * | * | * | A8 |
| | 50.284 | X 8032 | HAMILTON-W | GLANBROOK | 6 | 6 | 30M04 | 17 | 594750 | 4773600 | * | * | * | B8 |
| | 58.292 | X 8033 | HAMILTON-W | DUNDAS | near York Rd. & Ravina Dr. | | 30M05 | 17 | 586500 | 4791500 | * | * | * | B8 |
| | 60.288 | X 8034 | HAMILTOW-W | HAMILTON | near Shaeffe & Bay Sts. | | 30M05 | 17 | 591500 | 4790500 | * | * | * | A7 |
| | 92.022 | A 120101 | NIAGARA | ST. CATHARINES | 21-22 | 9 | 30M03 | 17 | 641220 | 4775710 | 1980 | 11 | 1 | A3 |
| | 96.405 | A 120102 | NIAGARA | ST. CATHARINES | Clifford's Creek | | 30M03 | 17 | 644800 | 4778560 | 1974 | 11 | 15 | A4 |
| | 96.635 | A 120103 | NIAGARA | ST. CATHARINES | PT 12 (Carter Creek) | 7 | 30M03 | 17 | 644680 | 4779450 | 1974 | 12 | 1 | A7 |
| | 98.988 | A 120107 | NIAGARA | ST. CATHARINES | 36 Cushman Rd. | | 30M03 | 17 | 646375 | 4781475 | 1979 | 3 | 14 | B1 |
| | 103.364 | A 120202 | NIAGARA | NIAGARA FALLS | PT 4, 17; in city of Niagara Falls | | 30M03 | 17 | 652540 | 4777850 | 1975 | 1 | 28 | A5 |
| | 87.917 | A 120301 | NIAGARA | PORT COLBORNE | 27 | 1 | 30L14 | 17 | 643250 | 4748350 | 1986 | 8 | 28 | A1 |
| | 90.230 | A 120307 | NIAGARA | PORT COLBORNE | 22-23 | 2 | 30L14 | 17 | 645350 | 4750950 | 1979 | 1 | 1 | A4 |
| | 92.004 | A 120308 | NIAGARA | PORT COLBORNE | PT 18 S | 3 | 30L14 | 17 | 646875 | 4753300 | 1979 | 10 | 26 | A5 |
| | 91.697 | A 120405 | NIAGARA | WELLAND | 18 | 7 | 30L14 | 17 | 645700 | 4758900 | 1982 | 1 | 20 | A4 |
| | 84.850 | A 120703 | NIAGARA | LINCOLN | PT 23 | 7 | 30M04 | 17 | 621160 | 4795910 | 1974 | 8 | 15 | B5 |
| | 78.407 | A 120704 | NIAGARA | LINCOLN | PT 14 | 3 | 30M03 | 17 | 624110 | 4780150 | 1972 | 12 | 31 | B5 |
| | 102.040 | A 120801 | NIAGARA | NIAGARA-ON-THE-LAKE | 182; in town of Niagara-on-the-Lake | | 30M03 | 17 | 650275 | 4780050 | 1976 | 1 | 1 | A6 |
| | 98.837 | A 121001 | NIAGARA | THOROLD | PT 43-45 & 231A | R.P. 11 | 30M03 | 17 | 648190 | 4776560 | 1982 | 11 | 1 | A3 |
| | 95.606 | A 121008 | NIAGARA | THOROLD | Beaverdams Rd. | | 30M03 | 17 | 645540 | 4774400 | * | * | * | A2 |
| | 64.511 | A 121202 | NIAGARA | LINCOLN, WEST | PT 2 | 3 | 30M04 | 17 | 616000 | 4764640 | 1982 | 4 | 1 | A4 |
| | 72.686 | A 121203 | NIAGARA | LINCOLN, WEST | 3 | A | 30M04 | 17 | 620420 | 4774900 | 1979 | 2 | 14 | A4 |
| | 70.969 | A 121204 | NIAGARA | LINCOLN, WEST | PT 6 | 9 | 30M04 | 17 | 619200 | 4773500 | 1985 | 4 | 16 | B5 |
| | 97.173 | X 0042 | NIAGARA | THOROLD | John St. & David St. | | 30M03 | 17 | 646325 | 4776790 | 1958 | * | * | NP |
| | 96.856 | X 0043 | NIAGARA | THOROLD | Towpath & Albert | | 30M03 | 17 | 646300 | 4775960 | 1959 | * | * | A7 |
| | 96.878 | X 0044 | NIAGARA | THOROLD | Beaver Dams Park | | 30M03 | 17 | 646410 | 4775725 | 1959 | * | * | A7 |
| | 94.184 | X 0045 | NIAGARA | ST. CATHARINES | Henley Is. & Main | | 30M03 | 17 | 640250 | 4783300 | 1965 | * | * | NP |
| | 95.130 | X 0046 | NIAGARA | ST. CATHARINES | Lakeport Rd. | | 30M03 | 17 | 640800 | 4784325 | 1970 | * | * | NP |
| | 94.803 | X 0047 | NIAGARA | ST. CATHARINES | Ontario St. | | 30M03 | 17 | 640925 | 4783325 | 1970 | * | * | A7 |
| | 95.261 | X 0048 | NIAGARA | ST. CATHARINES | Linwell near Friar | | 30M03 | 17 | 641625 | 4782925 | 1960 | * | * | A7 |
| | 95.825 | X 0049 | NIAGARA | ST. CATHARINES | Westgate Park Dr. | | 30M03 | 17 | 641350 | 4784780 | 1960 | * | * | A7 |
| | 94.057 | X 0050 | NIAGARA | ST. CATHARINES | Henrietta St. | | 30M03 | 17 | 642125 | 4778875 | 1940 | * | * | A7 |
| | 96.213 | X 0051 | NIAGARA | ST. CATHARINES | Glendale & Mountain | | 30M03 | 17 | 645050 | 4777420 | 1960 | * | * | NP |
| | 95.856 | X 0053 | NIAGARA | ST. CATHARINES | Argyle Cres. | | 30M03 | 17 | 643600 | 4780000 | 1940 | * | * | NP |
| | 96.375 | X 0054 | NIAGARA | ST. CATHARINES | Oakdale & Disher | | 30M03 | 17 | 644700 | 4778725 | 1972 | * | * | A4 |
| | 96.060 | X 0055 | NIAGARA | ST. CATHARINES | Longford & Kilkenny | | 30M03 | 17 | 641800 | 4784400 | 1966 | * | * | A7 |
| | 111.030 | X 0056 | NIAGARA | NIAGARA-ON-THE-LAKE | William & Nassau | | 30M03 | 17 | 655225 | 4791025 | 1920 | * | * | NP |
| | 110.223 | X 0057 | NIAGARA | NIAGARA-ON-THE-LAKE | Lakeshore Rd. | | 30M03 | 17 | 654350 | 4790975 | 1970 | * | * | A7 |
| | 85.100 | X 0058 | NIAGARA | LINCOLN | 17 | 7 | 30M03 | 17 | 633425 | 4776425 | 1971 | * | * | B5 |

# MINISTRY OF ENVIRONMENT WASTE DISPOSAL SITE INVENTORY, JUNE 1991
## REGIONAL INVENTORY OF CLOSED WASTE DISPOSAL SITES
## REGION: WEST CENTRAL

**SITE EASTING** 555,555 m E
**SITE NORTHING** 4,742,100 m N

| SITES < 10 Km | DISTANCE AWAY FROM SITE (km) | SITE NO | COUNTY | MUNICIPALITY | LOT OR STREET NO | CONCESSION | NTS | UTM COORDINATES ZONE | EAST | NORTH | DATE CLOSED YEAR | MONTH | DAY | CLASS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 85.256 | X 0059 | NIAGARA | LINCOLN | 16 | 5 | 30M03 | 17 | 633160 | 4777400 | * | * | * | B5 |
| | 77.023 | X 0060 | NIAGARA | LINCOLN | 23 | 1 | 30M04 | 17 | 621225 | 4782350 | 1955 | * | * | B8 |
| | 71.286 | X 0061 | NIAGARA | LINCOLN, WEST | 6 | 9 | 30M04 | 17 | 619380 | 4773850 | 1970 | * | * | B5 |
| | 74.314 | X 0062 | NIAGARA | GRIMSBY | Christie & Olive | | 30M04 | 17 | 617050 | 4783825 | 1946 | * | * | A7 |
| | 73.553 | X 0063 | NIAGARA | GRIMSBY | Livingston & Nelles | | 30M04 | 17 | 616350 | 4783500 | 1960 | * | * | A7 |
| | 72.481 | X 0064 | NIAGARA | GRIMSBY | end of Casablanca | | 30M04 | 17 | 614050 | 4784900 | 1942 | * | * | NP |
| | 99.005 | X 0065 | NIAGARA | ST. CATHARINES | G. M. Ontario St. | | 30M03 | 17 | 646400 | 4781460 | * | * | * | B7 |
| | 88.795 | X 0066 | NIAGARA | PORT COLBORNE | Inco Davis St. E. | | 30L14 | 17 | 644070 | 4749150 | * | * | * | B7 |
| | 89.849 | X 0067 | NIAGARA | WELLAND | Atlas Steels | | 30L14 | 17 | 643500 | 4760500 | * | * | * | B2 |
| | 89.849 | X 0068 | NIAGARA | WELLAND | Stelco | | 30L14 | 17 | 643500 | 4760500 | 1972 | * | * | B2 |
| | 86.528 | X 8035 | NIAGARA | WELLAND | 24 | 7 | 30L14 | 17 | 640600 | 4758050 | 1945 | * | * | A7 |
| | 103.878 | X 8036 | NIAGARA | NIAGARA FALLS | Valley Way Rd. | | 30M03 | 17 | 654900 | 4772450 | 1958 | * | * | A7 |
| | 103.470 | X 8037 | NIAGARA | NIAGARA FALLS | McLeod Rd. | | 30M03 | 17 | 655150 | 4770150 | 1968 | * | * | A7 |
| | 106.359 | X 8038 | NIAGARA | NIAGARA FALLS | Victoria Ave. | | 30M03 | 17 | 656500 | 4775600 | 1962 | * | * | A7 |
| | 105.263 | X 8039 | NIAGARA | NIAGARA FALLS | Stanley & Elm | | 30M03 | 17 | 655900 | 4773900 | 1925 | * | * | NP |
| | 105.082 | X 8040 | NIAGARA | NIAGARA FALLS | Fairview Cemetery | | 30M03 | 17 | 655550 | 4774400 | 1925 | * | * | NP |
| | 88.795 | X 8041 | NIAGARA | PORT COLBORNE | Cement Rd. & Lakeshore Rd. | | 30L14 | 17 | 644070 | 4749150 | * | * | * | NP |
| | 98.585 | X 8042 | NIAGARA | PORT COLBORNE | 1 | 1 | 30L14 | 17 | 653850 | 4749650 | 1973 | * | * | NP |
| | 104.878 | X 8043 | NIAGARA | NIAGARA FALLS | 7 | 2 | 30M03 | 17 | 658450 | 4762400 | 1970 | * | * | A4 |
| | 97.715 | X 8044 | NIAGARA | PORT COLBORNE | 9-10 | 3 | 30L14 | 17 | 650750 | 4764150 | 1970 | * | * | B8 |
| | 91.443 | X 8045 | NIAGARA | PORT COLBORNE | 23 | 3 | 30L14 | 17 | 646300 | 4753375 | 1970 | * | * | NP |
| | 97.410 | X 8048 | NIAGARA | PORT COLBORNE | 4 | 1 | 30L14 | 17 | 652700 | 4749275 | * | * | * | NP |
| | 105.030 | X 8049 | NIAGARA | FORT ERIE | Winger Rd. | | 30L14 | 17 | 659900 | 4754075 | 1979 | * | * | B5 |
| | 113.353 | X 8050 | NIAGARA | FORT ERIE | Thompson Rd. | | 30L15 | 17 | 668225 | 4754525 | 1960 | * | * | B8 |
| | 97.032 | X 8052 | NIAGARA | THOROLD | Ontario Paper | | 30M03 | 17 | 647150 | 4774125 | * | * | * | B2 |
| | 74.904 | X 8053 | NIAGARA | GRIMSBY | Elizabeth Ave. | | 30M04 | 17 | 617525 | 4784175 | 1963 | * | * | A7 |
| | 73.329 | X 8054 | NIAGARA | GRIMSBY | 2 | 5 | 30M04 | 17 | 618850 | 4779125 | 1956 | * | * | B8 |
| | 74.173 | X 8055 | NIAGARA | GRIMSBY | Robinson St. | | 30M04 | 17 | 617350 | 4783125 | 1960 | * | * | NP |
| | 97.507 | X 8058 | NIAGARA | NIAGARA FALLS | E. of R.R. #70 & Welland Line | | 30M03 | 17 | 649400 | 4768570 | * | * | * | B8 |
| | 114.618 | X 8119 | NIAGARA | FORT ERIE | Fleet Industries | | 30L15 | 17 | 669500 | 4754500 | * | * | * | A7 |
| | 61.551 | A 140101 | WATERLOO | CAMBRIDGE | PT 1 | 2 | 40P08 | 17 | 555940 | 4803650 | 1975 | 3 | 24 | A1 |
| | 65.452 | A 140102 | WATERLOO | CAMBRIDGE | PT 9 | 2 | 40P08 | 17 | 554280 | 4807540 | 1975 | 1 | 28 | A5 |
| | 64.778 | A 140103 | WATERLOO | CAMBRIDGE | 7 | 1 | 40P08 | 17 | 553650 | 4806850 | 1976 | 1 | 15 | A5 |
| | 64.848 | A 140202 | WATERLOO | KITCHENER | 3, 5, 48 | PLAN 10 | 40P08 | 17 | 543150 | 4805750 | 1979 | 12 | 31 | A1 |
| | 83.972 | A 140502 | WATERLOO | WELLESLEY | 12 | 7 | 40P10 | 17 | 520490 | 4818400 | 1979 | 2 | 22 | A6 |
| | 72.548 | A 140702 | WATERLOO | WOOLWICH | PT 87 N1/2; in German Co. tr | | 40P08 | 17 | 552310 | 4814575 | 1976 | 8 | 16 | A5 |
| | 80.849 | X 0082 | WATERLOO | WELLESLEY | 10 | 4 | 40P07 | 17 | 521550 | 4815450 | 1964 | * | * | B8 |
| | 74.057 | X 0083 | WATERLOO | WATERLOO | University Ave. & Hwy 85 | | 40P08 | 17 | 540450 | 4814600 | 1964 | * | * | B7 |
| | 74.449 | X 0084 | WATERLOO | WATERLOO | University Ave. E. of Hwy 85 | | 40P07 | 17 | 539400 | 4814775 | 1957 | * | * | B7 |
| | 72.362 | X 0085 | WATERLOO | WATERLOO | Caroline & Erb St. | | 40P07 | 17 | 538100 | 4812325 | 1945 | * | * | NP |
| | 73.177 | X 0086 | WATERLOO | WATERLOO | Lincoln Rd. | | 40P07 | 17 | 539525 | 4813500 | 1964 | * | * | NP |
| | 71.473 | X 0087 | WATERLOO | WATERLOO | Esson & John | | 40P07 | 17 | 538775 | 4811575 | 1900 | * | * | NP |
| | 72.805 | X 0088 | WATERLOO | WATERLOO | Seagram Dr. | | 40P07 | 17 | 537675 | 4812675 | 1961 | * | * | A7 |
| | 73.401 | X 0089 | WATERLOO | WATERLOO | Weber & Lodge | | 40P07 | 17 | 538850 | 4813575 | 1961 | * | * | A7 |
| | 71.616 | X 0090 | WATERLOO | KITCHENER | Guelph & Walker | | 40P07 | 17 | 540425 | 4812100 | * | * | * | NP |
| | 71.267 | X 0091 | WATERLOO | KITCHENER | Herbert & Pine | | 40P07 | 17 | 539675 | 4811575 | * | * | * | NP |
| | 70.386 | X 0093 | WATERLOO | KITCHENER | Westmount & Brandon | | 40P07 | 17 | 538750 | 4810450 | * | * | * | NP |
| | 70.340 | X 0094 | WATERLOO | KITCHENER | Westwood & Fernwood | | 40P07 | 17 | 537850 | 4810175 | * | * | * | A7 |
| | 70.036 | X 0095 | WATERLOO | KITCHENER | Brybeck Cres. | | 40P07 | 17 | 539100 | 4810175 | 1949 | * | * | A7 |
| | 71.731 | X 0096 | WATERLOO | KITCHENER | Guelph & Clifton | | 40P08 | 17 | 541800 | 4812500 | * | * | * | NP |
| | 69.913 | X 0097 | WATERLOO | KITCHENER | Hazelglen & Mooregate | | 40P07 | 17 | 538300 | 4809850 | 1949 | * | * | A7 |
| | 71.613 | X 0098 | WATERLOO | KITCHENER | Brunswick & Ahrens | | 40P08 | 17 | 540675 | 4812150 | * | * | * | NP |
| | 69.646 | X 0099 | WATERLOO | KITCHENER | Chopin & Rossford | | 40P07 | 17 | 538400 | 4809600 | 1949 | * | * | NP |
| | 61.825 | X 8070 | WATERLOO | CAMBRIDGE | Hespeler Rd. | | 40P08 | 17 | 555450 | 4803925 | 1973 | * | * | A4 |
| | 60.313 | X 8071 | WATERLOO | CAMBRIDGE | George St. Ext. | | 40P08 | 17 | 554300 | 4802400 | 1920 | * | * | NP |
| | 57.707 | X 8072 | WATERLOO | CAMBRIDGE | East St. | | 40P08 | 17 | 556425 | 4799800 | 1950 | * | * | NP |

# MINISTRY OF ENVIRONMENT WASTE DISPOSAL SITE INVENTORY, JUNE 1991
## REGIONAL INVENTORY OF CLOSED WASTE DISPOSAL SITES
## REGION: WEST CENTRAL

**SITE EASTING** 555,555 m E
**SITE NORTHING** 4,742,100 m N

| SITES < 10 Km | DISTANCE AWAY FROM SITE (km) | SITE NO | COUNTY | MUNICIPALITY | LOT OR STREET NO | CONCESSION | NTS | UTM COORDINATES ZONE | EAST | NORTH | DATE CLOSED YEAR | MONTH | DAY | CLASS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 56.675 | X 8073 | WATERLOO | CAMBRIDGE | Hwy. 24 & Myers | | 40P08 | 17 | 555350 | 4798775 | 1964 | * | * | NP |
| | 56.100 | X 8074 | WATERLOO | KITCHENER | Hwy. 24 | | 40P08 | 17 | 555375 | 4798200 | 1968 | * | * | NP |
| | 67.169 | X 8075 | WATERLOO | CAMBRIDGE | 9 & 10 | 4 | 40P08 | 17 | 557150 | 4809250 | 1940 | * | * | NP |
| | 63.937 | X 8076 | WATERLOO | CAMBRIDGE | Russ St. | | 40P08 | 17 | 552225 | 4805950 | 1968 | * | * | A7 |
| | 63.480 | X 8078 | WATERLOO | CAMBRIDGE | Rogers Dr. | | 40P08 | 17 | 551500 | 4805450 | 1960 | * | * | A7 |
| | 63.297 | X 8079 | WATERLOO | CAMBRIDGE | Margaret St. | | 40P08 | 17 | 552050 | 4805300 | * | * | * | NP |
| | 62.982 | X 8080 | WATERLOO | CAMBRIDGE | Lawrence St. | | 40P08 | 17 | 552350 | 4805000 | * | * | * | A7 |
| | 65.665 | X 8081 | WATERLOO | CAMBRIDGE | Beaverdale Rd. | | 40P08 | 17 | 554150 | 4807750 | 1973 | * | * | A7 |
| | 68.701 | X 8082 | WATERLOO | KITCHENER | Lorne Cr. | | 40P08 | 17 | 540925 | 4809225 | * | * | * | A7 |
| | 68.399 | X 8084 | WATERLOO | KITCHENER | Mausser Park | | 40P08 | 17 | 540850 | 4808900 | * | * | * | NP |
| | 69.882 | X 8085 | WATERLOO | KITCHENER | Victoria St. | | 40P07 | 17 | 539875 | 4810200 | * | * | * | A7 |
| | 69.024 | X 8086 | WATERLOO | KITCHENER | Kent Ave. | | 40P08 | 17 | 542100 | 4809800 | * | * | * | A7 |
| | 68.931 | X 8087 | WATERLOO | KITCHENER | Hurst Ave. | | 40P08 | 17 | 542075 | 4809700 | * | * | * | A7 |
| | 68.960 | X 8088 | WATERLOO | KITCHENER | Palmer Ave. | | 40P08 | 17 | 541925 | 4809700 | * | * | * | A7 |
| | 68.545 | X 8089 | WATERLOO | KITCHENER | Queens Blvd. | | 40P07 | 17 | 539550 | 4808750 | * | * | * | A7 |
| | 68.604 | X 8090 | WATERLOO | KITCHENER | Queenmount Public School | | 40P07 | 17 | 539300 | 4808750 | * | * | * | A7 |
| | 67.394 | X 8091 | WATERLOO | KITCHENER | Kinzie Ave. | | 40P08 | 17 | 545400 | 4808725 | * | * | * | NP |
| | 68.527 | X 8092 | WATERLOO | KITCHENER | Coral Cres. | | 40P08 | 17 | 540600 | 4808975 | * | * | * | NP |
| | 68.706 | X 8093 | WATERLOO | KITCHENER | Glen Rd. | | 40P07 | 17 | 540450 | 4809125 | * | * | * | A7 |
| | 67.321 | X 8094 | WATERLOO | KITCHENER | Jansen Ave. | | 40P08 | 17 | 545900 | 4808725 | * | * | * | A7 |
| | 69.791 | X 8095 | WATERLOO | KITCHENER | Karn St. | | 40P07 | 17 | 538600 | 4809800 | * | * | * | A7 |
| | 69.573 | X 8096 | WATERLOO | KITCHENER | Weichel St. | | 40P07 | 17 | 538900 | 4809650 | * | * | * | A7 |
| | 86.466 | X 8097 | WATERLOO | WOOLWICH | First St. | | 40P10 | 17 | 536325 | 4826400 | * | * | * | A7 |
| | 73.426 | A 140105 | WELLINGTON | GUELPH | 3 | 2 DIV B | 40P08 | 17 | 557510 | 4815500 | 1977 | 1 | 20 | A1 |
| | 90.811 | A 170107 | WELLINGTON | GUELPH | Eastview Rd. | | 40P09 | 17 | 519048 | 4825250 | * | * | * | A7 |
| | 130.191 | A 170401 | WELLINGTON | MOUNT FOREST | 3 | 12 | 40P15 | 17 | 519940 | 4867325 | 1970 | * | * | A7 |
| | 112.676 | A 170601 | WELLINGTON | ARTHUR | Preston St. | | 40P15 | 17 | 536050 | 4853075 | 1970 | * | * | A7 |
| | 105.907 | A 171002 | WELLINGTON | ERIN | March & Hwy. 24 | | 40P16 | 17 | 575300 | 4846150 | 1971 | * | * | NP |
| | 74.511 | A 171501 | WELLINGTON | GUELPH | 2 | 2 DIV B | 40P09 | 17 | 558580 | 4816550 | 1975 | 5 | 5 | A4 |
| | 120.034 | A 171802 | WELLINGTON | MINTO | PT 21 Farm; in village of Minto | | 40P15 | 17 | 512380 | 4854100 | 1972 | 7 | 31 | A5 |
| | 120.080 | A 171802 | WELLINGTON | PALMERSTON | 21 | 1 | 40P15 | 17 | 512250 | 4854100 | 1971 | * | * | A7 |
| | 71.241 | A 175501 | WELLINGTON | PUSLINCH | 30 | 8 | 40P08 | 17 | 571540 | 4811525 | 1975 | 3 | 21 | B7 |
| | 66.536 | X 0100 | WELLINGTON | PUSLINCH | 5 | 2 | 40P08 | 17 | 559400 | 4808525 | 1972 | * | * | NP |
| | 88.649 | X 0102 | WELLINGTON | ERAMOSA | 5 | 5 | 40P09 | 17 | 569150 | 4829700 | 1964 | * | * | NP |
| | 103.735 | X 0103 | WELLINGTON | ERIN | 15 | 8 | 40P09 | 17 | 573900 | 4844200 | 1950 | * | * | NP |
| | 103.893 | X 0105 | WELLINGTON | GARAFRAXA, WEST | 20-21 | 6 | 40P16 | 17 | 548825 | 4845775 | 1967 | * | * | B8 |
| | 106.470 | X 0106 | WELLINGTON | DRAYTON | Mills St. | | 40P15 | 17 | 526400 | 4844500 | 1966 | * | * | NP |
| | 81.640 | X 8098 | WELLINGTON | GUELPH | Riverside Park | | 40P09 | 17 | 558800 | 4823675 | * | * | * | A7 |
| | 79.609 | X 8099 | WELLINGTON | GUELPH | Boult Ave. | | 40P09 | 17 | 562275 | 4821425 | * | * | * | A7 |
| | 78.433 | X 8100 | WELLINGTON | GUELPH | Wellington St. | | 40P09 | 17 | 560525 | 4820375 | * | * | * | A7 |
| | 77.430 | X 8101 | WELLINGTON | GUELPH | Wellington & Waterloo | | 40P09 | 17 | 560048 | 4819400 | * | * | * | A7 |
| | 96.569 | X 8104 | WELLINGTON | FERGUS | Beatty Line | | 40P09 | 17 | 549050 | 4838450 | 1970 | * | * | A1 |
| | 130.959 | X 8106 | WELLINGTON | MOUNT FOREST | Martin St. | | 40P15 | 17 | 520500 | 4868280 | 1970 | * | * | A7 |
| | 95.695 | X 8108 | WELLINGTON | ELORA | 19 | 13 | 40P09 | 17 | 545125 | 4837225 | 1970 | * | * | A7 |
| | 112.321 | X 8109 | WELLINGTON | MARYBOROUGH | 10 | 8 | 40P15 | 17 | 523500 | 4849750 | 1974 | * | * | NP |
| | 128.203 | X 8110 | WELLINGTON | HARRISTON | William St. | | 40P15 | 17 | 509800 | 4861860 | 1971 | * | * | A7 |

REGION TOTAL = 269

# MINISTRY OF ENVIRONMENT WASTE DISPOSAL SITE INVENTORY, JUNE 1991
## REGIONAL INVENTORY OF CLOSED WASTE DISPOSAL SITES
## REGION: WEST CENTRAL

**SITE EASTING** 555,555 m E
**SITE NORTHING** 4,742,100 m N

**********

| SITES < 10 Km | DISTANCE AWAY FROM SITE (km) | SITE NO | COUNTY | MUNICIPALITY | LOT OR STREET NO | CONCESSION | NTS | UTM COORDINATES ZONE | EAST | NORTH | DATE CLOSED YEAR/MONTH/DAY | CLASS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

LIST OF ALL CLOSED WASTE DISPOSAL SITES
THAT ARE LISTED IN THE 1988 INVENTORY
BUT NOT IN THE 1990 INVENTORY

| SITE NUMBER | REASON |
|---|---|
| A100107 | TRANSFER STATION |
| A100202 | TRANSFER STATION |
| X8113 | NO LONGER A SITE |
| X8114 | NO LONGER A SITE |
| X8117 | NO LONGER A SITE |
| A110207 | NEVER WAS A SITE |
| A130403 | NOT INCLUDED IN THE 1988 INVENTORY |
| X0037 | NO LONGER A SITE |
| X0038 | NEVER WAS A SITE |
| X0039 | NEVER WAS A SITE |
| X8027 | NEVER WAS A SITE |
| A120108 | TRANSFER STATION |
| A120109 | TRANSFER STATION |
| A120208 | TRANSFER STATION |
| A120209 | TRANSFER STATION |
| A120309 | TRANSFER STATION |
| A120706 | TRANSFER STATION |
| A120707 | CANCELLED |
| A120805 | SAME AS A20801 |
| A121006 | NOT INCLUDED IN THE 1988 INVENTORY |
| A121009 | TRANSFER STATION |
| X0052 | NEVER WAS A SITE |
| X8046 | NEVER WAS A SITE |
| X8047 | NEVER WAS A SITE |
| X8051 | NIAGARA REGION INVESTIGATED THIS LOCATION AND FOUND NO WASTE |
| X8056 | NO LONGER A SITE |
| X8110 | CHANGED FROM WILLOW ST. TO WILLIAM ST. |
| X8057 | NO LONGER A SITE |
| X8157 | NO LONGER A SITE |
| X0092 | TRANSFER STATION |
| X0101 | NO LONGER A SITE |
| X0104 | SAME AS A171002 |
| X8102 | NO LONGER A SITE |
| X8103 | NO LONGER A SITE |
| X8105 | NO LONGER A SITE |
| X8107 | NO LONGER A SITE |
| X8118 | TRANSFER STATION |

LIST OF ALL CLOSED WASTE DISPOSAL SITES
THAT ARE LISTED IN THE 1990 INVENTORY
BUT NOT IN THE 1988 INVENTORY

| SITE NUMBER | REASON |
|---|---|
| A100101 | ACTIVE SITE IN 1988 |
| A121008 | ACTIVE SITE IN 1988 |
| A140105 | ACTIVE SITE IN 1988 |
| A170107 | NOT INCLUDED IN 1988 INVENTORY |
| A170401 | NOT INCLUDED IN 1988 INVENTORY |
| A170601 | NOT INCLUDED IN 1988 INVENTORY |
| A171002 | NOT INCLUDED IN 1988 INVENTORY |
| A171802 | NOT INCLUDED IN 1988 INVENTORY |

**SITE LOCATION:** Lot 18 Gore, Simcoe

**SITE EASTING:** 555,555 mE
**SITE NORTHING:** 4,742,100 mN

**MINISTRY OF ENVIRONMENT**
**INVENTORY OF COAL GASIFICATION PLANT WASTE SITES IN ONTARIO**
**INVENTORY OF INDUSTRIAL SITES PRODUCING OR USING COAL TAR AND RELATED TARS IN ONTARIO**
**WEST CENTRAL**

| SITES < 5 KM | DISTANCE AWAY FROM SITE | COUNTY | MUNICIPALITY | COMPANY NAME / OPERATOR / OWNER (IN DATE ORDER WHERE APPLICABLE) | SITE ADDRESS / LOCATION | EAST | NORTH | OPERATION YEARS | TYPE (primary/inital) | INVENTORY REFERENCE |
|---|---|---|---|---|---|---|---|---|---|---|
| | 34.7 | BRANT | BRANTFORD | Brantford Gas. Co. | East Ave (bounded by Alfred, Newport, and Colborne Sts) | 560380 | 4776460 | 1860-1911 | Coal gas | Waste |
| | 35.5 | BRANT | BRANTFORD | Brantford Roofing Co. | 22 Sydenham St. | 559272 | 4777397 | 1906-1950s | Roofing felt/tarred paper | Industrial |
| | 57.2 | HAMILTON | DUNDAS (HAMILTON) | Dundas Gas Light Co., Wentworth Gas Co. | 43 Cootes Dr (east side of Thorpe and King St E) | 585523 | 4790859 | 1863-1909 | Distribution | Waste |
| | 60.5 | HAMILTON | HAMILTON | United Gas and Fuel Co. Of Hamilton Ltd. (Hamilton By-Product Coke Oven) | N and S of Mulberry St. (between Bay St North & Park St. N) | 591624 | 4790633 | 1850-1925 | Retort coal | Waste |
| | 63.5 | HAMILTON | HAMILTON | Hamilton Gas Light Co., United Gas and Fuel Co. of Hamilton Ltd. | Hamilton By-Product Coke Ovens (Burlington St, Industrial Dr & Depew St) | 596250 | 4790790 | 1924-1958 | Coke oven gas | Waste |
| | 61.9 | HAMILTON | HAMILTON | Currie Products | 350 Wentworth St N | 593936 | 4790632 | 1978-Present | Coal tar distillation | Industrial |
| | 60.5 | HAMILTON | HAMILTON | Dominion Tar and Ammonia, Hamilton Tar & Ammonia, Hamilton Tar Products, Currie Products | East side Caroline between Mulberry & Sheaffe Sts. | 591624 | 4790633 | 1901-1977 | Coal tar distillation | Industrial |
| | 64.6 | HAMILTON | HAMILTON | Dominion Tar & Chemical, Domtar Chemicals | 725 Strathearne Ave | 598112 | 4790697 | 1950s-Present | Coal tar distillation | Industrial |
| | 62.4 | HAMILTON | HAMILTON | Building Products Ltd / Bird and Son Division | 70 Beach Rd. at Gage | 595166 | 4790309 | 1910-1954 | Roofing felt/tarred paper | Industrial |
| | 64.8 | HAMILTON | HAMILTON | Dominion Foundries and Steel, Dofasco | North of Burlington E between Kenilworth N. & Ottawa N. Wilcox St. | 597109 | 4791871 | 1951-Present | By-product/iron & steel | Industrial |
| | 64.0 | HAMILTON | HAMILTON | Steel Company of Canada (Stelco) | Wilcox Street | 595214 | 4792332 | 1918-Present | By-product/iron & steel | Industrial |
| | 95.8 | NIAGARA | ST. CATHARINES | St. Catharines and Welland Canal Gas Light Co., St. Catharines Gas Co. Ltd. | S of Gale Crescent, at bottom of Calvin St | 643376 | 4780253 | 1853-1928 | Retort coal | Waste |
| | 106.0 | NIAGARA | NIAGARA FALLS | American Cyanamid Co (Fertilizer Works) | North end of Fourth Avenue | 656175 | 4775290 | 1916-1920 | Industrial gas | Industrial |
| TRUE | 1.8 | HALDIMAND | SIMCOE | Simcoe Gas and Water Co. Ltd, Dominion Natural Gas Co. Ltd | SE corner of Pond and Water Sts. | 557191 | 4742802 | 1891-1910 | Coal gas | Waste |
| | 19.5 | HALDIMAND | NANTICOKE | Steel Company of Canada (Stelco) | Regional Rd 3 and Lake Erie | 574771 | 4738808 | 1981-Present | By-product/iron & steel | Industrial |
| | 59.5 | WATERLOO | CAMBRIDGE (GALT) | Galt Gas Light Co. | 140 North Water St (bounded by Grand River and opposite Simcoe St) | 555414 | 4801607 | 1887-1911 | Retort gas | Waste |
| | 70.3 | WATERLOO | KITCHENER | Berlin Gas Company, Berlin PUC | Gaukel St. (bounded by Joseph and Charles Sts) | 540949 | 4810895 | 1882-1958 | Retort gas | Waste |
| | 72.3 | WATERLOO | WATERLOO | Waterloo Gas Company, Waterloo Gas Department, Waterloo PUC | E. side of Regina St (W side of William St, S of Laurel Creek) | 538820 | 4812387 | 1889-1957 | Coal carbonization | Waste |
| | 63.8 | WATERLOO | CAMBRIDGE (PRESTON) | Pattinson Woolen Mill | 498 Eagle 5t. N. | 552030 | 4805845 | 1870s-1890s | Industrial gas | Industrial |
| | 79.5 | WELLINGTON | GUELPH | Guelph Gas Company, Guelph Light and Heat Commission | 118-124 Fountain St. (N.W. corner of Fountain & Wyndham Sts) | 560963 | 4821385 | 1871-1957 | Water gas | Waste |

**MINISTRY OF ENVIRONMENT**
**ONTARIO INVENTORY OF PCB STORAGE SITES**
**REGION: WEST CENTRAL**

**SITE LOCATION:**

**SITE EASTING:** **555,555** **mE**
**SITE NORTHING:** **4,742,100** **mN**

| SITES < 5 KM | DISTANCE AWAY FROM SITE | COUNTY | MUNICIPALITY | COMPANY | SITE NUMBER | SITE ADDRESS | EAST | NORTH | MINOR | MAJOR |
|---|---|---|---|---|---|---|---|---|---|---|
| | 13.26 | NORFOLK | DELHI | Delhi Hydro Electric Commission | 20193A022 | Industrial Dr. | 542462 | 4744206 | X | |
| | 14.13 | NORFOLK | DELHI | Delhi Industries Inc. | 20194A023 | 523 James St. | 541562 | 4744062 | X | |
| | 14.95 | NORFOLK | DELHI | McLaughlin Brothers (Formerly Granadex) | 20195A029 | 252 Power Street | 540724 | 4743985 | | |
| | 22.54 | NORFOLK | NANTICOKE | Ontario Clean Water Agency | 20192A045 | Lot 6, Conc. 1 | 577970 | 4739752 | | X |
| | 22.20 | NORFOLK | NANTICOKE | Ontario Hydro Nanticoke TGS | 20483A112 | Nanticoke Thermal GS | 577533 | 4738989 | | X |
| | 18.67 | NORFOLK | NANTICOKE | Stelco Inc. | 20484A107 | Lake Erie Works | 574005 | 4739245 | X | |
| TRUE | 2.47 | NORFOLK | SIMCOE | Alcatel Canada Wire | 20192A008 | 19-20 Gilbertson Dr. | 556941 | 4744143 | X | |
| TRUE | 2.15 | NORFOLK | SIMCOE | Canvil LDTD | 20194A007 | 390 Second Ave. | 555655 | 4744249 | X | |
| TRUE | 1.98 | NORFOLK | SIMCOE | Simcoe Sewage Treatment Plant | 20488A307 | 16 Oakwood Ave. | 557537 | 4742101 | X | |
| TRUE | 2.83 | NORFOLK | SIMCOE | Norfolk Co-operative Co. Ltd. | 20193A039 | 10 Davis St. | 556687 | 4744697 | X | |
| TRUE | 3.13 | NORFOLK | SIMCOE | Ontario Hydro | 20488A277 | 4 Boswell St. | 558660 | 4742486 | | X |
| | 13.26 | NORFOLK | SIMCOE | Simcoe Hydro Electric Comm. | 20191A006 | Rear of 16 Oakwood Ave. | 542462 | 4744206 | | X |
| TRUE | 2.15 | NORFOLK | SIMCOE | Simcoe Leaf Tobacco | 20192A035 | 401 Second Ave. | 555637 | 4744248 | X | |
| | 10.77 | NORFOLK | WATERFORD | Nanticoke Hydro Electric Commission | 20192A026 | Pt. Lot 7, Conc. 9 | 557909 | 4752607 | X | |
| TRUE | 2.64 | NORFOLK | SIMCOE | HALDIMAND-NORFOLK CATHOLIC SCHOC | 20194A005 | 55 PARK ROAD | 554541 | 4744538 | | |

:

:

Your search resulted in 1 page(s), 2 notice(s), **you may refine your search.**

**Save Criteria**

| Add | EBR Registry Number | Ministry Reference Number | Title or Proponent | Type | Published Date |
|---|---|---|---|---|---|
| ☐ | 012-0006 | 2056-9B3NBC | Napoleon Systems & Developments Ltd. (*OWRA s. 34*) - *Permit to take water* | Instrument Decision | October 21, 2013 |
| ☐ | 010-0854 | 24-34-OP-0165-024 | Municipality of West Elgin, (*Planning Act s17(34)&s21*) - *Approval of an Official Plan Amendment* | Instrument Decision | September 12, 2007 |

1

Add selected notices into My Watch List

Please select notices and click on add button for each individual page of results.

Search Criteria & Filters

| | |
|---|---|
| Text to search: | With **all** the Words: lot 18 gore<br>With the **Exact Phrase**:<br>With **at Least One** of the Words: |
| Keywords: | Abatement, Aggregates, Agriculture, Air, Aquifers, Brownfields, Compliance, Conservation, Drinking Water, Electricity, Environment Assessment, Fish and Wildlife, Forests, Fuel, Greenbelt, Ground Water, Health, Land, Land use planning, Legislation, Mining, Monitoring, Nutrient Management, Parks, Pesticides, Protected Areas, Sewage, Standard, Timber Management, Waste, Waste Diversion, Wastewater, Water, Wells, Zoning |
| Ministry: | Ministry of Agriculture, Food and Rural Affairs, Ministry of Consumer and Commercial Relations, Ministry of Culture, Ministry of Economic Development and Trade, Ministry of Education, Ministry of Energy, Ministry of Government Services, Ministry of Health and Long-Term Care, Ministry of Infrastructure, Ministry of Labour, Ministry of Municipal Affairs and Housing, Ministry of Natural Resources, Ministry of Northern Development and Mines, Ministry of Tourism and Recreation, Ministry of Transportation, Ministry of the Environment, Technical Standards and Safety Authority (Ministry of Consumer and Business services) |
| Notice Type: | All Notice Types |
| Notice Status: | All Statuses |
| Act: | Aggregate Resources Act, R.S.O. 1990(ARA), Conservation Authorities Act, R.S.O. 1990(CAA), Crown Forest Sustainability Act, 1994(CFSA), Clean Water Act, 2006, S.O. 2006, c. 22 (CWA), Environmental Assessment Act, R.S.O. 1990(EAA), Environmental Bill of Rights, 1993(EBR), Energy Efficiency Act, R.S.O. 1990(EEA), Environmental Protection Act, R.S.O. 1990(EPA), Endangered Species Act , R.S.O. 1990(ESA), Food Safety and Quality Act, 2001(FSQA), Fish and Wildlife Conservation Act, 1997(Formerly the Game and Fish Act)(FWCA), Green Energy Act, 2009(GEA), Lakes and Rivers Improvement Act, R.S.O. 1990(LRI), Lake Simcoe Protection Act, 2008(LSPA), Mining Act, R.S.O. 1990(MIA), Niagara Escarpment Planning and Development Act, R.S.O. 1990(NEPD), Nutrient Management Act, 2002(NMA), Ontario Energy Board Act, 1998(OEBA), Oil, Gas and Salt Resources Act, R.S.O. 1990(OGSR), Ontario Heritage Act, R.S.O. 1990(OHA), Oak Ridges Moraine Conservation Act, 2001(ORMCA), Ontario Water Resources Act, R.S.O. 1990(OWRA), Pesticides Act, R.S.O. 1990(PA), Public Lands Act, R.S.O. 1990(PLA), Planning Act, R.S.O. 1990(PLAN), Provincial Parks Act, R.S.O. 1990(PPA), Safe Drinking Water Act, 2002(SDWA), Sustainable Water and Sewage Systems Act, 2002(SWSS), Toxics Reduction Act, 2009(TRA), Technical Standards & Safety Act, 2000(TSSA), Waste Diversion Act, 2002(WDA), Waste Management Act, 1992, S.O. 1992(WMA) |
| Instrument: | Add, rescind, or vary a condition of a licence(ARA s. 13 (2)), Requirement that a licensee amend site plan(ARA s. 16 (1)), Approval of licensee proposed amendment to a site plan(ARA s. 16 (2)), Revocation of a licence(ARA s. 20 (1)), Issuance of an aggregate permit to extract aggregate from private land under water(ARA s. 37), Grant relief from compliance(ARA s. 68 (1)), Issuance of a Class A licence to remove more than 20,000 tonnes of aggregate annually from a pit or a quarry(ARA s. 7 (2) (a)), Issuance of a Class B licence to remove 20,000 tonnes or less of aggregate annually from a pit or quarry(ARA s. 7 (2) (b)), Determination of natural edge of the Niagara Escarpment(ARA s. 72 (3)), Approval of sale, lease or other means of disposition of land by a Conservation Authority(CAA s. 21 (2)), Requirement that authority carry out flood control operations (CAA s. 23 (1) (a)), Requirement that authority follow Minister's instructions for the operation of one or more of authority's water control structures(CAA s. 23 (1) (b)), Take over operation of authority's water control structure(CAA s. 23 (1) (c)), Requirement that council of municipality carry out flood control operations in a specified manner(CAA s. 23 (2) (a), Requirement that council of municipality follow Minister's instructions for the operation of one or more water control structures operated by the council(CAA s. 23 (2) (b)), Take over operation of water control structure operated by council of municipality(CAA s. 23 (2) (c)), Environmental Compliance Approval (project type: waste)(EPA Part II.1), Environmental Compliance Approval (project type: air)(EPA Part II.1), Environmental Compliance Approval (project type: sewage)(EPA Part II.1), All minister's orders - Air Pollution Index(EPA reg. 346), All minister's orders - Lambton Cty. Industry Meteorological Alert(EPA reg. 350), Approval of an alteration to an air standard under the Environmental Protection Act(EPA reg. 419 (32)21), Approval of an alteration to an air standard (now called site-specific air standard)(EPA reg. 419 (35)1), Approval of a site-specific air standard(EPA reg. 419 (35)1), An order having regard to an approved altered air standard (EPA reg. 419 (35)14), Order to approve the alteration of a standard(EPA reg. 419 s.32(31.1)), Approval for registration in the “Technical Standards Registry – Air Pollution” (Industry Standard) (EPA reg. 419 s.39(3)), Approval for registration in the “Technical Standards Registry – Air Pollution” (Equipment Standard)(EPA reg. 419 s.39(4)), Approval of a program preventing,reducing, or controlling discharge(EPA s. 10), Order for performance of environmental measures.(EPA s. 136), Certificate of Property Use(EPA s. 168.6), Order for remedial work.(EPA s. 17), Order for preventative measures.(EPA s. |

18), Approval for a waste disposal site.(EPA s. 27), All emergency Certificates of Approval for a waste disposal site(EPA s. 31), Order for removal of waste and restoration of site(EPA s. 43), Order for conformity with Act for waste disposal sites. (EPA s. 44), Approval for use of a former waste disposal site.(EPA s. 46), Order for controlling contaminant discharge.(EPA s. 7), All director's stop orders(EPA s. 8(1)), Approval for discharge into the natural environment other than water (i.e. Air) (EPA s. 9), All minister's orders:Direction to Employees and Agents of Min. to restore environment after spill(EPA s. 94), All minister's orders - Spills(EPA s. 97), Approval for a renewable energy project(EPA s.47.3(1)), Stewardship agreement for the purpose of assisting in the protection or recovery of a species on the Species at Risk in Ontario List(ESA s. 16(1)), Permit for activities necessary for the protection of human health or safety(ESA s. 17(2) (a)), Permit for species protection or recovery(ESA s. 17(2) (b)), Permit for activities with conditions to achieve overall benefit to the species (ESA s.17(2) (c)), Permit for significant social or economic benefit to Ontario(ESA s.17(2) (d)), Issuance of authorization to release wildlife or invertebrates(FWCA s. 54 (1)), Issuance of an aquaculture licence where there is a higher risk of ecological impact(FWCA s.47 (1)), Liquid Fuels Handling Code Section(Liquid Fuels Handling Code), Order to repair or remove dam(LRIA s. 17 (1)), Order to rectify problem(LRIA s. 17 (2)), Order to do what Minister considers necessary to further purposes of Act(LRIA s. 17 (3)), Order to provide a fishway(LRIA s. 17 (4)), Order to clear or remove timber, slash or debris from flooded area(LRIA s. 18 (1)), Order to regulate use of lake or river or use and operation of dam(LRIA s. 22 (2)), Order to take steps to maintain, raise or lower water levels(LRIA s. 23 (1)), Order to take steps to remove refuse, substance or matter(LRIA s. 36 (2)), Order to cease discharge from a mill or to remove the refuse, sawdust, chemical, substance or matter(LRIA s. 38 (3)), Director acknowledges receipt of a closure plan for advanced exploration within 45 days after filing(Mining Act 140 (5)(a)), Approval to Rehabilitate 139(2) Any person may apply to the Director for approval to rehabilitate a mine hazard on Crown land or on any other prescribed land. 2007, c.7, Sched.22,s.1. (Mining Act s. 139 (2)), Director acknowledges receipts of a closure plan for (re)commencing mine production(Mining Act s. 141 (4)(a)), Order of specific rehabilitation measure required in a closure plan if it has/will not be done.(Mining Act s. 145 (2)), Permission to Test Mineral Content 52(1) No person shall mine, mill or refine more than the prescribed quantity of mineral bearing substance from an unpatented mining claim for the purpose of testing mineral content without first obtaining the Minister's written permission. 2009, c. 21, s.30. (Mining Act s. 52 (1)), Certified amendments as filed by a proponent or ordered by a Director(Mining Act s.143(2)), Director orders changes to a filed closure plan or to amendments to a filed plan(Mining Act s.143(3)), Director orders proponent to file a certified closure plan to rehabilitate a mine hazard(Mining Act s.147(1)), Director has crown or an agent enter lands to rehabilitate the site following notice(Mining Act s.147(2)), Minister orders rehabilitation of a hazard that may cause immediate and dangerous adverse effect(Mining Act s.148(2)), Minister directs employees and agents to do work to prevent, eliminate and ameliorate adverse effect(Mining Act s.148(5)), Minister alters or revokes a decision of the Mining and Lands Commissioner for other than a question of law(Mining Act s.152(11)), Director orders compliance with requirements of a closure plan or to rehabilitate to standards(Mining Act s.153.2(3)), Director has Crown do rehabilitation after non compliance with order per s. 153.2(3)(Mining Act s.153.2(4)(b)), Unpatented mining claim, occupation licence, lease or patent and when terms apply to environmental protection(Mining Act s.176(3)), Grant surrender of mining lands when the terms of the surrender apply to environmental protection(Mining Act s.183(1)), Consent to carry out surface mining within 150 feet of highway or road limits (Mining Act s.34), Proposal to sell or award surface rights necessary to carry on mining operations(Mining Act s.39(2)), Reinstatement of a licence of occupation when the terms apply to environmental protection(Mining Act s.41(4)), Disposition order for chattels, tailings, etc. on mining properties forfeited to the Crown(Mining Act s.53(1)), Application to issue an exploration permit under section 78.3 of the Mining Act.(Mining Act s.78(3)), Surface rights lease when required for mining purposes(Mining Act s.84(1)), Inclusion of reservations or provisions to a lease when they apply to environmental protection (Mining Act s.86(3)), Permission to cut and use trees on mining lands(Mining Act s.92(5)), Approval of an amendment to the Niagara Escarpment Plan(NEPDA s. 10 (11)), Declaration that a by-law, improvement or other development or undertaking of a municipality is deemed not to conflict with plan(NEPDA s. 13 (2)), Order amending local plan to make it conform to the Niagara Escarpment Plan(NEPDA s. 15 (2)), Grant of a permit to inject substance(OGSRA s. 13 (1)), Amend, suspend. add or revoke term, condition, duty or liability(OGSRA s. 13 (2)), Suspend or cancel permit(OGSRA s. 14 (1)), A proposal for the approval of a zoning by-law amendment to bring a municipality's by-laws into conformity with the Oak Ridges Moraine Conservation Plan(ORMCA 10 (8) (a)), Direction to abandon a well.(OWRA reg. 903, s. 21(5)), Order prohibiting or regulating discharge of sewage into water(OWRA s. 31), Order for preventative measures for facilities discharging into water (OWRA s. 32), Permit to take water(OWRA s. 34), Notice for regulating water diversion.(OWRA s. 34(7)), Order for direction for unapproved water works.(OWRA s. 52(3)), Direction for maintaining water works.(OWRA s. 52(6)), Approval for sewage works(OWRA s. 53(1)), Order for unapproved sewage works.(OWRA s. 53(3)), Direction for maintaining sewage works. (OWRA s. 61), Direction on a report respecting sewage works or water works for municipalities(OWRA s. 62(1)), Order designating public water or sewage service area(OWRA s. 74(2)), Direction for sewage disposal.(OWRA s. 91), Order to stop or regulate discharge of sewage into sewer works(OWRA s. 92), All emergency notices/orders.(PA s. 13(7)), All stop orders.(PA s. 27), Order for controlling the handling, storage, use and disposal (etc.) of pesticides(PA s. 28), All minister's orders to repair damage(PA s. 30), Classification, reclassification or declassification of a pesticide(Pesticides Act - Reg 63/09), Issuance of a permit to erect a building, structure or make an improvement(PLA s. 13 (1)), Designation of area as a zone(PLA ss. 12 (1)), Approval of an Official Plan(Planning Act s17 (34)), Approval of an Official Plan Amendment(Planning Act s17(34)&s21), Approval of a draft plan of subdivision (no Official Plan in place)(Planning Act s51(31)), Change conditions of draft plan of subdivision (no Official Plan)(Planning Act s51(44)), A proposal for provisional consent (no Official Plan in Place)(Planning Act s53(17)), Change of conditions to a provisional consent (no Official Plan)(Planning Act s53(23))

Sort Results:

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Sort by: Most recent Publish Date
Sort Descending

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Ontario

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Ontario

Ministry of the Environment

**Brownfields Environmental Site Registry**

**Location:** Ministry > Brownfields > Search by Location

# Search Records of Site Condition and Transition Notices by Location

*Important Notice June 27 2011* As of 11:59 pm on June 30, 2011, the Brownfields Environmental Site Registry will no longer be available for the filing of records of site condition under the 2004 Records of Site Condition Regulation. Record of site condition submissions must be complete in order for the Ministry to file and acknowledge them to the Brownfields Environmental Site Registry before July 1, 2011. If the Ministry receives a new RSC submission this week, there is a risk that the RSC will not be filed and acknowledged before July 1, 2011 if the submission is incomplete. The requirements for the submission and filing of records of site condition change on July 1, 2011 when the amendments to O. Reg. 153/04 come into force. QPs will be able to login to the new system through the same web portal at start of business on July 1, 2011. May 25, 2011 As we approach the month of June, indications are that the volume of filings may increase significantly. Experience also indicates that processing filings can take a significant amount of time if documentation is not clear, complete and accurate. Given these two factors which can affect processing times, the ministry strongly encourages qualified persons and owners who wish to have a RSC filed and acknowledged before July 1, 2011 to make such filings now or as soon as possible in order to maximize the chances that filing and acknowledgement can be complete before July 1, 2011. You are also encouraged to forward this message to any contacts, clients or members who may be affected by this deadline.

Please enter a location by specifying UTM or Latitude/Longitude coordinates and a distance from this location where the RSC/TRN sites may be found. To find the coordinates of a specific location you are interested in you can use the **Locate on Map** function - it will pop up a new window with a map and you will be able to select a specific location.

**Search by Location**

- No RSC/TRN matching the search criteria where found

| | | |
|---|---|---|
| ◉ **UTM Coordinates** | Map Datum | NAD83 |
| | Zone | 17 |
| | Easting | 555555 |
| | Northing | 4742100 |
| ○ **Latitude and Longitude** | Latitude | ° ' " N |
| | Longitude | ° ' " W |
| | Latitude | ° N |
| | Longitude | ° W |
| **Search Radius** | | 0.5 Km |

Search | Locate on Map | Clear

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ver. 1.3.0 May 1, 2008

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# Well Record Data

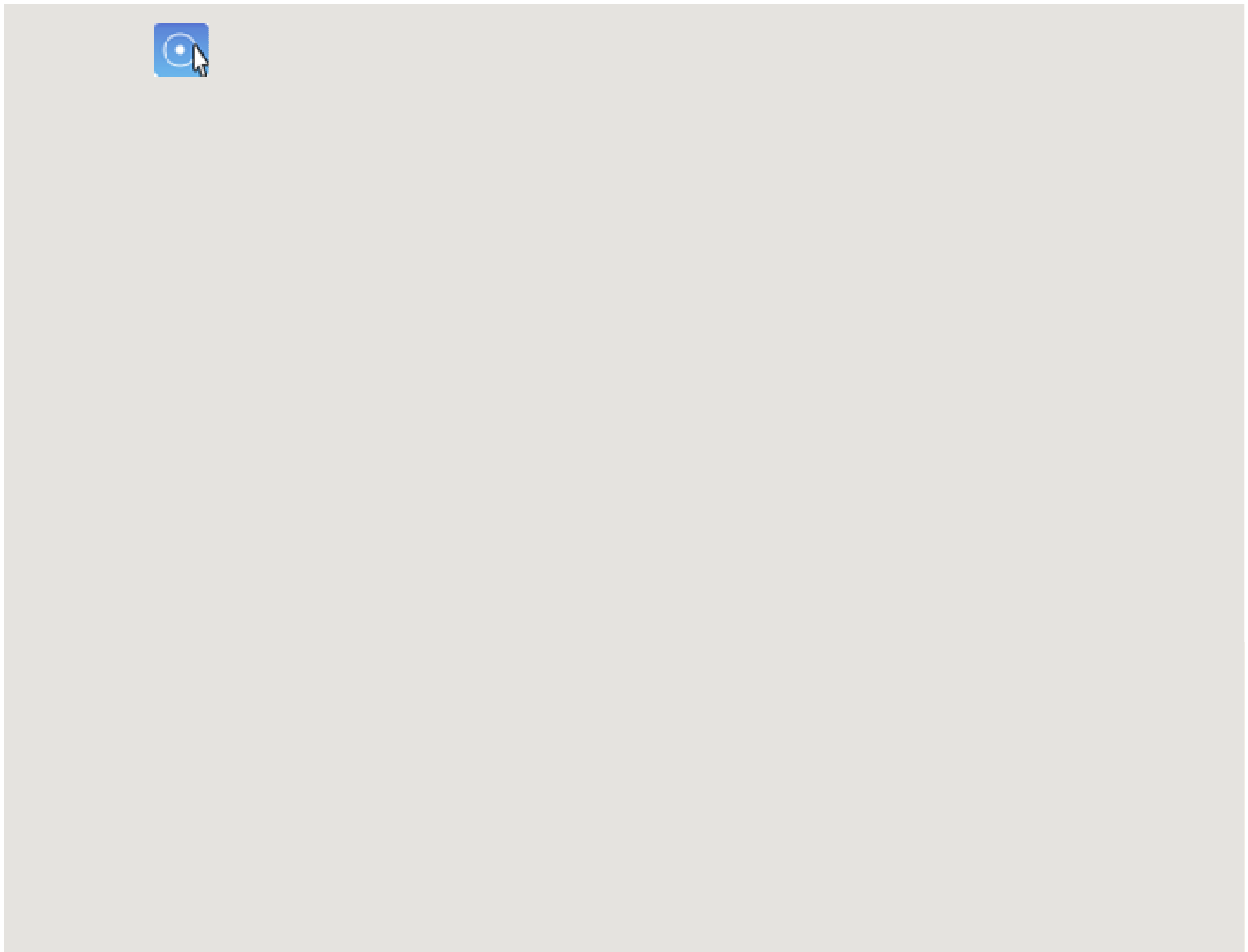
This interactive map allows you to search and view well record information from reported wells in Ontario.

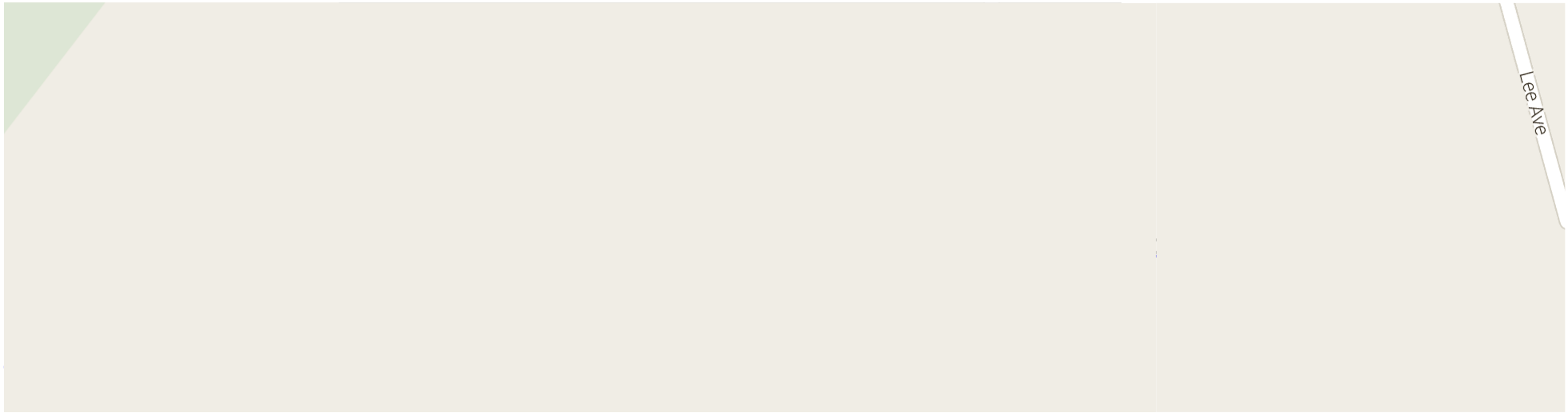
Full dataset is available on the MOE data download page ***(http://www.ene.gov.on.ca/environment/en/resources/collection/data_downloads/index.htm)*** .

Search interactive map

Search Current Map Display

Search **Address**, **Well Tag #**, **Well ID** or see help for advanced options.




Lee Ave

# Full Well Record Information

## Well ID

Well ID Number: 4401169
Well Audit Number:
Well Tag Number:

*This table contains information from the original well record and any subsequent updates.*

## Well Location

| | |
|---|---|
| **Township** | SIMCOE TOWN |
| **Lot** | |
| **Concession** | |
| **County/District/Municipality** | NORFOLK |
| **City/Town/Village** | |
| **Province** | ON |
| **Postal Code** | n/a |
| **UTM Coordinates** | NAD83 — Zone 17<br>Easting: 555799.10<br>Northing: 4742317.00 |
| **Municipal Plan and Sublot Number** | |
| **Other** | |

## Overburden and Bedrock Materials Interval

| General Colour | Most Common Material | Other Materials | General Description | Depth From | Depth To |
|---|---|---|---|---|---|
| YLLW | MSND | | | 0 ft | 6 ft |
| | GRVL | | | 6 ft | 10 ft |
| | FSND | | | 10 ft | 18 ft |

## 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 |
|---|---|
| Cable Tool | Domestic |

## Status of Well

Water Supply

## Construction Record - Casing

| Inside Diameter | Open Hole OR material | Depth From | Depth To |
|---|---|---|---|
| 1 inch | STEEL | | 16 ft |

## Construction Record - Screen

| Outside Diameter | Material | Depth From | Depth To |
|---|---|---|---|
| 1 inch | | | |

## Well Contractor and Well Technician Information

Well Contractor's Licence Number: 3310

## Results of Well Yield Testing

**After test of well yield, water was** CLEAR
**If pumping discontinued, give reason**

| | |
|---|---|
| **Pump intake set at** | |
| **Pumping Rate** | 4 GPM |
| **Duration of Pumping** | |
| **Final water level** | |
| **If flowing give rate** | |
| **Recommended pump depth** | |
| **Recommended pump rate** | |
| **Well Production** | PUMP |
| **Disinfected?** | |

### Draw Down & Recovery

| Draw Down Time (min) | Draw Down Water level | Recovery Time (min) | Recovery Water level |
|---|---|---|---|
| SWL | 11 ft | | |
| 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 |
|---|---|
| 11 ft | Fresh |

### Hole Diameter

| Depth From | Depth To | Diameter |
|---|---|---|

**Audit Number:**

**Date Well Completed:** November 18, 1955

**Date Well Record Received by MOE:** December 29, 1955

# Full Well Record Information

## Well ID

Well ID Number: 7101388
Well Audit Number: *Z67083*
Well Tag Number: *A060508*

*This table contains information from the original well record and any subsequent updates.*

## Well Location

38 VIRGINIA AVE

| | |
|---|---|
| **Township** | SIMCOE TOWN |
| **Lot** | |
| **Concession** | |
| **County/District/Municipality** | NORFOLK |
| **City/Town/Village** | SIMCOE |
| **Province** | ON |
| **Postal Code** | n/a |
| **UTM Coordinates** | NAD83 — Zone 17<br>Easting: 555309.00<br>Northing: 4742095.00 |
| **Municipal Plan and Sublot Number** | |
| **Other** | |

## Overburden and Bedrock Materials Interval

| General Colour | Most Common Material | Other Materials | General Description | Depth From | Depth To |
|---|---|---|---|---|---|
| BRWN | SAND | | | 0 m | 1.9 m |
| BRWN | CLAY | | | 1.9 m | 4.5 m |
| GREY | CLAY | | | 4.5 m | 6.5 m |
| BRWN | SAND | GRVL | HARD | 6.5 m | 16.7 m |
| BRWN | SAND | | CSND | 16.7 m | 21.3 m |

## Annular Space/Abandonment Sealing Record

| Depth From | Depth To | Type of Sealant Used (Material and Type) | Volume Placed |
|---|---|---|---|
| 0 m | 6 m | QUICKGROUT | |

## Method of Construction & Well Use

| Method of Construction | Well Use |
|---|---|
| Cable Tool | |

## Status of Well

Water Supply

## Construction Record - Casing

| Inside Diameter | Open Hole OR material | Depth From | Depth To |
|---|---|---|---|
| 13.1 cm | STEEL | | 19.5 m |

## Construction Record - Screen

| Outside Diameter | Material | Depth From | Depth To |
|---|---|---|---|
| | STEEL | | |

## Well Contractor and Well Technician Information

Well Contractor's Licence Number: 7356

## Results of Well Yield Testing

| | |
|---|---|
| **After test of well yield, water was** | CLEAR |
| **If pumping discontinued, give reason** | CLEAR |
| **Pump intake set at** | 18.8 m |
| **Pumping Rate** | 58 LPM |
| **Duration of Pumping** | 4 h:0 m |
| **Final water level** | 18 m |
| **If flowing give rate** | |
| **Recommended pump depth** | 18 m |
| **Recommended pump rate** | 58 LPM |
| **Well Production** | SUBMERGE |
| **Disinfected?** | Y |

## Draw Down & Recovery

| Draw Down Time (min) | Draw Down Water level | Recovery Time (min) | Recovery Water level |
|---|---|---|---|
| SWL | 16.7 m | | |
| 1 | 17.5 m | 1 | 17 m |
| 2 | 18 m | 2 | 16.7 m |
| 3 | 18 m | 3 | 16.7 m |
| 4 | 18 m | 4 | 16.7 m |
| 5 | 18 m | 5 | 16.7 m |
| 10 | 18 m | 10 | 16.7 m |
| 15 | 18 m | 15 | 16.7 m |
| 20 | 18 m | 20 | 16.7 m |
| 25 | 18 m | 25 | 16.7 m |
| 30 | 18 m | 30 | 16.7 m |
| 40 | 18 m | 40 | 16.7 m |
| 45 | | 45 | |
| 50 | 18 m | 50 | 16.7 m |
| 60 | 18 m | 60 | 16.7 m |

## Water Details

| Water Found at Depth | Kind |
|---|---|
| 16.7 m | Fresh |

## Hole Diameter

| Depth From | Depth To | Diameter |
|---|---|---|
| 21.3 m | | 13.9 cm |

**Audit Number:** Z67083

**Date Well Completed:** July 16, 2007

**Date Well Record Received by MOE:** January 30, 2008

# Full Well Record Information

## Well ID

Well ID Number: 4408530
Well Audit Number: *Z26997*
Well Tag Number: *A038160*

*This table contains information from the original well record and any subsequent updates.*

## Well Location

46 VIRGINIA AVE.

| | |
|---|---|
| **Township** | WOODHOUSE TOWNSHIP |
| **Lot** | |
| **Concession** | |
| **County/District/Municipality** | NORFOLK |
| **City/Town/Village** | SIMCOE |
| **Province** | ON |
| **Postal Code** | n/a |
| **UTM Coordinates** | NAD83 — Zone 17<br>Easting: 555299.00<br>Northing: 4742369.00 |
| **Municipal Plan and Sublot Number** | |
| **Other** | |

## Overburden and Bedrock Materials Interval

| General Colour | Most Common Material | Other Materials | General Description | Depth From | Depth To |
|---|---|---|---|---|---|
| BLCK | LOAM | | | 0 m | .62 m |
| BRWN | SAND | | | .62 m | 1.85 m |
| BRWN | CLAY | | | 1.85 m | 5.23 m |
| BLUE | CLAY | | | 5.23 m | 11.38 m |
| BRWN | SAND | GRVL | | 11.38 m | 17.54 m |
| BRWN | CSND | | | 17.54 m | 21.85 m |

## Annular Space/Abandonment Sealing Record

| Depth From | Depth To | Type of Sealant Used (Material and Type) | Volume Placed |
|---|---|---|---|
| 0 m | 6.15 m | QUICK GROUT | |

## Method of Construction & Well Use

| Method of Construction | Well Use |
|---|---|
| Cable Tool | Irrigation |

## Status of Well

Water Supply

## Construction Record - Casing

| Inside Diameter | Open Hole OR material | Depth From | Depth To |
|---|---|---|---|
| 12.7 cm | STEEL | 0 m | 19.38 m |

## Construction Record - Screen

| Outside Diameter | Material | Depth From | Depth To |
|---|---|---|---|
| 12.7 cm | STEEL | 19.38 m | 21.85 m |

## Well Contractor and Well Technician Information

Well Contractor's Licence Number: 7193

## Results of Well Yield Testing

| | |
|---|---|
| **After test of well yield, water was** | CLEAR |
| **If pumping discontinued, give reason** | |
| **Pump intake set at** | 21.54 m |
| **Pumping Rate** | 112.5 LPM |
| **Duration of Pumping** | 1 h:0 m |
| **Final water level** | 18.77 m |
| **If flowing give rate** | |
| **Recommended pump depth** | 21.54 m |
| **Recommended pump rate** | 112.5 LPM |
| **Well Production** | PUMP |
| **Disinfected?** | Y |

## Draw Down & Recovery

| Draw Down Time (min) | Draw Down Water level | Recovery Time (min) | Recovery Water level |
|---|---|---|---|
| SWL | 17.54 m | | |
| 1 | 18.15 m | 1 | 17.85 m |
| 2 | 18.77 m | 2 | 17.54 m |
| 3 | 18.77 m | 3 | 17.54 m |
| 4 | 18.77 m | 4 | 17.54 m |
| 5 | 18.77 m | 5 | 17.54 m |
| 10 | 18.77 m | 10 | 17.54 m |
| 15 | 18.77 m | 15 | 17.54 m |
| 20 | 18.77 m | 20 | 17.54 m |
| 25 | 18.77 m | 25 | 17.54 m |
| 30 | 18.77 m | 30 | 17.54 m |
| 40 | 18.77 m | 40 | 17.54 m |
| 45 | | 45 | |
| 50 | 18.77 m | 50 | 17.54 m |
| 60 | 18.77 m | 60 | 17.54 m |

## Water Details

| Water Found at Depth | Kind |
|---|---|
| 17.54 m | Fresh |

## Hole Diameter

| Depth From | Depth To | Diameter |
|---|---|---|
| 0 m | 6.15 m | 24.13 cm |

**Audit Number:** Z26997

**Date Well Completed:** June 07, 2006

**Date Well Record Received by MOE:** August 10, 2006

January 21, 2014

MTE Consultants Inc.
Attention: Jennifer Kato, C.Tech., B.A. (Hon.)
520 Bingemans Centre Drive,
Kitchener, Ontario N2B 3X9

**RE: Environmental Information Concerning Part Lot 18, Woodhouse Gore, presently in Norfolk County, currently owned by Westwood Trail Developments Inc., being Roll No. 331040201003502**

Dear Jennifer Kato:

In regards to the e-mail, dated January 21, 2014, the Norfolk County Public Works & Environmental Services department has reviewed the property referenced in the title of this letter and offers the following comments:

- to the best of our knowledge, the Environmental Services Division has not owned, operated or maintained a public waste disposal on the above-mentioned property, since January 1, 2001 when Norfolk County was formed until the present date

- an unsubstantiated report, which outlines waste disposal sites which were under the jurisdictions of former towns, townships, private and the Regional Municipality of Haldimand-Norfolk, does identify one former private disposal site within 1 km of the above mentioned property (Please refer to attached map and documents)

- to the best of our knowledge, Norfolk County is not presently monitoring or has not monitored the above-mentioned address since January 1, 2001, when Norfolk County was formed until the present date

- to the best of my knowledge, the former Norfolk Co-op property which was located on 150 Chapel Street, Stanley Street was remediated by the new owner which is within 1 kilometre of your site. Contact MOE for further information on this site. Otherwise, I am not aware of any spills reports on the above-mentioned property.

- to the best of our knowledge, Norfolk County, since January 1, 2001 has never sampled the effluent from the above-mentioned address

  The Ministry of the Environment's Permit to Take Water database does not identify all the private well sources in the Province of Ontario and as such there are private residences in the vicinity of the site relying on the surrounding groundwater for human consumption.

**Public Works & Environmental Services**
183 Main Street, Delhi, Ontario N4B 2W9
519-582-2100 Fax: 519-582-4571

- This property is within one kilometer of the Norfolk County's Two Wellhead Protection Areas 50 day, 2 year, and 10 year capture zones.

- In the near future, Norfolk County Source Protection Plans and Policies will be enacted and this property may require a risk management plan.

- It may be advisable to contact the MOE, West Central Branch in Hamilton. They may have some documentation on this property.

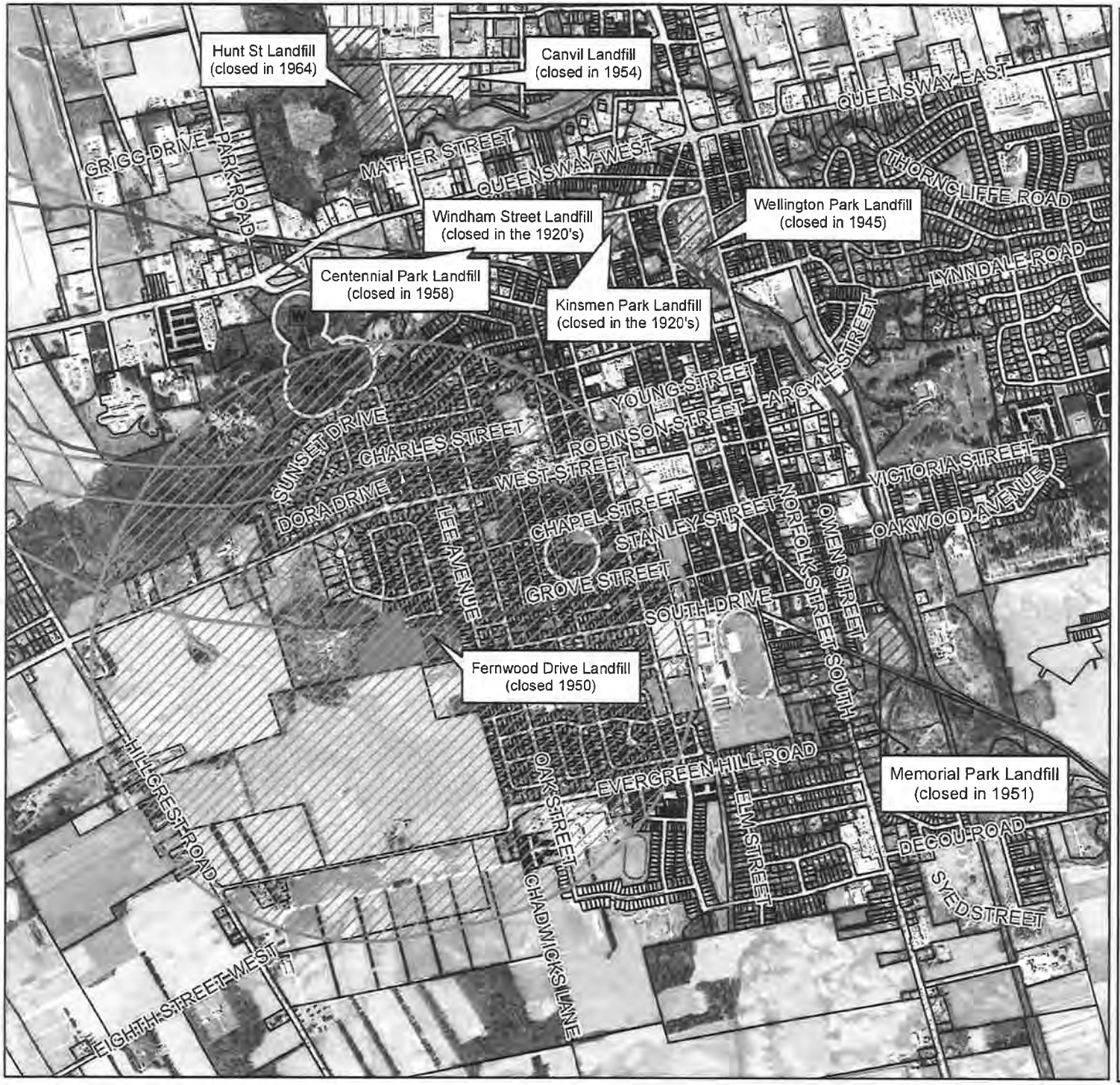
- It is Norfolk County's recommendation that should an environmental assessment be required, that the potable water standards identified in Ontario Regulation 153/04, as amended, be utilized in performing the Environmental Assessment for the property identified as Roll No. 331033104201003502, Woodhouse Gore Part Lot 18.

- If there are any questions or concerns please contact the undersigned. If no response is received by February 20th, 2014 Norfolk County will assume that. MTE Consultants Inc. is in agreement with our position.

**The present cost for processing an environmental request is $ 65.00. Therefore, please forward a cheque to Norfolk County, Public Works and Environmental Services, Attention Sheila VanGroningen 183 Main Street, Delhi, Ontario, N4B 2M3**

Sincerely,

Terrence H. Hall.
Environmental Services Technologist
Public Works & Environmental Services
Norfolk County
(519) 582-2100 ext 1504
terrence.hall@norfolkcounty.ca




# Westwood Trails
# Simcoe, Ontario

## LEGEND

- Property in Question
- 1 km Buffer around Property in Question
- Closed Landfill Sites

### WELLHEAD PROTECTION AREAS

- WHPA A
- WHPA B
- WHPA C
- WHPA D

N
W E
S

1:20,000

This plan has been produced by Norfolk County Environmental Services Division, January, 2014.

Ex. 10

Ontario

Ministry of the Environment

West Central Region

Centennial Plaza
140 Centennial Parkway North
Stoney Creek, Ontario L8E 3H2
Telephone: (416) 561-7410

February 18, 1981

RECEIVED
APR 28 2005
P.W. & E.S.

Mr. W. A. D. Smith
64 Berkley Crescent
Simcoe, Ontario

Dear Mr. Smith:

We have been informed that you are the current owner of property south of Thomson Road in the Town of Simcoe which formerly belonged to Canadian Canners Limited (see attached map). Part of this property had been used at one time as a waste disposal site.

As you may be aware, this Ministry initiated an investigation to locate old disposal sites as described in the report "Site Inventory Study, 1980" and followed this with preliminary field investigations of 197 sites selected on the basis of proximity of development and type of waste deposited.

You may have been informed of these studies prior to the consultant commencing his field activities, which included testing for the presence of gas and leachate and documenting any potential impacts arising from the production and migration of these contaminants.

I am attaching copies of the consultant's field work that was carried out on and/or near your property. In your case, no further action is required.

If you have any questions on this matter, please contact this office.

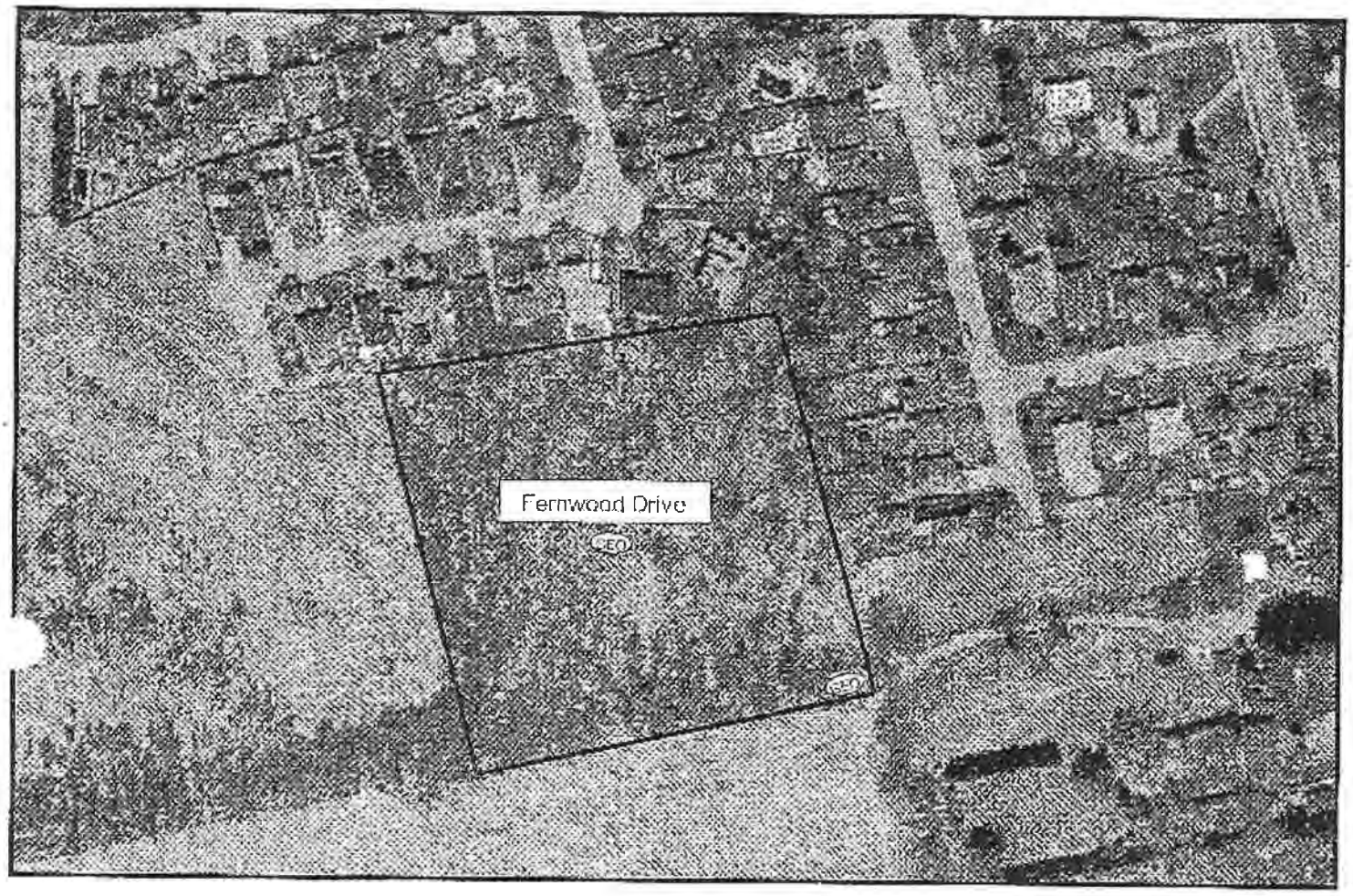
Yours truly,

G. H. Hicks, P. Eng.
District Officer
Municipal & Private Abatement

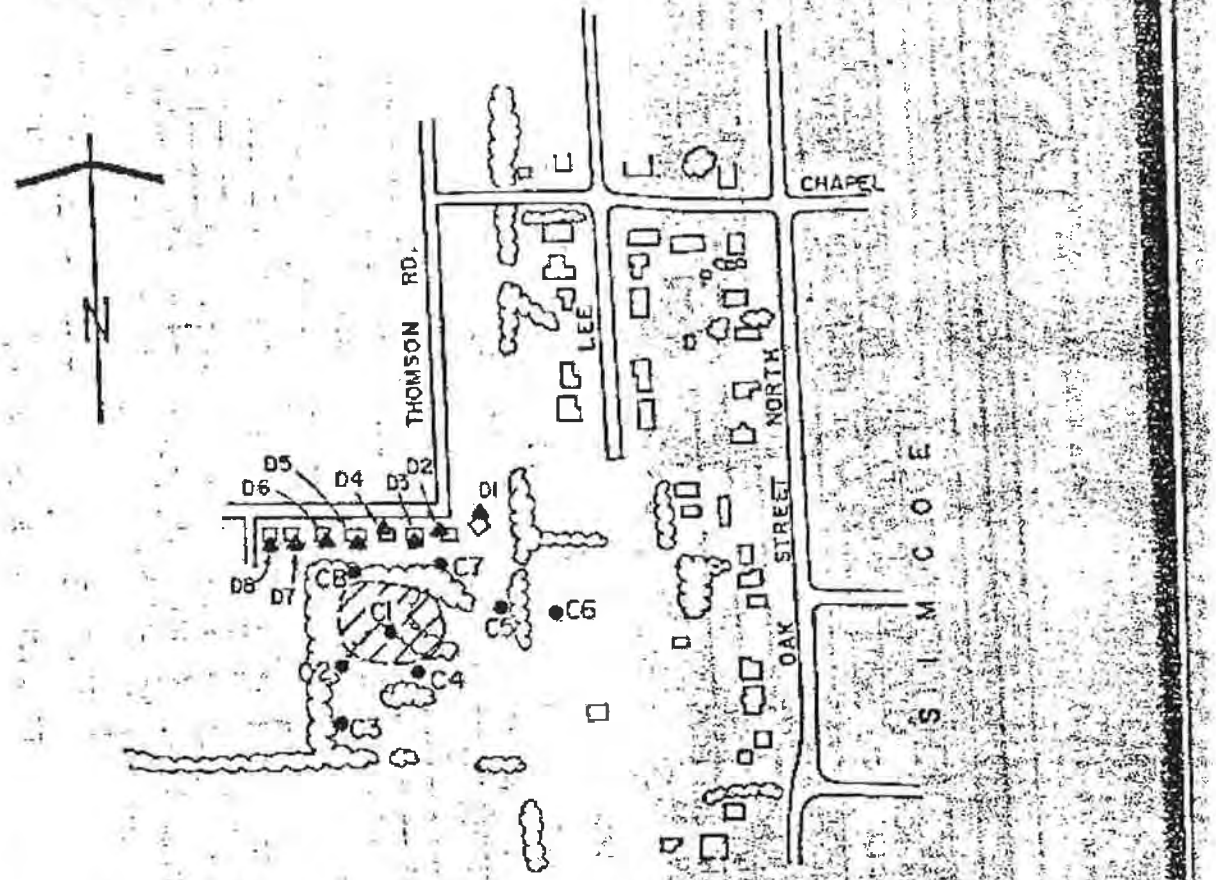
cc: Town of Simcoe, Attn: C. R. Campbell, Clerk
Regional Municipality of Haldimand-Norfolk,
Attn: Mrs. M. L. Johnston, Clerk

| | |
|---|---|
| Landfill Name | Fernwood Drive Landfill Site |
| Map Number | 4. |
| Assessment Number | 3310 402 010 048 00 |
| Former Township | Woodhouse |
| Location | Lot 18, Gore |
| Owner's Name | William Alexander Doug Smith |
| Owner's Mailing Address | 64 BERKLEY CRES<br>SIMCOE ON<br>N3Y 2K5 |
| Size of Property | 5.0 acres |
| Frontage | 448.8 feet |
| Depth | |
| Current Zoning | A - Agricultural Zone |
| Property Type | 100 - Vacant Residential Land Not On Water |
| Year Opened | |
| Year Closed | 1950 |
| Entry Point Co-ordinates | X-555780.5m Y-4742042.8m |
| Centre Landfill Co-ordinates | X-555687.0m Y-4742088.8m |
| Sheet Location | Sheet 1 Assessment Map Town of Simcoe (Woodhouse) |
| Usage | |
| Property Description | Believed that much of the waste at this site was removed in the 1940's. Former Canadian Canners dump site. |

# Fernwood Drive Landfill Site



# SITE 8005




LEGEND

- ●C1 Test hole locations
- ▲D1 Gas tests - buildings
- Suspected waste boundaries

SCALE 1:4800

# SITE 8005

THOMSON ROAD, SIMCOE

## CONCLUSIONS AND RECOMMENDATIONS

The field investigation identified a small area of waste south of Thomson Road. The refuse consisted of mainly tin and other metal and was relatively shallow, that is around 1.0 to 1.5 m deep, where investigated. Based on information supplied by others, most of the refuse was apparently removed during the early 1940's.

No combustible gas was detected in the refuse, the surrounding soils and the adjacent houses. As well leachate is not expected to be a problem at this site. Consequently, no further monitoring or investigations are recommended at this time.

(To be completed in duplicate, 1 copy to MOE Regional office, 1 copy

Ministry of the Environment
Ontario

# SITE INSPECTION

MOE REGION WEST CENTRAL DATE SEPTEMBER 22, 1980 SITE IDENTIFICATION CODE 8005

SITE CANADA CANNERS, THOMSON ROAD, SIMCOE
(Lot, concession #, or UTM coordinates, name, address)

## ON-SITE TESTS

### I Leachate

A. WATER BODIES WITHIN 100 METRES

| Parameter | Results 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1) Chlorides | | | | | | | | | | |
| 2) Dissolved solids | | | | | | | | | | |
| 3) Iron | | | | | | | | | | |
| 4) Alkalinity | | | | | | | | | | |
| 5) Conductivity | | | | | | | | | | |

B. WELLS WITHIN 100 METRES

| Parameter | Results 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| 1) Chlorides | | | | | | | | | |
| 2) Dissolved solids | | | | | | | | | |
| 3) Iron | | | | | | | | | |
| 4) Alkalinity | | | | | | | | | |
| 5) Conductivity | | | | | | | | | |

Any significant odour problems Yes____ No____ Comments NO WATER BODIES OR WELLS WITHIN 100 m.

## LAB TESTS (2 LITRE SAMPLES)

Required, Yes____ No____ If Yes, complete Form II, Lab Analysis. If No, go to Part II, Gas.

### II Gas

C. ON-SITE

| Test Holes | Results | Test Holes | Results |
|---|---|---|---|
| #1 | 0% | #6 | 0% |
| #2 | 0% | #7 | 0% |
| #3 | 0% | #8 | |
| #4 | 0% | #9 | |
| #5 | 0% | #10 | |

D. BUILDINGS

| Name/Address | Results | Name/Address |
|---|---|---|
| 1. 51 THOMSON ROAD | 0% | 6. 61 THOMSON ROAD |
| 2. 53 THOMSON ROAD | 0% | 7. 63 THOMSON ROAD |
| 3. 55 THOMSON ROAD | 0% | 8. 65 THOMSON ROAD |
| 4. 57 THOMSON ROAD | NT | 9. |
| 5. 59 THOMSON ROAD | 0% | 10. |

III General Comments (vegetation, leachate springs, depth, etc.) WASTE APPEARS TO BE MOSTLY TIN AND METAL CONFINED T
SMALL AREA SOUTH OF THE PROPERTIES ALONG THOMSON ROAD. FILLS ARE PROBABLY SHALLOW ALTHOUGH THIS IS NOT CONFI
AREA IS OVERGROWN WITH WILLOW AND RASPBERRY CANES. NO PROBLEMS WITH THIS SITE.

(Detail all test point locations in a sketch on reverse side)

Form completed by: D E Jaggs

...OE 1640A/80

# AUGER HOLE LOGS
## SITE 8005

C1

| | |
|---|---|
| 0 - 1.07 m | Dark brown silty fine sand fill, traces of metal fragments - moist<br>0% Gas |

C2

| | |
|---|---|
| 0 - 0.31 m | Dark brown sandy silt |
| 0.31 - 0.76 m | Red brown silty fine sand - moist |
| 0.76 - 0.84 m | Light brown fine sand with gravel - moist<br>0% Gas |

C3

| | |
|---|---|
| 0 - 0.82 m | Red brown silty fine sand - moist |
| 0.82 - 1.22 m | Medium brown gravelly sand - moist<br>0% Gas |

C4

| | |
|---|---|
| 0 - 1.86 m | Medium brown silty fine sand - moist<br>0% Gas |

C5

| | |
|---|---|
| 0 - 0.18 m | Dark brown silty fine sand topsoil |
| 0.18 - 0.46 m | Light brown silty fine sand - moist |
| 0.46 - 0.92 m | Grey brown gravelly fine-medium sand - moist<br>0% Gas |

C6

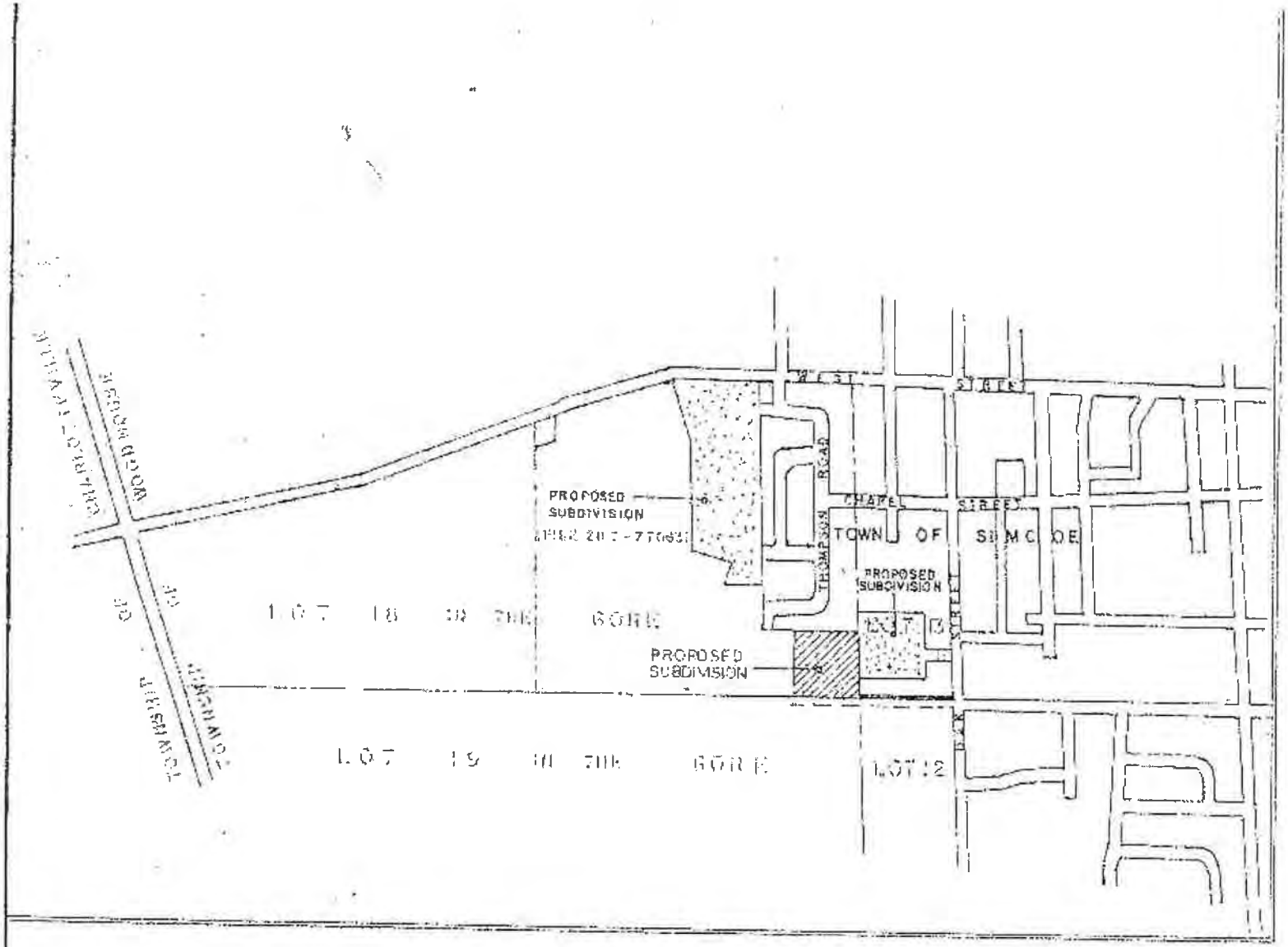
| | |
|---|---|
| 0 - 0.05 m | Dark brown silty sand |
| 0.05 - 0.31 m | Medium brown silty fine sand - moist |
| 0.31 - 0.46 m | Grey brown gravelly fine-coarse sand - moist |
| 0.46 m | NFP Gravel<br>0% Gas |

C7

| | | |
|---|---|---|
| 0 | -0.61 m | Medium brown gravelly sand - moist<br>0% Gas |

C8

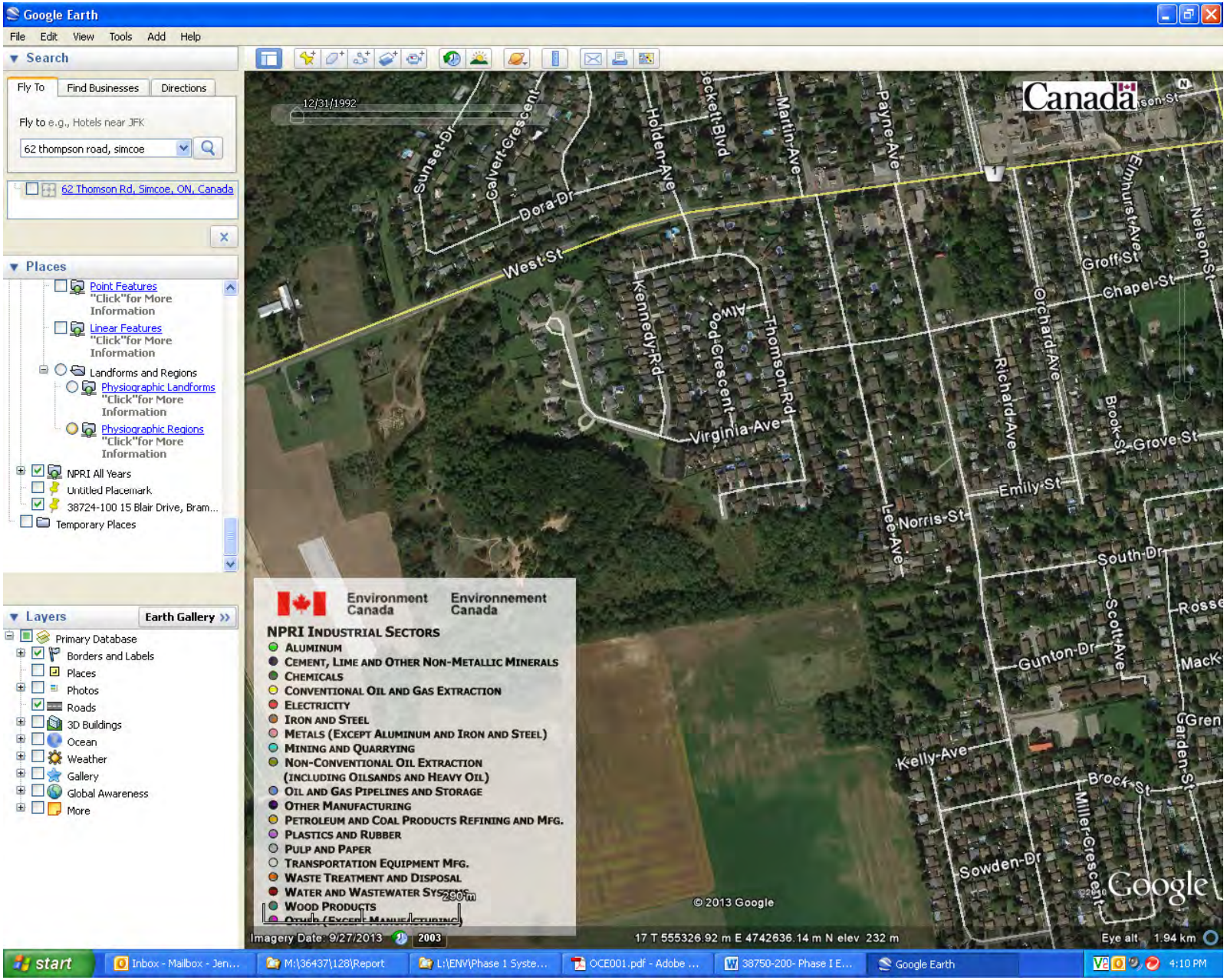
| | | |
|---|---|---|
| 0 | - 0.97 m | Medium brown gravelly fine-coarse sand - moist<br>0% Gas |




REG'D PLAN

33 32 31 30 29 28 1022 27

Fernwood Drive
Landfill
WEST
ST
CLOSED
10-045
142.67 ML
10-045-(1)
8.0 ML


Google Earth
File Edit View Tools Add Help
Search
Fly To
Find Businesses
Directions
Fly to e.g., Hotels near JFK
62 thompson road, simcoe
62 Thomson Rd, Simcoe, ON, Canada
Places
Point Features "Click"for More Information
Linear Features "Click"for More Information
Landforms and Regions
Physiographic Landforms "Click"for More Information
Physiographic Regions "Click"for More Information
NPRI All Years
Untitled Placemark
38724-100 15 Blair Drive, Bram...
Temporary Places
Layers
Earth Gallery
Primary Database
Borders and Labels
Places
Photos
Roads
3D Buildings
Ocean
Weather
Gallery
Global Awareness
More
12/31/1992
Canada
Sunset Dr
Calvert Crescent
Holden Ave
Beckett Blvd
Martin Ave
Payne Ave
Elmhurst Ave
Nelson St
Dora Dr
West St
Groff St
Chapel St
Kennedy Rd
Alwood Crescent
Thomson Rd
Orchard Ave
Richard Ave
Brook St
Grove St
Virginia Ave
Emily St
Norris St
Lee Ave
South Dr
Scott Ave
Gunton Dr
Kelly Ave
Brock St
Miller Crescent
Sowden Dr
Environment Canada
Environnement Canada
NPRI Industrial Sectors
Aluminum
Cement, Lime and Other Non-Metallic Minerals
Chemicals
Conventional Oil and Gas Extraction
Electricity
Iron and Steel
Metals (Except Aluminum and Iron and Steel)
Mining and Quarrying
Non-Conventional Oil Extraction (including Oilsands and Heavy Oil)
Oil and Gas Pipelines and Storage
Other Manufacturing
Petroleum and Coal Products Refining and Mfg.
Plastics and Rubber
Pulp and Paper
Transportation Equipment Mfg.
Waste Treatment and Disposal
Water and Wastewater Systems
Wood Products
290m
© 2013 Google
Google
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Government of Canada Gouvernement du Canada

Canada

Treasury Board of Canada Secretariat



# DFRP/FCSI - Map Navigator

**Area:** Norfolk County **Content:** 0 Federal Contaminated Site,

## Layers

- Federal Properties
- Federal Buildings
- Federal Contaminated Sites
- Economic Region
- Census Divisions
- Census Subdivisions
- Metropolitan Areas
- Federal Electoral Districts
- Treaty Areas

[1] This layer is visible only when the map scale is smaller than 1:3,000,000.

[2] Google base maps are only available when the map scale is smaller than 1:60,000.

The tables content is currently representating the actual map.

## Federal Properties

Federal Properties
Page(s): 1 / 0

Select the number of rows per page 5

| Property Number | Official name | Custodian | Primary use | Type of interest |
|---|---|---|---|---|

## Federal Buildings

## Federal Contaminated Sites

# APPENDIX C

# ECOLOG ERIS REPORT

ENVIRONMENTAL RISK INFORMATION SERVICE

# DATABASE REPORT

| | |
|---|---|
| **Project Property:** | *38750-600*<br>*n/a*<br>*Simcoe ON* |
| **Report Type:** | *Custom-Build Your Own Report* |
| **Order #:** | *20140128008* |
| **Requested by:** | *MTE Consultants Inc.* |
| **Date:** | *February 5, 2014* |

**Ecolog ERIS Ltd.**
Environmental Risk Information Service Ltd. (ERIS)
A division of Glacier Media Inc.
P: 1.866.517.5204
E: info@erisinfo.com

**www.erisinfo.com**

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**Notice: IMPORTANT LIMITATIONS and YOUR LIABILITY**

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# *Executive Summary*

***Property Information:***

| | |
|---|---|
| **Project Property:** | *38750-600*<br>*n/a  Simcoe ON* |

***Order Information:***

| | |
|---|---|
| **Order No.:** | *20140128008* |
| **Date Requested:** | *05/02/2014* |
| **Requested by:** | *MTE Consultants Inc.* |
| **Report Type:** | *Custom-Build Your Own Report* |

***Additional Products:***

# Executive Summary: Report Summary

| Database | Name | Searched | Project Property | Boundary to 0.25km | Total |
|---|---|---|---|---|---|
| AAGR | Abandoned Aggregate Inventory | Y | 0 | 0 | 0 |
| AGR | Aggregate Inventory | Y | 0 | 0 | 0 |
| AMIS | Abandoned Mine Information System | Y | 0 | 0 | 0 |
| ANDR | Anderson's Waste Disposal Sites | Y | 0 | 0 | 0 |
| AUWR | Automobile Wrecking & Supplies | Y | 0 | 0 | 0 |
| BORE | Borehole | Y | 0 | 0 | 0 |
| CA | Certificates of Approval | Y | 0 | 2 | 2 |
| CFOT | Commercial Fuel Oil Tanks | Y | 0 | 0 | 0 |
| CHEM | Chemical Register | Y | 0 | 0 | 0 |
| COAL | Inventory of Coal Gasification Plants and Coal Tar Sites | Y | 0 | 0 | 0 |
| CONV | Compliance and Convictions | Y | 0 | 0 | 0 |
| CPU | Certificates of Property Use | Y | 0 | 0 | 0 |
| DRL | Drill Hole Database | Y | 0 | 0 | 0 |
| EASR | Environmental Activity and Sector Registry | Y | 0 | 0 | 0 |
| EBR | Environmental Registry | Y | 0 | 0 | 0 |
| ECA | Environmental Compliance Approval | Y | 0 | 0 | 0 |
| EEM | Environmental Effects Monitoring | Y | 0 | 0 | 0 |
| EHS | ERIS Historical Searches | Y | 0 | 1 | 1 |
| EIIS | Environmental Issues Inventory System | Y | 0 | 0 | 0 |
| EXP | List of TSSA Expired Facilities | Y | 0 | 0 | 0 |
| FCON | Federal Convictions | Y | 0 | 0 | 0 |
| FCS | Contaminated Sites on Federal Land | Y | 0 | 0 | 0 |
| FOFT | Fisheries & Oceans Fuel Tanks | Y | 0 | 0 | 0 |
| FST | Fuel Storage Tank | Y | 0 | 0 | 0 |
| FSTH | Fuel Storage Tank - Historic | Y | 0 | 0 | 0 |
| GEN | Ontario Regulation 347 Waste Generators Summary | Y | 0 | 0 | 0 |
| HINC | TSSA Historic Incidents | Y | 0 | 0 | 0 |
| IAFT | Indian & Northern Affairs Fuel Tanks | Y | 0 | 0 | 0 |
| INC | TSSA Incidents | Y | 0 | 0 | 0 |
| LIMO | Landfill Inventory Management Ontario | Y | 0 | 0 | 0 |
| MINE | Canadian Mine Locations | Y | 0 | 0 | 0 |
| MNR | Mineral Occurrences | Y | 0 | 0 | 0 |
| NATE | National Analysis of Trends in Emergencies System (NATES) | Y | 0 | 0 | 0 |
| NCPL | Non-Compliance Reports | Y | 0 | 0 | 0 |
| NDFT | National Defence & Canadian Forces Fuel Tanks | Y | 0 | 0 | 0 |
| NDSP | National Defence & Canadian Forces Spills | Y | 0 | 0 | 0 |
| NDWD | National Defence & Canadian Forces Waste Disposal Sites | Y | 0 | 0 | 0 |

| Database | Name | Searched | Project Property | Boundary to 0.25km | Total |
|---|---|---|---|---|---|
| NEES | National Environmental Emergencies System (NEES) | Y | 0 | 0 | 0 |
| NPCB | National PCB Inventory | Y | 0 | 0 | 0 |
| NPRI | National Pollutant Release Inventory | Y | 0 | 0 | 0 |
| OGW | Oil and Gas Wells | Y | 0 | 0 | 0 |
| OOGW | Ontario Oil and Gas Wells | Y | 0 | 0 | 0 |
| OPCB | Inventory of PCB Storage Sites | Y | 0 | 0 | 0 |
| ORD | Orders | Y | 0 | 0 | 0 |
| PAP | Canadian Pulp and Paper | Y | 0 | 0 | 0 |
| PCFT | Parks Canada Fuel Storage Tanks | Y | 0 | 0 | 0 |
| PES | Pesticide Register | Y | 0 | 1 | 1 |
| PINC | TSSA Pipeline Incidents | Y | 0 | 0 | 0 |
| PRT | Private and Retail Fuel Storage Tanks | Y | 0 | 0 | 0 |
| PTTW | Permit to Take Water | Y | 0 | 0 | 0 |
| REC | Ontario Regulation 347 Waste Receivers Summary | Y | 0 | 0 | 0 |
| RSC | Record of Site Condition | Y | 0 | 0 | 0 |
| RST | Retail Fuel Storage Tanks | Y | 0 | 0 | 0 |
| SCT | Scott's Manufacturing Directory | Y | 0 | 0 | 0 |
| SPL | Ontario Spills | Y | 0 | 0 | 0 |
| SRDS | Wastewater Discharger Registration Database | Y | 0 | 0 | 0 |
| TANK | Anderson's Storage Tanks | Y | 0 | 0 | 0 |
| TCFT | Transport Canada Fuel Storage Tanks | Y | 0 | 0 | 0 |
| VAR | TSSA Variances for Abandonment of Underground Storage Tanks | Y | 0 | 0 | 0 |
| WDS | Waste Disposal Sites - MOE CA Inventory | Y | 0 | 0 | 0 |
| WDSH | Waste Disposal Sites - MOE 1991 Historical Approval Inventory | Y | 0 | 0 | 0 |
| WWIS | Water Well Information System | Y | 0 | 5 | 5 |
| | Total: | | 0 | 9 | 9 |

# *Executive Summary: Site Report Summary – Project Property*

| Map Key | DB | Company/Site Name | Address | 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* | *Page Number* |
|---|---|---|---|---|
| 1 | WWIS | | ON | 11 |
| 2 | EHS | | South Dr<br>Simcoe ON | 11 |
| 3 | WWIS | | ON | 11 |
| 4 | WWIS | | ON | 12 |
| 5 | CA | DOUG HUNT HUNT SUBDIVISION | LEE AVENUE/NORRIS STREET<br>SIMCOE TOWN ON | 13 |
| 5 | CA | DOUG HUNT HUNT SUBD. | LEE AVENUE/NORRIS STREET<br>SIMCOE TOWN ON | 13 |
| 6 | WWIS | | ON | 13 |
| 7 | PES | TRI-CITY PEST CONTROL | 18 KENNEDY RD<br>SIMCOE ON N3Y 5A6 | 14 |
| 8 | WWIS | | ON | 14 |

# *Executive Summary: Summary By Data Source*

## CA - Certificates of Approval

A search of the CA database, dated 1985-Oct 30, 2011* has found that there are 2 CA site(s) within approximately 0.25 Kilometers of the project property.

| Site | Address | Map Key |
|---|---|---|
| DOUG HUNT HUNT SUBD. | LEE AVENUE/NORRIS STREET<br>SIMCOE TOWN ON | 5 |
| DOUG HUNT HUNT SUBDIVISION | LEE AVENUE/NORRIS STREET<br>SIMCOE TOWN ON | 5 |

## EHS - ERIS Historical Searches

A search of the EHS database, dated 1999-Mar 2013 has found that there are 1 EHS site(s) within approximately 0.25 Kilometers of the project property.

| Site | Address | Map Key |
|---|---|---|
| | South Dr<br>Simcoe ON | 2 |

## PES - Pesticide Register

A search of the PES database, dated 1988-Jun 2013 has found that there are 1 PES site(s) within approximately 0.25 Kilometers of the project property.

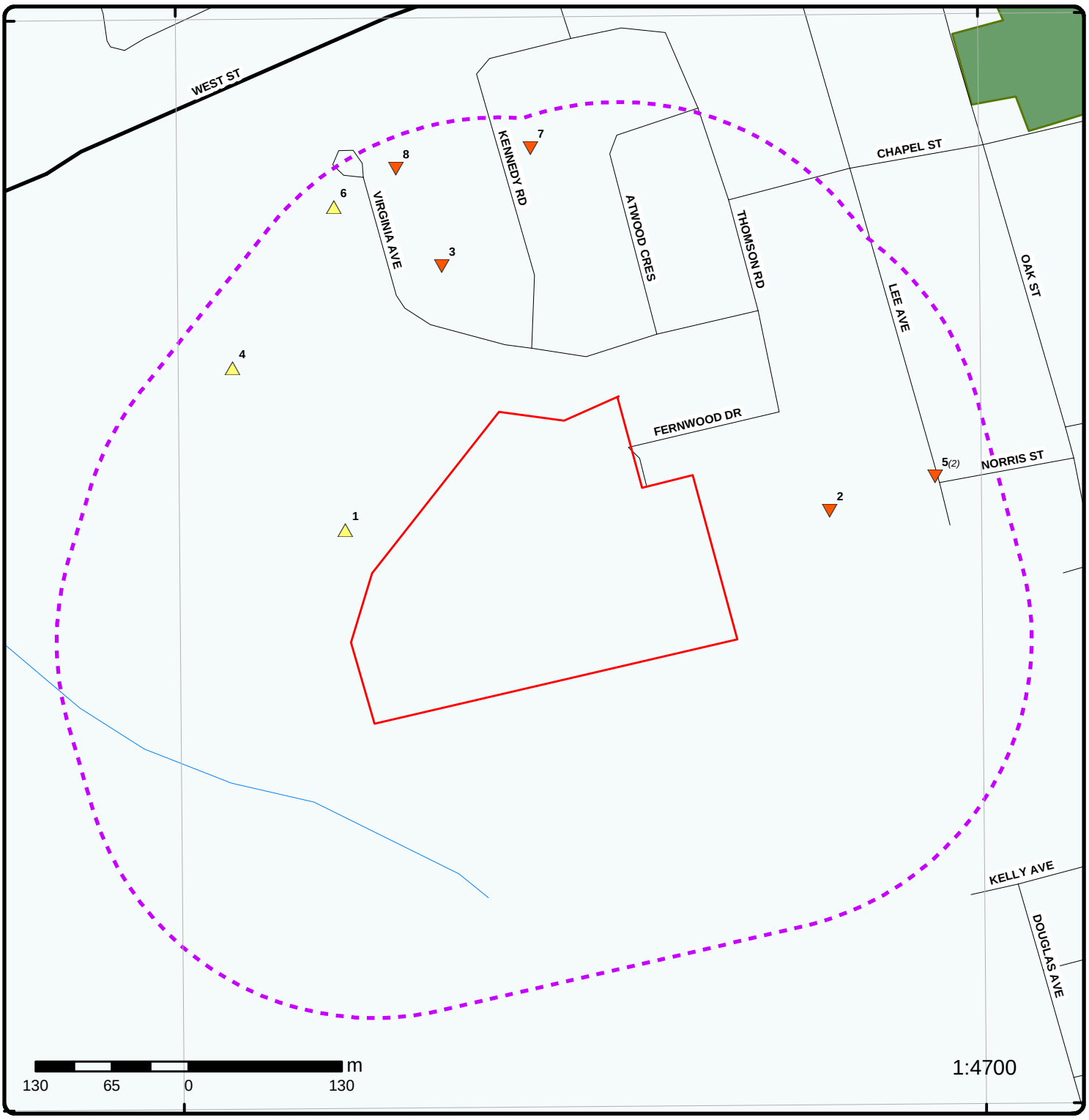
| Site | Address | Map Key |
|---|---|---|
| TRI-CITY PEST CONTROL | 18 KENNEDY RD<br>SIMCOE ON N3Y 5A6 | 7 |

## WWIS - Water Well Information System

A search of the WWIS database, dated 1955-May 2013 has found that there are 5 WWIS site(s) within approximately 0.25 Kilometers of the project property.

| Site | Address | Map Key |
|---|---|---|
| | ON | 1 |
| | ON | 3 |
| | ON | 4 |

| Site | Address | Map Key |
| --- | --- | --- |
| | | 6 |
| | ON | |
| | | 8 |
| | ON | |




# Map

Order No: 20140128008

Address: n/a, Simcoe, ON

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- Expressway
- Principal Highway
- Secondary Highway
- Major Road
- Local road
- Trail
- Proposed Road
- Ferry Route/Ice Road
- Industrial and Resource - Regions
- Main Line
- Sidetrack
- Transit Line
- Abandoned Line
- National Park
- Provincial or Territorial Park
- Other Park
- Golf Course or Driving Range
- Park or Sports Field
- Other Recreation Area

**Source:** © 2012 DMTI Spatial Inc.

# Aerial

Order No: 20140128008

**Address: n/a, Simcoe, ON**

**Source:** ESRI World Imagery, Updated December 2012

© Ecolog ERIS Ltd

# Detail Report

| Map Key | Number of Records | Elevation m | Site | DB |
|---|---|---|---|---|
| 1 | 1 of 1 | 235.8 | ON | WWIS |

| | | | |
|---|---|---|---|
| Well Id: | 7101388 | Lot: | |
| Concession: | | Concession Name: | |
| County: | NORFOLK | Municipality: | SIMCOE TOWN |
| Easting Nad83: | 555309 | Northing Nad83: | 4742095 |
| Zone: | 17 | Utm Reliability: | margin of error : 10 - 30 m |
| Primary Water Use: | | Construction Date: | 16-JUL-07 |
| Sec. Water Use: | | Well Depth: | 6.5 m |
| Pump Rate: | 58 LPM | Static Water Level: | 16.7 m |
| Flow Rate: | | Clear/Cloudy: | CLEAR |
| Specific Capacity: | | Final Well Status: | Water Supply |
| Construction Method: | Cable Tool | Flowing (y/n): | N |
| Elevation (m): | 234.44 | Elevation Reliability: | |
| Depth to Bedrock: | | Overburden/Bedrock: | |
| Water Type: | FRESH | Casing Material: | STEEL |

--- Details ---

| | | | |
|---|---|---|---|
| Thickness: | 1.9 m | Original Depth: | 1.9 m |
| Material Colour: | BROWN | Material: | SAND |
| + | | | |
| Thickness: | 2.6 m | Original Depth: | 4.5 m |
| Material Colour: | BROWN | Material: | CLAY |
| + | | | |
| Thickness: | 2 m | Original Depth: | 6.5 m |
| Material Colour: | GREY | Material: | CLAY |
| + | | | |
| Thickness: | 10.2 m | Original Depth: | 16.7 m |
| Material Colour: | BROWN | Material: | SAND, GRAVEL, HARD |
| + | | | |
| Thickness: | 4.6 m | Original Depth: | 21.3 m |
| Material Colour: | BROWN | Material: | SAND, , COARSE SAND |

| Map Key | Number of Records | Elevation m | Site | DB |
|---|---|---|---|---|
| 2 | 1 of 1 | 232.4 | South Dr Simcoe ON | EHS |

| | |
|---|---|
| Order No.: | 20120822032 |
| Report Date: | 30-AUG-12 |
| Report Type: | Custom Report |
| Search Radius (km): | .25 |
| Addit. Info Ordered: | |

| Map Key | Number of Records | Elevation m | Site | DB |
|---|---|---|---|---|
| 3 | 1 of 1 | 234.5 | ON | WWIS |

| | | | |
|---|---|---|---|
| Well Id: | 7048300 | Lot: | |

| Map Key | Number of Records | Elevation m | Site | DB |
|---|---|---|---|---|

| | | | |
|---|---|---|---|
| *Concession:* | | *Concession Name:* | |
| *County:* | NORFOLK | *Municipality:* | SIMCOE TOWN |
| *Easting Nad83:* | 555391 | *Northing Nad83:* | 4742319 |
| *Zone:* | 17 | *Utm Reliability:* | margin of error : 10 - 30 m |
| *Primary Water Use:* | Domestic | *Construction Date:* | 30-MAY-07 |
| *Sec. Water Use:* | | *Well Depth:* | 20.68 m |
| *Pump Rate:* | 48 LPM | *Static Water Level:* | 16.49 m |
| *Flow Rate:* | | *Clear/Cloudy:* | CLEAR |
| *Specific Capacity:* | | *Final Well Status:* | Water Supply |
| *Construction Method:* | Cable Tool | *Flowing (y/n):* | N |
| *Elevation (m):* | 235.71 | *Elevation Reliability:* | |
| *Depth to Bedrock:* | | *Overburden/Bedrock:* | |
| *Water Type:* | FRESH | *Casing Material:* | STEEL |

*--- Details ---*

| | | | |
|---|---|---|---|
| *Thickness:* | 13.08 m | *Original Depth:* | 13.08 m |
| *Material Colour:* | BROWN | *Material:* | COARSE SAND |
| + | | | |
| *Thickness:* | 7.6 m | *Original Depth:* | 20.68 m |
| *Material Colour:* | BROWN | *Material:* | COARSE SAND |

| | | | | |
|---|---|---|---|---|
| ***4*** | ***1 of 1*** | ***235.6*** | ***ON*** | ***WWIS*** |

| | | | |
|---|---|---|---|
| *Well Id:* | 7110031 | *Lot:* | |
| *Concession:* | | *Concession Name:* | |
| *County:* | NORFOLK | *Municipality:* | SIMCOE TOWN |
| *Easting Nad83:* | 555213 | *Northing Nad83:* | 4742232 |
| *Zone:* | 17 | *Utm Reliability:* | margin of error : 10 - 30 m |
| *Primary Water Use:* | Irrigation | *Construction Date:* | 08-JUL-08 |
| *Sec. Water Use:* | | *Well Depth:* | 9.7 m |
| *Pump Rate:* | 38 LPM | *Static Water Level:* | 16.1 m |
| *Flow Rate:* | | *Clear/Cloudy:* | CLEAR |
| *Specific Capacity:* | | *Final Well Status:* | Water Supply |
| *Construction Method:* | Cable Tool | *Flowing (y/n):* | N |
| *Elevation (m):* | 230.55 | *Elevation Reliability:* | |
| *Depth to Bedrock:* | | *Overburden/Bedrock:* | |
| *Water Type:* | FRESH | *Casing Material:* | STEEL |

*--- Details ---*

| | | | |
|---|---|---|---|
| *Thickness:* | 2.4 m | *Original Depth:* | 2.4 m |
| *Material Colour:* | BROWN | *Material:* | SAND, CLAY |
| + | | | |
| *Thickness:* | 7.3 m | *Original Depth:* | 9.7 m |
| *Material Colour:* | BROWN | *Material:* | CLAY |
| + | | | |
| *Thickness:* | 6.5 m | *Original Depth:* | 16.2 m |
| *Material Colour:* | BROWN | *Material:* | SAND, GRAVEL, HARD |
| + | | | |
| *Thickness:* | 5.2 m | *Original Depth:* | 21.4 m |
| *Material Colour:* | BROWN | *Material:* | SAND, GRAVEL, WATER-BEARING |
| + | | | |
| *Thickness:* | m | *Original Depth:* | m |
| *Material Colour:* | | *Material:* | COARSE GRAVEL |
| + | | | |
| *Thickness:* | m | *Original Depth:* | 21.7 m |

| Map Key | Number of Records | Elevation m | Site | DB |
|---|---|---|---|---|

*Material Colour:* GREY *Material:* CLAY, SILT

**5** **1 of 2** **231.4** **DOUG HUNT HUNT SUBDIVISION** **CA**
**LEE AVENUE/NORRIS STREET**
**SIMCOE TOWN ON**

*Certificate #:* 7-1797-89-
*Application Year:* 89
*Issue Date:* 11/7/1989
*Approval Type:* Municipal water
*Status:* Approved
*Application Type:*
*Client Name:*
*Client Address:*
*Client City:*
*Client Postal Code:*
*Project Description:*
*Contaminants:*
*Emission Control:*

**5** **2 of 2** **231.4** **DOUG HUNT HUNT SUBD.** **CA**
**LEE AVENUE/NORRIS STREET**
**SIMCOE TOWN ON**

*Certificate #:* 3-2169-89-
*Application Year:* 89
*Issue Date:* 11/7/1989
*Approval Type:* Municipal sewage
*Status:* Approved
*Application Type:*
*Client Name:*
*Client Address:*
*Client City:*
*Client Postal Code:*
*Project Description:*
*Contaminants:*
*Emission Control:*

**6** **1 of 1** **235.5** **WWIS**
**ON**

*Well Id:* 4408530
*Concession:*
*County:* NORFOLK
*Easting Nad83:* 555299
*Zone:* 17
*Primary Water Use:* Irrigation
*Sec. Water Use:*
*Pump Rate:* 112.5 LPM
*Flow Rate:*
*Specific Capacity:*
*Construction Method:* Cable Tool
*Elevation (m):* 235.09
*Depth to Bedrock:*
*Water Type:* FRESH

*Lot:*
*Concession Name:*
*Municipality:* WOODHOUSE
*Northing Nad83:* 4742369
*Utm Reliability:* margin of error : 10 - 30 m
*Construction Date:* 07-JUN-06
*Well Depth:* 5.23 m
*Static Water Level:* 17.54 m
*Clear/Cloudy:* CLEAR
*Final Well Status:* Water Supply
*Flowing (y/n):*
*Elevation Reliability:*
*Overburden/Bedrock:* Overburden
*Casing Material:* STEEL

*--- Details ---*

| Map Key | Number of Records | Elevation m | Site | DB |
|---|---|---|---|---|

| | | | |
|---|---|---|---|
| *Thickness:* | .62 m | *Original Depth:* | .62 m |
| *Material Colour:* | BLACK | *Material:* | TOPSOIL |
| + | | | |
| *Thickness:* | 1.23 m | *Original Depth:* | 1.85 m |
| *Material Colour:* | BROWN | *Material:* | SAND |
| + | | | |
| *Thickness:* | 3.38 m | *Original Depth:* | 5.23 m |
| *Material Colour:* | BROWN | *Material:* | CLAY |
| + | | | |
| *Thickness:* | 6.15 m | *Original Depth:* | 11.38 m |
| *Material Colour:* | BLUE | *Material:* | CLAY |
| + | | | |
| *Thickness:* | 6.16 m | *Original Depth:* | 17.54 m |
| *Material Colour:* | BROWN | *Material:* | SAND, GRAVEL |
| + | | | |
| *Thickness:* | 4.31 m | *Original Depth:* | 21.85 m |
| *Material Colour:* | BROWN | *Material:* | COARSE SAND |

***7*** ***1 of 1*** ***232.6*** ***TRI-CITY PEST CONTROL*** ***PES***
***18 KENNEDY RD***
***SIMCOE ON N3Y 5A6***

| | |
|---|---|
| *Licence No.:* | 02-01-06785-0 |
| *Licence Type:* | OPERATOR |

***8*** ***1 of 1*** ***234.6*** ***WWIS***
***ON***

| | | | |
|---|---|---|---|
| *Well Id:* | 4408451 | *Lot:* | 018 |
| *Concession:* | | *Concession Name:* | |
| *County:* | NORFOLK | *Municipality:* | WOODHOUSE |
| *Easting Nad83:* | 555352 | *Northing Nad83:* | 4742402 |
| *Zone:* | 17 | *Utm Reliability:* | margin of error : 10 - 30 m |
| *Primary Water Use:* | Domestic | *Construction Date:* | 19-OCT-05 |
| *Sec. Water Use:* | | *Well Depth:* | 7.9 m |
| *Pump Rate:* | 45 LPM | *Static Water Level:* | 21.3 m |
| *Flow Rate:* | | *Clear/Cloudy:* | CLEAR |
| *Specific Capacity:* | | *Final Well Status:* | Water Supply |
| *Construction Method:* | Cable Tool | *Flowing (y/n):* | |
| *Elevation (m):* | 235.57 | *Elevation Reliability:* | |
| *Depth to Bedrock:* | | *Overburden/Bedrock:* | Overburden |
| *Water Type:* | FRESH | *Casing Material:* | STEEL |

*--- Details ---*

| | | | |
|---|---|---|---|
| *Thickness:* | 4 m | *Original Depth:* | 4 m |
| *Material Colour:* | BROWN | *Material:* | SAND, LOOSE |
| + | | | |
| *Thickness:* | 3.9 m | *Original Depth:* | 7.9 m |
| *Material Colour:* | BROWN | *Material:* | CLAY, SOFT |
| + | | | |
| *Thickness:* | 7.9 m | *Original Depth:* | 15.8 m |
| *Material Colour:* | GREY | *Material:* | SILT, CLAY, SOFT |
| + | | | |

| | | | |
|---|---|---|---|
| *Thickness:* | 7.2 m | *Original Depth:* | 23 m |
| *Material Colour:* | BROWN | *Material:* | MEDIUM SAND |
| + | | | |
| *Thickness:* | 1.1 m | *Original Depth:* | 24.1 m |
| *Material Colour:* | BROWN | *Material:* | COARSE SAND |
| + | | | |
| *Thickness:* | .9 m | *Original Depth:* | 25 m |
| *Material Colour:* | GREY | *Material:* | CLAY, SANDY |
| + | | | |
| *Thickness:* | 6 m | *Original Depth:* | 31 m |
| *Material Colour:* | GREY | *Material:* | CLAY, SILTY |

# *Unplottable Summary*

| DB | Company Name/Site Name | Address | City | Zip |
|---|---|---|---|---|
| CA | R.M. OF HALDIMAND-NORFOLK | CHAPEL ST. | SIMCOE TOWN ON | |

# *Unplottable Report*

***Site:*** ***R.M. OF HALDIMAND-NORFOLK***
***CHAPEL ST. SIMCOE TOWN ON***

***Database:***
***CA***

| | |
|---|---|
| *Certificate #:* | 7-0266-86- |
| *Application Year:* | 86 |
| *Issue Date:* | 4/9/1986 |
| *Approval Type:* | Municipal water |
| *Status:* | Approved |
| *Application Type:* | |
| *Client Name:* | |
| *Client Address:* | |
| *Client City:* | |
| *Client Postal Code:* | |
| *Project Description:* | |
| *Contaminants:* | |
| *Emission Control:* | |

# *Appendix: Database Descriptions*

*Ecolog Environmental Risk Information Services Ltd 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 Ecolog 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:*** Sept 2002* Provincial AAGR
The MAAP Program maintains a database of all 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.*

***Aggregate Inventory:*** Up to Aug 2012 Provincial AGR
The Ontario Ministry of Natural Resources maintains a database of all active pits and quarries. The database provides information regarding the registered owner/operator, location name, operation type, approval type, and maximum annual tonnage.

***Abandoned Mine Information System:*** 1800-Feb 2013 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.

***Anderson's Waste Disposal Sites:*** 1860s-Present 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 authoritive. The information was collected for research purposes only.

***Automobile Wrecking & Supplies:*** 2001-Jun 2010 Private AUWR
This database provides an inventory of all 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.

***Borehole:*** 1875-Aug 2011 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.

***Certificates of Approval:*** 1985-Oct 30, 2011* 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.

***Commercial Fuel Oil Tanks:*** 1948-Apr 2013 Provincial CFOT

Since May 2002, Ontario developed a new act where it became mandatory for fuel oil tanks to be registered with Technical Standards & Safety Authority (TSSA). This data would include all commercial underground fuel oil tanks in Ontario with fields such as location, registration number, tank material, age of tank and tank size.

***Chemical Register:*** 1992, 1999-Jun 2010 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.).

***Inventory of Coal Gasification Plants and Coal Tar Sites:*** Apr 1987 and Nov 1988* 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.*

***Compliance and Convictions:*** 1989-Jun 2013 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.

***Certificates of Property Use:*** 1994-Jul 2013 Provincial CPU

This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include all CPU's on the registry such as (EPA s. 168.6) - Certificate of Property Use.

***Drill Hole Database:*** 1886-Jun 2013 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".

***Environmental Activity and Sector Registry:*** Oct 31 2011-Dec 2013 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.

***Environmental Registry:*** 1994-Jul 2013 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.

***Environmental Compliance Approval:*** Oct 31, 2011-Jul 2013 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 CofA's prior to Nov 1st, 2011, please refer to the CA database. For all Waste Disposal Sites please refer to the WDS database.

***Environmental Effects Monitoring:*** 1992-2007* 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.

***ERIS Historical Searches:*** 1999-Mar 2013 Private EHS

EcoLog 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.

***Environmental Issues Inventory System:*** 1992-2001* 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.

***List of TSSA Expired Facilities:*** Current to May 2013 Provincial EXP

This is a list of all expired facilities that fall under the TSSA (TSSA Act & Safety Regulations), including the six regulations that exist under the Fuels Safety Division. It will include facilities such as private fuel outlets, bulk plants, fuel oil tanks, gasoline stations, marinas, propane filling stations, liquid fuel tanks, piping systems, etc. These tanks have been removed and automatically fall under the expired facilities inventory held by TSSA.

***Federal Convictions:*** 1988-Jun 2007* 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.

***Contaminated Sites on Federal Land:*** June 2000-Jan 2013 Federal FCS

The Federal Contaminated Sites Inventory includes information on all 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.

***Fisheries & Oceans Fuel Tanks:*** 1964-Sept 2003 Federal FOFT

Fisheries & Oceans Canada maintains an inventory of all 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.

***Fuel Storage Tank:*** 2010-May 2013 Provincial FST

The Technical Standards & Safety Authority (TSSA), under the Technical Standards & Safety Act of 2000 maintains a database of registered private and retail fuel storage tanks in Ontario with fields such as location, tank status, license date, tank type, tank capacity, fuel type, installation year and facility type.

***Fuel Storage Tank - Historic:*** Pre-Jan 2010* Provincial FSTH

The Technical Standards & Safety Authority (TSSA), under the Technical Standards & Safety Act of 2000 maintains a database of registered private and retail fuel storage tanks in Ontario with fields such as location, tank status, license date, tank type, tank capacity, fuel type, installation year and facility type.

***Ontario Regulation 347 Waste Generators Summary:*** 1986-Jul 2013 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.

***TSSA Historic Incidents:*** 2006-June 2009 Provincial HINC

This database will cover all incidences recorded by TSSA with their older system, before they moved to their new management system. 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, TSSA regulates fuel suppliers, storage facilities, transport trucks, pipelines, contractors and equipment or appliances that use fuels. The TSSA works to protect the public, the environment and property from fuel-related hazards such as spills, fires and explosions. This database will include spills and leaks from pipelines, diesel, fuel oil, gasoline, natural gas, propane and hydrogen recorded by the TSSA.

***Indian & Northern Affairs Fuel Tanks:*** 1950-Aug 2003* Federal IAFT

The Department of Indian & Northern Affairs Canada (INAC) maintains an inventory of all 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.

***TSSA Incidents:*** June 2009-Apr 2013 Provincial INC

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, TSSA regulates fuel suppliers, storage facilities, transport trucks, pipelines, contractors and equipment or appliances that use fuels. Includes incidents from fuel-related hazards such as spills, fires and explosions. This database will include spills and leaks from diesel, fuel oil, gasoline, natural gas, propane and hydrogen recorded by the TSSA.

***Landfill Inventory Management Ontario:*** 2012 Provincial LIMO

The Landfill Inventory Management Ontario (LIMO) database is updated every year, as the ministry compiles new and updated information. The inventory will include small and large landfills. Additionally, each year the ministry will request operators of the larger landfills complete a landfill data collection form that will be used to update LIMO and will include the following information from the previous operating year. This will include additional information such as 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 will include information such as site owner, site location and certificate of approval # and status.

***Canadian Mine Locations:*** 1998-2009 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.

***Mineral Occurrences:*** 1846-Apr 2013 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 planimetric (X and Y) coordinates of that point with the coordinates of the same point as defined from a source of higher accuracy.

***National Analysis of Trends in Emergencies System (NATES):*** 1974-1994* 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.

***Non-Compliance Reports:*** 1994-2011 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.

***National Defence & Canadian Forces Fuel Tanks:*** Up to May 2001* Federal NDFT

The Department of National Defence 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.

***National Defence & Canadian Forces Spills:*** Mar 1999-Aug 2010 Federal NDSP

The Department of National Defence 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.

***National Defence & Canadian Forces Waste Disposal Sites:*** 2001-Apr 2007* 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.

***National Environmental Emergencies System (NEES):*** 1974-2003* 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 all 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.

***National PCB Inventory:*** 1988-2008* Federal NPCB

Environment Canada's National PCB inventory includes information on in-use PCB containing equipment in Canada including federal, provincial and private facilities. All federal out-of-service PCB containing equipment and all 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.

***National Pollutant Release Inventory:*** 1993-2011 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.

***Oil and Gas Wells:*** 1988-Jun 2013 Private OGW

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.

***Ontario Oil and Gas Wells:*** 1800-Jul 2013 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, well cap date, licence 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.

***Inventory of PCB Storage Sites:*** 1987-Oct 2004 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.

***Orders:*** 1994-Jul 2013 Provincial ORD

This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include all 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.

***Canadian Pulp and Paper:*** 1999, 2002, 2004, 2005, 2009 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.

***Parks Canada Fuel Storage Tanks:*** 1920-Jan 2005* Federal PCFT

Canadian Heritage maintains an inventory of all 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.

***Pesticide Register:*** 1988-Jun 2013 Provincial PES

The Ontario Ministry of Environment maintains a database of all manufacturers and vendors of registered pesticides.

***TSSA Pipeline Incidents:*** June 2009-Mar 2012 Provincial PINC

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, TSSA regulates fuel suppliers, storage facilities, transport trucks, pipelines, contractors and equipment or appliances that use fuels. This database will include spills, strike and leaks from recorded by the TSSA.

***Private and Retail Fuel Storage Tanks:*** 1989-1996* 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).

***Permit to Take Water:*** 1994-Jul 2013 Provincial PTTW

This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include all PTTW's on the registry such as OWRA s. 34 - Permit to take water.

***Ontario Regulation 347 Waste Receivers Summary:*** 1986-2011 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.

***Record of Site Condition:*** 1997-Sept 2001, Oct 2004-Jun 2013 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).

***Retail Fuel Storage Tanks:*** 1999-Jun 2010 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.

***Scott's Manufacturing Directory:*** 1992-Mar 2011 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.

***Ontario Spills:*** 1988-Jun 2013 Provincial SPL

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.

***Wastewater Discharger Registration Database:*** 1990-2011 Provincial SRDS

Information under this heading is combination of the following 2 programs. The Municipal/Industrial Strategy for Abatement (MISA) division of the Ontario Ministry of Environment maintained a database of all 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. All sampling information is now collected and stored within the Sample Result Data Store (SRDS).

***Anderson's Storage Tanks:*** 1915-1953* 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.

***Transport Canada Fuel Storage Tanks:*** 1970-Mar 2007 Federal TCFT

With the provinces of BC, MB, NB, NF, ON, PE, and QC; Transport Canada currently owns and operates 90 fuel storage tanks. Our inventory provides information on the site name, location, tank age, capacity and fuel type.

***TSSA Variances for Abandonment of Underground Storage Tanks:*** Current to Jun 2013 Provincial VAR

The TSSA, Under the Liquid Fuels Handling Code and the Fuel Oil Code, all underground storage tanks must be removed within two years of disuse. If removal of a tank is not feasible, you may apply to seek a variance from this code requirement. This is a list of all variances granted for abandoned tanks.

***Waste Disposal Sites - MOE CA Inventory:*** 1970-Jul 2013 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.

***Waste Disposal Sites - MOE 1991 Historical Approval Inventory:*** Up to Oct 1990* 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.

***Water Well Information System:*** 1955-May 2013 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.

# *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 were included as reference.

# APPENDIX D

# SITE AND INSPECTION RECORDS

| LAND USE TABLE | | |
|---|---|---|
| LOT OR BLOCK | PROPOSED LAND USE | AREA |
| 9-LOTS 1 TO 19 | SINGLE FAMILY RESIDENTIAL | 1.22ha |
| C-UNITS 1 TO 23 | VACANT LAND CONDO LOTS | 2.48ha |
| LOT 20 | WALKWAY | .02ha |
| PARCEL B | PROPOSED CONVEYANCE TO ABUTTING LANDS | .01ha |
| TOTAL AREA 3.74ha | | |

KEY PLAN

PROPOSED REDLINE REVISION

# DRAFT PLAN OF SUBDIVISION

OF PART OF

LOT 18 GORE

GEOGRAPHIC TOWNSHIP OF WOODHOUSE

SIMCOE

NORFOLK COUNTY

## SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE LANDS TO BE SUBDIVIDED AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

DATED: _____

_____

MIKE YEO ONTARIO LAND SURVEYOR

## OWNER'S CONSENT

I HEREBY CONSENT TO THE FILING OF THIS PLAN IN DRAFT FORM FOR APPROVAL.

DATED: _____

OWNER: _____

WESTWOOD TRAIL Inc.

## SECTION 51 (17) PLANNING ACT, R.S.O. 1990

(a) SHOWN ON DRAWINGS.

(b) SHOWN ON DRAWINGS.

(c) SHOWN ON DRAWINGS.

(d) LOTS S1 TO S19 TO BE USED FOR SINGLE FAMILY DWELLINGS; LOTS C1 TO C23 TO BE USED FOR CONDOMINIUM UNITS; LOT 20 TO BE USED FOR WALKWAY

(e) SHOWN ON DRAWINDS.

(f) SHOWN ON DRAWINGS

(g) SHOWN ON DRAWINGS

(h) A MUNICIPAL WATER SUPPLY WILL BE INSTALLED BY THE DEVELOPER IN ACCORDANCE WITH THE REQUIREMENTS OF THE COUNTY OF NORFOLK.

(i) SOIL POROSITY – HIGH

(j) SHOWN ON DRAWING

(k) MUNICIPAL SERVICES INCLUDING WATER SUPPLY, SANITARY SEWERS, STORM SEWERS, CURB AND GUTTER, PAVED ROADS, STREET LIGHTING AND SIDEWALKS WILL BE INSTALLED BY THE DEVELOPER IN ACCORDANCE WITH THE REQUIREMENTS OF THE COUNTY OF NORFOLK

(l) NO RESTRICTIVE COVENANTS IN EXCESS OF THE EXISTING ZONING AND BUILDING BY-LAWS ARE PROPOSED

| DATE | REVISION |
|---|---|
| JAN 10 2011 | REVISE PLAN / RENUMBER LOTS |
| NOV 08 2011 | REDLINE REVISIONS |

SUBDIVISION/CONDOMINIUM DRAFT PLAN

TOWN OF SIMCOE

| DRAWN BY: | DESIGNED BY: | CHECKED BY: | SCALE |
|---|---|---|---|
| RCS | JDV | JDV | 1:300 |

G. DOUGLAS VALLEE LIMITED
2 TALBOT STREET NORTH
SIMCOE, ONTARIO N3Y 3W4
(519) 426-6270

DATE: DEC 2010

DRAWING NO: 08-031-DP

# PHASE I
# ENVIRONMENTAL SITE ASSESSMENT
# INITIAL INSPECTION REPORT

| | | | |
|---|---|---|---|
| **PROJECT NAME:** | PHASE I ESA | | |
| **DATE OF INSPECTION:** | FEB 12, 2014 | **PROJECT NO:** | 30750-600 |
| **COMPLETED BY:** | JENNIFER KATO | **SITE CONTACT:** | MIKE MCARTHUR |
| **NUMBER OF PHOTOS TAKEN:** | | | -10°C, SUNNY, SNOW COVER |
| **ADDRESS OF PROPERTY:** | LOT 18 GORE<br>SIMCOE | | |
| **NAME AND ADDRESS OF CURRENT TENANT:** | | | |
| VACANT UNDEVELOPED LOT<br>(OWNER = MIKE MCARTHUR) | | | |
| **PHONE NUMBER:** | 519-427-9393 | **FAX NUMBER:** | — |
| **DESCRIPTION OF PROPERTY:** (i.e. size, layout, terrain, etc.) | | | |
| **Approximate Land Area (acreage):** | | 9.1 acres | |
| **Number of Buildings:** | Ø | **Building Square Footage:** | N/A |
| NO STRUCTURES OR VISIBLE BUILDING REMNANT ON PROPERTY | | | |
| **VISUAL APPEARANCE OF PROPERTY:** | | | |
| SNOW COVERED LOT W MATURE TREES AND SOME AREAS OF DENSE BRUSH.<br>CROSS COUNTRY SKI TRAILS THROUGH THE PROPERTY | | | |
| **LIST OF ADJACENT PROPERTIES:** | | | |
| NORTH & EAST RESIDENTIAL + WEST ACRES PARK (PLAYGROUND & TENNIS COURT)<br>WEST & SOUTH AGRICULTURAL | | | |

| DESCRIPTION OF CURRENT OPERATIONS (INCLUDING 3Rs): |
|---|
| VACANT. |

| DESCRIPTION OF PAST OPERATIONS (IF AVAILABLE): |
|---|
| AGRICULTURAL ACCORDING TO AERIAL PHOTOGRAPHS |

| CONFIRM THE FOLLOWING SITE FEATURES: | |
|---|---|
| **TYPE OF WATER SUPPLY** | NONE |
| **TYPE OF SANITARY WASTE DISPOSAL** | NONE |
| **STORM WATER AND SURFACE WATER HANDLING** | OVERLAND TOWARDS THE SOUTHWEST |
| **PRESENCE OF FLOOR DRAINS** (if present where do they drain?) | N/A |

| PRESENCE OF TRANSFORMERS | | | |
|---|---|---|---|
| **Quantity** | Ø | **Owner** | N/A |
| **Have they been tested?** | N/A | **Test data available?** | N/A |
| **Are they property tagged?** N/A | | | |

| General Description (i.e. size, location, etc.) |
|---|
| N/A |

| PRESENCE OF ANY OTHER POTENTIAL PCB ELECTRICAL EQUIPMENT? (i.e. capacitors, switches) |
|---|
| NONE |

| PRESENCE OF MACHINE SHOP |
|---|
| NO. |

| NOTE THE LOCATION, EXTENT, AND CONDITION OF SUSPECTED ASBESTOS CONTAINING MATERIALS OBSERVED. FOR EACH TYPE, ESTIMATE THE TOTAL SURFACE AREA OR LINER LENGTH: | |
|---|---|
| Sprayed-on Insulation: | NO STRUCTURES THEREFORE N/A |
| Roofing Materials: | |
| Pipe Wrap: | |
| Boiler Insulation: | |
| Tank Linings: | |
| Ceiling Tiles: | |
| Floor Tile: | |
| Expansion Joint: | |
| Thermal Insulation: | |
| Spray-on Fire-Proofing Materials: | |

| DOES THE FACILITY DEAL IN BATTERIES? |
|---|
| N/A |
| **HOW ARE USED BATTERIES DISPOSED? (Review disposal records if offsite.)** |
| N/A |
| **PRESENCE OF UNDERGROUND/ABOVEGROUND TANKS** |

| Quantity and Type | NONE OBSERVED, NO RECORDS |
|---|---|
| Is the number of tanks identified consistent with observed site features? | N/A |
| Does the area of the tank(s) show signs of surface spills? | N/A |
| What products are / were stored in the tank(s)? | |
| N/A | |

| | |
|---|---|
| **When were the tank(s) installed?** | N/A |
| **Have the tank(s) been registered? (Confirm with records.)** | NA |
| **Have the tank(s) been tested? (Confirm with records.)** | NA |
| **Have any tanks been removed in the past?<br>(If YES, identify records of removal, who removed, was removal certified by anyone, was any testing done during removal?)** | |
| NO RECORDS | |
| **PRESENCE AND LOCATION OF EQUIPMENT WASH DOWN AREA** | |
| NONE | |
| **WERE ORGANIC SOLVENTS EVER USED OR ARE THEY USED NOW?<br>(If YES, identify which ones and where disposed?)** | |
| NO | |
| **DESCRIPTION OF ANY OTHER FEATURES NOT COVERED IN POINTS ABOVE** | |
| **Use of Pesticides:** | POSSIBLE HISTORIC APPLICATION |
| **Floodplain:** | NONE |
| **Lagoons:** | NONE |
| **Air:** | NO NOTEABLE ODOURS |
| **Housekeeping:** | NO VISIBLE PILES OF DEBRIS OR GARBAGE |
| **Past placement of fill on the Property:** | UNKNOWN |
| **WASTE GENERATED AND STORED** | |
| **How are cuttings and waste oil handled?** | |
| N/A | |

| Generation and location of waste oils or other wastes on Property. |
|---|
| NONE |
| **Where are waste oils or other wastes stored?** |
| NA |
| **Are there signs of leaks or spills in waste storage areas?** |
| NIA |
| **How are wastes disposed? (Review disposal records)** |
| NA |

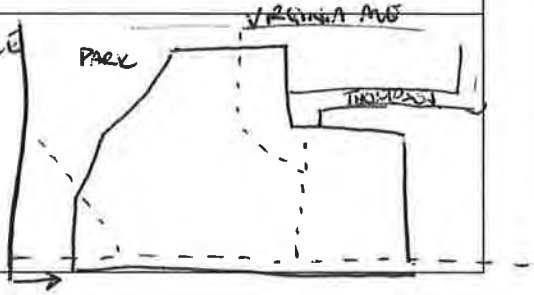
| HOW ARE WASTES STORED ON-SITE? | |
|---|---|
| **Storage** | **Waste** |
| **Drums** | NONE OBSERVED |
| **AST** | |
| **UST** | |
| **Surface Impoundment** | |
| **Waste Piles** | |
| **Dumpsters** | |
| **Other – Description** | |
| **INSPECTION OF PROPERTY** (Walk entire property boundary.) * WALKED SKI TRAIL ALONG SOUTH & WEST PART OF WEST BOUNDARY | |
| **PRESENCE OF WASTE MATERIALS DISPOSED OF OR STORED ON SITE (i.e. scrap metal, drums, garbage, batteries, etc.)** | |
| NO WASTE OBSERVED | |
| **EVIDENCE OF SOIL STAINING, VEGETATION DISTRESS (i.e. from spills, etc.)** | |
| SNOW COVER, UNABLE TO SEE GROUND SURFACE BUT NOT NOTICABLE IMPACTS TO NATURE TREES AND DENSE VEGETATION | |

| EVIDENCE OF ANY IMPACT CAUSED BY SURFACE RUN-ON OR DISPOSAL FROM ADJACENT PROPERTIES | | | |
|---|---|---|---|
| NONE OBSERVED | | | |
| **GROUNDWATER USAGE** | | | |
| **Onsite Wells?** | Ø | **Quantity** | Ø |
| **Completion Depth:** | N/A | **Water Quality Information Available?** | N/A |
| **AIR QUALITY** | | | |
| **Odours Noted** | NO NOTEABLE ODOURS | | |
| **Air Conditioning/CFCs** | N/A | | |

| EMERGENCY PROCEDURES | | | |
|---|---|---|---|
| **MSDS** | NA | | |
| **Fire** | NA | | |
| **ENVIRONMENTAL COMPLAINTS OR SPILLS** | | | |
| **Municipal / Fire Department** | NONE REPORTED TO MTE | | |
| **Other** | NA | | |
| **PERSONS INTERVIEWED (Title & Phone #)** | | | |
| **Name:** | MIKE MCARTHUR | | |
| **Title:** | OWNER | | |
| **Phone Number:** | 519-427-9393 | **Email:** | mcarthur@linebacklusion |

**LIMITATIONS (i.e. snow cover, inaccessible areas, locked rooms, etc.)**

- SNOW COVER, COULD NOT OBSERVE GROUND SURFACE
- NO ACCESS TO FOR WEST PROPERTY BOUNDARY
- SLIGHT BERM ALONG SOUTH BOUNDARY
- AREA JUST SOUTH OF THE PARK IS AT A HIGHER ELEVATION THAN THE SURROUNDINGS.



## AIR EMISSIONS

| Operation | All Materials/Wastes Used | Known Emission Contaminants | Method of Discharge (Stack, Fan, etc.) | Permit Obtained From Provincial or Other Agency |
|---|---|---|---|---|
| NONE | N/A | N/A | N/A | N/A |

## AVAILABLE DOCUMENTATION:

| | | | | | | |
|---|---|---|---|---|---|---|
| Current Site Plan | Y | ☑ | N | ☐ | N/A | ☐ |
| Historic Site Plan | Y | ☐ | N | ☐ | N/A | ☑ |
| Reported Results of Tank Integrity Testing | Y | ☐ | N | ☑ | N/A | ☐ |
| Applicable Documentation – leaks or spills from storage tanks | Y | ☐ | N | ☑ | N/A | ☐ |
| Material Safety Data Sheets (MSDS) | Y | ☐ | N | ☑ | N/A | ☐ |
| Environmental Compliance Approvals (ECA) | Y | ☐ | N | ☑ | N/A | ☐ |
| Environmental Activity and Sector Registry (EASR) | Y | ☐ | N | ☑ | N/A | ☐ |
| Applicable Correspondence and Notices and Work Orders (Regulatory Agencies) | Y | ☐ | N | ☑ | N/A | ☐ |
| MOE Acknowledgment of Subject Waste Registration (FOR ADJACENT PROPERTY) | Y | ☑ | N | ☐ | N/A | ☐ |
| Waste Shipment Manifest Records | Y | ☐ | N | ☑ | N/A | ☐ |
| Waste Audit | Y | ☐ | N | ☑ | N/A | ☐ |
| Spill Prevention, Containment and Countermeasures Plan | Y | ☐ | N | ☑ | N/A | ☐ |
| Applicable Reports or Correspondence Pertaining to Previous Environmental Evaluation or Remediation, Hydrogeologic Investigation or Geotechnical Study | Y | ☑ | N | ☐ | N/A | ☐ |
| Applicable Construction Pit/Boring Logs or Well Construction Logs | Y | ☐ | N | ☑ | N/A | ☐ |
| Notices of Violations, A/O Correspondence Pertaining to Violation of Environmental Law, Legal Proceedings | Y | ☐ | N | ☑ | N/A | ☐ |
| Asbestos Survey/Management Plan | Y | ☐ | N | ☑ | N/A | ☐ |
| PCB Inventory or Storage Documentation | Y | ☐ | N | ☑ | N/A | ☐ |
| Permits – AST, UST | Y | ☐ | N | ☑ | N/A | ☐ |
| Reports of Releases of Hazardous materials or Oil | Y | ☐ | N | ☑ | N/A | ☐ |
| Insurance Risk Survey | Y | ☐ | N | ☑ | N/A | ☐ |

**From:** Mike McArthur <mcarthur@clinebackus.com>
**Sent:** Wednesday, January 22, 2014 7:54 PM
**To:** Jennifer Y. Kato
**Subject:** RE: 38750-100 Westwood Trail Subdivision Phase I Environmental Site Assessment
**Attachments:** Phase I ESA Interview Westwood, Simcoe.doc

Jennifer,
Here is the completed questionnaire. Any other questions, let me know. Thanks for getting to this in a timely fashion. Reagrds,
Mike McArthur
Cell 1-519-427-9393

---

**From:** Jennifer Y. Kato [mailto:JKato@mte85.com]
**Sent:** Monday, January 20, 2014 2:53 PM
**To:** Mike McArthur
**Subject:** 38750-100 Westwood Trail Subdivision Phase I Environmental Site Assessment

Good Afternoon,
I am working with Steve Roorda and John Goodwin to complete the Phase I Environmental Site Assessment (ESA) for the Westwood Trail Subdivision (Lot 18 Gore) in Simcoe, Ontario. As part of the ESA process, an interview questionnaire must be completed by someone knowledgeable with the Site. Could you please complete the attached questionnaire to the best of your knowledge and return it to me? Alternatively, you can call me and we can complete the questionnaire together over the phone. Please be aware that the questionnaire is standard therefore, some questions may not apply to your Site. An answer of 'not applicable' is acceptable.
Please contact me if you have any questions.
Thank you,
Jennifer

---

**MTE Consultants Inc.**
**Jennifer Kato**, C.Tech., B.A. (Hon.)
*Environmental Scientist*
520 Bingemans Centre Drive, Kitchener, Ontario N2B 3X9
Phone: 519-743-6500 x1356 Fax: 519-743-6513
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## MTE Consultants Inc.
## Phase I ESA Interview Questions

| | |
|---|---|
| Project No: | 38750-200 |
| Client: | Westwood Trails Developments Inc. |
| Date: | January 22, 2014 |

| | |
|---|---|
| Municipal Address or Legal Description of the Phase I Site: | n/a but at south and west corner of Thomson and Fernwood, Simcoe, Ontario |
| Name of Interview Candidate? | Mike McArthur |
| Title: | Officer / Director |
| Relationship/How long with company? | Shareholder since inception |

| | |
|---|---|
| 1. | Who is the current owner/tenant of the Site? How long have they owned/leased? |

Westwood Trail Developments Inc since approximately June 2007

| | |
|---|---|
| 2. | Who is the previous owner of the Site? Who is the previous tenant of the Site? |

Rosart Properties Inc. (Oakville)

| | |
|---|---|
| 3. | Have any major renovations been conducted? Demolition of buildings/structures? |

No.

| | |
|---|---|
| 4. | Are any water wells located on the property? If so, is the driller's well log available? How deep is the well? |

No. On a number of adjacent land to the northwest, yes.

| | |
|---|---|
| 5. | Are any septic beds located on the property? Are permits available? |

No. Will be connected to municipal sewer system.

| | |
|---|---|
| 6. | Are there any problems with Site drainage? Has there ever been any flooding in the basement, building or external area of the property? Any issues with roof leaks? |

No.

| | |
|---|---|
| 7. | Are there any easements on the property (hydro, gas, telephone, etc.)? |
| No. | |
| 8. | Has dust control ever been used on the property? If so, what was used? |
| No. | |
| 9. | Are there any transformers located on the property? If so, who owns them? |
| No. | |
| 10. | Are there any aboveground storage tanks located on the Site? Have any been removed in the past? If so, when, what size and what did it contain? |
| No. | |
| 11. | Are there any underground storage tanks located on the Site? Have any been removed in the past? If so, when, what size and what did it contain? |
| No. | |
| 12. | Are there any fuel pumps or fuelling systems on the Site? Have any been removed in the past? |
| No. | |
| 13. | Have any pesticides/herbicides/sludge ever been applied to the Site? If so, when, and what products? |
| Likely pesticides and herbicides when the area was part of a tobacco farm now ovr 40 years or more ago. | |
| 14. | Are there any noise or odours problems from the Site to your neighbours or from the surrounding neighbouring properties to your Site? |
| No. | |
| 15. | Is there chemical/solvent storage on Site? Which chemicals/method of storage? |
| No. | |

| | |
|---|---|
| 16. | How is solid waste stored and disposed? |
| Not applcable | |
| 17. | Is any vehicle maintenance performed on the Site currently or in the past? How are the waste vehicle fluids dealt with? |
| No. | |
| 18. | Are any liquid industrial wastes generated at the Site? If so, how are they disposed? |
| Not applicable. | |
| 19. | Does any equipment, vehicle or plant floor wash down occur on the Site currently or in the past? |
| No. | |
| 20. | Was the Site ever used for agricultural purposes? If so, approximately what years and what crops? |
| Yes, for tobacco, wheat and agricultural food crops over 40 years ago. | |
| 21. | When was the Site developed? Has the building ever been heated with fuel oil (furnace oil)? |
| Most of former farm was developed to the then urban boundary with remnant farm in Agricultural zone only but no longer farmed. | |
| 22. | Have any chemical/oil spills occurred? How are spills handled? Are spill kits available? Do employees have Spill Response training? |
| None. | |
| 23. | Are Material Safety Data Sheets (MSDS) available for any chemical compounds used on the Site? |
| No | |
| 24. | Is there a Joint Health and Safety Committee? Do they have any outstanding environmental concerns? |
| Not apllicable | |

| | |
|---|---|
| 25. | Are there any outstanding regulatory compliance issues (such as zoning, labour or environment) with the Site? Have there been any in the past? |
| None | |
| 26. | Is there any asbestos, lead, UFFI or PCB containing materials on the Site? Have any been removed in the past? |
| No. | |
| 27. | Are batteries (non-household type) used on the Site? If so, how are they disposed? |
| No | |
| 28. | Have any other inspections occurred on the Site (i.e. Ministry of Labour, Ministry of the Environment, Township/Municipality, Insurance agency, etc.) Any other environmental reports completed for the Site? |
| Municipal and governmental for prior zoning and official plan approvals | |
| 29. | Any other problems with the neighbouring properties such as chemical storage, contamination, etc? |
| Approximate 4 acre block adjacent to east of the subject lands was owned by Canadian Canners where waste solids from food processing were purported to be placed. This has been owned since by current owner, Doug Smith, for perhaps 40 years and he obtained Ministry of Environment Certificate for clean-up efforts made many years ago. | |
| 30. | Are any waste oils generated/stored on Site? If so, how are these wastes stored and disposed of? Is there an oil-water separator? |
| No. | |
| 31. | Are there any hoists on the Site? If so are the above ground or in ground and how are they powered? |
| No. | |
| 32. | Have there been any fires or do you burn or incinerate anything? |
| No | |
| 33. | Are there any areas of mould/water damage in the building? |

| | |
|---|---|
| No. | |
| 34. | Has any waste been dumped on the property? Has any soil or fill from an unknown source been deposited on the Site? |
| No. | |
| 35. | Are there any concerns related to indoor air quality in the building? |
| No. | |
| 36. | Do you have any stack emissions, fugitive air emissions? Do you have a Certificate of Approval (Air) issued by the Ontario Ministry of the Environment? |
| Not applicable | |
| 37. | Is there another person we should contact for additional information? |
| Unkown. | |

The above information is a true representation of my knowledge of the Site and operations. I understand that this information will be reviewed by MTE and compiled in the Phase I ESA report.

Are there any additional comments related to environmental matters that you have?

**Signature of Interviewed Candidate:** *Mike McArthur*

**From:** Mike McArthur <mcarthur@clinebackus.com>
**Sent:** Thursday, January 23, 2014 10:13 AM
**To:** Jennifer Y. Kato
**Subject:** Re: 38750-100 Westwood Trail Subdivision Phase I Environmental Site Assessment

Jennifer,
Sorry for that oversight. There are no transformers on the property.

Yes, the original farm was about 100 acres. It was a tobacco farm and also grew other crops. The last farmer who owned the land was a family named Haegman(or something like that). Rosart properties (or their earlier entities which may have been a name like Villagefield Estates) developed over the year all but the remnant as residential subdivision and these are the existing homes on the streets of Thompson, Atwood, Kennedy and Virginia. The remnant vacant area including the subject property has not been farmed since which has been at least 40 years.

Smith is only the owner of the adjacent site and he has nothing to do with the subject lands in any way.

If you need anything else, let me know. Thanks.
Mike McArthur

On Jan 23, 2014, at 9:45 AM, "Jennifer Y. Kato" <JKato@mte85.com> wrote:

> Thanks for completing the questionnaire. I just need an answer for "Number 9. Are there any transformers located on the property? If so, who owns them?"
>
> I was also wondering how you know it was a tobacco, wheat and agricultural food crop farm over 40 years ago. Was it part of the agricultural property to the south and severed? I'm just trying to piece together a timeline of how the property has been used (i.e. Did Rosart Properties Inc. purchase from the original farmer? Has the property been vacant for the last 40 years or did someone else farm it in the interim? Etc.)
>
> As well, how is Doug Smith associated with our Site? Or does he just own the adjacent parcel?
>
> Thanks for your help with this,
> Jennifer
>
> ---
>
> **From:** Mike McArthur [mailto:mcarthur@clinebackus.com]
> **Sent:** Wednesday, January 22, 2014 7:54 PM
> **To:** Jennifer Y. Kato
> **Subject:** RE: 38750-100 Westwood Trail Subdivision Phase I Environmental Site Assessment
>
> Jennifer,
> Here is the completed questionnaire. Any other questions, let me know. Thanks for getting to this in a timely fashion. Reagrds,
> Mike McArthur
> Cell 1-519-427-9393
>
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Please contact me if you have any questions.
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---

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# APPENDIX E

# PHOTOGRAPHIC LOG

**Photographic Log for the Phase I ESA**
**Lot 18 Gore, Simcoe, ON**

**Photograph No. 1 – East facing view from dead end at Fernwood Drive and Thomson Road, adjacent to the north boundary of the Site.**

**Photograph No. 2 – West facing view of dead end of Thomson Road, adjacent to Site.**

**Photograph No. 3 – East facing view of north Site boundary along rear or residential dwellings on Thomson Road. Site is adjacent to a former waste disposal site.**

**Photograph No. 4 – North facing view of former waste disposal site adjacent to the Phase I Site. (Beyond trees are the residential dwellings on Thomson Road.)**

**Photograph No. 5 – Left: South facing view of south Site boundary. Agricultural farmland on other side of the embankment.**
**Right: South facing view of agricultural farmland.**

**Photograph No. 6 – Typical vegetation across the Site.**

**Photograph No. 7 – North facing view of agricultural farmland beyond the woodlot west of the Site.**

**Photograph No. 8 – Left: Notice of Public Meeting next to the park adjacent to the north Site boundary. Right: Southwest facing view of the adjacent park (circled). Note woodlot is at a higher elevation in this location.**

# APPENDIX F

# LIST OF POTENTIALLY CONTAMINATING ACTIVITIES

# Appendix F
# Potentially Contaminating Activities (PCA's)

1. Acid and Alkali Manufacturing, Processing and Bulk Storage
2. Adhesives and Resins Manufacturing, Processing and Bulk Storage
3. Airstrips and Hangars Operation
4. Antifreeze and De-icing Manufacturing and Bulk Storage
5. Asphalt and Bitumen Manufacturing
6. Battery Manufacturing, Recycling and Bulk Storage
7. Boat Manufacturing
8. Chemical Manufacturing, Processing and Bulk Storage
9. Coal Gasification
10. Commercial Autobody Shops
11. Commercial Trucking and Container Terminals
12. Concrete, Cement and Lime Manufacturing
13. Cosmetics Manufacturing, Processing and Bulk Storage
14. Crude Oil Refining, Processing and Bulk Storage
15. Discharge of Brine related to oil and gas production
16. Drum and Barrel and Tank Reconditioning and Recycling
17. Dye Manufacturing, Processing and Bulk Storage
18. Electricity Generation, Transformation and Power Stations
19. Electronic and Computer Equipment Manufacturing
20. Explosives and Ammunition Manufacturing, Production and Bulk Storage
21. Explosives and Firing Range
22. Fertilizer Manufacturing, Processing and Bulk Storage
23. Fire Retardant Manufacturing, Processing and Bulk Storage
24. Fire Training
25. Flocculants Manufacturing, Processing and Bulk Storage
26. Foam and Expanded Foam Manufacturing and Processing
27. Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles
28. Gasoline and Associated Products Storage in Fixed Tanks
29. Glass Manufacturing
30. Importation of Fill Material of Unknown Quality
31. Ink Manufacturing, Processing and Bulk Storage
32. Iron and Steel Manufacturing and Processing
33. Metal Treatment, Coating, Plating and Finishing
34. Metal Fabrication
35. Mining, Smelting and Refining; Ore Processing; Tailings Storage
36. Oil Production
37. Operation of Dry Cleaning Equipment (where chemicals are used)
38. Ordnance Use
39. Paints Manufacturing, Processing and Bulk Storage
40. Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-scale Applications
41. Petroleum-derived Gas Refining, Manufacturing, Processing and Bulk Storage
42. Pharmaceutical Manufacturing and Processing
43. Plastics (including Fibreglass) Manufacturing and Processing
44. Port Activities, including Operation and Maintenance of Wharves and Docks
45. Pulp, Paper and Paperboard Manufacturing and Processing
46. Rail Yards, Tracks and Spurs
47. Rubber Manufacturing and Processing
48. Salt Manufacturing, Processing and Bulk Storage
49. Salvage Yard, including automobile wrecking
50. Soap and Detergent Manufacturing, Processing and Bulk Storage
51. Solvent Manufacturing, Processing and Bulk Storage
52. Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems
53. Tannery
54. Textile Manufacturing and Processing
55. Transformer Manufacturing, Processing and Use
56. Treatment of Sewage equal to or greater than 10,000 litres per day
57. Vehicles and Associated Parts Manufacturing
58. Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners
59. Wood Treating and Preservative Facility and Bulk Storage of Treated and Preserved Wood Products

(Reference: Table 2, Schedule D, Ontario Regulation 153/04 as amended)

# LOT 18 GORE, COUNTY OF NORFOLK

## Draft

## Phase II Environmental Site Assessment

**Project Location:**
Lot 18 Gore
Simcoe, ON

**Prepared for:**

Westwood Trail Developments Inc.
c/o M.McArthur and Dave Pond
34 Virginia Avenue
Simcoe, ON
N3Y 5M4

**June 19, 2014**

**MTE File No.: 38750-600**

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## FIGURES


FIGURE 1: SITE LOCATION MAP
FIGURE 2: SITE FEATURES AND SAMPLING LOCATIONS
FIGURE 3: GROUNDWATER FLOW MAP


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TABLE 2.2: SOIL SAMPLE SUMMARY
TABLE 2.4: GROUNDWATER SAMPLE SUMMARY
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# 1.0 INTRODUCTION

## 1.1 Purpose

MTE Consultants Inc. (MTE) was retained by Westwood Trail Developments Inc., the owner of an undeveloped property known as Lot 18 Gore in Simcoe, Ontario ("the Phase II Site" or "the Site") to conduct a Phase II Environmental Site Assessment (ESA). Refer to **Figure 1** for the Site Location and Limits. The Phase II Site is vacant with mature trees and unmaintained vegetation. There is no vehicle access to the Site and there are no structures on the property.

The Site comprises an area of approximately 3.7ha (9.1 acres) and is bounded by residential dwellings to the north, agricultural farmland to the south and woodlot to the east and west. Refer to **Figure 2** for the Site Layout and Features.

Authorization to proceed with the project was received from Mr. Mike McArthur of Westwood Trail Development Inc. following acceptance of our proposal for services. The assignment was completed by MTE according to Reference Number 38750-600. The report has been issued to Westwood Trail Developments Inc. for due diligence purposes in advance of financing.

A Phase I ESA dated February 28, 2014 was completed by MTE on behalf of Westwood Trail Developments Inc. and was provided under separate cover.

## 1.2 Scope of Work

The Phase II ESA was conducted in accordance with CSA document Z769-00 (December, 2000) and follows the methodology of Ontario Regulation 153/04 (as amended), including soil and groundwater Standards which came into effect on July 1, 2011.

The Phase II ESA work program completed by MTE included the following:

- Development of a Site Specific Health and Safety Plan (HASP) for field activities;
- Utility clearance for drilling locations;
- Advancement of five (5) boreholes completed as monitoring wells, to a maximum depth of 12.2 metres (40 feet) below ground surface (m bgs), in areas deemed to be potential environmental risks by the Phase I ESA (refer to Section 1.3, below);
- Collection of soil samples from each borehole for examination of staining, odours, or elevated Organic Vapour readings;
- Submission of selected soil samples to an accredited laboratory for analysis of organo chlorine (OC) pesticides; metals; petroleum hydrocarbon (PHC) fractions F1 – F4; and benzene, toluene, ethyl benzene, xylene (BTEX) compounds as specified on the chain of custody;

- Collection of groundwater samples from the new monitoring wells for submission to an accredited laboratory for analysis of PHC fractions F1 – F4, BTEX compounds, metals and pH as specified on the chain of custody;
- Measurement of water levels and elevation surveying of all monitoring wells to determine groundwater flow direction;
- Quality Assurance/Quality Control (QA/QC) procedures for field work and laboratory analysis;
- Photographic record of field activities; and
- Data analysis and report preparation.

The Phase II ESA was completed under the direct supervision of a Qualified Person ($QP_{ESA}$) for use by Westwood Trail Developments Inc.

The sampling program (including QA/QC methods) was conducted in accordance with MTE Standard Operating Procedures in conjunction with the MOE document *"Guidance on Sampling and Analytical Methods of Use at Contaminated Sites in Ontario,"* dated December 1996. All chemical analyses were performed in accordance with the document "*Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act,"* dated March 2004 (as amended).

## 1.3 Selection of Site Condition Standards

Based upon a review of the conditions outlined in Part IX Sections 41 and 43.1 of Ontario Regulation 153/04 (as amended), the Property is not to be in proximity to a water body or a shallow soil condition. The Site is adjacent to a Norfolk County designated Significant Woodland. In addition, the north portion of the Phase II Site appears to be within a Wellhead Protection Area (WHPA B and WHPA C). The closest municipal well (Chapel Street Well) is located approximately 0.7km to the northeast and there are several private wells along Virginia Avenue to the northwest. Therefore, the Site would very likely qualify as a "Sensitive Site" under the Regulation (this could be confirmed with the County if necessary) and to be conservative, the Table 1 Site Condition Standards included in the *MOE Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* (April 15, 2011) were applied to the Phase II Site.

## 1.4 Previous Environmental Reports

MTE completed a Phase I ESA for the Site.

**"*Phase I Environmental Site Assessment, Lot 18 Gore, Simcoe, Ontario,"* dated February 28, 2014, prepared by MTE Consultants Inc.**

This report applies to the entire Site and provided the following information:

- According to aerial photographs, the Site was agricultural farmland from 1945 to 1983. There are no records to indicate the development of any structures on the Site.

- At the time of the Phase I Site inspection the Site was comprised of an undeveloped field with mature trees and vegetation over the majority of the property with maintained grass along the north portion. There were no structures or evidence of former structures, wells or septic systems observed within the limits of the Site. The Site is bounded by residential dwellings to the north, woodlot to the east and west and agricultural farmland to the south.
- A response from Norfolk County included an MOE investigation report dated February 18, 1981 which indicated that the adjacent parcel to the east was a former waste disposal site for Canadian Canners Limited. The investigation included testing for the presence of gas and leachate and documenting any potential impacts arising from the production and migration of these contaminants. The investigation concluded that the majority of the refuse was removed with only a small area containing refuse remaining. The refuse consists mainly of tin and other metal to a maximum depth of 1.5m. There were no combustible gases detected in the refuse, surrounding soils or the adjacent homes. The MOE did not recommend any further monitoring or investigations.
- MTE identified the following potentially contaminating activities that have either occurred on the Site or within the Phase I Study Area.

| Potentially Contaminating Activity | Basis |
|---|---|
| Importation of Fill Material of Unknown Quality | Potential fill on the adjacent property to the east. |
| Pesticides Manufacturing, Processing, Bulk Storage and Large-scale Applications | Former pesticide use on the Site and on the adjacent property to the south. |
| Waste disposal and waste management | Former property use on adjacent property to the east. |

- Due to the identified potentially contaminating activities a Phase II ESA was recommended and included the advancement of boreholes, some completed as monitoring wells, to investigate the following Contaminants of Potential Concern (COPC):
  1. Metals in soil and groundwater;
  2. BTEX in soil and groundwater;
  3. PHCs in soil and groundwater;
  4. OC Pesticides in soil.

No other previous environmental reports were provided to MTE in preparation of this Phase II ESA.

## 2.0 PHASE II WORK PROGRAM

### 2.1 Borehole Drilling

A Site Specific Health and Safety Plan (HASP) was developed in accordance with MTE's policy prior to commencement of any field work. The HASP details the Site location, field activities, MTE and contractor personnel present, potential compounds of concern, physical hazards, environmental conditions, personal protective equipment and directions to the nearest emergency health care provider. Utility services were located and marked by the utility providers through Ontario One Call. Refer to **Appendix A**.

The drilling portion of the investigation was conducted in conjunction with a geotechnical investigation by CMT Engineering Inc. (the geotechnical consultant retained by the client) and a hydrogeological investigation by MTE. Detailed geotechnical information by CMT is provided under a separate cover. The result from the hydrogeological investigation completed by MTE is provided under a separate cover.

Drilling activities were completed between May 23 and 30, 2014 by Direct Environmental Drilling (Direct) of St. Thomas, Ontario, who are a MOE licenced well contractor, using a track-mounted 7822DT GeoProbe drill rig. The drilling method included a combination of split spoons and the advancement of a continuous macro-core to the intended drilling depth to obtain soil samples. The open borehole was subsequently over-drilled with hollow stem augers in order to construct a permanent monitoring well. Soil conditions encountered in the work area typically included topsoil above silty sand to a maximum depth of 4.3m bgs above silt and clay to the depths explored. Saturated conditions that appeared to represent the shallow water table were encountered at depths ranging from 1.5 to 2.3m bgs. There was no evidence of peat or organic materials and bedrock was not encountered to the depth explored.

Monitoring wells were installed in accordance with Ontario Regulation 903 (as amended) and in consideration with the guidance document "Test Holes and Dewatering Wells – Requirements and Best Management Practices" (MOE April, 2014), for obtaining information in respect of groundwater. Each monitoring well was constructed with a 3.0m long No. 10 slotted PVC screen measuring 50mm diameter and a coarse grained sand pack to allow for groundwater collection in the well. The monitor pipes and screens were received pre-cleaned and sealed in a protective plastic wrap from the manufacturer. The riser pipe and screen sections were pre-threaded with O-ring seals. No glues or solvents were used to connect the pipe sections. Because these wells are screened in the shallow water table, which is not locally used for supplying water to meet domestic consumption, a minimum of 0.6m of Bentonite gravel (Holeplug) was placed immediately above the sand pack to hydraulically isolate the screened portion of the well rather than the 2.5m specified by Section 14, Ontario Regulation 903.

The remaining portion of the groundwater monitoring well was completed with a steel stick-up protective casing, which was cemented in place.

The drill equipment was cleaned between locations using soapy water and rinsed, according to industry standard procedures, to avoid cross contamination. At the conclusion of soil sampling, BH8-13 was filled with bentonite and sealed. Soil cuttings were dispersed to ground surface near each drilling location.

MTE was present during the drilling activities to record and document the environmental findings. Soil cores were recovered at each borehole to the depth explored with the exception of MW4a-14. Monitoring well MW4-14 was advanced to a depth of 9.0m bgs to accommodate the installation of a monitoring well for hydrogeological investigation purposes. Monitoring well MW4a-14 was advanced directly south of MW4-14 and screened between 1.2-4.3m bgs in the shallow water table, to investigate potential environmental concerns. Soil stratigraphy for MW4a-14 is surmised to be the same as MW4-14.

The rationale for drilling locations was based upon areas of potential environmental risk identified in the Phase I ESA and in consideration of utility locations, Site access and terrain limitations.

- MW3-14: located with the central portion of the Site, to investigate the quality and extent of potential fill reported on the adjacent parcel to the east;
- MW4-14 & MW4a-14: located in the north portion of the Site, south of the homes on Virginia Avenue, to investigate the quality and extent of potential fill reported on the adjacent parcel to the east;
- MW5-14: located in the northeast portion of the Site, directly south of the homes on Thomson Road, to investigate the quality and extent of potential fill reported on the adjacent parcel to the east and possible historic pesticide use on the Site; and
- MW6-14: located in the southeast portion of the Site, to investigate the quality and extent of potential fill reported on the adjacent parcel to the east and potential impacts from agricultural operations to the south.

An additional borehole, BH8-14, was advanced as part of the geotechnical investigation. No soil samples were collected by MTE at this location. Borehole and monitoring well locations are shown on **Figure 2**. Photographs are provided in **Appendix B** and borehole logs are provided in **Appendix C**.

## 2.2 Soil Samples

An MTE field technician performed field screening activities and collected samples during the investigation.

Soil samples collected for field screening were placed in a sealable plastic bag for measurement of total organic vapour (TOV) in the headspace using a pre-cleaned and calibrated Photoionization Detector (PID). TOV measurements in headspace typically ranged from 0.0 – 1.5 ppm which is considered background or ambient levels. Accordingly, there are no concerns related to organic vapour.

As required by the MOE, *Protocol of Analytical Methods Used in the Assessment of properties under Part Xv.1 of the Environmental Protection Act*, amended as of July 1, 2011, special care must be used when sampling for VOC, BTEX and PHC F1 fractions. For this project MTE obtained soil samples for analysis of PHC F1 fractions and BTEX compounds using a Terra Core Sampler (a disposable tool which takes a single soil sample from the undisturbed soil) and placing the soil sample in a 40mL vial with 5mL of methanol.

Soil samples from this investigation were placed in laboratory-supplied sample jars and hermetic devices, sealed, labeled and stored in a cooler with ice for transportation to the Maxxam Analytics (Maxxam) depot in Waterloo, Ontario. Maxxam is certified by the Canadian Association for Laboratory Accreditation (CALA) for all parameters tested as part of this investigation. Soil samples were submitted under chain of custody for analysis as outlined in **Table 2.2**, below.

Standard QA/QC protocols for bottle preparation, sampling and transportation were followed as outlined by MOE guidance documents.

**Table 2.2: Soil Sample Summary**
**Lot 18 Gore, Simcoe, Ontario**

| Sample Location | Sample Depth (m bgs) | Sample IDs | Parameter Group |
|---|---|---|---|
| MW3-14 | 0-0.3 | MW3-14 0-1’ | On hold with the laboratory |
| | 0.3-0.6 | MW3-14 1-2’ | On hold with the laboratory |
| | 1.1-1.4 | MW3-14 3.5-4.5’ | PHCs, BTEX |
| MW4-14 | 0-0.3 | MW4-14 0-1’ | metals |
| | 1.5-1.8 | MW4-14 5-6’ | PHCs, BTEX |
| | 6.1-6.4 | MW4-14 20-21’ | On hold with the laboratory |
| | 8.5-8.8 | MW4-14 28-29’ | On hold with the laboratory |
| MW5-14 | 0-0.3 | MW5-14 0-1’ | OC Pesticides |
| | 0.3-0.6 | MW5-14 1-2’ | metals |
| | 1.5-1.8 | MW5-14 5-6’ | On hold with the laboratory |
| | 2.4-2.7 | MW5-14 8-9’ | PHCs, BTEX |
| | 4.0-4.3 | MW5-14 13-14’ | On hold with the laboratory |
| | 5.5-5.8 | MW5-14 18-19’ | On hold with the laboratory |
| MW15-14 | 0-0.3 | MW15-14 0-1’ | Metals, duplicate of MW5-14 0-1’ |
| MW6-14 | 0-0.3 | MW6-14 0-1’ | Metals, OC Pesticides |
| | 1.5-1.8 | MW6-14 5-6’ | PHCs, BTEX |
| | 3.0-3.3 | MW6-14 10-11’ | On hold with the laboratory |
| BH8-14 | 0-0.3 | BH8-14 0-1’ | On hold with the laboratory |
| | 0.3-0.6 | BH8-14 1-2’ | On hold with the laboratory |
| | 1.0-1.2 | BH8-12 3-4’ | On hold with the laboratory |

## 2.3 Groundwater Field Measurements of Water Quality Parameters

Prior to the collection of groundwater samples, monitoring wells were instrumented with dedicated tubing and developed. Well development included purging stagnant water from the monitoring well and the surrounding sand pack to allow a representative groundwater sample to be collected. Water purged from the monitoring wells was drawn to the surface through the use of dedicated Waterra tubing and a foot valve

Field chemistry parameters, including: temperature, specific conductivity, pH, and total dissolved solids were monitored during well development using a Hanna Multi-parameter Water Quality Meter until stabilized measurements were recorded. Purge liquids were dispersed to the ground surface.

## 2.4 Groundwater Samples

Monitoring well MW4-14 was screened between 5.9 and 9.0m bgs for a hydrogeological investigation and MW4a-14 was screened between 1.2 and 4.3m bgs to investigate potential environmental concerns. At the time of water sampling MW4-14 had not yet recovered and therefore, MTE could not collect a groundwater sample at this location. MTE did submit a groundwater sample from MW4a-14, which was screened in the shallow water table. The $QP_{ESA}$ has determined that the groundwater samples from MW4a-14 provide sufficient information for the northern portion of the Site and the exclusion of water analysis from MW4-14 does not change the outcome of this investigation.

All groundwater samples were examined for visual and olfactory evidence of impact and placed in laboratory-supplied sample jars, sealed, labeled and stored in a cooler with ice for transportation to the Maxxam depot in Waterloo, Ontario. There were no obvious visual or olfactory concerns identified at the time of sample collection. The samples were submitted under chain-of-custody for analysis, as outlined in **Table 2.4** below.

Standard QA/QC protocols were followed for bottle preparation, sample collection and transportation, as outlined by MOE guidance documents.

**Table 2.4: Groundwater Sample Summary**
**Lot 18 Gore, Simcoe, Ontario**

| Sample Name | Sample Description | Parameter Group |
|---|---|---|
| MW4a-14 | Cloudy | PHCs, BTEX, pH |
| MW5-14 | Cloudy | Metals, PHCs, BTEX |
| MW6-14 | Cloudy | Metals, PHCs, BTEX |

## 2.5 Surveying and Groundwater Elevations

Surveying of the monitoring wells was completed by MTE. Monitoring well elevations and groundwater elevations are summarized in **Table 2.5** below. The measured depth to groundwater was between 1.66 and 2.16m bgs. Based on groundwater elevations and a review of local topography, groundwater is interpreted to generally be flowing in a northerly direction. Groundwater elevations and contours are shown on **Figure 3**.

**Table 2.5: Groundwater Elevations – Lot 18 Gore, Simcoe, Ontario**

| Monitoring Well | Ground Surface Elevation (m) | Water Level (m bgs) | Ground water Elevation (m bgs) | Well Depth (m bgs) | Screen Length (m) | Sand Pack (m) |
|---|---|---|---|---|---|---|
| MW3-14 | 235.847 | - | - | 4.0 | 3.0 | 3.35 |
| MW4-14 | 237.104 | dry | - | 9.0 | 3.0 | 3.35 |
| MW4a-14 | 237.044 | 1.55 | 235.494 | 4.27 | 3.0 | 3.35 |
| MW5-14 | 237.664 | 2.07 | 235.594 | 4.27 | 3.0 | 3.35 |
| MW6-14 | 237.299 | 1.58 | 235.719 | 4.27 | 3.0 | 3.35 |

Notes:
Water levels were measured on May 29, 2014.
m bgs - metres below ground surface
- was not measured

## 3.0 LABORATORY RESULTS

Laboratory Certificates of Analyses are provided in **Appendix D**.

## 3.1 Analytical Results in Soil

Analytical results are shown in **Table 3.1** along with a comparison to the MOE 2011 Table 1 Site Condition Standards (SCS) for residential/parkland/ institutional/industrial/commercial/community property use. The following sections summarize the analytical findings for the soil samples.

### *3.1.1 BTEX Compounds*

Three (3) soil samples were submitted for analysis of BTEX compounds. There were no detections and accordingly, no exceedances of the MOE 2011 Table 1 Standards for BTEX compounds, in the soil samples analyzed.

### *3.1.2 PHC Fractions F1-F4*

Three (3) soil samples were submitted for analysis of PHC fractions F1-F4. There were no detections and accordingly, no exceedances of the MOE 2011 Table 1 Standards for BTEX compounds, in the soil samples analyzed.

### *3.1.3 Metals*

Six (6) soil samples were submitted for analysis of metals including a duplicate taken from MW5-14 at 0-0.3m bgs (0-1') labeled MW15-14 0-1'. There were no elevated levels or exceedances of the MOE 2011 Table 1 Standards for any metals in the soil samples analyzed.

### *3.1.4 OC Pesticides*

Two (2) soil samples were submitted for analysis of OC Pesticides. There were no exceedances of the MOE 2011 Table 1 Standards for OC Pesticides in the soil samples analyzed.

### *3.1.5 Additional Evaluation*

The $QP_{ESA}$ has determined that there are no compounds measured above the MOE 2011 Table 1 Standards for any analyzed compounds in soil and therefore there are no environmental concerns related to soil. Based on the above, the samples placed on hold with the laboratory were not analyzed.

## 3.2 Analytical Results in Groundwater

Analytical results in groundwater are shown in **Table 3.2**, along with a comparison to the MOE 2011 Table 1 Standards. The following sections summarize the analytical findings for the groundwater samples.

### *3.2.1 BTEX Compounds*

Three (3) groundwater samples were submitted for analysis of BTEX compounds. There were detections of Toluene in the samples collected from MW4a-14 and MW5-14, but no exceedances of the MOE 2011 Table 1 Standards. There were no other detections and accordingly, no exceedances of the MOE 2011 Table 1 Standards for BTEX compounds in the analyzed groundwater samples.

### *3.2.2 PHC Fractions F1-F4*

Three (3) groundwater samples were submitted for analysis of PHC fractions F1-F4. There were no detections and accordingly, no exceedances of the MOE 2011 Table 1 Standards for PHC fractions F1-F4 in the analyzed groundwater samples.

### *3.2.3 Metals*

Two (2) groundwater samples were submitted for analysis of metals. There were no exceedances of the MOE 2011 Table 1 Standards for metals in the groundwater samples analyzed.

### *3.2.4 Other Parameters*

One (1) groundwater sample was submitted for analysis of pH. The pH result was 7.86, which is considered within the MOE acceptable range for drinking water.

### *3.2.5 Additional Evaluation*

The $QP_{ESA}$ has determined that there are no compounds measured above the MOE 2011 Table 1 Standards for any analyzed compounds in groundwater and therefore there are no environmental concerns related to groundwater.

## 3.3 Quality Assurance/Quality Control

Quality assurance/quality control (QA/QC) was maintained during the field program through equipment decontamination and sampling procedures, as outlined in the MOE Guidance on Sampling and Analytical Methods (MOE, 1996) and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (MOE, 2004).

Soil samples analyzed for PHC fraction F1 and BTEX compounds were collected in unpreserved hermetic sample devices that take and seal a single soil sample from the undisturbed soil core preserved in methanol. Soil samples collected for all other parameters were collected in 120mL unpreserved glass jars supplied by the laboratory.

All samples were clearly labeled with a unique sample identifier, project number, MTE contact, sample parameters required and date.

Laboratory Quality Control was carried out in strict accordance with the requirements of the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (MOE, 2004). Included in the laboratory QA/QC program are the use of Method blanks, Laboratory Control Samples, Matrix Spikes, Laboratory Duplicates, Surrogates and Internal Standards depending on the analyte of interest.

All of the soil and water samples were stored and transported in iced, insulated coolers to initiate cooling until same-day submission to the analytical laboratory. Chain-of-Custody sheets were maintained for all samples.

No samples were rejected by the lab and MTE did not qualify any results as bias. Based on the QA/QC procedures, the analytical data is suitable for evaluation of Site conditions.

## 4.0 SUMMARY

### 4.1 Geology

Soil conditions encountered in the work area typically included topsoil above silty sand to a maximum depth of 4.3m bgs above silt and clay to the maximum depths explored. Bedrock was not encountered. There were no noticeable odours or staining in the soil and no evidence of buried waste, debris or decaying material observed. No excavations were performed.

### 4.2 Soil Results

There were no exceedances of the MOE 2011 Table 1 Standards for PHCs, BTEX, metals or OC Pesticides in the soil samples.

### 4.3 Groundwater Results

There were no exceedances of the MOE 2011 Table 1 Standards for PHCs, BTEX or metals in the analyzed groundwater samples.

### 4.4 Recommendations

This Phase II ESA was designed to investigate potential impacts in soil and groundwater, related to potential on-Site and off-Site environmental concerns, as a due diligence measure. No further investigation is required or warranted at this time. Based on the above, MTE recommends the following:

1. The wells should be maintained in accordance with Ontario Regulation 903.
2. No further soil or groundwater testing is required or recommended at this time.

### Exclusions

This report does not address geotechnical conditions or municipal planning matters.

## 5.0 LIMITATIONS

Services performed by **MTE Consultants Inc.** (MTE) were conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the Environmental Engineering & Consulting profession. No other warranty or representation expressed or implied as to the accuracy of the information, conclusions or recommendations is included or intended in this report.

This report was completed for the sole use of MTE and the client. It was completed in accordance with the Scope of Work referred to in Section 1.2 and meets the mandatory requirements of CAN/CSA-Z769-00. As such, this report may not deal with all issues potentially applicable to the site and may omit issues, which are or may be of interest to the reader. MTE makes no representation that the present report has dealt with any and all of the important features, including any or all important environmental features, except as provided in the Scope of Work. All findings and conclusions presented in this report are based on site conditions as they existed during the time period of the investigation. This report is not intended to be exhaustive in scope or to imply a risk-free facility.

Any use which a third party makes of this report, or any reliance on, or decisions to be made based upon it, are the responsibility of such third parties. MTE accepts no responsibility for liabilities incurred by or damages, if any, suffered by any third party as a result of decisions made or actions taken, based upon this report. Others with interest in the site should undertake their own investigations and studies to determine how or if the condition affects them or their plans.

It should be recognized that the passage of time may affect the views, conclusions and recommendations (if any) provided in this report because environmental conditions of a property can change. Should additional or new information become available, MTE recommends that it be brought to our attention in order that we may re-assess the contents of this report.

Respectfully Submitted,

**MTE CONSULTANTS INC.**

***DRAFT***

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***DRAFT***

Jennifer Kato, B.A., C.Tech.
Environmental Scientist

JYK:plw

## 6.0 REFERENCES

MTE Consultants Inc., 2014:

Phase I Environmental Site Assessment, Lot 18 Gore, County of Norfolk, Ontario, February 28, 2014.

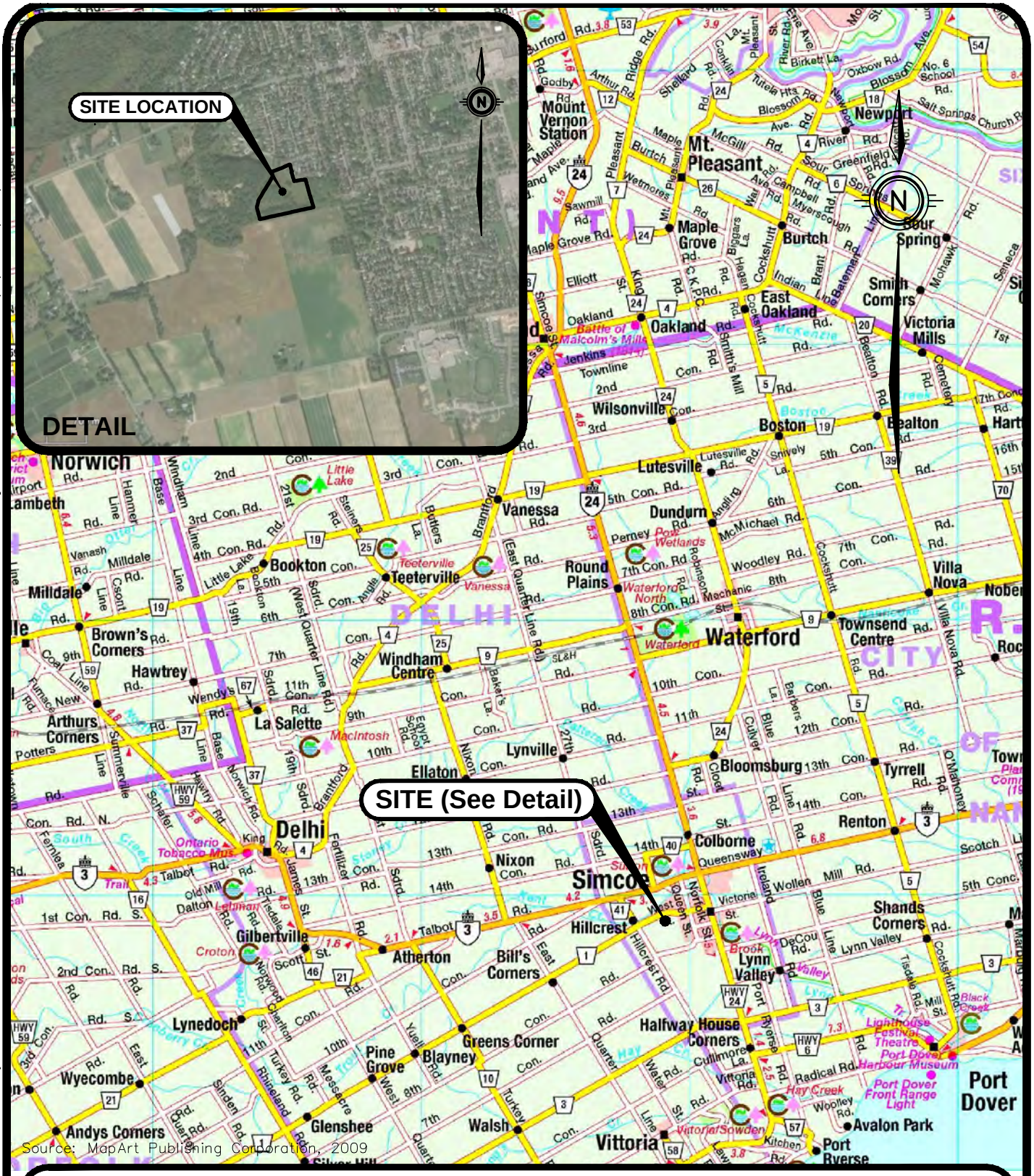
Ontario Ministry of the Environment, 2011:

Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, O. Reg. 511/09, April 15, 2011.

Ontario Ministry of the Environment, 1996:

Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario, December 1996.

# FIGURES




# SITE LOCATION MAP

| Project Name | |
|---|---|
| Phase II Environmental Site Assessment | |
| Site: Lot 18 Gore, Simcoe, Ontario | Client: Westwood Trail Developments Inc. |
| Scale (8.5x11): 1:200,000 | MTE Project No.: 38750-600 |
| Date: June 2014 | Figure No.: 1 |

MTE 25 YEARS 1985-2010
ENVIRONMENTAL DIVISION

June 18, 2014 – 3:49 p.m. – Plotted By: kmadsen
Project: 38750-200 CAD: P:\38750\600\38750-600-EV2.DWG
EV2.1

LEGEND

⊕ Monitoring Well Installed May 2014

MTE 25 YEARS 1985-2010
ENVIRONMENTAL DIVISION

# SITE FEATURES & SAMPLING LOCATIONS

| Project Name | |
|---|---|
| **Phase II Environmental Site Assessment** | |
| Site: Lot 18 Gore, Simcoe, Ontario | Client: Westwood Trail Developments Inc. |

| Scale. (8.5x11) | MTE Project No. | Date | Figure No. |
|---|---|---|---|
| 1:2000 | 38750-600 | June 2014 | **2** |

LEGEND

- Monitoring Well Installed May 2014
- 235.494 Groundwater Elevation
- Inferred Direction of Shallow Groundwater Flow

MTE 25 YEARS 1985-2010
ENVIRONMENTAL DIVISION

# GROUNDWATER FLOW MAP

| Project Name | | | |
|---|---|---|---|
| **Phase II Environmental Site Assessment** | | | |
| Site: Lot 18 Gore, Simcoe, Ontario | | Client: Westwood Trail Developments Inc. | |
| Scale. (8.5x11): 1:2000 | MTE Project No.: 38750-600 | Date: June 2014 | Figure No.: **3** |

# TABLES

**Table 3.1: Soil Analytical Results**
**Lot 18 Gore, Simcoe, ON**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | **Sample Identification:** | **MW3-14 1-2'** | **MW4-14 0-1'** | **MW4-14 5-6'** | **MW5-14 0-1'** | **MW15-14 0-1'** | **MW5-14 1-2'** | **MW5-14 8-9'** | **MW6-14 0-1'** | **MW6-14 5-6'** |
| | | | | **Metric Conversion (m bgs):** | **0.3-0.6** | **0-0.3** | **1.5-1.8** | **0-0.3** | **0-0.3** | **0.3-0.6** | **2.4-2.7** | **0-0.3** | **1.5-1.8** |
| | | | | **Date Sampled:** | May 30, 2014 | May 26, 2014 | May 26, 2014 | May 26, 2014 | May 26, 2014 | May 26, 2014 | May 26, 2014 | May 26, 2014 | May 26, 2014 |
| | | | | **Maxxam Job #** | B491742 | B487624 | B487624 | B487624 | B487624 | B487624 | B487624 | B487624 | B487624 |
| **Parameter** | **Units** | **R.D.L** | **MOE 2011 Table 1** | **Maximum** | WD2291 | WA9876 | WA9877 | WA9880 | WA9889 | WA9881 | WA9882 | WA9886 | WA9887 |
| **Metals** | | | | | | | | | | | | | |
| Antimony (Sb) | ug/g | 0.2 | 1.3 | 0.24 | <0.20 | <0.20 | - | TBA | <0.20 | <0.20 | - | 0.24 | - |
| Arsenic (As) | ug/g | 1 | 18 | 2.3 | 2.1 | 2.3 | - | TBA | 1.5 | 1.1 | - | 1.2 | - |
| Barium (Ba) | ug/g | 0.5 | 220 | 36 | 20 | 28 | - | TBA | 36 | 27 | - | 30 | - |
| Beryllium (Be) | ug/g | 0.2 | 2.5 | 0.25 | 0.21 | 0.2 | - | TBA | 0.24 | 0.2 | - | 0.25 | - |
| Boron (B) | ug/g | 5 | 36 | ND | <5.0 | <5.0 | - | TBA | <5.0 | <5.0 | - | <5.0 | - |
| Cadmium (Cd) | ug/g | 0.1 | 1.2 | 0.14 | 0.1 | 0.14 | - | TBA | <0.10 | <0.10 | - | 0.14 | - |
| Chromium (Cr) | ug/g | 1 | 70 | 9 | 9 | 5.6 | - | TBA | 5.5 | 5.2 | - | 6 | - |
| Cobalt (Co) | ug/g | 0.1 | 21 | 2 | 2 | 1.6 | - | TBA | 2 | 2 | - | 1.9 | - |
| Copper (Cu) | ug/g | 0.5 | 92 | 6.9 | 4 | 3.9 | - | TBA | 5.1 | 3.7 | - | 6.9 | - |
| Lead (Pb) | ug/g | 1 | 120 | 21 | 11 | 15 | - | TBA | 7.1 | 4.6 | - | 21 | - |
| Molybdenum (Mo) | ug/g | 0.5 | 2 | ND | <0.50 | <0.50 | - | TBA | <0.50 | <0.50 | - | <0.50 | - |
| Nickel (Ni) | ug/g | 0.5 | 82 | 4 | 3.9 | 3.1 | - | TBA | 3.8 | 3.7 | - | 4 | - |
| Selenium (Se) | ug/g | 0.5 | 1.5 | ND | <0.50 | <0.50 | - | TBA | <0.50 | <0.50 | - | <0.50 | - |
| Silver (Ag) | ug/g | 0.2 | 0.5 | ND | <0.20 | <0.20 | - | TBA | <0.20 | <0.20 | - | <0.20 | - |
| Thallium (Tl) | ug/g | 0.05 | 1 | ND | <0.050 | <0.050 | - | TBA | <0.050 | <0.050 | - | <0.050 | - |
| Uranium (U) | ug/g | 0.05 | 2.5 | 0.39 | 0.39 | 0.31 | - | TBA | 0.22 | 0.21 | - | 0.19 | - |
| Vanadium (V) | ug/g | 5 | 86 | 25 | 25 | 13 | - | TBA | 11 | 11 | - | 11 | - |
| Zinc (Zn) | ug/g | 5 | 290 | 30 | 30 | 26 | - | TBA | 24 | 20 | - | 30 | - |
| Moisture | % | 1 | NV | 21 | - | - | 21 | 12 | | | 16 | 12 | 16 |
| **BTEX Compounds** | | | | | | | | | | | | | |
| Benzene | ug/g | <0.020 | 0.02 | ND | - | - | <0.020 | - | - | - | <0.020 | - | <0.020 |
| Toluene | ug/g | <0.020 | 0.2 | ND | - | - | <0.020 | - | - | - | <0.020 | - | <0.020 |
| Ethylbenzene | ug/g | <0.020 | 0.05 | ND | - | - | <0.020 | - | - | - | <0.020 | - | <0.020 |
| o-Xylene | ug/g | <0.020 | NV | ND | - | - | <0.020 | - | - | - | <0.020 | - | <0.020 |
| p+m-Xylene | ug/g | <0.040 | NV | ND | - | - | <0.040 | - | - | - | <0.040 | - | <0.040 |
| Total Xylenes | ug/g | <0.040 | 0.05 | ND | - | - | <0.040 | - | - | - | <0.040 | - | <0.040 |
| **PHCs fractions F1-F4** | | | | | | | | | | | | | |
| F1 (C6-C10) | ug/g | <10 | 25 | ND | - | - | <10 | - | - | - | <10 | - | <10 |
| F1 (C6-C10) - BTEX | ug/g | <10 | 25 | ND | - | - | <10 | - | - | - | <10 | - | <10 |
| F2 (C10-C16 Hydrocarbons) | ug/g | <10 | 10 | ND | - | - | <10 | - | - | - | <10 | - | <10 |
| F3 (C16-C34 Hydrocarbons) | ug/g | <50 | 240 | ND | - | - | <50 | - | - | - | <50 | - | <50 |
| F4 (C34-C50 Hydrocarbons) | ug/g | <50 | 120 | ND | - | - | <50 | - | - | - | <50 | - | <50 |
| Reached Baseline at C50 | ug/g | YES | NV | ND | - | - | YES | - | - | - | YES | - | YES |

**Table 3.1: Soil Analytical Results**
**Lot 18 Gore, Simcoe, ON**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | **Sample Identification:** | **MW3-14 1-2'** | **MW4-14 0-1'** | **MW4-14 5-6'** | **MW5-14 0-1'** | **MW15-14 0-1'** | **MW5-14 1-2'** | **MW5-14 8-9'** | **MW6-14 0-1'** | **MW6-14 5-6'** |
| | | | | **Metric Conversion (m bgs):** | **0.3-0.6** | **0-0.3** | **1.5-1.8** | **0-0.3** | **0-0.3** | **0.3-0.6** | **2.4-2.7** | **0-0.3** | **1.5-1.8** |
| | | | | **Date Sampled:** | May 30, 2014 | May 26, 2014 | May 26, 2014 | May 26, 2014 | May 26, 2014 | May 26, 2014 | May 26, 2014 | May 26, 2014 | May 26, 2014 |
| | | | | **Maxxam Job #** | B491742 | B487624 | B487624 | B487624 | B487624 | B487624 | B487624 | B487624 | B487624 |
| **Parameter** | **Units** | **R.D.L** | **MOE 2011 Table 1** | **Maximum** | WD2291 | WA9876 | WA9877 | WA9880 | WA9889 | WA9881 | WA9882 | WA9886 | WA9887 |
| **OC Pesticides** | | | | | | | | | | | | | |
| Chlordane (Total) | ug/g | 0.002 | 0.05 | ND | - | - | - | <0.0020 | - | - | - | <0.0020 | - |
| o,p-DDD + p,p-DDD | ug/g | 0.002 | NV | ND | - | - | - | <0.0020 | - | - | - | <0.0020 | - |
| o,p-DDE + p,p-DDE | ug/g | 0.002 | NV | 0.017 | - | - | - | 0.017 | - | - | - | 0.002 | - |
| o,p-DDT + p,p-DDT | ug/g | 0.002 | NV | 0.005 | - | - | - | 0.005 | - | - | - | <0.0020 | - |
| Total Endosulfan | ug/g | 0.002 | NV | ND | - | - | - | <0.0020 | - | - | - | <0.0020 | - |
| Aldrin | ug/g | 0.002 | 0.05 | ND | - | - | - | <0.0020 | - | - | - | <0.0020 | - |
| a-Chlordane | ug/g | 0.002 | 0.05 | ND | - | - | - | <0.0020 | - | - | - | <0.0020 | - |
| g-Chlordane | ug/g | 0.002 | 0.05 | ND | - | - | - | <0.0020 | - | - | - | <0.0020 | - |
| o,p-DDD | ug/g | 0.002 | 0.05 | ND | - | - | - | <0.0020 | - | - | - | <0.0020 | - |
| p,p-DDD | ug/g | 0.002 | 0.05 | ND | - | - | - | <0.0020 | - | - | - | <0.0020 | - |
| o,p-DDE | ug/g | 0.002 | 0.05 | ND | - | - | - | <0.0020 | - | - | - | <0.0020 | - |
| p,p-DDE | ug/g | 0.002 | 0.05 | 0.017 | - | - | - | 0.017 | - | - | - | 0.002 | - |
| o,p-DDT | ug/g | 0.002 | 1.4 | ND | - | - | - | <0.0020 | - | - | - | <0.0020 | - |
| p,p-DDT | ug/g | 0.002 | 1.4 | 0.005 | - | - | - | 0.005 | - | - | - | <0.0020 | - |
| Dieldrin | ug/g | 0.002 | 0.05 | ND | - | - | - | <0.0020 | - | - | - | <0.0020 | - |
| Lindane | ug/g | 0.002 | 0.01 | ND | - | - | - | <0.0020 | - | - | - | <0.0020 | - |
| Endosulfan I (alpha) | ug/g | 0.002 | 0.04 | ND | - | - | - | <0.0020 | - | - | - | <0.0020 | - |
| Endosulfan II | ug/g | 0.002 | 0.04 | ND | - | - | - | <0.0020 | - | - | - | <0.0020 | - |
| Endrin | ug/g | 0.002 | 0.04 | ND | - | - | - | <0.0020 | - | - | - | <0.0020 | - |
| Heptachlor | ug/g | 0.002 | 0.05 | ND | - | - | - | <0.0020 | - | - | - | <0.0020 | - |
| Heptachlor epoxide | ug/g | 0.002 | 0.05 | ND | - | - | - | <0.0020 | - | - | - | <0.0020 | - |
| Hexachlorobenzene | ug/g | 0.002 | 0.01 | ND | - | - | - | <0.0020 | - | - | - | <0.0020 | - |
| Hexachlorobutadiene | ug/g | 0.005 | 0.01 | ND | - | - | - | <0.0050 | - | - | - | <0.0050 | - |
| Hexachloroethane | ug/g | 0.005 | 0.01 | ND | - | - | - | <0.0050 | - | - | - | <0.0050 | - |
| Methoxychlor | ug/g | 0.005 | 0.05 | ND | - | - | - | <0.0050 | - | - | - | <0.0050 | - |

Notes:
R.D.L. = Reported Detection Limits
NV = No value listed
ND= Non-detect
TBA = Analysis in Process
- = Not Analyzed
m bgs = metres below ground surface
Refer to lab certificates for dates of sample analysis
Results compared to the Table 1 of the MOE's "Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act," (April 15, 2011) for residential property use with coarse textured soil

| | |
|---|---|
| **500** | Bold value indicates a result detected but not exceeding the MOE 2011 Table 1 Standards |
| **500** | Bold and highlighted value indicates a result exceeding the MOE 2011 Table 1 Standards |

**Table 3.2: Groundwater Analytical Results**
**Lot 18 Gore, Simcoe, ON**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | **Sample Identification:** | **MW4A-14** | **MW5-14** | **MW6-14** |
| | | | | **Date Sampled:** | 29-May-14 | | |
| **Parameter** | **Units** | **R.D.L** | **MOE 2011 Table 1** | **Maximum** | WC4479 | WC4480 | WC4481 |
| **Other Regulated Parameters** | | | | | | | |
| pH | pH | NA | NV | | 7.86 | - | - |
| **Metals** | | | | | | | |
| Antimony (Sb) | ug/L | 0.5 | 1.5 | ND | - | <0.50 | <0.50 |
| Arsenic (As) | ug/L | 1 | 13 | ND | - | <1.0 | <1.0 |
| Barium (Ba) | ug/L | 2 | 610 | 74 | - | 20 | 74 |
| Beryllium (Be) | ug/L | 0.5 | 0.5 | ND | - | <0.50 | <0.50 |
| Boron (B) | ug/L | 10 | 1700 | 50 | - | <10 | 50 |
| Cadmium (Cd) | ug/L | 0.1 | 0.5 | ND | - | <0.10 | <0.10 |
| Chromium (Cr) | ug/L | 5 | 11 | ND | - | <5.0 | <5.0 |
| Cobalt (Co) | ug/L | 0.5 | 3.8 | 0.69 | - | <0.50 | 0.69 |
| Copper (Cu) | ug/L | 1 | 5 | 1.3 | - | <1.0 | 1.3 |
| Lead (Pb) | ug/L | 0.5 | 1.9 | ND | - | <0.50 | <0.50 |
| Molybdenum (Mo) | ug/L | 0.5 | 23 | ND | - | <0.50 | <0.50 |
| Nickel (Ni) | ug/L | 1 | 14 | 1.7 | - | <1.0 | 1.7 |
| Selenium (Se) | ug/L | 2 | 5 | ND | - | <2.0 | <2.0 |
| Silver (Ag) | ug/L | 0.1 | 0.3 | ND | - | <0.10 | <0.10 |
| Thallium (Tl) | ug/L | 0.05 | 0.5 | ND | - | <0.050 | <0.050 |
| Uranium (U) | ug/L | 0.1 | 8.9 | 0.36 | - | 0.36 | 0.14 |
| Vanadium (V) | ug/L | 0.5 | 3.9 | ND | - | <0.50 | <0.50 |
| Zinc (Zn) | ug/L | 5 | 160 | 5.2 | - | <5.0 | 5.2 |
| **Benzene, Toluene, Ethylbenzene and Xylene (BTEX) Compounds** | | | | | | | |
| Benzene | ug/L | 0.2 | 0.5 | ND | <0.20 | <0.20 | <0.20 |
| Toluene | ug/L | 0.2 | 0.8 | 0.44 | 0.44 | 0.39 | <0.20 |
| Ethylbenzene | ug/L | 0.2 | 0.5 | ND | <0.20 | <0.20 | <0.20 |
| o-Xylene | ug/L | 0.2 | NV | ND | <0.20 | <0.20 | <0.20 |
| p+m-Xylene | ug/L | 0.4 | NV | ND | <0.40 | <0.40 | <0.40 |
| Total Xylenes | ug/L | 0.4 | 72 | ND | <0.40 | <0.40 | <0.40 |
| **Petroleum Hydrocarbon (PHC) fractions F1-F4** | | | | | | | |
| F1 (C6-C10) | ug/L | 25 | 420 | ND | <25 | <25 | <25 |
| F1 (C6-C10) - BTEX | ug/L | 25 | 420 | ND | <25 | <25 | <25 |
| F2 (C10-C16 Hydrocarbons) | ug/L | 100 | 150 | ND | <100 | <100 | <100 |
| F3 (C16-C34 Hydrocarbons) | ug/L | 200 | 500 | ND | <200 | <200 | <200 |
| F4 (C34-C50 Hydrocarbons) | ug/L | 200 | 500 | ND | <200 | <200 | <200 |

Notes:
R.D.L. = Reported Detection Limits
NV = No value listed
ND= Non-detect
- = Not Analyzed
m bgs = metres below ground surface
Refer to lab certificates for dates of sample analysis

Results compared to the Table 1 of the MOE's "Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act," (April 15, 2011) for residential property use with coarse textured soil

| | |
|---|---|
| **500** | Bold value indicates a result detected but not exceeding the MOE 2011 Table 1 Standards |
| **500** | Bold and highlighted value indicates a result exceeding the MOE 2011 Table 1 Standards |

# APPENDIX A

# HEALTH AND SAFETY DOCUMENTATION

**ENVIRONMENTAL DIVISION OF MTE CONSULTANTS INC**
**SITE SPECIFIC ENVIRONMENTAL HEALTH & SAFETY PLAN**

## 1.0 SITE DESCRIPTION

Name: Phase II ESA – Lot 18 Gore
Address: Thomson Road/Fernwood Drive, Simcoe (referred to as "the Site".)

## 2.0 FIELD WORK

Inspection and documentation of drilling activities at the Site. MTE will complete field screening & sampling of soil that could possibly be contaminated by Petroleum Hydrocarbons (PHCs) F1-F4, Volatile Organic Compounds (VOCs) and metals. Soil and groundwater samples will be submitted for analysis to an analytical laboratory.

## 3.0 ONSITE ORGANIZATION

Site Owner/Client: Westwood Trail Developments Inc.
Contractor: Direct Environmental Drilling
Private Locator: Down Under

### 3.1 MTE Onsite Personnel

The following MTE Environmental staffs are expected to be present at the Site at various times:

| | | |
|---|---|---|
| Jennifer Kato | Field Technician | (519) 505-0595 |
| John Goodwin | Project Manager | (519) 743-6500 |

## 4.0 SITE CHARACTERIZATION

### 4.1 Utility Locates

Check Locates in Hand:

- ☑ Telephone
- ☑ Water
- ☑ Storm Sewer
- ☐ Sanitary Sewer
- ☐ Traffic Lights N/A
- ☑ Hydro
- ☑ Gas
- ☑ Cable
- ☐ Other _____
- ☐ Other _____

☐ Private Locates

## 4.2 Hazardous Chemicals

Chemical parameters suspected to be present at the Site are PHCs F1-F4, VOCs, and metals. The concentrations are unknown.

Organic compounds vary in composition, but in general consist of VOCs, and hydrocarbons. Exposure to organic compounds and hydrocarbons can produce narcotics effects such as dizziness, head-aches, and giddiness similar to alcohol intoxication. Organic compounds are also an irritant to the mucous membranes and can irritate the eyes, throat, and skin. For example, the Ministry of Labour Time Weighted Average Exposure Value (TWAEV) for an 8-hour workday and a 40-hour workweek of a chemical substance (in the form of gases, dusts, fumes, vapours or mists) present in the air in a worker's respiratory zone for gasoline is 200 ppm. The short-term exposure limit (STEL) for 15 minutes is 333 ppm. Most people can detect gasoline vapour in concentrations as low as 500 ppm with their sense of smell.

## 4.3 Physical Hazards

There are a number of physical hazards that are common to construction sites where earthworks are being performed.

Vehicles
Transport, construction or excavation equipment could be present in the active work area. Care must be taken when working around the vehicles.

Road traffic will be present along Thomson Road and Fernwood Drive. All reversing activities along or near the roadway will require a flagman.

Slips, Trips and Falls
Sites always carry the potential for injuries from slips, trips and falls. Look down at the path you are about to walk. Walk around areas where equipment and materials are lying on the ground. Practise good house keeping.

# 5.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

Safety boots, safety glasses, hard hats, and reflective vests are mandatory at all construction sites.

MTE staff will operate a photo-ionization detector (PID) during the field sampling activities to screen soil and water samples, as well as to monitor real time organic vapour concentrations in the air in the work area. The action levels to be used at this Site will be 5 ppm for a 15 minute average. If the downwind concentrations exceed the action level, MTE Environmental staff will either don respirators with VOC cartridges or leave the area where the action level is exceeded.

## 6.0 SITE ACCESS

- Access to the Site is provided from the dead end of Fernwood Drive.
- As stated above, any MTE staff that does not have a respirator shall leave the area of the contaminated soil excavation if PID levels exceed the action level.
- During Site activities, all MTE staff present shall be required to:
- Wear safety glasses, surgical gloves, respirators if required by PID measurements;
- Refrain from horseplay;
- Use the buddy system;
- Be alert for signs of heat stress; and
- Refrain from eating, drinking, smoking, or applying makeup.

## 7.0 REQUIRED TRAINING

All MTE and subcontractor staff working at the Site at any time must have completed MTE's safety orientation. In addition, any staff present in the exclusion zone for the contaminated soil investigation must have completed WHMIS Training.

## 8.0 NOISE

Previous experience indicates the noise level during use of excavation machinery may exceed the MOL proposed noise exposure level of 85 dBA (decibels on A-weighted scale). Therefore, all workers operating on-Site during use of this equipment should wear hearing protection in the form of plugs and/or muffs.

## 9.0 SPILL CONTAINMENT

There is a low potential for spills related to the investigation and sampling activities, or any other MTE activities at the Site. Accordingly, this plan does not address spill response and reference to the property owner's or general contractor's emergency response plan is required. In the unlikely event that a spill occurs, the **MOE Spills Action Centre** should be contacted immediately at **1-800-268-6060**.

## 10.0 DECONTAMINATION

As MTE staff exit the exclusion zone, they will remove surgical gloves & place them inside garbage bags. The garbage bags will be placed in onsite lugger bins or drums for disposal.

If respirators were used, they will be cleaned off with disposal wipes to remove any dust. The PID, and any other field equipment to be reused, shall also be wiped down with disposal wipes.

Due to the short duration of the work, change rooms and showers will not be available at the Site. MTE staff that was in the exclusion zone shall shower at home or at its office, and change into clean clothing. Clothing that was worn onsite shall be laundered by itself (i.e. not combined with other household laundry) by staff in their homes.

## 11.0 EMERGENCY INFORMATION

In the event of a medical emergency:

| | |
|---|---|
| Ambulance, Police, Fire: | 911 |
| MOE Spills or Emergencies: | 1-800-267-1373 |
| Poison Control Centre: | 1-800-268-9017 |

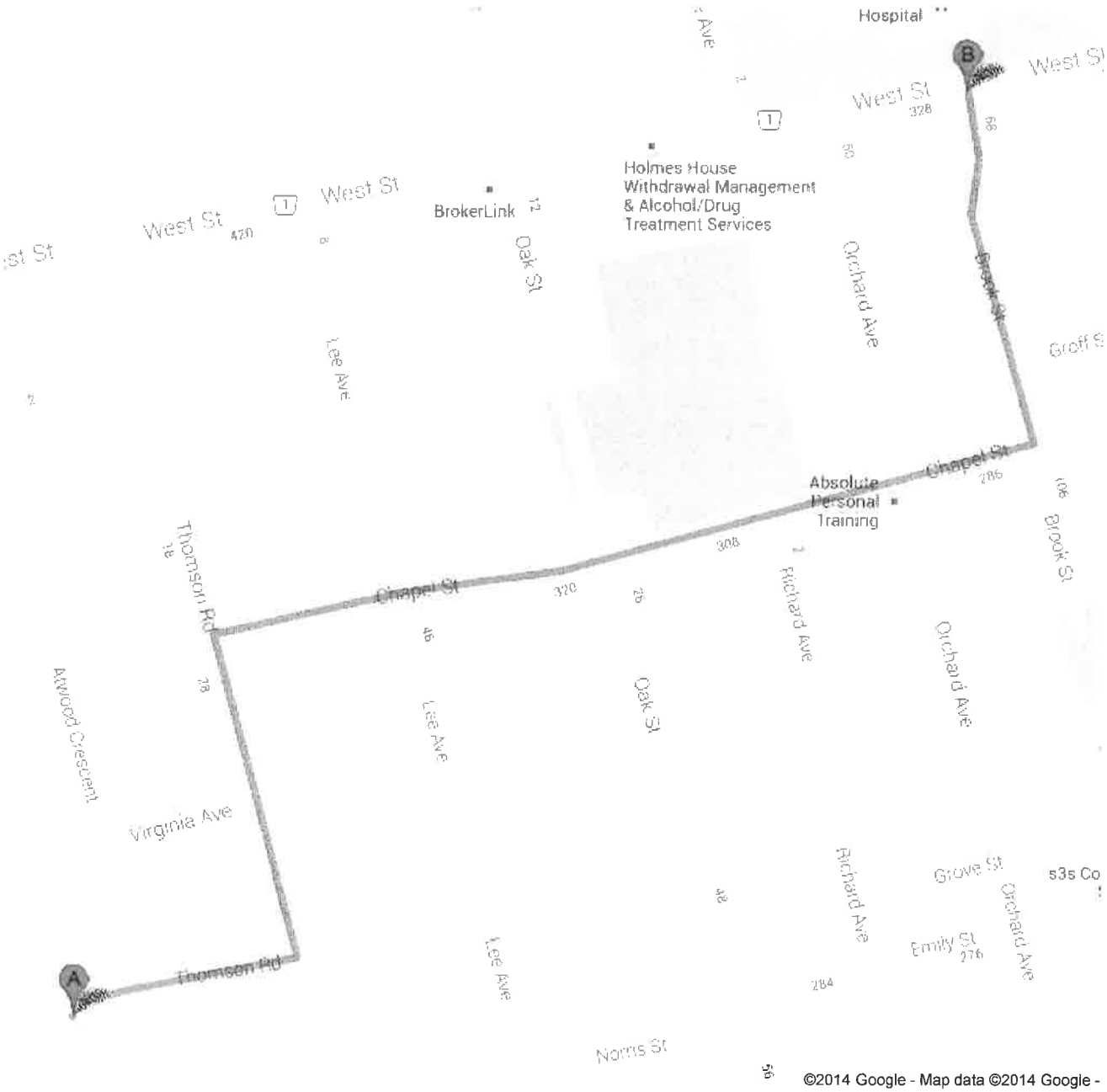
In event of an emergency, staff will be transported to the nearest emergency care facility:

Norfolk General Hospital
365 West Street
Simcoe, ON N3Y 1T7
(519) 426-0130

SEE ATTACHED DIRETIONS

Google

**Directions to 365 West St, Simcoe, ON N3Y 1T7**
**1.0 km** – about **2 mins**



Fernwood Dr, Simcoe, ON N3Y

| | | |
|---|---|---|
| 1. | Head **northeast** on **Thomson Rd** toward **Thomson Rd**<br>About 45 secs | go 300 m<br>total 300 m |
| 2. | Take the 1st right onto **Chapel St**<br>About 1 min | go 450 m<br>total 800 m |
| 3. | Turn left onto **Brook St**<br>Destination will be on the left | go 200 m<br>total 1.0 km |

365 West St, Simcoe, ON N3Y 1T7

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Map data ©2014 Google

Directions weren't right? Please find your route on maps.google.ca and click "Report a problem" at the bottom left.

Jennifer Y. Kato

**From:** Madia Evans on behalf of Kitchener Reception
**Sent:** Wednesday, May 07, 2014 8:57 AM
**To:** Jennifer Y. Kato
**Subject:** FW: Request 20141913335

-----Original Message-----
From: solutions@on1call.com [mailto:solutions@on1call.com]
Sent: Wednesday, May 07, 2014 9:03 AM
To: Kitchener Reception
Subject: Request 20141913335

ONTARIO ONE CALL
Locate Request Confirmation

Ticket #:20141913335 Reason Code:STANDARD RELOCATE
Work to Begin Date: 05/14/2014 Time: 08:00:00 AM
WAP No:

---

CALLER INFORMATION

JENNIFER KATO Tel.:(519)743-6500
Contractor ID: 12112
MTE CONSULTANTS Cell:
WORK BEING DONE FOR: Fax:(519)743-6513
KitchenerReception@mte85.com
ALT CONTACT:JOHN GOODWIN Tel.:(519)743-6500

---

DIG LOCATION

City: NORFOLK , NORFOLK
Community: SIMCOE
Address : To: Lot/Unit#:
Street : FERNWOOD DR
Nearest Intersecting Street :
THOMSON RD
Second Intersecting Street :

Nb of Segments: 5

---

Type of Work: BORE HOLES Max Depth: 0.00 FT

Machine Dig: X Hand Dig:
Public Property: X Private Property: X
Mark & Fax: X Site Meet Req.: Area is Not Marked: X
Area is Marked:
Directional Drilling:

Work Extent/Location:
W1404101938050 WORK AREA CHANGED FROM TICKET #2014150132. THE PROPERTY IS A VACANT LOT AT THE END OF FERNWOOD DRIVE AND THOMSON ROAD - SEE ATTACHED. DEPTH OF BOREHOLES UNKNOWN - NEED TO REACH WATER TABLE 5-8M. FRONT, SIDE, BACK

Remarks: RELOCATE 20141516000 DEPTH UNKNOWN

---

The following utility owners have been notified of your proposed excavation site:
NFLK01 NORFOLK COUNTY (NFLK NFP01 G-TEL FOR NORFOLK PO
UGOW01 G-TEL FOR UNION GAS

These members have been removed due to the relocate:
BAOW01 -R G-TEL FOR BELL ALIAN ELOW01 -R EASTLINK (ELOW01)

Note: -C = Cleared, -S = Supressed, -L = Lookup center cleared, -A = Alternate Locate,
-R = Existing locate valid - maintain marks

---

PLEASE REMEMBER:
Review your locate request information and contact the center for any changes.
Note your request number and the status of our members for this request. Not all facility owners are members of Ontario One Call, you must contact non- members directly. This includes private electrical and gas lines to pool heaters, BBQ's, fuel oil tanks, etc. Do not excavate before obtaining all required locates.
Respect the marks and instructions provided by the locators and dig with care.

Some Members may provide a clearance if you have selected a minimal depth, a low risk type of work or hand digging (shovel, pick or spade).
If you have received a clearance (-C) from some Members, this is based on the information that you have provided.
If there is a damage, contact the utility owner directly. Ontario One Call does not track the completion of field locates. To inquire as to the status of your locate request, please go to www.on1call.com and select the "Ticket Status" option. Please note that not all members participate in this program; this will be indicated in the Status program for the ticket in question.
Non-participating members must still be contacted directly.

Printed: 07/05/2014 9:23 AM

# Work Order Form
## NORFOLK COUNTY

W.O. #: **L14-00762**

**REQUEST**

| | | | | | |
|---|---|---|---|---|---|
| Date: | 07/05/2014 9:22 AM | Notify: Email | Assign To: | TERRY, LYNN | |
| Due Date: | | Class: | Priority: 1-High | Service Type: | LOCATES |

| | | | | | |
|---|---|---|---|---|---|
| Request By: | **MTE CONSULTANTS** | Phone: | 519-743-6500 | Fax: | |
| | | Phone: | | Fax: | |
| Address: | : FERNWOOD DR | Email: | | MTE # | |
| | SIMCOE | Loc: | Submitted | | |
| | | Created: | terry-l | Rec'd | MAY 07 2014 |
| Billing: | | | | FYI | JYK INIT |

Request: **20141913335-BORE HOLES-DEPTH UNKNOWN-05/14/14**

**Distr. by Admin:** **Subm. to Admin:**

Details: **W1404101938050 WORK AREA CHANGED FROM TICKET #2014150132. THE PROPERTY IS A VACANT LOT AT THE END OF FERNWOOD DRIVE AND THOMSON ROAD - SEE ATTACHED. DEPTH OF BOREHOLES UNKNOWN - NEED TO REACH WATER TABLE 5-8M. FRONT, SIDE, BACK Nearest Intersecting Street: THOMSON RD**

**NO MUNICIPAL DRAINS IN LOCATE AREA**
**"CAUTION" Depth is not given. Hand dig within 3 feet of location given. Use adequate support systems to prevent settlement damage to Utility Services.**

**It is understood and agreed that the location and marking of the service by Norfolk County Public Works and Environmental Services is for the convenience of the applicant only, and does not relieve the applicant or any other person or corporation from liability for damages for personal injury including death to any person, or for property damage caused to the service or to any other property by reason of the applicant or any other person or corporation having relied upon the location and marking of the services by Norfolk County Public Works and Environmental Services. Norfolk County does not locate on private property.**

**RESPONSE**

Date Done: 07/05/2014 Time Done: 9:22 AM Sched.: On:

Completed By: TERRY, LYNN Job: Activity:

Action Taken:

Action Details: ALL CLEAR OF ROADS/WATER/SEWER/MUNICIPAL DRAINS

# Primary Locate Sheet

Phone : 519-439-0763 Fax 866-692-0209 Toll Free: 866-692-0208 Request #: **20141913335**

| Locating for: | Revised | Excavation Date: | Request Type: RELOCATE |
|---|---|---|---|
| ☐ CATV ☐ Water ☐ Traffic ☐ Sewer ☐ Street Lighting<br>☒ Hydro ☐ Telephone ☒ Gas ☐ Fibre ☐ Private | 05/14/2014 | 05/14/2014 | Status NORMAL |

| Requested By: | Company: | Phone: | Fax | Email: |
|---|---|---|---|---|
| JENNIFER KATO | MTE CONSULTANTS | (519)-743-6500 ext. | (519)-743-6519 ext. | kitchenerreception@mte85.com |

| Appt. Date: | Received Date: | Locate Address: | |
|---|---|---|---|
| 05/07/2014 00:00:00 | 05/07/2014 | FERNWOOD DR<br>XStreet: THOMSON RD | |

| Type of work: | Contractor Type: | Div: |
|---|---|---|
| BORE HOLES | CONTRACTOR | NORFOLK |

**Caller's Remarks:** W1404101938050 WORK AREA CHANGED FROM TICKET #20141150132. THE PROPERTY IS A VACANT LOT AT THE END OF FERNWOOD DRIVE AND THOMSON ROAD - SEE ATTACHED. DEPTH OF BOREHOLES UNKNOWN - NEED TO REACH WATER TABLE 5-8M. FRONT, SIDE, BACK

UPDATE OF 20141516000RELOCATE 20141516000 DEPTH UNKNOWN PUBL. PROP. PRIV. PROP AREA NOT MARKED MARK + FAX MACH. DIG NB_SEGMENTS::1 NFLK01 NORFOLK COUNTY (NFLK NFP01 G-TEL FOR NORFOLK PO ELOW01 -R EASTLINK (ELOW01) UGOW01 G-TEL FOR UNION GAS BAOW01 -R G-TEL FOR BELL ALIAN U_CROQUIS1::20141913335.PNG

| Gas | | Telecom | | Hydro | | Water | | Sewer | | StreetLighting | | CATV | | Traffic Signal | | Other | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mark | Clear | Mark | Clear | Mark | Clear | Mark | Clear | Mark | Clear | Mark | Clear | Mark | Clear | Mark | Clear | Mark | Clear |
| X | | | | X | | | | | | | | | | | | | |

**LOCATED AREA: EXCAVATOR SHALL NOT WORK OUTSIDE THE LOCATED AREA WITHOUT OBTAINING ANOTHER LOCATE.**

Records Reference:

☒ LAC MULTI-VIEWER

☐ UTILITY OWNER MAPPING

Lat & Long: 42.82989 -80.329242

Depth of Excavation (in Meters): UNKNOWN

Field Notes:

Other:

OPT Remarks:

☐ Third Party Notification:

NNX: 519 428

Neighborhood: SIMCOE In Ref Ticket #: 20141516000

PRJ #: Working For:

Apply Sticker Here if Required

Excavator shall notify and receive a clearance from Regional contacts prior to excavation for the following:

Gas ☐ End Thrust ☐ Valve ☐ Vital Main

Telephone ☐ High Priority Cables ☐ Central Office Vicinity

Material type: Gas ☐ Cast Iron ☐ Steel ☐ Plastic ☐ Copper; Telephone ☐ Cable ☐ Conduit; Hydro ☐ Direct Buried ☐ Duct; Water ☐ _____

Method of Field Marking: ☐ Paint ☐ Stakes ☐ Flags ☐ Offset Stakes ☐ Chalk ☐ Other (Gas-Yellow, Hydro-Red, CATV/Telephone-Orange, Water-Blue, Sewer-Green)

Caution: Locates provided are valid for a limited time frame. See Disclaimer for the specific locate validity period as identified by specific Utility Owner. For all locate requests including remarks contact Ontario One. Call 1-800-400-2255.

Caution: The markings may disappear or be misplaced. This is based on information given at the time. Any changes to location or nature of work require a new locate. The EXCAVATOR must not work outside the indicated Located Area without a further locate by the company. Privately owned facilities may be present in Locate Area, check with property owner.

Documents given to be used with this locate:

☐ NEB Excavation/Construction Booklet

☐ Gas Excavation Guidelines

☐ Hydro Electric Excavation Guidelines

☐ Belt Guidelines for Excavation

Located by: G-TEL

I.D. Number: 332

Date and Time: MAY 12/14 12:10
mm/dd/yy 24 hr clock

Accepted By: _____

Print: _____

☒ Mark and Fax or Email ☐ Left on Site ☐ Mailbox

A copy of the Primary Locate Sheet and the Auxiliary Locate Sheet must be on site and in the hands of the machine operator during work operations. Should sketch and markings not coincide, a new locate must be obtained.

This form revised June 2013

G-TEL

## Auxiliary Locate Sheet

Phone : 519-439-0763 Fax 866-692-0209 Toll Free: 866-692-0208

| Locating for: | Date Located: | Request #: |
|---|---|---|
| ☐ CATV ☐ Water ☐ Traffic ☐ Sewer ☐ Street Lighting ☐ Hydro ☐ Telephone ☒ Gas ☐ Fibre ☐ Private | MAY 12/14 (mm/dd/yy) | 20141913335 |

Number of Services Marked: (Specify Building Numbers) FERNWOOD DR-SIMCOE

**LOCATED AREA: EXCAVATOR SHALL NOT WORK OUTSIDE THE LOCATED AREA WITHOUT OBTAINING ANOTHER LOCATE.**

From: 3.0M W OF GUIDE RAIL AT DEAD END OF THOMSON — 300.0M W OF FERNWOOD DEAD END & 160.0M E OF FERNWOOD DEAD END

From: 285.0M S OF REAR PROPERTY LINES OF VIRGINIA AVE

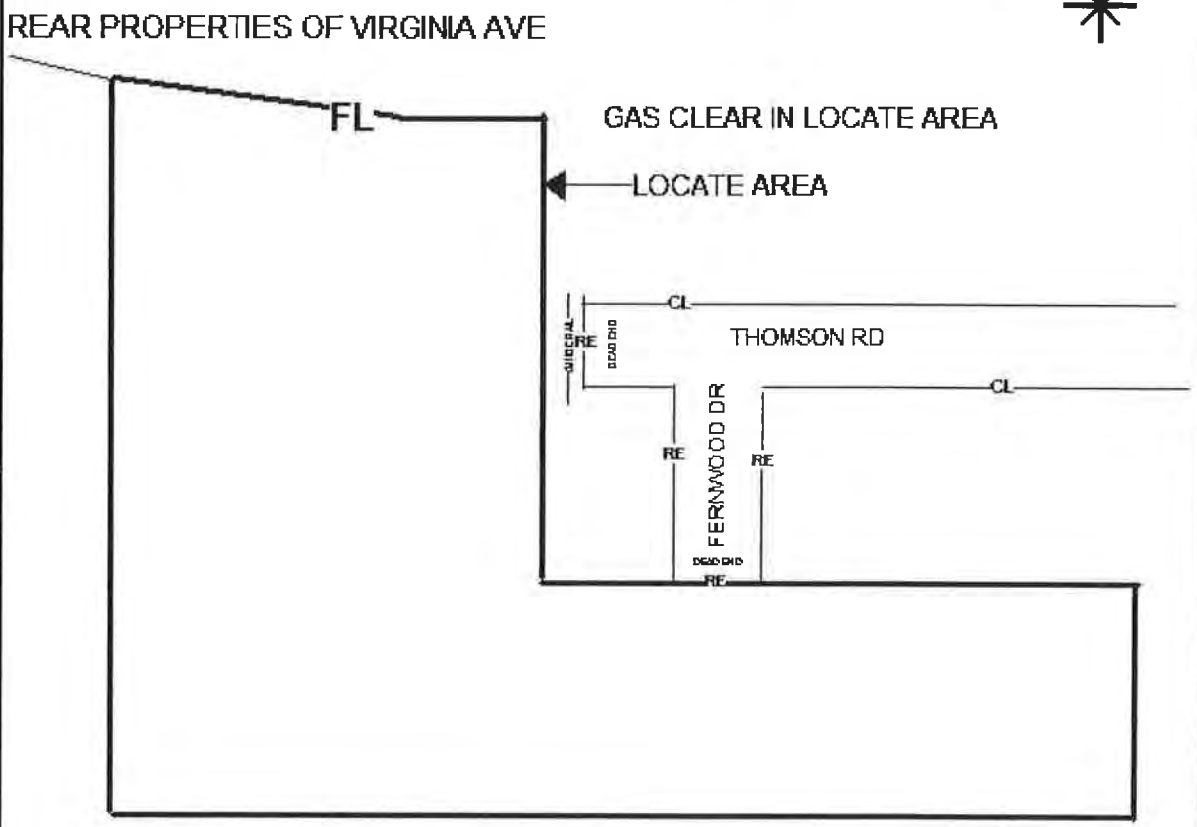
LEGEND:

- Building Line –BL–
- Fence Line –FL–
- Face of Curb –CL–
- Road Edge –RE–
- Driveway –DW–
- Manhole M/H
- Catch Basin CB
- Sidewalk SW
- Pole
- Demarcation DM
- Flush To Grade Pedestal FTG
- Railway
- Pedestal
- Telephone Cable –B–
- Conduit
- Buried Service Wire –BSW–
- Fiber Optic Cable –FO–
- Gas Main –GM–
- Gas Service –GS–
- Gas Valve
- Hydrant
- Transformer
- Hydro –H–
- North N.
- South S.
- East E.
- West W.
- Sanitary Sewer –SAN–
- Storm Sewer –ST–
- Valve Chamber
- Water Main Valve W
- Water Service Valve
- Handwell HW
- Traffic Signal –TS–
- Street Light –SL–
- Junction Box JB

HAND DIG WITHIN 1 m (3.28 ft.) AS MEASURED HORIZONTALLY FROM THE FIELD MARKINGS:
DEPTH VARIES AND MUST BE VERIFIED BY HAND DIGGING

☐ LOCATED AREA HAS BEEN ALTERED AS PER: _____

N




This form valid only with the primary locate sheet. This sketch is not scale. Measurements are in metres.
Any privately owned services within the located area have not been marked - check with service / property owner.

A copy of this Auxiliary Locate Sheet and the Primary Locate Sheet must be on site and in the hands of the machine operator during work operations. Should sketch and markings not coincide, a new locate must be obtained.

# Auxiliary Locate Sheet

Phone: 519-439-0763 Fax: 866-692-0209 Toll Free: 866-692-0208

| ☐ NORFOLK POWER | X HYDRO<br>☐ FIBER OPTIC CABLE | Date Located:<br>MAY 12/14<br>mm/dd/yy | Request #: |
|---|---|---|---|

Number of Services Marked: (Specify Building Numbers) FERNWOOD DR-SIMCOE

**LOCATED AREA: EXCAVATOR SHALL NOT WORK OUTSIDE THE LOCATED AREA WITHOUT OBTAINING ANOTHER LOCATE.**

From: 3.0M W OF GUIDE RAIL AT DEAD END OF THOMSON To: 300.0M W OF FERNWOOD DEAD END & 160.0M E OF FERNWOOD DEAD END

From: 285.0M S OF REAR PROPERTY LINES OF VIRGINIA AVE

**LEGEND:**

| | |
|---|---|
| Building Line | — BL — |
| Fence Line | — FL — |
| Face of Curb | — CL — |
| Road Edge | — RE — |
| Driveway | — DW — |
| Manhole | MH |
| Catch Basin | CB |
| Sidewalk | SW |
| Pole | O |
| Demarcation | DM |
| Flush To Grade Pedestal | FTG |
| Railway | |
| Pedestal | P |
| Telephone Cable | — B — |
| Conduit | — C — |
| Buried Service Wire | — BSW — |
| Fiber Optic Cable | — FO — |
| Gas Main | — GM — |
| Gas Service | — GS — |
| Gas Valve | |
| Hydrant | |
| Transformer | |
| Hydro | — H — |
| North | N. |
| South | S. |
| East | E. |
| West | W. |
| Sanitary Sewer | — SAN — |
| Storm Sewer | — SY — |
| Valve Chamber | |
| Water Main | — WM — |
| Water Service | — WS — |
| Water Main Valve | W |
| Water Service Valve | |
| Handwell | HW |
| Traffic Signal | — TS — |
| Street Light | — SL — |
| Junction Box | JB |

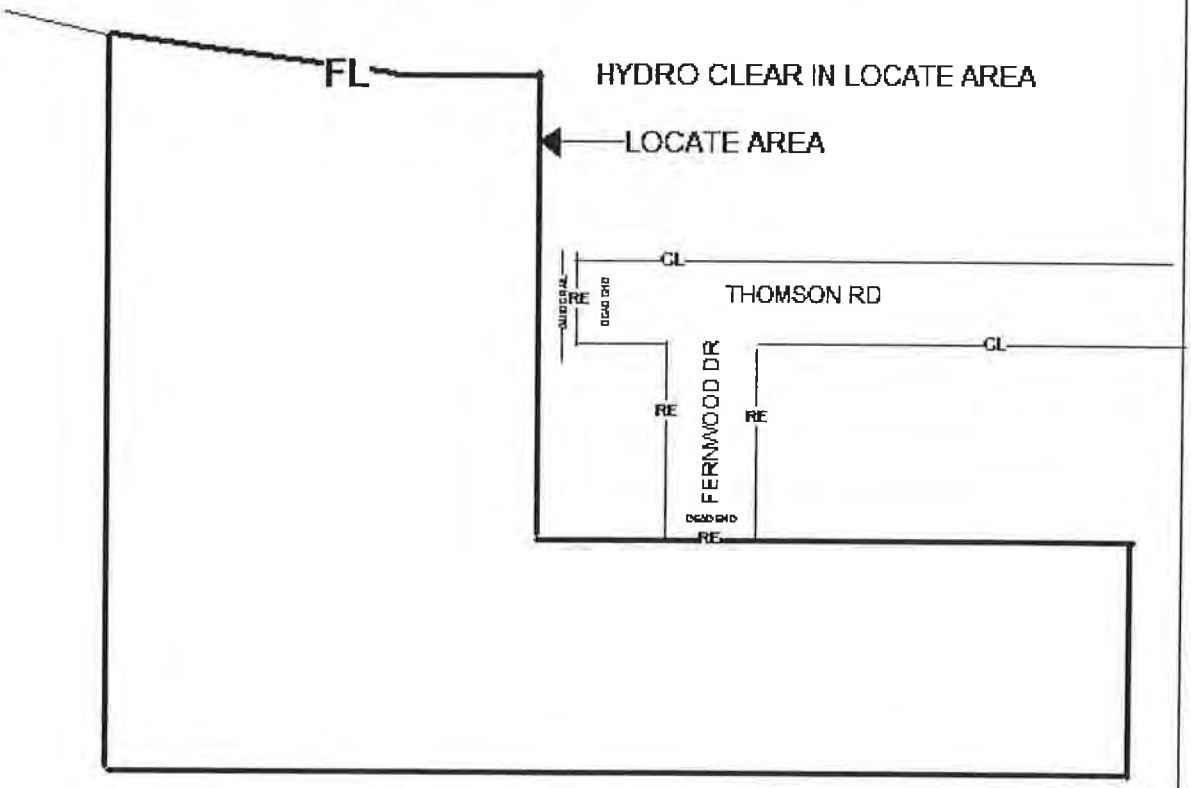
HAND DIG CAUTIOUSLY WITHIN 1 m AS MEASURED HORIZONTALLY FROM THE FIELD MARKINGS TO AVOID DAMAGING THE UNDERGROUND UTILITIES. IF YOU DAMAGE THE PLANT, YOU MAY BE HELD LIABLE. IF YOU DAMAGE UNDERGROUND PLANT, CONTACT THE FACILITY OWNER IMMEDIATELY.

DEPTH VARIES AND MUST BE VERIFIED BY HAND DIGGING OR VACUUM EXCAVATION.

☐ LOCATED AREA HAS BEEN ALTERED AS PER: _____

N

REAR PROPERTIES OF VIRGINIA AVE




This form valid only with the primary locate sheet. This sketch is not to scale. Measurements are in metres.
Any privately owned services within the located area have not been marked - check with service / property owner.

**A copy of this Auxiliary Locate Sheet and the Primary Locate Sheet must be on site and in the hands of the machine operator during work operations. Should sketch and markings not coincide, a new locate must be obtained.**

Apr. 15. 2014 9:58AM Norfolk County Public Works and No. 1760 P MTE#

Rec'd APR 15 2014

FW JYK INIT.

Printed: 11/04/2014 12:04 PM

# Work Order Form
# NORFOLK COUNTY

W.O. #: L14-00440

**REQUEST**

| | | | | | |
|---|---|---|---|---|---|
| Date: | 11/04/2014 12:03 PM | Notify: Email | Assign To: | TERRY, LYNN | |
| Due Date: | 21/04/2014 Class: | Priority: 1-High | Service Type: | LOCATES | |
| Request By: | MTE CONSULTANTS | Phone: | 519-745-6566 | Fax: 519-745-6513 | |
| | | Phone: | | Fax | |
| Address: | : FERNWOOD DR<br>SIMCOE | Email: | | | |
| | | Loc: | _Submitted | | |
| | | Created: | terry-l | | |
| Billing: | | | | | |

Request: 20141518000-BORE HOLES-DEPTH UNKNOWN-04/21/14

Distr. by Admin: dc 11/4/14 Subm. to Admin:

Details: W1404101938050 WORK AREA CHANGED FROM TICKET #20141500132. THE PROPERTY IS A VACANT LOT AT THE END OF FERNWOOD DRIVE AND THOMSON ROAD - SEE ATTACHED. DEPTH OF BOREHOLES UNKNOWN - NEED TO REACH WATER TABLE 6-8M, FRONT, SIDE, BACK Nearest Intersecting Street: THOMSON Rd

NO MUNICIPAL DRAINS IN LOCATE AREA
"CAUTION" Depth is not given. Hand dig within 3 feet of location given. Use adequate support systems to prevent settlement damage to Utility Services.

It is understood and agreed that the location and marking of the service by Norfolk County Public Works and Environmental Services is for the convenience of the applicant only, and does not relieve the applicant or any other person or corporation from liability for damages for personal injury including death to any person, or for property damage caused to the service or to any other property by reason of the applicant or any other person or corporation having relied upon the location and marking of the services by Norfolk County Public Works and Environmental Services. Norfolk County does not locate on private property.

**RESPONSE**

Date Done: APR 14/14 Time Done: AM Sched.: _____ On: _____

Completed By: DAVES Job: _____ Activity: _____

Action Taken: ☑ Completed ☑ With Vendor ALL-CLEAR FOR MTS

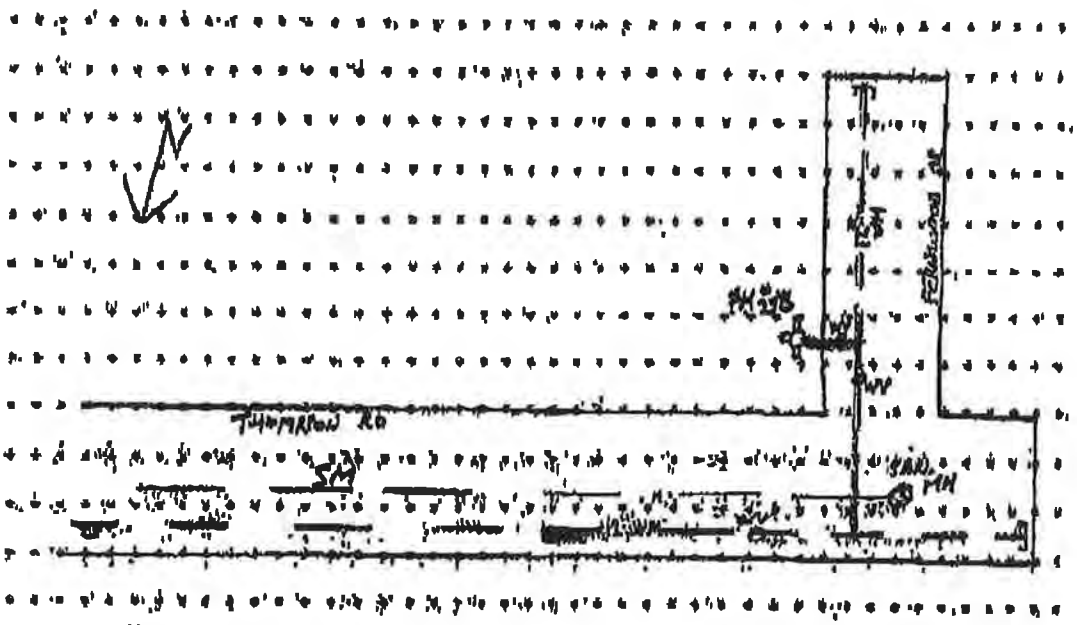
ROADS-ALL CLEAR

*house refreshed May 2014 bb

Work Order Form
NORFOLK COUNTY

W.O. # L14-00191

Printed: 17/04/2014
09:11 AM




SKETCH OF SERVICE LOCATION (NOT TO SCALE)

# FRONTIER
## UTILITY LOCATING SERVICES INC.

# Private Utility Locate Report

701 Trinity Road, Unit 6, Ancaster, ON L9G 3L1
www.frontierlocating.com
Phone: 905-548-7643
Fax: 905-548-7613

**CLIENT**

| | |
|---|---|
| Company | MTE CONSULTANTS |
| Applicant | JENNIFER KATO |
| Address | 520 BINGEMANS CENTRE DR |
| City | KITCHENER |
| Postal Code | N2B 3X9 |
| Phone | 519-743-6500 |
| Cell | 519-505-0595 |
| Email / Fax | jkato@mte85.com |

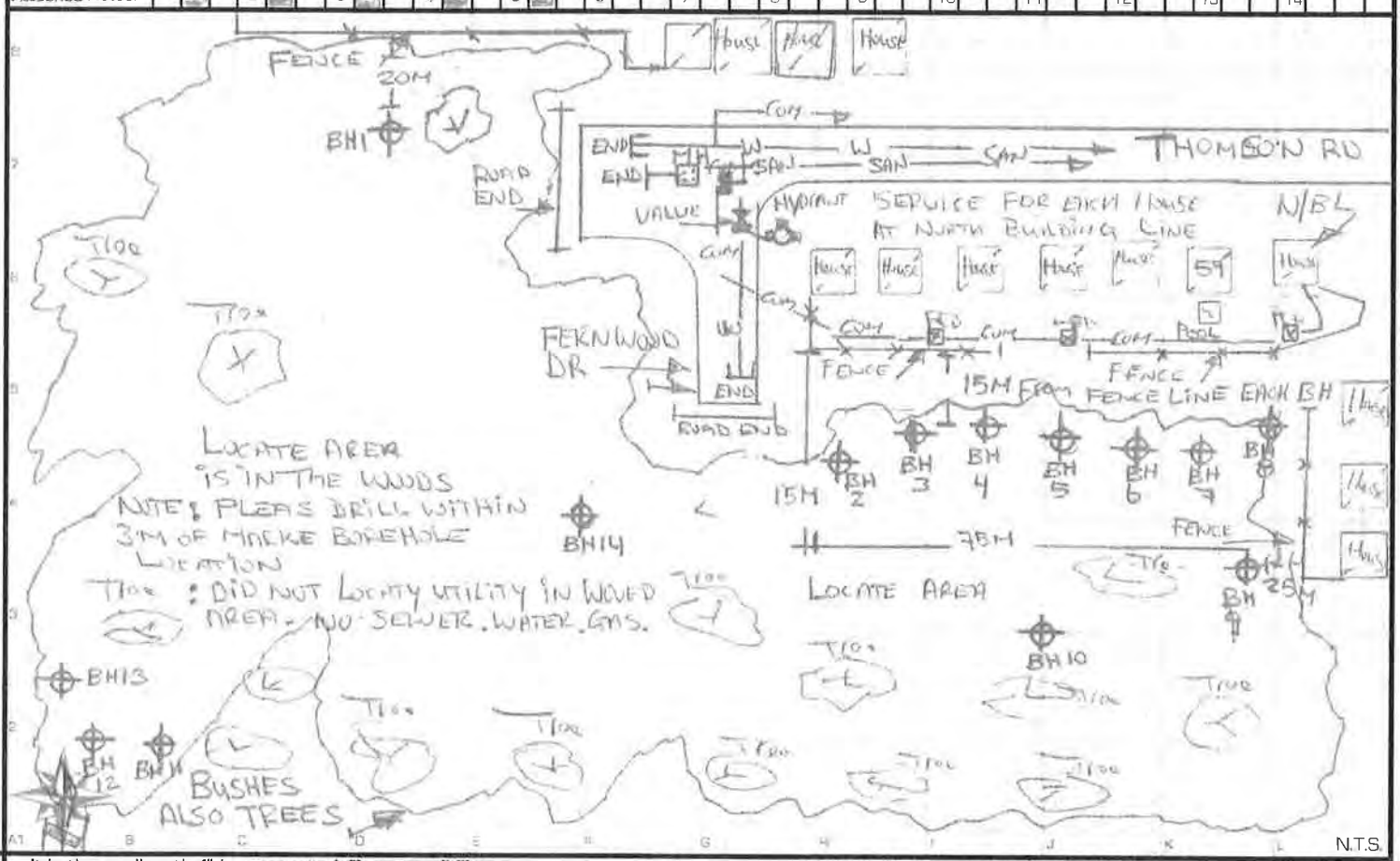
**PROJECT**

| | |
|---|---|
| Work Order | FWO-551418 |
| Purchase Order | 38750-tue |
| Project | WOODS |
| Site Address | FERNWOOD DR & THOMSON RD |
| City | SIMCOE |
| Description | 13BH |

**SKETCH**

NOTE: NON-CONDUCTIVE LINES, INCLUDING, FOR EG., SOME SEWER AND WATER LINES, MAY NOT BE DETECTABLE.

Attached Notes: 1 2 3 4 5 6 7 8 9 10 11 12 13 14




**NOTICES**

It is the applicant's ("the excavator's") responsibility to ensure that all utility owners are contacted prior to excavating in the vicinity of buried utility lines. Hand dig within one (1) meter of markings. Depths of utility lines vary, and must be determined by hand digging.

Public Locates: Called? Y (N) ? Available? Y (N) ? Reviewed? Y (N) ? (Please circle)

Locate expires 30 days from date of report. See expiry date below. Sketch depicts approximate locations only, and is a guide to markings in the field. If markings are not visible, a new locate is required. The applicant agrees and understands that the location and marking of underground utility services is for the convenience of the applicant only, and does not relieve the applicant or any other person or corporation from liability for damages or personal injury to any person, or for property damage caused to the service or to any other property by reason of the applicant or any other person having relied upon the location and marking of the service. Applicant signing has authority to do so. The applicant acknowledges receipt and understanding of the Standard Terms & Conditions of Locate. Faxed or emailed reports implies acknowledgment & agreement with these terms. Payment for this locate is due Net 30 Days.

**APPROVAL**

Approval (Office only)

Approved by: (Print & sign) X

Date:

**BILLING**

| Equipment | | Personnel | Print | Initial | N/B |
|---|---|---|---|---|---|
| P&CLE | 3.0 hrs | Tech 1: | RS | 3 hrs | ■ |
| GPR | hrs | Tech 2: | | hrs | □ |
| Sonde | hrs | Tech 3: | | hrs | □ |
| Other | hrs | Mob: | RS | 2 hrs | ■ |

**SIGN**

Locate Technician (Print & sign) X Ross Stewart

Client (Print & sign) X

Date: MAY 13/14

Expires (30 days from date of Locate): JUNE 11/14

Total Hours (Add Mob & Personnel Only): 5.0 hrs

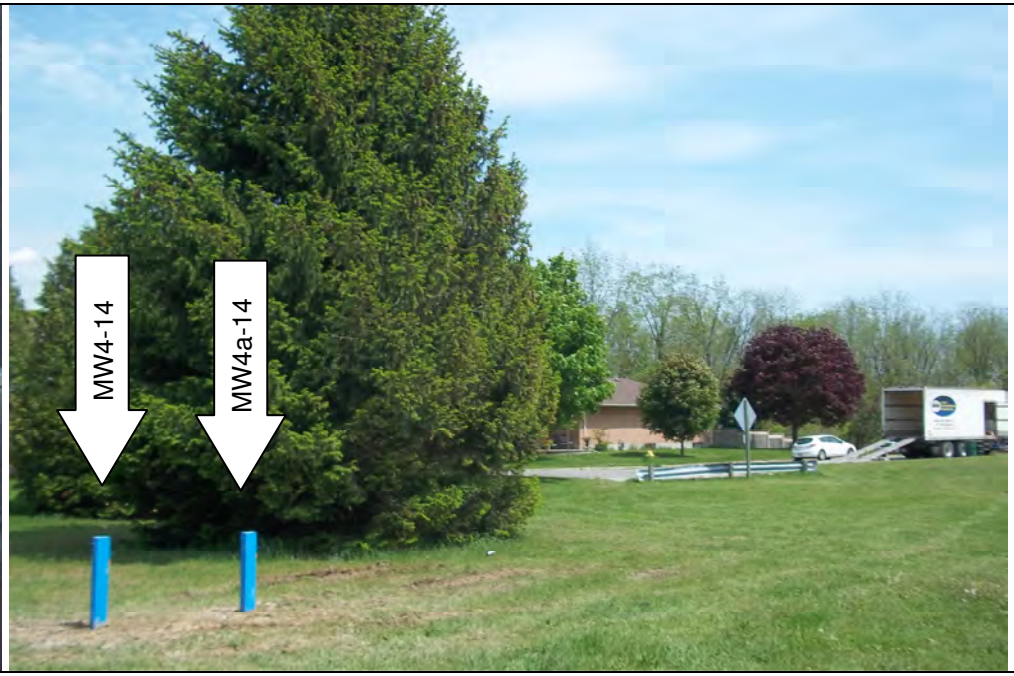
Page 1 of 2

White Copy- Frontier Yellow Copy- Client Pink Copy- Office

# APPENDIX B

# PHOTOGRAPHIC LOG

**Photographic Log**
**Fernwood Drive/Thomson Road, Simcoe, ON**




**Photograph No. 1 – Drilling MW4-14 and MW4a-14, north of the dead end of Thomson Road.**

**Photograph No. 2 – Left: MW4-14 Split spoon (SS) 0-2' (0-0.3m): Topsoil underlain by compact, brown sand, moist.**
**Right: MW4-14 SS 2.5-4.5' (0.76-1.37m) Compact, brown sand with some gravel at 4.5', moist.**

**Photograph No. 3 – Left: MW4-14 SS 5-7' (1.5-2.1m): Loose, brown, silty sand, saturated.**
**Right: MW4-14 SS 7.5-9.5' (2.3-2.9m): Loose, brown, silty sand, saturated.**

**Photograph No. 4 – Left MW4-14 SS 10-12' (3.0-3.6m): Loose, brown, silty sand, saturated, increased silt at 11' (3.3m).**
**Right: MW4-14 SS 12.5-14.5 (3.8-4.4m): Stiff, grayish brown, clayey silt, wet.**

**Photograph No. 5 – Left: MW4-14 SS 15-17' (4.6-5.2m): Stiff, grayish brown, clayey silt, moist.**
**Right: MW4-14 SS 17.5-19.5' (5.3-6.0m): Stiff, grayish brown, clayey silt, moist.**

**Photograph No. 6 – Left: MW4-14 SS 20-22' (6.1-6.7m): Stiff, grayish brown, clayey silt, wet.**
**Right: MW4-14 SS 22.5-24.5' (6.9-7.5m): Stiff, brownish gray, clayey silt, wet.**

**Photograph No. 7 – Left: MW4-14 SS25-27 (7.6-8.2m): Stiff, gray, clayey silt, wet.**
**Right: MW4-14 SS 27.5-29.5' (8.4-9.0m): Firm, gray, clayey silt, wet.**

**Photograph No. 8 – Left: East facing view of MW5-14 (circled) from the dead end at Fernwood Drive.
Right: South facing view of MW5-14.**

**Photograph No. 9 – Left: Northwest facing view of MW6-14. Located at the south end of a footpath from the dead end at Fernwood Drive.
Right: South facing view of MW6-14, beyond trees is agricultural farmland.**

# APPENDIX C

# BOREHOLE LOGS

**Client:** Westwood Trail Developments Inc.

**Project:** Phase II Environmental Site Assessment

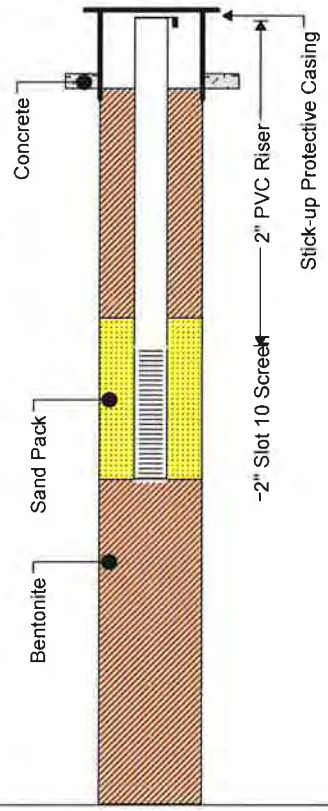
**Location:** Fernwood Drive/Thomson Road, Simcoe, ON

## Borehole Number: MW1-14

**Job Number:** 38750-600

**Drill Date:** May 30, 2014

| Depth (m) | Elevation (m) | Soil Description | Symbol | Number | Type | Recovery (%) | Headspace (ppm) | Groundwater Observations and Well Details |
|---|---|---|---|---|---|---|---|---|
| | 0.00 | Ground Elevation | | | | | | |
| 0.0 | 0.00 | **TOPSOIL** | | 1 | SS | 90 | 0.4 | |
| | -0.61 | | | | | | | |
| 2.0 | 0.61 | **SILT**<br>Soft, light brown, sandy silt with some clay, moist. | | 2 | SS | 90 | 0.4 | |
| 4.0 | -1.52 | | | | | | | |
| 6.0 | 1.52 | Soft to firm, brown, clayey silt, moist.<br>Turning grey and wet at 2.3m (7.5'). | | 3 | SS | 70 | | |
| 8.0 | | | | 4 | SS | 80 | 0.1 | |
| 10.0 | | | | 5 | SS | 100 | 0.3 | |
| 12.0 | -3.81 | | | | | | | |
| 14.0 | 3.81 | Soft, grey, clayey silt, wet.<br>Turning moist at 4.6m (15'). | | 6 | SS | 100 | 0.3 | |
| 16.0 | | | | 7 | SS | 100 | 0.2 | |
| 18.0 | | | | 8 | SS | 100 | 0.2 | |
| 20.0 | | | | 9 | SS | 100 | 0.2 | |
| 22.0 | -6.86 | | | | | | | |
| 24.0 | 6.86 | **SAND**<br>Compact, brown, medium sand with some silt, wet. | | 10 | SS | 100 | | |
| 26.0 | -8.23 | | | 11 | SS | 100 | | |
| 28.0 | 8.23 | Borehole Terminated at 8.2m (27') | | | | | | |
| 30.0 | | | | | | | | |
| 32.0 | | | | | | | | |
| 34.0 | | | | | | | | |
| 36.0 | | | | | | | | |
| 38.0 | | | | | | | | |
| 40.0 | | | | | | | | |
| 42.0 | | | | | | | | |




**Reviewed By:** CLM

**Method:** Geoprobe SS

**Notes:** No noteable odours or staining.

**MTE Consultants Inc.**
520 Bingemans Centre Drive
Kitchener, Ontario
N2B 3X9
(519) 743-6500

**Logged By:** JYK

**Sheet:** 1 of 1

**Client:** Westwood Trail Developments Inc.

**Project:** Phase II Environmental Site Assessment

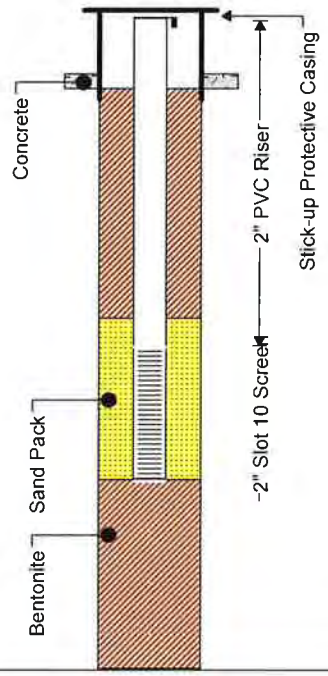
**Location:** Fernwood Drive/Thomson Road, Simcoe, ON

## Borehole Number: MW2-14

**Job Number:** 38750-600

**Drill Date:** May 30, 2014

| Depth (m) | Elevation (m) | Soil Description | Symbol | Number | Type | Recovery (%) | Headspace (ppm) | Groundwater Observations and Well Details |
|---|---|---|---|---|---|---|---|---|
| 0.0 | 0.00 | Ground Elevation | | | | | | |
| 0.0 | 0.00 | **TOPSOIL** | | | | | | |
| | | **SILT** | | 1 | SS | 90 | | |
| 2.0 | | Soft, brown, sandy silt, moist. | | 2 | SS | 90 | | |
| 4.0 | | | | 3 | SS | 90 | | |
| 6.0 | -2.29 | | | | | | | |
| 2.0 | 2.29 | Firm, clayey silt, moist. | | 4 | SS | 80 | | |
| 8.0 | -3.05 | | | | | | | |
| 10.0 | 3.05 | Soft to firm, grey, clayey silt, wet. | | 5 | SS | 100 | | |
| 12.0 | | | | 6 | SS | 100 | | |
| 4.0 | | | | 7 | SS | 100 | | |
| 14.0 | | | | 8 | SS | 100 | | |
| 16.0 | | | | 9 | SS | 100 | | |
| 18.0 | | | | | | | | |
| 20.0 | | | | | | | | |
| 6.0 | | | | | | | | |
| 22.0 | -6.71 | | | | | | | |
| | 6.71 | Borehole Terminated at 6.7m (22') | | | | | | |
| 24.0 | | | | | | | | |
| 26.0 | | | | | | | | |
| 8.0 | | | | | | | | |
| 28.0 | | | | | | | | |
| 30.0 | | | | | | | | |
| 32.0 | | | | | | | | |
| 10.0 | | | | | | | | |
| 34.0 | | | | | | | | |
| 36.0 | | | | | | | | |
| 38.0 | | | | | | | | |
| 12.0 | | | | | | | | |
| 40.0 | | | | | | | | |
| 42.0 | | | | | | | | |




**Reviewed By:** CLM

**Method:** Geoprobe SS

**Notes:** No noteable odours or staining.

**MTE Consultants Inc.**
520 Bingemans Centre Drive
Kitchener, Ontario
N2B 3X9
(519) 743-6500

**Logged By:** JYK

**Sheet:** 1 of 1

**Client:** Westwood Trail Developments Inc.

**Project:** Phase II Environmental Site Assessment

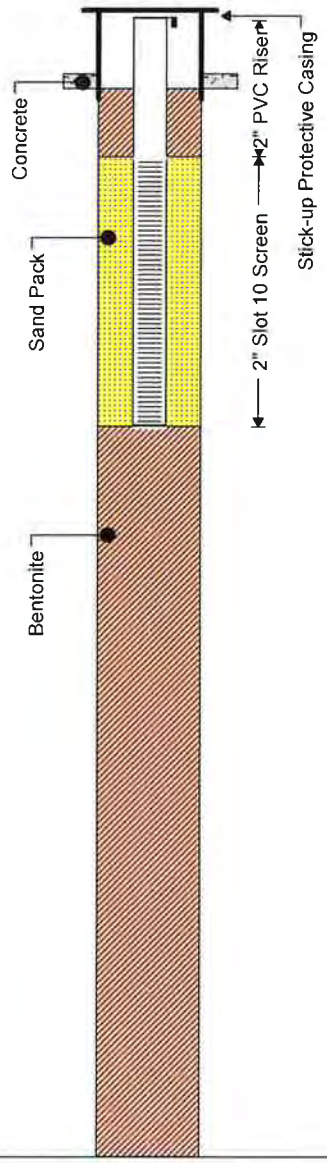
**Location:** Fernwood Drive/Thomson Road, Simcoe, ON

## Borehole Number: MW3-14

**Job Number:** 38750-600

**Drill Date:** May 30, 2014

| Depth (m) | Elevation (m) | Soil Description | Symbol | Number | Type | Recovery (%) | Headspace (ppm) | Groundwater Observations and Well Details |
|---|---|---|---|---|---|---|---|---|
| 0.0 | 0.00 | Ground Elevation | | | | | | |
| 0.0 | 0.00 | **TOPSOIL** | | 1 | SS | 90 | | |
| 2.0 | -1.07 | **SAND** Compact, brown, moist. | | 2 | SS | 90 | | |
| 4.0 | 1.07 | Sand and gravel, wet. | | | | | | |
| | -1.52 | | | | | | | |
| 6.0 | 1.52 | **SILT** Firm, brown, sandy silt, wet. | | 3 | SS | 90 | | |
| 8.0 | -2.29 2.29 | Stiff, brownish grey, clayey silt, moist. | | 4 | SS | 80 | | |
| 10.0 | | | | 5 | SS | 100 | | |
| 12.0 | -3.96 3.96 | Firm, brownish gray, sandy silt, moist. | | 6 | SS | 100 | | |
| 14.0 | | | | 7 | SS | 100 | | |
| 16.0 | -5.33 5.33 | Stiff, grey, clayey silt, moist. | | 8 | SS | 100 | | |
| 18.0 | | | | 9 | SS | 100 | | |
| 20.0 | | | | 10 | DP | 100 | | |
| 22.0 | | | | 11 | DP | 100 | | |
| 24.0 | | | | 12 | DP | 100 | | |
| 26.0 | | | | 13 | DP | 100 | | |
| 28.0 | | | | | | | | |
| 30.0 | | | | | | | | |
| 32.0 | | | | | | | | |
| 34.0 | | | | | | | | |
| 36.0 | | | | | | | | |
| 38.0 | | | | | | | | |
| 40.0 | -12.19 12.19 | Borehole Terminated at 12.2m (40') | | | | | | |
| 42.0 | | | | | | | | |




**Reviewed By:** CLM

**Method:** Geoprobe SS

**Notes:** No noteable odours or staining

**MTE Consultants Inc.**
520 Bingemans Centre Drive
Kitchener, Ontario
N2B 3X9
(519) 743-6500

**Logged By:** JYK

**Sheet:** 1 of 1

**Client:** Westwood Trail Developments Inc.

**Project:** Phase II Environmental Site Assessment

**Location:** Fernwood Drive/Thomson Road, Simcoe, ON

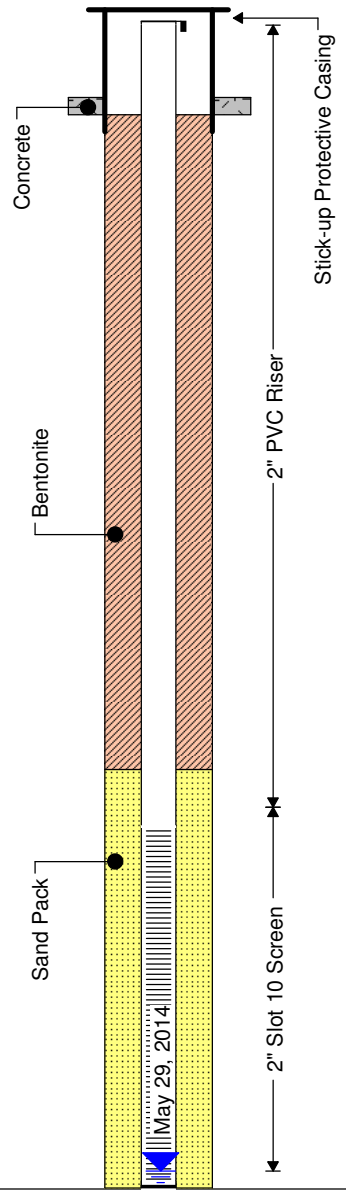
## Borehole Number: MW4-14

**Job Number:** 38750-600

**Drill Date:** May 26, 2014

| Depth (m) | Elevation (m) | Soil Description | Symbol | Number | Type | Recovery (%) | Headspace (ppm) |
|---|---|---|---|---|---|---|---|
| | 0.00 | Ground Elevation | | | | | |
| 0.0 | 0.00 | **TOPSOIL** | | 1 | SS | 75 | 1.5 |
| 2.0 | | **SAND**<br>Compact, brown silty sand, moist.<br>Some gravel at 1.2m (4'). | | 2 | SS | 80 | 0.5 |
| 4.0 | -1.52<br>1.52 | Loose, brown, some silt, saturated at 1.5m (5'). | | 3 | SS | 80 | 0.2 |
| 6.0 | 2.0 | | | 4 | SS | 75 | 0.5 |
| 8.0 | | | | | | | |
| 10.0 | -3.35<br>3.35 | Increased silt content, wet at 3.3m (11'). | | 5 | SS | 90 | 0.5 |
| 12.0 | -3.81<br>3.81 | **SILT**<br>Stiff, greyish brown, clayey silt, moist. | | 6 | SS | 100 | 0.9 |
| 14.0 | 4.0 | | | | | | |
| 16.0 | | | | 7 | SS | 100 | 1.5 |
| 18.0 | | | | 8 | SS | 100 | 0.4 |
| 20.0 | -6.10<br>6.10 | Increased silt, wet at 6.1m (20'). | | 9 | SS | 100 | 0.2 |
| 22.0 | -6.71<br>6.71 | Stiff, brownish grey, clayey silt, wet. | | 10 | SS | 100 | 0.2 |
| 24.0 | | | | | | | |
| 26.0 | 8.0 | | | 11 | SS | 100 | |
| 28.0 | | | | 12 | SS | 100 | |
| 30.0 | -9.14<br>9.14 | Borehole Terminated at 9.1m (30') | | | | | |
| 32.0 | | | | | | | |

**Groundwater Observations and Well Details**




**Reviewed By:** CLM

**Method:** Geoprobe SS

**Notes:** No noteable odours or staining.

**MTE Consultants Inc.**
520 Bingemans Centre Drive
Kitchener, Ontario
N2B 3X9
(519) 743-6500

**Logged By:** JYK

**Sheet:** 1 of 1

**Client:** Westwood Trail Developments Inc.

**Project:** Phase II Environmental Site Assessment

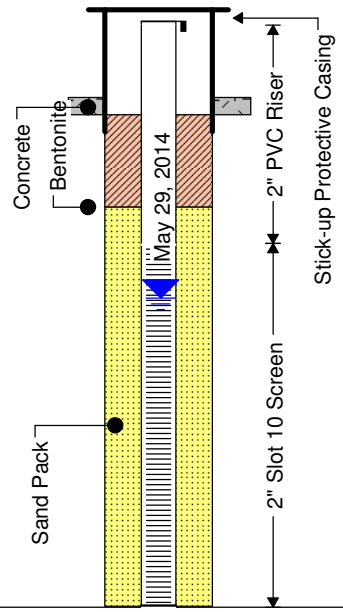
**Location:** Fernwood Drive/Thomson Road, Simcoe, ON

## Borehole Number: MW4a-14

**Job Number:** 38750-600

**Drill Date:** May 26, 2014

| Depth (m) | Elevation (m) | Soil Description | Symbol | Number | Type | Recovery (%) | Headspace (ppm) | Groundwater Observations and Well Details |
|---|---|---|---|---|---|---|---|---|
| ft / m | | | | | | | | |
| -2.0 | | Ground Elevation | | | | | | |
| 0.0 | 0.00 | **TOPSOIL** | | | | | | |
| 2.0 | | **SAND**<br>Compact, brown, silty sand, moist.<br>Some gravel at 1.2m (4'). | | | | | | |
| 4.0 | 1.52 | Loose, brown, some silt, saturated at 1.5m (5'). | | | | | | |
| 6.0 / 2.0 | | | | | | | | |
| 8.0 | | | | | | | | |
| 10.0 | | | | | | | | |
| 12.0 | 3.35 | Increased silt content, wet at 3.3m (11'). | | | | | | |
| 14.0 / 4.0 | 3.81 | **SILT**<br>Stiff, greyish brown, clayey, moist. | | | | | | |
| | 4.27 | Notes: Soil description from adjacent monitoring well MW4-14, drilled on May 26, 2014 | | | | | | Borehole Terminated at 4.3m (14') |
| 16.0 | | | | | | | | |
| 18.0 | | | | | | | | |
| 20.0 / 6.0 | | | | | | | | |
| 22.0 | | | | | | | | |
| 24.0 | | | | | | | | |
| 26.0 / 8.0 | | | | | | | | |
| 28.0 | | | | | | | | |
| 30.0 | | | | | | | | |
| 32.0 | | | | | | | | |




**Reviewed By:** CLM

**Method:** Geoprobe SS

**Notes:** Stratigraphy from MW4-14.

**MTE Consultants Inc.**
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(519) 743-6500

**Logged By:** JYK

**Sheet:** 1 of 1

**Client:** Westwood Trail Developments Inc.

**Project:** Phase II Environmental Site Assessment

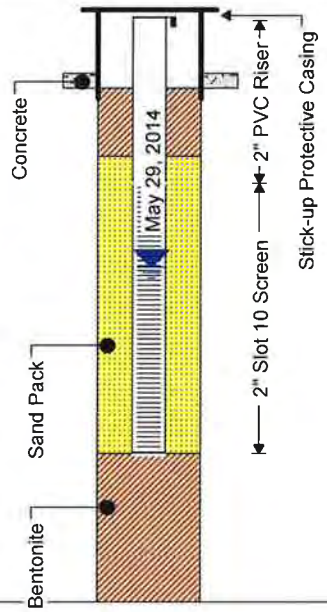
**Location:** Fernwood Drive/Thomson Road, Simcoe, ON

## Borehole Number: MW5-14

**Job Number:** 38750-600

**Drill Date:** May 26, 2014

| Depth (m) | Elevation (m) | Soil Description | Symbol | Number | Type | Recovery (%) | Headspace (ppm) | Groundwater Observations and Well Details |
|---|---|---|---|---|---|---|---|---|
| 0.0 | 0.00 | Ground Elevation | | | | | | |
| 0.0 | 0.00 | **TOPSOIL** | | 1 | SS | 100 | 0.0 | |
| 2.0 | | **SAND**<br>Compact, brown, some topsoil, damp. | | 2 | SS | 5 | | |
| 4.0 | -1.52 | | | | | | 0.2 | |
| 6.0 | 1.52 | Loose, brown, with gravel, moist. | | 3 | SS | 40 | 0.0 | |
| 8.0 | -2.29<br>2.29 | Loose, brown, some silt, saturated at 2.3m (7.5'). | | 4 | SS | 100 | 0.0 | |
| 10.0 | | | | 5 | SS | 100 | 0.0 | |
| 12.0 | | | | | | | | |
| 14.0 | -4.27<br>4.27 | Increased silt at 4.3m (14'). | | 6 | SS | 100 | 0.2<br>0.3 | |
| 16.0 | | **SILT**<br>Firm, greyish brown, clayey, moist. | | 7 | SS | 100 | 0.1 | |
| 18.0 | | | | 8 | SS | 100 | 0.1 | |
| 20.0 | -5.94<br>5.94 | Borehole Terminated at 6.0m (19.5') | | | | | | |
| 22.0 | | | | | | | | |
| 24.0 | | | | | | | | |
| 26.0 | | | | | | | | |
| 28.0 | | | | | | | | |
| 30.0 | | | | | | | | |
| 32.0 | | | | | | | | |
| 34.0 | | | | | | | | |
| 36.0 | | | | | | | | |
| 38.0 | | | | | | | | |
| 40.0 | | | | | | | | |
| 42.0 | | | | | | | | |




**Reviewed By:** CLM

**Method:** Geoprobe SS

**Notes:** No noteable odours or staining.

**MTE Consultants Inc.**
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Kitchener, Ontario
N2B 3X9
(519) 743-6500

**Logged By:** JYK

**Sheet:** 1 of 1

**Client:** Westwood Trail Developments Inc.

**Project:** Phase II Environmental Site Assessment

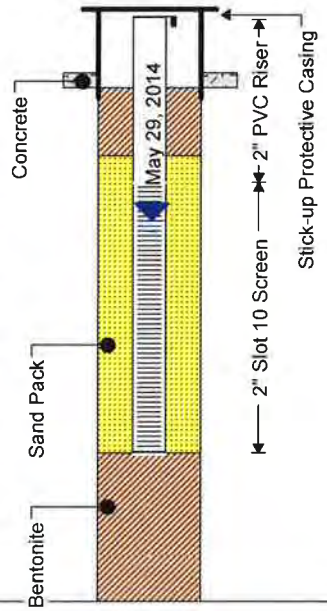
**Location:** Fernwood Drive/Thomson Road, Simcoe, ON

## Borehole Number: MW6-14

**Job Number:** 38750-600

**Drill Date:** May 26, 2014

| Depth (m) | Elevation (m) | Soil Description | Symbol | Number | Type | Recovery (%) | Headspace (ppm) | Groundwater Observations and Well Details |
|---|---|---|---|---|---|---|---|---|
| ft / m | | | | | | | | |
| -2.0 | | | | | | | | |
| 0.0 | 0.00 | Ground Elevation | | | | | | |
| | 0.00 | **TOPSOIL** | | 1 | SS | 80 | 0.3 | |
| 2.0 | | **SAND**<br>Compact, brown, some silt, moist. | | 2 | SS | 100 | 0.2 | |
| 4.0 | -1.52<br>1.52 | Increased silt, saturated at 1.5m (5'). Sand and gravel seam at 1.8-2.0m (6-6.5'). | | 3 | SS | 80 | 0.3 | |
| 6.0 | 2.0 | | | | | | | |
| | -2.29<br>2.29 | **SILT**<br>Firm, brown, sandy silt with some clay, wet. | | 4 | SS | 100 | 0.2 | |
| 8.0 | -3.05<br>3.05 | Increased sand content, saturated at 3.0m (10'). | | 5 | SS | 100 | 0.3 | |
| 10.0 | | Firm, brown, clayey, wet. | | 6 | SS | 100 | 0.1 | |
| 12.0 | 4.0 | | | | | | | |
| 14.0 | | | | 7 | SS | 100 | 0.2 | |
| 16.0 | -5.33<br>5.33 | Increased sand, moist, at 5.3m (17.5'). | | 8 | SS | 100 | 0.2 | |
| 18.0 | -5.94<br>5.94 | Borehole Terminated at 6.0m (19.5') | | | | | | |
| 20.0 | 6.0 | | | | | | | |
| 22.0 | | | | | | | | |
| 24.0 | | | | | | | | |
| 26.0 | 8.0 | | | | | | | |
| 28.0 | | | | | | | | |
| 30.0 | | | | | | | | |
| 32.0 | 10.0 | | | | | | | |
| 34.0 | | | | | | | | |
| 36.0 | | | | | | | | |
| 38.0 | | | | | | | | |
| 40.0 | 12.0 | | | | | | | |
| 42.0 | | | | | | | | |




**Reviewed By:** CLM

**Method:** Geoprobe SS

**Notes:** No noteable odours or staining.

**MTE Consultants Inc.**
520 Bingemans Centre Drive
Kitchener, Ontario
N2B 3X9
(519) 743-6500

**Logged By:** JYK

**Sheet:** 1 of 1

**Client:** Westwood Trail Developments Inc.

**Project:** Phase II Environmental Site Assessment

**Location:** Fernwood Drive/Thomson Road, Simcoe, ON

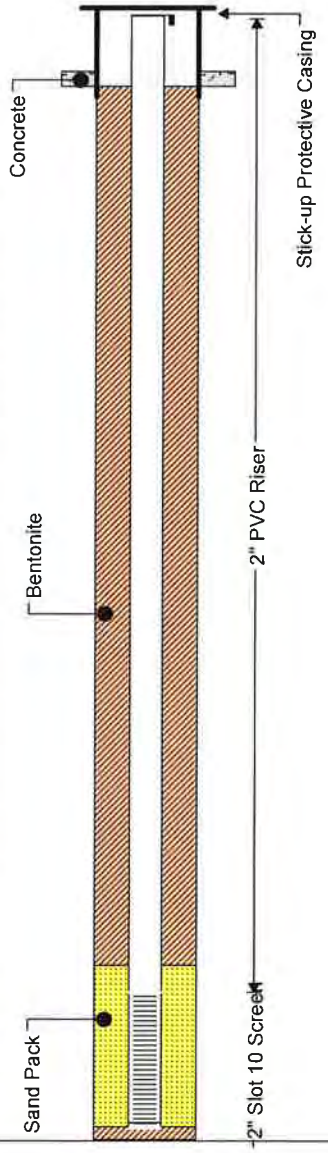
## Borehole Number: MW7-14

**Job Number:** 38750-600

**Drill Date:** May 26, 2014

| Depth (m) | Elevation (m) | Soil Description | Symbol | Number | Type | Recovery (%) | Headspace (ppm) |
|---|---|---|---|---|---|---|---|
| | 0.00 | Ground Elevation | | | | | |
| | 0.00 | **TOPSOIL** | | 1 | SS | 80 | 0.0 |
| | | **SAND**<br>Compact, brown, with gravel, damp | | 2 | SS | 80 | 0.4 |
| 2.0 | | | | 3 | SS | 80 | 0.1 |
| | -2.44<br>2.44 | Compact, brown, saturated at 2.4m (8'). | | 4 | SS | 80 | 0.3 |
| | | | | 5 | SS | 100 | 0.3 |
| 4.0 | -4.11<br>4.11 | **SILT**<br>Firm, brown, silty sand with clay. | | 6 | SS | 100 | 0.4 |
| | | | | 7 | SS | 100 | 0.1 |
| | | | | 8 | SS | 100 | 0.2 |
| 6.0 | | | | 9 | DP | 100 | 0.0 |
| | -7.47<br>7.47 | Stiff, greyish brown, moist at 7.5m (24.5'). | | 10 | DP | 100 | 0.1 |
| 8.0 | | | | 11 | DP | 100 | 0.3 |
| | -10.52<br>10.52 | Very soft, grey, clayey silt, saturated at 10.5m (34.5'). | | 12 | DP | 100 | 0.3 |
| 10.0 | | | | | | | |
| 12.0 | -12.04<br>12.04 | Borehole Terminated at 12m (39.5') | | | | | |

**Groundwater Observations and Well Details**




**Reviewed By:** CLM

**Method:** Geoprobe SS/DP

**Notes:** No noteable odours or staining

**MTE Consultants Inc.**
520 Bingemans Centre Drive
Kitchener, Ontario
N2B 3X9
(519) 743-6500

**Logged By:** JYK

**Sheet:** 1 of 1

**Client:** Westwood Trail Developments Inc.

**Project:** Phase II Environmental Site Assessment

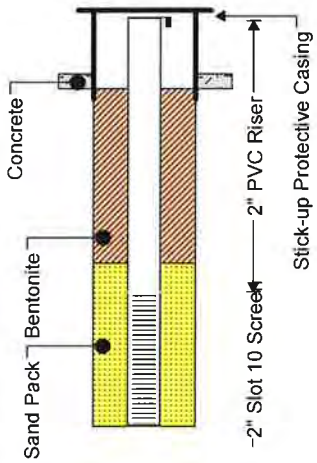
**Location:** Fernwood Drive/Thomson Road, Simcoe, ON

## Borehole Number: MW7a-14

**Job Number:** 38750-600

**Drill Date:** May 26, 2014

| Depth (m) | Elevation (m) | Soil Description | Symbol | Number | Type | Recovery (%) | Headspace (ppm) | Groundwater Observations and Well Details |
|---|---|---|---|---|---|---|---|---|
| | 0.00 | Ground Elevation | | | | | | |
| | 0.00 | **TOPSOIL** | | 1 | SS | 80 | 0.0 | |
| | | **SAND**<br>Compact, brown, with gravel, damp | | 2 | SS | 80 | 0.4 | |
| 2.0 | | | | 3 | SS | 80 | 0.1 | |
| | -2.44<br>2.44 | Compact, brown, saturated at 2.4m (8'). | | 4 | SS | 80 | 0.3 | |
| | | | | 5 | SS | 100 | 0.3 | |
| 4.0 | -4.11<br>4.11 | **SILT**<br>Firm, brown, silty sand with clay. | | 6 | SS | 100 | 0.4 | |
| | | | | 7 | SS | 100 | 0.1 | |
| | | | | 8 | SS | 100 | 0.2 | |
| 6.0 | | | | 9 | DP | 100 | 0.0 | |
| | -7.47<br>7.47 | Stiff, greyish brown, moist at 7.5m (24.5'). | | 10 | DP | 100 | 0.1 | |
| 8.0 | | | | 11 | DP | 100 | 0.3 | |
| 10.0 | -10.52<br>10.52 | Very soft, grey, clayey silt, saturated at 10.5m (34.5'). | | 12 | DP | 100 | 0.3 | |
| 12.0 | -12.19<br>12.19 | | | | | | | |




Borehole Terminated at 4.0m (13')

**Reviewed By:** CLM

**Method:** Geoprobe SS/DP

**Notes:** Stratigraphy from MW7-14

**MTE Consultants Inc.**
520 Bingemans Centre Drive
Kitchener, Ontario
N2B 3X9
(519) 743-6500

**Logged By:** JYK

**Sheet:** 1 of 1

**Client:** Westwood Trail Developments Inc.

**Project:** Phase II Environmental Site Assessment

**Location:** Fernwood Drive/Thomson Road, Simcoe, ON

## Borehole Number: BH8-14

**Job Number:** 38750-600

**Drill Date:** May 30, 2014

| Depth (m) | Elevation (m) | Soil Description | Symbol | Number | Type | Recovery (%) | Headspace (ppm) | Groundwater Observations and Well Details |
|---|---|---|---|---|---|---|---|---|
| | 0.00 | Ground Elevation | | | | | | |
| | 0.00 | **TOPSOIL** | | 1 | SS | 90 | | |
| | | **SAND**<br>Compact, brown, sand, moist. | | 2 | SS | 90 | | |
| | -1.37<br>1.37 | **SILT**<br>Firm, brown, sandy silt, moist. Wet at 1.8m (6'). | | 3 | SS | 90 | | |
| 2.0 | -2.29<br>2.29 | Firm, brown, sandy silt with clay, moist. | | 4 | SS | 80 | | |
| | | | | 5 | SS | 100 | | |
| 4.0 | | | | 6 | SS | 100 | | |
| | | | | 7 | SS | 100 | | |
| | | | | 8 | SS | 100 | | Bentonite |
| 6.0 | -6.10<br>6.10 | Turning grey at 6.1m (20'). | | 9 | SS | 100 | | |
| | -6.71<br>6.71 | Borehole Terminated at 6.7m (22') | | | | | | |
| 8.0 | | | | | | | | |
| 10.0 | | | | | | | | |
| 12.0 | | | | | | | | |

**Reviewed By:** CLM

**Method:** Geoprobe SS

**Notes:** No noteable odours or staining.

**MTE Consultants Inc.**
520 Bingemans Centre Drive
Kitchener, Ontario
N2B 3X9
(519) 743-6500

**Logged By:** JYK

**Sheet:** 1 of 1

# APPENDIX D

# LABORATORY CERTIFICATES OF ANALYSIS

Your Project #: 38750-600
Your C.O.C. #: 47129703, 471297-03-01

**Attention: Jennifer Kato**
MTE Consultants Inc
520 Bingemans Centre Dr
Kitchener, ON
N2B 3X9

**Report Date: 2014/06/19**
**Report #: R3063430**
**Version: 3P**

# CERTIFICATE OF ANALYSIS – PARTIAL RESULTS

**MAXXAM JOB #: B487624**
**Received: 2014/05/27, 10:45**

Sample Matrix: Soil
# Samples Received: 8

| Analyses | Quantity | Date Extracted | Date Analyzed | Laboratory Method | Method Reference |
|---|---|---|---|---|---|
| Petroleum Hydro. CCME F1 & BTEX in Soil | 2 | 2014/05/27 | 2014/05/29 | CAM SOP-00315 | CCME CWS |
| Petroleum Hydro. CCME F1 & BTEX in Soil | 1 | 2014/05/27 | 2014/05/30 | CAM SOP-00315 | CCME CWS |
| Petroleum Hydrocarbons F2-F4 in Soil | 3 | 2014/05/30 | 2014/06/02 | CAM SOP-00316 | CCME CWS |
| Acid Extr. Metals (aqua regia) by ICPMS | 4 | 2014/05/30 | 2014/05/30 | CAM SOP-00447 | EPA 6020 |
| Moisture | 5 | N/A | 2014/05/28 | CAM SOP-00445 | R.Carter,1993 |
| OC Pesticides (Selected) & PCB (1) | 2 | 2014/05/28 | 2014/05/29 | CAM SOP-00307 | SW846 8081, 8082 |
| OC Pesticides Summed Parameters | 2 | N/A | 2014/05/29 | CAM SOP-00307 | SW846 8081, 8082 |

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Chlordane ( Total) = Alpha Chlordane + Gamma Chlordane

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Keshani Vijh, Project Manager
Email: KVijh@maxxam.ca
Phone# (905) 817-5700

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 1





Maxxam Analytics – Partial/Rush Results

Maxxam Job #: B487624
Report Date: 2014/06/19

MTE Consultants Inc
Client Project #: 38750-600

Sampler Initials: JK

## RESULTS OF ANALYSES OF SOIL

| Maxxam ID | | WA9877 | | WA9880 | | WA9882 | | |
|---|---|---|---|---|---|---|---|---|
| Sampling Date | | 2014/05/26 08:45 | | 2014/05/26 12:15 | | 2014/05/26 12:20 | | |
| COC Number | | 471297-03-01 | | 471297-03-01 | | 471297-03-01 | | |
| | **Units** | **MW4-14 5-6'** | **QC Batch** | **MW5-14 0-1'** | **QC Batch** | **MW5-14 8-9'** | **RDL** | **QC Batch** |
| **Inorganics** | | | | | | | | |
| Moisture | % | 21 | 3621361 | 12 | 3620895 | 16 | 1.0 | 3621361 |

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

| Maxxam ID | | WA9886 | | WA9887 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2014/05/26 14:00 | | 2014/05/26 14:15 | | |
| COC Number | | 471297-03-01 | | 471297-03-01 | | |
| | **Units** | **MW6-14 0-1'** | **QC Batch** | **MW6-14 5-6'** | **RDL** | **QC Batch** |
| **Inorganics** | | | | | | |
| Moisture | % | 12 | 3620895 | 16 | 1.0 | 3621361 |

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics - Partial/Rush Results



Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B487624
Report Date: 2014/06/19

MTE Consultants Inc
Client Project #: 38750-600

Sampler Initials: JK

## ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

| Maxxam ID | | | WA9876 | | WA9881 | | |
|---|---|---|---|---|---|---|---|
| Sampling Date | | | 2014/05/26 08:30 | | 2014/05/26 12:15 | | |
| COC Number | | | 471297-03-01 | | 471297-03-01 | | |
| | **Units** | **Criteria** | **MW4-14 0-1'** | **QC Batch** | **MW5-14 1-2'** | **RDL** | **QC Batch** |
| **Metals** | | | | | | | |
| Acid Extractable Antimony (Sb) | ug/g | **1.3** | <0.20 | 3623436 | <0.20 | 0.20 | 3623578 |
| Acid Extractable Arsenic (As) | ug/g | **18** | 2.3 | 3623436 | 1.1 | 1.0 | 3623578 |
| Acid Extractable Barium (Ba) | ug/g | **220** | 28 | 3623436 | 27 | 0.50 | 3623578 |
| Acid Extractable Beryllium (Be) | ug/g | **2.5** | 0.20 | 3623436 | 0.20 | 0.20 | 3623578 |
| Acid Extractable Boron (B) | ug/g | **36** | <5.0 | 3623436 | <5.0 | 5.0 | 3623578 |
| Acid Extractable Cadmium (Cd) | ug/g | **1.2** | 0.14 | 3623436 | <0.10 | 0.10 | 3623578 |
| Acid Extractable Chromium (Cr) | ug/g | **70** | 5.6 | 3623436 | 5.2 | 1.0 | 3623578 |
| Acid Extractable Cobalt (Co) | ug/g | **21** | 1.6 | 3623436 | 2.0 | 0.10 | 3623578 |
| Acid Extractable Copper (Cu) | ug/g | **92** | 3.9 | 3623436 | 3.7 | 0.50 | 3623578 |
| Acid Extractable Lead (Pb) | ug/g | **120** | 15 | 3623436 | 4.6 | 1.0 | 3623578 |
| Acid Extractable Molybdenum (Mo) | ug/g | **2** | <0.50 | 3623436 | <0.50 | 0.50 | 3623578 |
| Acid Extractable Nickel (Ni) | ug/g | **82** | 3.1 | 3623436 | 3.7 | 0.50 | 3623578 |
| Acid Extractable Selenium (Se) | ug/g | **1.5** | <0.50 | 3623436 | <0.50 | 0.50 | 3623578 |
| Acid Extractable Silver (Ag) | ug/g | **0.5** | <0.20 | 3623436 | <0.20 | 0.20 | 3623578 |
| Acid Extractable Thallium (Tl) | ug/g | **1** | <0.050 | 3623436 | <0.050 | 0.050 | 3623578 |
| Acid Extractable Uranium (U) | ug/g | **2.5** | 0.31 | 3623436 | 0.21 | 0.050 | 3623578 |
| Acid Extractable Vanadium (V) | ug/g | **86** | 13 | 3623436 | 11 | 5.0 | 3623578 |
| Acid Extractable Zinc (Zn) | ug/g | **290** | 26 | 3623436 | 20 | 5.0 | 3623578 |

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
Table 1: Full Depth Background Site Condition Standards
Soil - Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use

Maxxam Analytics - Partial/Rush Results



Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B487624
Report Date: 2014/06/19

MTE Consultants Inc
Client Project #: 38750-600

Sampler Initials: JK

## ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

| Maxxam ID | | | WA9886 | WA9889 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | | 2014/05/26 14:00 | 2014/05/26 12:15 | | |
| COC Number | | | 471297-03-01 | 471297-03-01 | | |
| | **Units** | **Criteria** | **MW6-14 0-1'** | **MW15-14 0-1'** | **RDL** | **QC Batch** |
| **Metals** | | | | | | |
| Acid Extractable Antimony (Sb) | ug/g | **1.3** | 0.24 | <0.20 | 0.20 | 3623436 |
| Acid Extractable Arsenic (As) | ug/g | **18** | 1.2 | 1.5 | 1.0 | 3623436 |
| Acid Extractable Barium (Ba) | ug/g | **220** | 30 | 36 | 0.50 | 3623436 |
| Acid Extractable Beryllium (Be) | ug/g | **2.5** | 0.25 | 0.24 | 0.20 | 3623436 |
| Acid Extractable Boron (B) | ug/g | **36** | <5.0 | <5.0 | 5.0 | 3623436 |
| Acid Extractable Cadmium (Cd) | ug/g | **1.2** | 0.14 | <0.10 | 0.10 | 3623436 |
| Acid Extractable Chromium (Cr) | ug/g | **70** | 6.0 | 5.5 | 1.0 | 3623436 |
| Acid Extractable Cobalt (Co) | ug/g | **21** | 1.9 | 2.0 | 0.10 | 3623436 |
| Acid Extractable Copper (Cu) | ug/g | **92** | 6.9 | 5.1 | 0.50 | 3623436 |
| Acid Extractable Lead (Pb) | ug/g | **120** | 21 | 7.1 | 1.0 | 3623436 |
| Acid Extractable Molybdenum (Mo) | ug/g | **2** | <0.50 | <0.50 | 0.50 | 3623436 |
| Acid Extractable Nickel (Ni) | ug/g | **82** | 4.0 | 3.8 | 0.50 | 3623436 |
| Acid Extractable Selenium (Se) | ug/g | **1.5** | <0.50 | <0.50 | 0.50 | 3623436 |
| Acid Extractable Silver (Ag) | ug/g | **0.5** | <0.20 | <0.20 | 0.20 | 3623436 |
| Acid Extractable Thallium (Tl) | ug/g | **1** | <0.050 | <0.050 | 0.050 | 3623436 |
| Acid Extractable Uranium (U) | ug/g | **2.5** | 0.19 | 0.22 | 0.050 | 3623436 |
| Acid Extractable Vanadium (V) | ug/g | **86** | 11 | 11 | 5.0 | 3623436 |
| Acid Extractable Zinc (Zn) | ug/g | **290** | 30 | 24 | 5.0 | 3623436 |

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
Table 1: Full Depth Background Site Condition Standards
Soil - Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use

Maxxam Analytics - Partial/Rush Results



Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B487624
Report Date: 2014/06/19

MTE Consultants Inc
Client Project #: 38750-600

Sampler Initials: JK

## PETROLEUM HYDROCARBONS (CCME)

| Maxxam ID | | | WA9877 | WA9877 | WA9882 | WA9887 | | |
|---|---|---|---|---|---|---|---|---|
| Sampling Date | | | 2014/05/26 08:45 | 2014/05/26 08:45 | 2014/05/26 12:20 | 2014/05/26 14:15 | | |
| COC Number | | | 471297-03-01 | 471297-03-01 | 471297-03-01 | 471297-03-01 | | |
| | **Units** | **Criteria** | **MW4-14 5-6'** | **MW4-14 5-6' Lab-Dup** | **MW5-14 8-9'** | **MW6-14 5-6'** | **RDL** | **QC Batch** |
| **BTEX & F1 Hydrocarbons** | | | | | | | | |
| Benzene | ug/g | **0.02** | <0.020 | | <0.020 | <0.020 | 0.020 | 3622646 |
| Toluene | ug/g | **0.2** | <0.020 | | <0.020 | <0.020 | 0.020 | 3622646 |
| Ethylbenzene | ug/g | **0.05** | <0.020 | | <0.020 | <0.020 | 0.020 | 3622646 |
| o-Xylene | ug/g | **-** | <0.020 | | <0.020 | <0.020 | 0.020 | 3622646 |
| p+m-Xylene | ug/g | **-** | <0.040 | | <0.040 | <0.040 | 0.040 | 3622646 |
| Total Xylenes | ug/g | **0.05** | <0.040 | | <0.040 | <0.040 | 0.040 | 3622646 |
| F1 (C6-C10) | ug/g | **25** | <10 | | <10 | <10 | 10 | 3622646 |
| F1 (C6-C10) - BTEX | ug/g | **25** | <10 | | <10 | <10 | 10 | 3622646 |
| **F2-F4 Hydrocarbons** | | | | | | | | |
| F2 (C10-C16 Hydrocarbons) | ug/g | **10** | <10 | <10 | <10 | <10 | 10 | 3624354 |
| F3 (C16-C34 Hydrocarbons) | ug/g | **240** | <50 | <50 | <50 | <50 | 50 | 3624354 |
| F4 (C34-C50 Hydrocarbons) | ug/g | **120** | <50 | <50 | <50 | <50 | 50 | 3624354 |
| Reached Baseline at C50 | ug/g | **-** | Yes | Yes | Yes | Yes | | 3624354 |
| **Surrogate Recovery (%)** | | | | | | | | |
| 1,4-Difluorobenzene | % | - | 101 | | 98 | 99 | | 3622646 |
| 4-Bromofluorobenzene | % | - | 103 | | 102 | 102 | | 3622646 |
| D10-Ethylbenzene | % | - | 102 | | 82 | 89 | | 3622646 |
| D4-1,2-Dichloroethane | % | - | 103 | | 100 | 101 | | 3622646 |
| o-Terphenyl | % | - | 95 | 94 | 94 | 93 | | 3624354 |

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
Table 1: Full Depth Background Site Condition Standards
Soil - Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use

Maxxam Analytics - Partial/Rush Results



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Report Date: 2014/06/19

MTE Consultants Inc
Client Project #: 38750-600

Sampler Initials: JK

Maxxam Analytics – Partial/Rush Results

## ORGANOCHLORINATED PESTICIDES BY GC-ECD (SOIL)

| Maxxam ID | | | WA9880 | WA9886 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | | 2014/05/26 12:15 | 2014/05/26 14:00 | | |
| COC Number | | | 471297-03-01 | 471297-03-01 | | |
| | **Units** | **Criteria** | **MW5-14 0-1'** | **MW6-14 0-1'** | **RDL** | **QC Batch** |
| **Calculated Parameters** | | | | | | |
| Chlordane (Total) | ug/g | **0.05** | <0.0020 | <0.0020 | 0.0020 | 3619486 |
| o,p-DDD + p,p-DDD | ug/g | **-** | <0.0020 | <0.0020 | 0.0020 | 3619486 |
| o,p-DDE + p,p-DDE | ug/g | **-** | 0.017 | 0.0020 | 0.0020 | 3619486 |
| o,p-DDT + p,p-DDT | ug/g | **-** | 0.0050 | <0.0020 | 0.0020 | 3619486 |
| Total Endosulfan | ug/g | **-** | <0.0020 | <0.0020 | 0.0020 | 3619486 |
| **Pesticides & Herbicides** | | | | | | |
| Aldrin | ug/g | **0.05** | <0.0020 | <0.0020 | 0.0020 | 3620155 |
| a-Chlordane | ug/g | **0.05** | <0.0020 | <0.0020 | 0.0020 | 3620155 |
| g-Chlordane | ug/g | **0.05** | <0.0020 | <0.0020 | 0.0020 | 3620155 |
| o,p-DDD | ug/g | **0.05** | <0.0020 | <0.0020 | 0.0020 | 3620155 |
| p,p-DDD | ug/g | **0.05** | <0.0020 | <0.0020 | 0.0020 | 3620155 |
| o,p-DDE | ug/g | **0.05** | <0.0020 | <0.0020 | 0.0020 | 3620155 |
| p,p-DDE | ug/g | **0.05** | 0.017 | 0.0020 | 0.0020 | 3620155 |
| o,p-DDT | ug/g | **1.4** | <0.0020 | <0.0020 | 0.0020 | 3620155 |
| p,p-DDT | ug/g | **1.4** | 0.0050 | <0.0020 | 0.0020 | 3620155 |
| Dieldrin | ug/g | **0.05** | <0.0020 | <0.0020 | 0.0020 | 3620155 |
| Lindane | ug/g | **0.01** | <0.0020 | <0.0020 | 0.0020 | 3620155 |
| Endosulfan I (alpha) | ug/g | **0.04** | <0.0020 | <0.0020 | 0.0020 | 3620155 |
| Endosulfan II | ug/g | **0.04** | <0.0020 | <0.0020 | 0.0020 | 3620155 |
| Endrin | ug/g | **0.04** | <0.0020 | <0.0020 | 0.0020 | 3620155 |
| Heptachlor | ug/g | **0.05** | <0.0020 | <0.0020 | 0.0020 | 3620155 |
| Heptachlor epoxide | ug/g | **0.05** | <0.0020 | <0.0020 | 0.0020 | 3620155 |
| Hexachlorobenzene | ug/g | **0.01** | <0.0020 | <0.0020 | 0.0020 | 3620155 |
| Hexachlorobutadiene | ug/g | **0.01** | <0.0050 | <0.0050 | 0.0050 | 3620155 |
| Hexachloroethane | ug/g | **0.01** | <0.0050 | <0.0050 | 0.0050 | 3620155 |
| Methoxychlor | ug/g | **0.05** | <0.0050 | <0.0050 | 0.0050 | 3620155 |
| **Surrogate Recovery (%)** | | | | | | |
| 2,4,5,6-Tetrachloro-m-xylene | % | - | 79 | 78 | | 3620155 |
| Decachlorobiphenyl | % | - | 109 | 109 | | 3620155 |

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
Table 1: Full Depth Background Site Condition Standards
Soil - Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use



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Client Project #: 38750-600

Sampler Initials: JK

| | |
|---|---|
| Package 1 | 8.7°C |

Each temperature is the average of up to three cooler temperatures taken at receipt

**GENERAL COMMENTS**

Sample WA9876-01: Revised Report (2014/06/17): Requested regulatory criteria have been included on this report.

**Results relate only to the items tested.**

Maxxam Analytics - Partial/Rush Results



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MTE Consultants Inc
Attention: Jennifer Kato
Client Project #: 38750-600
P.O. #:
Site Location:

Maxxam Analytics – Partial/Rush Results

# Quality Assurance Report

Maxxam Job Number: WB487624

| QA/QC Batch Num | Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|---|
| 3620155 | FSO | Matrix Spike | 2,4,5,6-Tetrachloro-m-xylene | 2014/05/29 | | 74 | % | 50 - 130 |
| | | | Decachlorobiphenyl | 2014/05/29 | | 110 | % | 50 - 130 |
| | | | Aldrin | 2014/05/29 | | 67 | % | 50 - 130 |
| | | | a-Chlordane | 2014/05/29 | | 83 | % | 50 - 130 |
| | | | g-Chlordane | 2014/05/29 | | 83 | % | 50 - 130 |
| | | | o,p-DDD | 2014/05/29 | | 95 | % | 50 - 130 |
| | | | p,p-DDD | 2014/05/29 | | 87 | % | 50 - 130 |
| | | | o,p-DDE | 2014/05/29 | | 87 | % | 50 - 130 |
| | | | p,p-DDE | 2014/05/29 | | 87 | % | 50 - 130 |
| | | | o,p-DDT | 2014/05/29 | | 94 | % | 50 - 130 |
| | | | p,p-DDT | 2014/05/29 | | 94 | % | 50 - 130 |
| | | | Dieldrin | 2014/05/29 | | 90 | % | 50 - 130 |
| | | | Lindane | 2014/05/29 | | 74 | % | 50 - 130 |
| | | | Endosulfan I (alpha) | 2014/05/29 | | 70 | % | 50 - 130 |
| | | | Endosulfan II | 2014/05/29 | | 83 | % | 50 - 130 |
| | | | Endrin | 2014/05/29 | | 78 | % | 50 - 130 |
| | | | Heptachlor | 2014/05/29 | | 77 | % | 50 - 130 |
| | | | Heptachlor epoxide | 2014/05/29 | | 79 | % | 50 - 130 |
| | | | Hexachlorobenzene | 2014/05/29 | | 78 | % | 50 - 130 |
| | | | Hexachlorobutadiene | 2014/05/29 | | 74 | % | 50 - 130 |
| | | | Hexachloroethane | 2014/05/29 | | 48 (1) | % | 50 - 130 |
| | | | Methoxychlor | 2014/05/29 | | 108 | % | 50 - 130 |
| | | Spiked Blank | 2,4,5,6-Tetrachloro-m-xylene | 2014/05/29 | | 81 | % | 50 - 130 |
| | | | Decachlorobiphenyl | 2014/05/29 | | 113 | % | 50 - 130 |
| | | | Aldrin | 2014/05/29 | | 72 | % | 50 - 130 |
| | | | a-Chlordane | 2014/05/29 | | 91 | % | 50 - 130 |
| | | | g-Chlordane | 2014/05/29 | | 95 | % | 50 - 130 |
| | | | o,p-DDD | 2014/05/29 | | 107 | % | 50 - 130 |
| | | | p,p-DDD | 2014/05/29 | | 96 | % | 50 - 130 |
| | | | o,p-DDE | 2014/05/29 | | 91 | % | 50 - 130 |
| | | | p,p-DDE | 2014/05/29 | | 89 | % | 50 - 130 |
| | | | o,p-DDT | 2014/05/29 | | 92 | % | 50 - 130 |
| | | | p,p-DDT | 2014/05/29 | | 88 | % | 50 - 130 |
| | | | Dieldrin | 2014/05/29 | | 112 | % | 50 - 130 |
| | | | Lindane | 2014/05/29 | | 88 | % | 50 - 130 |
| | | | Endosulfan I (alpha) | 2014/05/29 | | 85 | % | 50 - 130 |
| | | | Endosulfan II | 2014/05/29 | | 95 | % | 50 - 130 |
| | | | Endrin | 2014/05/29 | | 92 | % | 50 - 130 |
| | | | Heptachlor | 2014/05/29 | | 80 | % | 50 - 130 |
| | | | Heptachlor epoxide | 2014/05/29 | | 95 | % | 50 - 130 |
| | | | Hexachlorobenzene | 2014/05/29 | | 85 | % | 50 - 130 |
| | | | Hexachlorobutadiene | 2014/05/29 | | 98 | % | 50 - 130 |
| | | | Hexachloroethane | 2014/05/29 | | 72 | % | 50 - 130 |
| | | | Methoxychlor | 2014/05/29 | | 101 | % | 50 - 130 |
| | | Method Blank | 2,4,5,6-Tetrachloro-m-xylene | 2014/05/29 | | 85 | % | 50 - 130 |
| | | | Decachlorobiphenyl | 2014/05/29 | | 117 | % | 50 - 130 |
| | | | Aldrin | 2014/05/29 | <0.0020 | | ug/g | |
| | | | a-Chlordane | 2014/05/29 | <0.0020 | | ug/g | |
| | | | g-Chlordane | 2014/05/29 | <0.0020 | | ug/g | |
| | | | o,p-DDD | 2014/05/29 | <0.0020 | | ug/g | |
| | | | p,p-DDD | 2014/05/29 | <0.0020 | | ug/g | |
| | | | o,p-DDE | 2014/05/29 | <0.0020 | | ug/g | |
| | | | p,p-DDE | 2014/05/29 | <0.0020 | | ug/g | |
| | | | o,p-DDT | 2014/05/29 | <0.0020 | | ug/g | |
| | | | p,p-DDT | 2014/05/29 | <0.0020 | | ug/g | |

MTE Consultants Inc
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Client Project #: 38750-600
P.O. #:
Site Location:

Maxxam Analytics – Partial/Rush Results

## Quality Assurance Report (Continued)

Maxxam Job Number: WB487624

| QA/QC Batch Num | Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|---|
| 3620155 | FSO | Method Blank | Dieldrin | 2014/05/29 | <0.0020 | | ug/g | |
| | | | Lindane | 2014/05/29 | <0.0020 | | ug/g | |
| | | | Endosulfan I (alpha) | 2014/05/29 | <0.0020 | | ug/g | |
| | | | Endosulfan II | 2014/05/29 | <0.0020 | | ug/g | |
| | | | Endrin | 2014/05/29 | <0.0020 | | ug/g | |
| | | | Heptachlor | 2014/05/29 | <0.0020 | | ug/g | |
| | | | Heptachlor epoxide | 2014/05/29 | <0.0020 | | ug/g | |
| | | | Hexachlorobenzene | 2014/05/29 | <0.0020 | | ug/g | |
| | | | Hexachlorobutadiene | 2014/05/29 | <0.0050 | | ug/g | |
| | | | Hexachloroethane | 2014/05/29 | <0.0050 | | ug/g | |
| | | | Methoxychlor | 2014/05/29 | <0.0050 | | ug/g | |
| | | RPD | Aldrin | 2014/05/29 | NC | | % | 40 |
| | | | a-Chlordane | 2014/05/29 | NC | | % | 40 |
| | | | g-Chlordane | 2014/05/29 | NC | | % | 40 |
| | | | o,p-DDD | 2014/05/29 | NC | | % | 40 |
| | | | p,p-DDD | 2014/05/29 | NC | | % | 40 |
| | | | o,p-DDE | 2014/05/29 | NC | | % | 40 |
| | | | p,p-DDE | 2014/05/29 | NC | | % | 40 |
| | | | o,p-DDT | 2014/05/29 | NC | | % | 40 |
| | | | p,p-DDT | 2014/05/29 | NC | | % | 40 |
| | | | Dieldrin | 2014/05/29 | NC | | % | 40 |
| | | | Lindane | 2014/05/29 | NC | | % | 40 |
| | | | Endosulfan I (alpha) | 2014/05/29 | NC | | % | 40 |
| | | | Endosulfan II | 2014/05/29 | NC | | % | 40 |
| | | | Endrin | 2014/05/29 | NC | | % | 40 |
| | | | Heptachlor | 2014/05/29 | NC | | % | 40 |
| | | | Heptachlor epoxide | 2014/05/29 | NC | | % | 40 |
| | | | Hexachlorobenzene | 2014/05/29 | NC | | % | 40 |
| | | | Hexachlorobutadiene | 2014/05/29 | NC | | % | 40 |
| | | | Hexachloroethane | 2014/05/29 | NC | | % | 40 |
| | | | Methoxychlor | 2014/05/29 | NC | | % | 40 |
| 3620895 | BOP | RPD | Moisture | 2014/05/28 | 3.1 | | % | 20 |
| 3621361 | BOP | RPD | Moisture | 2014/05/28 | 2.1 | | % | 20 |
| 3622646 | GRU | Matrix Spike | 1,4-Difluorobenzene | 2014/05/29 | | 95 | % | 60 - 140 |
| | | | 4-Bromofluorobenzene | 2014/05/29 | | 103 | % | 60 - 140 |
| | | | D10-Ethylbenzene | 2014/05/29 | | 89 | % | 60 - 140 |
| | | | D4-1,2-Dichloroethane | 2014/05/29 | | 95 | % | 60 - 140 |
| | | | Benzene | 2014/05/29 | | 94 | % | 60 - 140 |
| | | | Toluene | 2014/05/29 | | 72 | % | 60 - 140 |
| | | | Ethylbenzene | 2014/05/29 | | 105 | % | 60 - 140 |
| | | | o-Xylene | 2014/05/29 | | 101 | % | 60 - 140 |
| | | | p+m-Xylene | 2014/05/29 | | 77 | % | 60 - 140 |
| | | | F1 (C6-C10) | 2014/05/29 | | NC (2) | % | 60 - 140 |
| | | Spiked Blank | 1,4-Difluorobenzene | 2014/05/29 | | 101 | % | 60 - 140 |
| | | | 4-Bromofluorobenzene | 2014/05/29 | | 100 | % | 60 - 140 |
| | | | D10-Ethylbenzene | 2014/05/29 | | 96 | % | 60 - 140 |
| | | | D4-1,2-Dichloroethane | 2014/05/29 | | 96 | % | 60 - 140 |
| | | | Benzene | 2014/05/29 | | 100 | % | 60 - 140 |
| | | | Toluene | 2014/05/29 | | 102 | % | 60 - 140 |
| | | | Ethylbenzene | 2014/05/29 | | 107 | % | 60 - 140 |
| | | | o-Xylene | 2014/05/29 | | 107 | % | 60 - 140 |
| | | | p+m-Xylene | 2014/05/29 | | 99 | % | 60 - 140 |
| | | | F1 (C6-C10) | 2014/05/29 | | 103 | % | 80 - 120 |
| | | Method Blank | 1,4-Difluorobenzene | 2014/05/29 | | 101 | % | 60 - 140 |
| | | | 4-Bromofluorobenzene | 2014/05/29 | | 100 | % | 60 - 140 |

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P.O. #:
Site Location:

## Quality Assurance Report (Continued)

Maxxam Job Number: WB487624

| QA/QC Batch Num | Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|---|
| 3622646 | GRU | Method Blank | D10-Ethylbenzene | 2014/05/29 | | 84 | % | 60 - 140 |
| | | | D4-1,2-Dichloroethane | 2014/05/29 | | 101 | % | 60 - 140 |
| | | | Benzene | 2014/05/29 | <0.020 | | ug/g | |
| | | | Toluene | 2014/05/29 | <0.020 | | ug/g | |
| | | | Ethylbenzene | 2014/05/29 | <0.020 | | ug/g | |
| | | | o-Xylene | 2014/05/29 | <0.020 | | ug/g | |
| | | | p+m-Xylene | 2014/05/29 | <0.040 | | ug/g | |
| | | | Total Xylenes | 2014/05/29 | <0.040 | | ug/g | |
| | | | F1 (C6-C10) | 2014/05/29 | <10 | | ug/g | |
| | | | F1 (C6-C10) - BTEX | 2014/05/29 | <10 | | ug/g | |
| | | RPD | F1 (C6-C10) | 2014/05/29 | 7.6 | | % | 50 |
| | | | F1 (C6-C10) - BTEX | 2014/05/29 | 7.7 | | % | 50 |
| 3623436 | VIV | Matrix Spike | Acid Extractable Antimony (Sb) | 2014/05/30 | | 96 | % | 75 - 125 |
| | | | Acid Extractable Arsenic (As) | 2014/05/30 | | 95 | % | 75 - 125 |
| | | | Acid Extractable Barium (Ba) | 2014/05/30 | | NC (2) | % | 75 - 125 |
| | | | Acid Extractable Beryllium (Be) | 2014/05/30 | | 101 | % | 75 - 125 |
| | | | Acid Extractable Boron (B) | 2014/05/30 | | 96 | % | 75 - 125 |
| | | | Acid Extractable Cadmium (Cd) | 2014/05/30 | | 99 | % | 75 - 125 |
| | | | Acid Extractable Chromium (Cr) | 2014/05/30 | | 99 | % | 75 - 125 |
| | | | Acid Extractable Cobalt (Co) | 2014/05/30 | | 99 | % | 75 - 125 |
| | | | Acid Extractable Copper (Cu) | 2014/05/30 | | 96 | % | 75 - 125 |
| | | | Acid Extractable Lead (Pb) | 2014/05/30 | | 96 | % | 75 - 125 |
| | | | Acid Extractable Molybdenum (Mo) | 2014/05/30 | | 101 | % | 75 - 125 |
| | | | Acid Extractable Nickel (Ni) | 2014/05/30 | | 98 | % | 75 - 125 |
| | | | Acid Extractable Selenium (Se) | 2014/05/30 | | 98 | % | 75 - 125 |
| | | | Acid Extractable Silver (Ag) | 2014/05/30 | | 99 | % | 75 - 125 |
| | | | Acid Extractable Thallium (Tl) | 2014/05/30 | | 89 | % | 75 - 125 |
| | | | Acid Extractable Uranium (U) | 2014/05/30 | | 98 | % | 75 - 125 |
| | | | Acid Extractable Vanadium (V) | 2014/05/30 | | 100 | % | 75 - 125 |
| | | | Acid Extractable Zinc (Zn) | 2014/05/30 | | NC (2) | % | 75 - 125 |
| | | Spiked Blank | Acid Extractable Antimony (Sb) | 2014/05/30 | | 99 | % | 80 - 120 |
| | | | Acid Extractable Arsenic (As) | 2014/05/30 | | 99 | % | 80 - 120 |
| | | | Acid Extractable Barium (Ba) | 2014/05/30 | | 101 | % | 80 - 120 |
| | | | Acid Extractable Beryllium (Be) | 2014/05/30 | | 101 | % | 80 - 120 |
| | | | Acid Extractable Boron (B) | 2014/05/30 | | 97 | % | 80 - 120 |
| | | | Acid Extractable Cadmium (Cd) | 2014/05/30 | | 99 | % | 80 - 120 |
| | | | Acid Extractable Chromium (Cr) | 2014/05/30 | | 101 | % | 80 - 120 |
| | | | Acid Extractable Cobalt (Co) | 2014/05/30 | | 100 | % | 80 - 120 |
| | | | Acid Extractable Copper (Cu) | 2014/05/30 | | 100 | % | 80 - 120 |
| | | | Acid Extractable Lead (Pb) | 2014/05/30 | | 101 | % | 80 - 120 |
| | | | Acid Extractable Molybdenum (Mo) | 2014/05/30 | | 98 | % | 80 - 120 |
| | | | Acid Extractable Nickel (Ni) | 2014/05/30 | | 99 | % | 80 - 120 |
| | | | Acid Extractable Selenium (Se) | 2014/05/30 | | 101 | % | 80 - 120 |
| | | | Acid Extractable Silver (Ag) | 2014/05/30 | | 100 | % | 80 - 120 |
| | | | Acid Extractable Thallium (Tl) | 2014/05/30 | | 95 | % | 80 - 120 |
| | | | Acid Extractable Uranium (U) | 2014/05/30 | | 100 | % | 80 - 120 |
| | | | Acid Extractable Vanadium (V) | 2014/05/30 | | 98 | % | 80 - 120 |
| | | | Acid Extractable Zinc (Zn) | 2014/05/30 | | 101 | % | 80 - 120 |
| | | Method Blank | Acid Extractable Antimony (Sb) | 2014/05/30 | <0.20 | | ug/g | |
| | | | Acid Extractable Arsenic (As) | 2014/05/30 | <1.0 | | ug/g | |
| | | | Acid Extractable Barium (Ba) | 2014/05/30 | <0.50 | | ug/g | |
| | | | Acid Extractable Beryllium (Be) | 2014/05/30 | <0.20 | | ug/g | |
| | | | Acid Extractable Boron (B) | 2014/05/30 | <5.0 | | ug/g | |
| | | | Acid Extractable Cadmium (Cd) | 2014/05/30 | <0.10 | | ug/g | |
| | | | Acid Extractable Chromium (Cr) | 2014/05/30 | <1.0 | | ug/g | |

Maxxam Analytics – Partial/Rush Results



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MTE Consultants Inc
Attention: Jennifer Kato
Client Project #: 38750-600
P.O. #:
Site Location:

## Quality Assurance Report (Continued)

Maxxam Job Number: WB487624

| QA/QC Batch Num | Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|---|
| 3623436 | VIV | Method Blank | Acid Extractable Cobalt (Co) | 2014/05/30 | <0.10 | | ug/g | |
| | | | Acid Extractable Copper (Cu) | 2014/05/30 | <0.50 | | ug/g | |
| | | | Acid Extractable Lead (Pb) | 2014/05/30 | <1.0 | | ug/g | |
| | | | Acid Extractable Molybdenum (Mo) | 2014/05/30 | <0.50 | | ug/g | |
| | | | Acid Extractable Nickel (Ni) | 2014/05/30 | <0.50 | | ug/g | |
| | | | Acid Extractable Selenium (Se) | 2014/05/30 | <0.50 | | ug/g | |
| | | | Acid Extractable Silver (Ag) | 2014/05/30 | <0.20 | | ug/g | |
| | | | Acid Extractable Thallium (Tl) | 2014/05/30 | <0.050 | | ug/g | |
| | | | Acid Extractable Uranium (U) | 2014/05/30 | <0.050 | | ug/g | |
| | | | Acid Extractable Vanadium (V) | 2014/05/30 | <5.0 | | ug/g | |
| | | | Acid Extractable Zinc (Zn) | 2014/05/30 | <5.0 | | ug/g | |
| | | RPD | Acid Extractable Antimony (Sb) | 2014/05/30 | NC | | % | 30 |
| | | | Acid Extractable Arsenic (As) | 2014/05/30 | NC | | % | 30 |
| | | | Acid Extractable Barium (Ba) | 2014/05/30 | 1.7 | | % | 30 |
| | | | Acid Extractable Beryllium (Be) | 2014/05/30 | NC | | % | 30 |
| | | | Acid Extractable Boron (B) | 2014/05/30 | NC | | % | 30 |
| | | | Acid Extractable Cadmium (Cd) | 2014/05/30 | NC | | % | 30 |
| | | | Acid Extractable Chromium (Cr) | 2014/05/30 | 1.3 | | % | 30 |
| | | | Acid Extractable Cobalt (Co) | 2014/05/30 | 0.6 | | % | 30 |
| | | | Acid Extractable Copper (Cu) | 2014/05/30 | 0.3 | | % | 30 |
| | | | Acid Extractable Lead (Pb) | 2014/05/30 | 2.0 | | % | 30 |
| | | | Acid Extractable Molybdenum (Mo) | 2014/05/30 | NC | | % | 30 |
| | | | Acid Extractable Nickel (Ni) | 2014/05/30 | 5.4 | | % | 30 |
| | | | Acid Extractable Selenium (Se) | 2014/05/30 | NC | | % | 30 |
| | | | Acid Extractable Silver (Ag) | 2014/05/30 | NC | | % | 30 |
| | | | Acid Extractable Thallium (Tl) | 2014/05/30 | NC | | % | 30 |
| | | | Acid Extractable Uranium (U) | 2014/05/30 | 1.1 | | % | 30 |
| | | | Acid Extractable Vanadium (V) | 2014/05/30 | NC | | % | 30 |
| | | | Acid Extractable Zinc (Zn) | 2014/05/30 | 7.9 | | % | 30 |
| 3623578 | VIV | Matrix Spike | Acid Extractable Antimony (Sb) | 2014/05/30 | | 95 | % | 75 - 125 |
| | | | Acid Extractable Arsenic (As) | 2014/05/30 | | 99 | % | 75 - 125 |
| | | | Acid Extractable Barium (Ba) | 2014/05/30 | | NC | % | 75 - 125 |
| | | | Acid Extractable Beryllium (Be) | 2014/05/30 | | 103 | % | 75 - 125 |
| | | | Acid Extractable Boron (B) | 2014/05/30 | | 96 | % | 75 - 125 |
| | | | Acid Extractable Cadmium (Cd) | 2014/05/30 | | 101 | % | 75 - 125 |
| | | | Acid Extractable Chromium (Cr) | 2014/05/30 | | 102 | % | 75 - 125 |
| | | | Acid Extractable Cobalt (Co) | 2014/05/30 | | 101 | % | 75 - 125 |
| | | | Acid Extractable Copper (Cu) | 2014/05/30 | | NC | % | 75 - 125 |
| | | | Acid Extractable Lead (Pb) | 2014/05/30 | | 100 | % | 75 - 125 |
| | | | Acid Extractable Molybdenum (Mo) | 2014/05/30 | | 101 | % | 75 - 125 |
| | | | Acid Extractable Nickel (Ni) | 2014/05/30 | | 100 | % | 75 - 125 |
| | | | Acid Extractable Selenium (Se) | 2014/05/30 | | 102 | % | 75 - 125 |
| | | | Acid Extractable Silver (Ag) | 2014/05/30 | | 102 | % | 75 - 125 |
| | | | Acid Extractable Thallium (Tl) | 2014/05/30 | | 94 | % | 75 - 125 |
| | | | Acid Extractable Uranium (U) | 2014/05/30 | | 98 | % | 75 - 125 |
| | | | Acid Extractable Vanadium (V) | 2014/05/30 | | 101 | % | 75 - 125 |
| | | | Acid Extractable Zinc (Zn) | 2014/05/30 | | NC | % | 75 - 125 |
| | | Spiked Blank | Acid Extractable Antimony (Sb) | 2014/05/30 | | 100 | % | 80 - 120 |
| | | | Acid Extractable Arsenic (As) | 2014/05/30 | | 100 | % | 80 - 120 |
| | | | Acid Extractable Barium (Ba) | 2014/05/30 | | 96 | % | 80 - 120 |
| | | | Acid Extractable Beryllium (Be) | 2014/05/30 | | 101 | % | 80 - 120 |
| | | | Acid Extractable Boron (B) | 2014/05/30 | | 96 | % | 80 - 120 |
| | | | Acid Extractable Cadmium (Cd) | 2014/05/30 | | 101 | % | 80 - 120 |
| | | | Acid Extractable Chromium (Cr) | 2014/05/30 | | 104 | % | 80 - 120 |
| | | | Acid Extractable Cobalt (Co) | 2014/05/30 | | 103 | % | 80 - 120 |

Maxxam Analytics – Partial/Rush Results



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MTE Consultants Inc
Attention: Jennifer Kato
Client Project #: 38750-600
P.O. #:
Site Location:

Maxxam Analytics – Partial/Rush Results

## Quality Assurance Report (Continued)

Maxxam Job Number: WB487624

| QA/QC Batch Num | Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|---|
| 3623578 | VIV | Spiked Blank | Acid Extractable Copper (Cu) | 2014/05/30 | | 102 | % | 80 - 120 |
| | | | Acid Extractable Lead (Pb) | 2014/05/30 | | 103 | % | 80 - 120 |
| | | | Acid Extractable Molybdenum (Mo) | 2014/05/30 | | 103 | % | 80 - 120 |
| | | | Acid Extractable Nickel (Ni) | 2014/05/30 | | 104 | % | 80 - 120 |
| | | | Acid Extractable Selenium (Se) | 2014/05/30 | | 102 | % | 80 - 120 |
| | | | Acid Extractable Silver (Ag) | 2014/05/30 | | 102 | % | 80 - 120 |
| | | | Acid Extractable Thallium (Tl) | 2014/05/30 | | 97 | % | 80 - 120 |
| | | | Acid Extractable Uranium (U) | 2014/05/30 | | 101 | % | 80 - 120 |
| | | | Acid Extractable Vanadium (V) | 2014/05/30 | | 101 | % | 80 - 120 |
| | | | Acid Extractable Zinc (Zn) | 2014/05/30 | | 104 | % | 80 - 120 |
| | | Method Blank | Acid Extractable Antimony (Sb) | 2014/05/30 | <0.20 | | ug/g | |
| | | | Acid Extractable Arsenic (As) | 2014/05/30 | <1.0 | | ug/g | |
| | | | Acid Extractable Barium (Ba) | 2014/05/30 | <0.50 | | ug/g | |
| | | | Acid Extractable Beryllium (Be) | 2014/05/30 | <0.20 | | ug/g | |
| | | | Acid Extractable Boron (B) | 2014/05/30 | <5.0 | | ug/g | |
| | | | Acid Extractable Cadmium (Cd) | 2014/05/30 | <0.10 | | ug/g | |
| | | | Acid Extractable Chromium (Cr) | 2014/05/30 | <1.0 | | ug/g | |
| | | | Acid Extractable Cobalt (Co) | 2014/05/30 | <0.10 | | ug/g | |
| | | | Acid Extractable Copper (Cu) | 2014/05/30 | <0.50 | | ug/g | |
| | | | Acid Extractable Lead (Pb) | 2014/05/30 | <1.0 | | ug/g | |
| | | | Acid Extractable Molybdenum (Mo) | 2014/05/30 | <0.50 | | ug/g | |
| | | | Acid Extractable Nickel (Ni) | 2014/05/30 | <0.50 | | ug/g | |
| | | | Acid Extractable Selenium (Se) | 2014/05/30 | <0.50 | | ug/g | |
| | | | Acid Extractable Silver (Ag) | 2014/05/30 | <0.20 | | ug/g | |
| | | | Acid Extractable Thallium (Tl) | 2014/05/30 | <0.050 | | ug/g | |
| | | | Acid Extractable Uranium (U) | 2014/05/30 | <0.050 | | ug/g | |
| | | | Acid Extractable Vanadium (V) | 2014/05/30 | <5.0 | | ug/g | |
| | | | Acid Extractable Zinc (Zn) | 2014/05/30 | <5.0 | | ug/g | |
| | | RPD | Acid Extractable Antimony (Sb) | 2014/05/30 | NC | | % | 30 |
| | | | Acid Extractable Arsenic (As) | 2014/05/30 | 0.3 | | % | 30 |
| | | | Acid Extractable Barium (Ba) | 2014/05/30 | 1.4 | | % | 30 |
| | | | Acid Extractable Beryllium (Be) | 2014/05/30 | NC | | % | 30 |
| | | | Acid Extractable Boron (B) | 2014/05/30 | NC | | % | 30 |
| | | | Acid Extractable Cadmium (Cd) | 2014/05/30 | NC | | % | 30 |
| | | | Acid Extractable Chromium (Cr) | 2014/05/30 | 0.8 | | % | 30 |
| | | | Acid Extractable Cobalt (Co) | 2014/05/30 | 1.9 | | % | 30 |
| | | | Acid Extractable Copper (Cu) | 2014/05/30 | 0.6 | | % | 30 |
| | | | Acid Extractable Lead (Pb) | 2014/05/30 | 3.4 | | % | 30 |
| | | | Acid Extractable Molybdenum (Mo) | 2014/05/30 | NC | | % | 30 |
| | | | Acid Extractable Nickel (Ni) | 2014/05/30 | 0.4 | | % | 30 |
| | | | Acid Extractable Selenium (Se) | 2014/05/30 | NC | | % | 30 |
| | | | Acid Extractable Silver (Ag) | 2014/05/30 | NC | | % | 30 |
| | | | Acid Extractable Thallium (Tl) | 2014/05/30 | NC | | % | 30 |
| | | | Acid Extractable Uranium (U) | 2014/05/30 | 5.1 | | % | 30 |
| | | | Acid Extractable Vanadium (V) | 2014/05/30 | NC | | % | 30 |
| | | | Acid Extractable Zinc (Zn) | 2014/05/30 | 3.8 | | % | 30 |
| 3624354 | ZZ | Matrix Spike [WA9877-01] | o-Terphenyl | 2014/06/02 | | 91 | % | 50 - 130 |
| | | | F2 (C10-C16 Hydrocarbons) | 2014/06/02 | | 101 | % | 50 - 130 |
| | | | F3 (C16-C34 Hydrocarbons) | 2014/06/02 | | 105 | % | 50 - 130 |
| | | | F4 (C34-C50 Hydrocarbons) | 2014/06/02 | | 104 | % | 50 - 130 |
| | | Spiked Blank | o-Terphenyl | 2014/06/02 | | 92 | % | 50 - 130 |
| | | | F2 (C10-C16 Hydrocarbons) | 2014/06/02 | | 100 | % | 80 - 120 |
| | | | F3 (C16-C34 Hydrocarbons) | 2014/06/02 | | 104 | % | 80 - 120 |
| | | | F4 (C34-C50 Hydrocarbons) | 2014/06/02 | | 103 | % | 80 - 120 |

MTE Consultants Inc
Attention: Jennifer Kato
Client Project #: 38750-600
P.O. #:
Site Location:

## Quality Assurance Report (Continued)

Maxxam Job Number: WB487624

| QA/QC Batch Num | Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|---|
| 3624354 | ZZ | Method Blank | o-Terphenyl | 2014/06/02 | | 93 | % | 50 - 130 |
| | | | F2 (C10-C16 Hydrocarbons) | 2014/06/02 | <10 | | ug/g | |
| | | | F3 (C16-C34 Hydrocarbons) | 2014/06/02 | <50 | | ug/g | |
| | | | F4 (C34-C50 Hydrocarbons) | 2014/06/02 | <50 | | ug/g | |
| | | RPD [WA9877-01] | F2 (C10-C16 Hydrocarbons) | 2014/06/02 | NC | | % | 30 |
| | | | F3 (C16-C34 Hydrocarbons) | 2014/06/02 | NC | | % | 30 |
| | | | F4 (C34-C50 Hydrocarbons) | 2014/06/02 | NC | | % | 30 |

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).
NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).
( 1 ) The recovery for the flagged target analyte was below the control limit as stipulated by Ontario Regulation 153, however, this recovery is still within Maxxam's performance based limits. Results reported for this specific analyte with spike recoveries within this range are still valid but may have an associated low bias.
( 2 ) The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

Maxxam Analytics - Partial/Rush Results

# Validation Signature Page

**Maxxam Job #: B487624**

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Cristina Carriere, Scientific Services

Suzana Popovic, Supervisor, Hydrocarbons

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics - Partial/Rush Results



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Success Through Science®

Your Project #: 38750-600
Your C.O.C. #: 39054

**Attention:Jennifer Kato**

MTE Consultants Inc
520 Bingemans Centre Dr
Kitchener, ON
N2B 3X9

**Report Date: 2014/06/16**
Report #: R3060414
Version: 2R

# CERTIFICATE OF ANALYSIS – REVISED REPORT

**MAXXAM JOB #: B491742**
**Received: 2014/06/02, 09:47**

Sample Matrix: Soil
# Samples Received: 1

| Analyses | Quantity | Date Extracted | Date Analyzed | Laboratory Method | Reference |
|---|---|---|---|---|---|
| Strong Acid Leachable Metals by ICPMS | 1 | 2014/06/09 | 2014/06/09 | CAM SOP-00447 | EPA 6020 |

**Remarks:**

Maxxam Analytics has performed all analytical testing herein in accordance with ISO 17025 and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. All methodologies comply with this document and are validated for use in the laboratory. The methods and techniques employed in this analysis conform to the performance criteria (detection limits, accuracy and precision) as outlined in the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. Reporting results to two significant figures at the RDL is to permit statistical evaluation and is not intended to be an indication of analytical precision.

The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following the 'Alberta Environment Draft Addenda to the CWS-PHC, Appendix 6, Validation of Alternate Methods'. Documentation is available upon request. Maxxam has made the following improvements to the CWS-PHC reference benchmark method: (i) Headspace for F1; and, (ii) Mechanical extraction for F2-F4. Note: F4G cannot be added to the C6 to C50 hydrocarbons. The extraction date for samples field preserved with methanol for F1 and Volatile Organic Compounds is considered to be the date sampled.

Maxxam Analytics is accredited for all specific parameters as required by Ontario Regulation 153/04. Maxxam Analytics is limited in liability to the actual cost of analysis unless otherwise agreed in writing. There is no other warranty expressed or implied. Samples will be retained at Maxxam Analytics for three weeks from receipt of data or as per contract.

* RPDs calculated using r of final results may result in the apparent difference.

Encryption Key

Keshani Vijh
16 Jun 2014 18:48:22 -04:00

Please direct all questior ate of Analysis to your Project Manager.
Keshani Vijh, Project Manager
Email: KVijh@maxxam.ca
Phone# (905) 817-5700

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



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Maxxam Job #: B491742
Report Date: 2014/06/16

MTE Consultants Inc
Client Project #: 38750-600
Sampler Initials: JK

## O.REG 153 ICPMS METALS (SOIL)

| Maxxam ID | | | WD2291 | | |
|---|---|---|---|---|---|
| Sampling Date | | | 2014/05/30 | | |
| COC Number | | | 39054 | | |
| | **Units** | **Criteria** | **MW3-14 1-2'** | **RDL** | **QC Batch** |
| **Metals** | | | | | |
| Acid Extractable Antimony (Sb) | ug/g | **1.3** | <0.20 | 0.20 | 3633875 |
| Acid Extractable Arsenic (As) | ug/g | **18** | 2.1 | 1.0 | 3633875 |
| Acid Extractable Barium (Ba) | ug/g | **220** | 20 | 0.50 | 3633875 |
| Acid Extractable Beryllium (Be) | ug/g | **2.5** | 0.21 | 0.20 | 3633875 |
| Acid Extractable Boron (B) | ug/g | **36** | <5.0 | 5.0 | 3633875 |
| Acid Extractable Cadmium (Cd) | ug/g | **1.2** | 0.10 | 0.10 | 3633875 |
| Acid Extractable Chromium (Cr) | ug/g | **70** | 9.0 | 1.0 | 3633875 |
| Acid Extractable Cobalt (Co) | ug/g | **21** | 2.0 | 0.10 | 3633875 |
| Acid Extractable Copper (Cu) | ug/g | **92** | 4.0 | 0.50 | 3633875 |
| Acid Extractable Lead (Pb) | ug/g | **120** | 11 | 1.0 | 3633875 |
| Acid Extractable Molybdenum (Mo) | ug/g | **2** | <0.50 | 0.50 | 3633875 |
| Acid Extractable Nickel (Ni) | ug/g | **82** | 3.9 | 0.50 | 3633875 |
| Acid Extractable Selenium (Se) | ug/g | **1.5** | <0.50 | 0.50 | 3633875 |
| Acid Extractable Silver (Ag) | ug/g | **0.5** | <0.20 | 0.20 | 3633875 |
| Acid Extractable Thallium (Tl) | ug/g | **1** | <0.050 | 0.050 | 3633875 |
| Acid Extractable Uranium (U) | ug/g | **2.5** | 0.39 | 0.050 | 3633875 |
| Acid Extractable Vanadium (V) | ug/g | **86** | 25 | 5.0 | 3633875 |
| Acid Extractable Zinc (Zn) | ug/g | **290** | 30 | 5.0 | 3633875 |

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
Table 1: Full Depth Background Site Condition Standards
Soil - Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use



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Maxxam Job #: B491742
Report Date: 2014/06/16

MTE Consultants Inc
Client Project #: 38750-600
Sampler Initials: JK

## TEST SUMMARY

**Maxxam ID:** WD2291
**Sample ID:** MW3-14 1-2'
**Matrix:** Soil

**Collected:** 2014/05/30
**Shipped:**
**Received:** 2014/06/02

| Test Description | Instrumentation | Batch | Extracted | Date Analyzed | Analyst |
|---|---|---|---|---|---|
| Strong Acid Leachable Metals by ICPMS | ICP/MS | 3633875 | 2014/06/09 | 2014/06/09 | Viviana Canzonieri |



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Maxxam Job #: B491742
Report Date: 2014/06/16

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Sampler Initials: JK

## GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

| | |
|---|---|
| Package 1 | 6.3°C |

Revised Report (2014/06/16): Requested regulatory criteria have been included on this report.

**Results relate only to the items tested.**



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Maxxam Job #: B491742
Report Date: 2014/06/16

MTE Consultants Inc
Client Project #: 38750-600
Sampler Initials: JK

## QUALITY ASSURANCE REPORT

| QA/QC Batch | Init | QC Type | Parameter | Date Analyzed | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|---|
| 3633875 | VIV | Matrix Spike | Acid Extractable Antimony (Sb) | 2014/06/09 | | 103 | % | 75 - 125 |
| | | | Acid Extractable Arsenic (As) | 2014/06/09 | | 99 | % | 75 - 125 |
| | | | Acid Extractable Barium (Ba) | 2014/06/09 | | NC (1) | % | 75 - 125 |
| | | | Acid Extractable Beryllium (Be) | 2014/06/09 | | 99 | % | 75 - 125 |
| | | | Acid Extractable Boron (B) | 2014/06/09 | | 95 | % | 75 - 125 |
| | | | Acid Extractable Cadmium (Cd) | 2014/06/09 | | 105 | % | 75 - 125 |
| | | | Acid Extractable Chromium (Cr) | 2014/06/09 | | NC (1) | % | 75 - 125 |
| | | | Acid Extractable Cobalt (Co) | 2014/06/09 | | 102 | % | 75 - 125 |
| | | | Acid Extractable Copper (Cu) | 2014/06/09 | | NC (1) | % | 75 - 125 |
| | | | Acid Extractable Lead (Pb) | 2014/06/09 | | 106 | % | 75 - 125 |
| | | | Acid Extractable Molybdenum (Mo) | 2014/06/09 | | 108 | % | 75 - 125 |
| | | | Acid Extractable Nickel (Ni) | 2014/06/09 | | NC (1) | % | 75 - 125 |
| | | | Acid Extractable Selenium (Se) | 2014/06/09 | | 102 | % | 75 - 125 |
| | | | Acid Extractable Silver (Ag) | 2014/06/09 | | 104 | % | 75 - 125 |
| | | | Acid Extractable Thallium (Tl) | 2014/06/09 | | 95 | % | 75 - 125 |
| | | | Acid Extractable Uranium (U) | 2014/06/09 | | 99 | % | 75 - 125 |
| | | | Acid Extractable Vanadium (V) | 2014/06/09 | | NC (1) | % | 75 - 125 |
| | | | Acid Extractable Zinc (Zn) | 2014/06/09 | | NC (1) | % | 75 - 125 |
| 3633875 | VIV | Spiked Blank | Acid Extractable Antimony (Sb) | 2014/06/09 | | 106 | % | 80 - 120 |
| | | | Acid Extractable Arsenic (As) | 2014/06/09 | | 103 | % | 80 - 120 |
| | | | Acid Extractable Barium (Ba) | 2014/06/09 | | 100 | % | 80 - 120 |
| | | | Acid Extractable Beryllium (Be) | 2014/06/09 | | 101 | % | 80 - 120 |
| | | | Acid Extractable Boron (B) | 2014/06/09 | | 96 | % | 80 - 120 |
| | | | Acid Extractable Cadmium (Cd) | 2014/06/09 | | 103 | % | 80 - 120 |
| | | | Acid Extractable Chromium (Cr) | 2014/06/09 | | 106 | % | 80 - 120 |
| | | | Acid Extractable Cobalt (Co) | 2014/06/09 | | 107 | % | 80 - 120 |
| | | | Acid Extractable Copper (Cu) | 2014/06/09 | | 105 | % | 80 - 120 |
| | | | Acid Extractable Lead (Pb) | 2014/06/09 | | 104 | % | 80 - 120 |
| | | | Acid Extractable Molybdenum (Mo) | 2014/06/09 | | 104 | % | 80 - 120 |
| | | | Acid Extractable Nickel (Ni) | 2014/06/09 | | 105 | % | 80 - 120 |
| | | | Acid Extractable Selenium (Se) | 2014/06/09 | | 107 | % | 80 - 120 |
| | | | Acid Extractable Silver (Ag) | 2014/06/09 | | 105 | % | 80 - 120 |
| | | | Acid Extractable Thallium (Tl) | 2014/06/09 | | 100 | % | 80 - 120 |
| | | | Acid Extractable Uranium (U) | 2014/06/09 | | 101 | % | 80 - 120 |
| | | | Acid Extractable Vanadium (V) | 2014/06/09 | | 104 | % | 80 - 120 |
| | | | Acid Extractable Zinc (Zn) | 2014/06/09 | | 103 | % | 80 - 120 |
| 3633875 | VIV | Method Blank | Acid Extractable Antimony (Sb) | 2014/06/09 | <0.20 | | ug/g | |
| | | | Acid Extractable Arsenic (As) | 2014/06/09 | <1.0 | | ug/g | |
| | | | Acid Extractable Barium (Ba) | 2014/06/09 | <0.50 | | ug/g | |
| | | | Acid Extractable Beryllium (Be) | 2014/06/09 | <0.20 | | ug/g | |
| | | | Acid Extractable Boron (B) | 2014/06/09 | <5.0 | | ug/g | |
| | | | Acid Extractable Cadmium (Cd) | 2014/06/09 | <0.10 | | ug/g | |
| | | | Acid Extractable Chromium (Cr) | 2014/06/09 | <1.0 | | ug/g | |
| | | | Acid Extractable Cobalt (Co) | 2014/06/09 | <0.10 | | ug/g | |
| | | | Acid Extractable Copper (Cu) | 2014/06/09 | <0.50 | | ug/g | |
| | | | Acid Extractable Lead (Pb) | 2014/06/09 | <1.0 | | ug/g | |
| | | | Acid Extractable Molybdenum (Mo) | 2014/06/09 | <0.50 | | ug/g | |
| | | | Acid Extractable Nickel (Ni) | 2014/06/09 | <0.50 | | ug/g | |
| | | | Acid Extractable Selenium (Se) | 2014/06/09 | <0.50 | | ug/g | |
| | | | Acid Extractable Silver (Ag) | 2014/06/09 | <0.20 | | ug/g | |
| | | | Acid Extractable Thallium (Tl) | 2014/06/09 | <0.050 | | ug/g | |
| | | | Acid Extractable Uranium (U) | 2014/06/09 | <0.050 | | ug/g | |
| | | | Acid Extractable Vanadium (V) | 2014/06/09 | <5.0 | | ug/g | |



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Maxxam Job #: B491742
Report Date: 2014/06/16

MTE Consultants Inc
Client Project #: 38750-600
Sampler Initials: JK

## QUALITY ASSURANCE REPORT(CONT'D)

| QA/QC Batch | Init | QC Type | Parameter | Date Analyzed | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|---|
| | | | Acid Extractable Zinc (Zn) | 2014/06/09 | <5.0 | | ug/g | |

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

(1) The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).



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Maxxam Job #: B491742
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MTE Consultants Inc
Client Project #: 38750-600
Sampler Initials: JK

## VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Cristina Carriere

Cristina Carriere, Scientific Services

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



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# CHAIN OF CUSTODY RECORD

39054

Page 1 of 1

| INVOICE INFORMATION | REPORT INFORMATION (if differs from invoice) | PROJECT INFORMATION | TURNAROUND TIME (TAT) REQUIRED |
|---|---|---|---|
| Company Name: MTE CONSULTANTS INC. | Company Name: | Quotation #: | [X] Regular TAT (5-7 days) |
| Contact Name: JENNIFER KATO | Contact Name: | P.O. #: | PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS |
| Address: 520 BINGEMANS CENTRE KITCHENER, ON | Address: | Project #: | Rush TAT (Applicable Surcharge) |
| Phone: (519) 743-6500 Fax: (519) 743-6503 | Phone: Fax: | Site Location: | [ ] 1 Day (100%) |
| Email: jkato@mtecon.com | Email: | Site #: | [ ] 2 Days (50%) |
| | | Sampled By: | [ ] 3-4 Days (25%) |

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

**REGULATION 153 (2011)**

[ ] Table 1 [X] Res/Park [ ] Med/Fine
[X] Table 2 [ ] Ind/Comm [X] Coarse
[ ] Table 3 [ ] Agri/Other
[ ] Table ___

FOR RSC (PLEASE CIRCLE) YES / NO

**OTHER REGULATIONS**

[ ] CCME [ ] Sanitary Sewer Bylaw
[ ] MISA [ ] Storm Sewer Bylaw
[ ] PWQO Municipality:
[ ] Other (Specify):

[ ] REG 558 (MINIMUM 3 DAY TAT REQUIRED)

Include Criteria on Certificate of Analysis (Y/N)? ____

SAMPLES MUST BE KEPT COOL ( < 10 °C ) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

FIELD FILTERED (PLEASE CIRCLE) Metals / Hg / CrVI

ANALYSIS REQUESTED

Rush Confirmation #:

Date Required:

LABORATORY USE ONLY

| CUSTODY SEAL (Y/N) | | Temperature (°C) on Receipt |
|---|---|---|
| Present | Y | 7/6/6 °C |
| Intact | Y | 9/17/17 °C |
| COOLING MEDIA PRESENT (Y / N) | Y | |

| | SAMPLE IDENTIFICATION | DATE SAMPLED | TIME SAMPLED | MATRIX | # OF CONT. | COMMENTS / TAT COMMENTS |
|---|---|---|---|---|---|---|
| 1 | BHB-14 0-1' | 14/05/30 | | S | 1 | HOLD |
| 2 | BHB-14 1-2' | | | | 1 | HOLD |
| 3 | BHB-14 3-4' | | | | 3 | HOLD |
| 4 | MW3-14 0-1' | | | | 1 | HOLD |
| 5 | MW3-14 1-2' | | | | 1 | HOLD |
| 6 | MW3-14 3.5-4.5 | | | | 3 | HOLD |
| 7 | | | | | | |
| 8 | | | | | | |
| 9 | | | | | | |
| 10 | | | | | | |

2-Jun-14 09:47
Keshani Vijh
B491742
JGN
WAT-001

| RELINQUISHED BY: (Signature/Print) | DATE: (YYYY/MM/DD) | TIME: | RECEIVED BY: (Signature/Print) | DATE: (YYYY/MM/DD) | TIME: | # JARS USED AND NOT SUBMITTED | MAXXAM JOB # |
|---|---|---|---|---|---|---|---|
| JENNIFER KATO | 2014/05/30 | 6:40 | JOCELYN GUENTHER | 2014/06/02 | 9:47 | | |
| | | | Travis Persaud | 2014/06/02 | 17:11 | | |

COC-1004 (11/13) - ENV. ENG.

Maxxam Analytics International Corporation o/a Maxxam Analytics

White: Maxxam ~ Yellow: Client

Maxxam Job #: B491742
Report Date: 2014/06/16

MTE Consultants Inc
Client Project #: 38750-600
Sampler Initials: JK

## Exceedence Summary Table – Reg153/04 Table1-Soil/Res

### Result Exceedences

| Sample ID | Maxxam ID | Parameter | Criteria | Result | DL | Units |
|---|---|---|---|---|---|---|
| No Exceedences | | | | | | |

The exceedence summary table is for information purposes only and should not be considered a comprehensive listing or statement of conformance to applicable regulatory guidelines.


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Maxxam

Success Through Science®

Your Project #: 38750-600
Your C.O.C. #: 47176101, 471761-01-01

**Attention:Jennifer Kato**

MTE Consultants Inc
520 Bingemans Centre Dr
Kitchener, ON
N2B 3X9

**Report Date: 2014/06/16**
Report #: R3060408
Version: 2R

# CERTIFICATE OF ANALYSIS – REVISED REPORT

**MAXXAM JOB #: B490716**
**Received: 2014/05/30, 13:43**

Sample Matrix: Water
# Samples Received: 3

| Analyses | Quantity | Date Extracted | Date Analyzed | Laboratory Method | Reference |
|---|---|---|---|---|---|
| Petroleum Hydro. CCME F1 & BTEX in Water | 3 | N/A | 2014/06/03 | CAM SOP-00315 | CCME CWS |
| Petroleum Hydrocarbons F2-F4 in Water | 3 | 2014/06/04 | 2014/06/05 | CAM SOP-00316 | CCME Hydrocarbons |
| Dissolved Metals by ICPMS | 2 | N/A | 2014/06/02 | CAM SOP-00447 | EPA 6020 |
| pH | 1 | N/A | 2014/06/02 | CAM SOP-00413 | SM 4500H+ B |

**Remarks:**

Maxxam Analytics has performed all analytical testing herein in accordance with ISO 17025 and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. All methodologies comply with this document and are validated for use in the laboratory. The methods and techniques employed in this analysis conform to the performance criteria (detection limits, accuracy and precision) as outlined in the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. Reporting results to two significant figures at the RDL is to permit statistical evaluation and is not intended to be an indication of analytical precision.

The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following the 'Alberta Environment Draft Addenda to the CWS-PHC, Appendix 6, Validation of Alternate Methods'. Documentation is available upon request. Maxxam has made the following improvements to the CWS-PHC reference benchmark method: (i) Headspace for F1; and, (ii) Mechanical extraction for F2-F4. Note: F4G cannot be added to the C6 to C50 hydrocarbons. The extraction date for samples field preserved with methanol for F1 and Volatile Organic Compounds is considered to be the date sampled.

Maxxam Analytics is accredited for all specific parameters as required by Ontario Regulation 153/04. Maxxam Analytics is limited in liability to the actual cost of analysis unless otherwise agreed in writing. There is no other warranty expressed or implied. Samples will be retained at Maxxam Analytics for three weeks from receipt of data or as per contract.

* RPDs calculated using r of final results may result in the apparent difference.

Encryption Key

Keshani Vijh
16 Jun 2014 18:36:14 -04:00

Please direct all questior ate of Analysis to your Project Manager.
Keshani Vijh, Project Manager
Email: KVijh@maxxam.ca
Phone# (905) 817-5700

==========

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Maxxam Job #: B490716
Report Date: 2014/06/16

MTE Consultants Inc
Client Project #: 38750-600
Sampler Initials: JK

## RESULTS OF ANALYSES OF WATER

| Maxxam ID | | WC4479 | |
|---|---|---|---|
| Sampling Date | | 2014/05/29 09:40 | |
| COC Number | | 471761-01-01 | |
| | **Units** | **MW4A-14** | **QC Batch** |
| **Inorganics** | | | |
| pH | pH | 7.86 | 3625391 |
| QC Batch = Quality Control Batch | | | |



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Maxxam Job #: B490716
Report Date: 2014/06/16

MTE Consultants Inc
Client Project #: 38750-600
Sampler Initials: JK

## O.REG 153 DISSOLVED ICPMS METALS (WATER)

| Maxxam ID | | | WC4480 | WC4480 | WC4481 | | |
|---|---|---|---|---|---|---|---|
| Sampling Date | | | 2014/05/29 10:30 | 2014/05/29 10:30 | 2014/05/29 12:10 | | |
| COC Number | | | 471761-01-01 | 471761-01-01 | 471761-01-01 | | |
| | **Units** | **Criteria** | **MW5-14** | **MW5-14 Lab-Dup** | **MW6-14** | **RDL** | **QC Batch** |
| **Metals** | | | | | | | |
| Dissolved Antimony (Sb) | ug/L | **1.5** | <0.50 | <0.50 | <0.50 | 0.50 | 3624986 |
| Dissolved Arsenic (As) | ug/L | **13** | <1.0 | <1.0 | <1.0 | 1.0 | 3624986 |
| Dissolved Barium (Ba) | ug/L | **610** | 20 | 20 | 74 | 2.0 | 3624986 |
| Dissolved Beryllium (Be) | ug/L | **0.5** | <0.50 | <0.50 | <0.50 | 0.50 | 3624986 |
| Dissolved Boron (B) | ug/L | **1700** | <10 | <10 | 50 | 10 | 3624986 |
| Dissolved Cadmium (Cd) | ug/L | **0.5** | <0.10 | <0.10 | <0.10 | 0.10 | 3624986 |
| Dissolved Chromium (Cr) | ug/L | **11** | <5.0 | <5.0 | <5.0 | 5.0 | 3624986 |
| Dissolved Cobalt (Co) | ug/L | **3.8** | <0.50 | <0.50 | 0.69 | 0.50 | 3624986 |
| Dissolved Copper (Cu) | ug/L | **5** | <1.0 | <1.0 | 1.3 | 1.0 | 3624986 |
| Dissolved Lead (Pb) | ug/L | **1.9** | <0.50 | <0.50 | <0.50 | 0.50 | 3624986 |
| Dissolved Molybdenum (Mo) | ug/L | **23** | <0.50 | <0.50 | <0.50 | 0.50 | 3624986 |
| Dissolved Nickel (Ni) | ug/L | **14** | <1.0 | <1.0 | 1.7 | 1.0 | 3624986 |
| Dissolved Selenium (Se) | ug/L | **5** | <2.0 | <2.0 | <2.0 | 2.0 | 3624986 |
| Dissolved Silver (Ag) | ug/L | **0.3** | <0.10 | <0.10 | <0.10 | 0.10 | 3624986 |
| Dissolved Thallium (Tl) | ug/L | **0.5** | <0.050 | <0.050 | <0.050 | 0.050 | 3624986 |
| Dissolved Uranium (U) | ug/L | **8.9** | 0.36 | 0.36 | 0.14 | 0.10 | 3624986 |
| Dissolved Vanadium (V) | ug/L | **3.9** | <0.50 | <0.50 | <0.50 | 0.50 | 3624986 |
| Dissolved Zinc (Zn) | ug/L | **160** | <5.0 | <5.0 | 5.2 | 5.0 | 3624986 |

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
Table 1: Full Depth Background Site Condition Standards
Ground Water - All Types of Property Uses



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Maxxam Job #: B490716
Report Date: 2014/06/16

MTE Consultants Inc
Client Project #: 38750-600
Sampler Initials: JK

## O.REG 153 PETROLEUM HYDROCARBONS (WATER)

| Maxxam ID | | | WC4479 | WC4480 | WC4481 | | |
|---|---|---|---|---|---|---|---|
| Sampling Date | | | 2014/05/29 09:40 | 2014/05/29 10:30 | 2014/05/29 12:10 | | |
| COC Number | | | 471761-01-01 | 471761-01-01 | 471761-01-01 | | |
| | **Units** | **Criteria** | **MW4A-14** | **MW5-14** | **MW6-14** | **RDL** | **QC Batch** |
| **BTEX & F1 Hydrocarbons** | | | | | | | |
| Benzene | ug/L | **0.5** | <0.20 | <0.20 | <0.20 | 0.20 | 3627159 |
| Toluene | ug/L | **0.8** | 0.44 | 0.39 | <0.20 | 0.20 | 3627159 |
| Ethylbenzene | ug/L | **0.5** | <0.20 | <0.20 | <0.20 | 0.20 | 3627159 |
| o-Xylene | ug/L | - | <0.20 | <0.20 | <0.20 | 0.20 | 3627159 |
| p+m-Xylene | ug/L | - | <0.40 | <0.40 | <0.40 | 0.40 | 3627159 |
| Total Xylenes | ug/L | **72** | <0.40 | <0.40 | <0.40 | 0.40 | 3627159 |
| F1 (C6-C10) | ug/L | **420** | <25 | <25 | <25 | 25 | 3627159 |
| F1 (C6-C10) - BTEX | ug/L | **420** | <25 | <25 | <25 | 25 | 3627159 |
| **F2-F4 Hydrocarbons** | | | | | | | |
| F2 (C10-C16 Hydrocarbons) | ug/L | **150** | <100 | <100 | <100 | 100 | 3629390 |
| F3 (C16-C34 Hydrocarbons) | ug/L | **500** | <200 | <200 | <200 | 200 | 3629390 |
| F4 (C34-C50 Hydrocarbons) | ug/L | **500** | <200 | <200 | <200 | 200 | 3629390 |
| Reached Baseline at C50 | ug/L | - | Yes | Yes | Yes | | 3629390 |
| **Surrogate Recovery (%)** | | | | | | | |
| 1,4-Difluorobenzene | % | - | 103 | 106 | 104 | | 3627159 |
| 4-Bromofluorobenzene | % | - | 105 | 105 | 105 | | 3627159 |
| D10-Ethylbenzene | % | - | 100 | 104 | 98 | | 3627159 |
| D4-1,2-Dichloroethane | % | - | 88 | 89 | 88 | | 3627159 |
| o-Terphenyl | % | - | 96 | 94 | 95 | | 3629390 |

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
Table 1: Full Depth Background Site Condition Standards
Ground Water - All Types of Property Uses



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Maxxam Job #: B490716
Report Date: 2014/06/16

MTE Consultants Inc
Client Project #: 38750-600
Sampler Initials: JK

## TEST SUMMARY

**Maxxam ID:** WC4479
**Sample ID:** MW4A-14
**Matrix:** Water

**Collected:** 2014/05/29
**Shipped:**
**Received:** 2014/05/30

| Test Description | Instrumentation | Batch | Extracted | Date Analyzed | Analyst |
|---|---|---|---|---|---|
| Petroleum Hydro. CCME F1 & BTEX in Water | HSGC/MSFD | 3627159 | N/A | 2014/06/03 | Yang Yu |
| Petroleum Hydrocarbons F2-F4 in Water | GC/FID | 3629390 | 2014/06/04 | 2014/06/05 | Zhiyue (Frank) Zhu |
| pH | PH | 3625391 | N/A | 2014/06/02 | Yogesh Patel |

**Maxxam ID:** WC4480
**Sample ID:** MW5-14
**Matrix:** Water

**Collected:** 2014/05/29
**Shipped:**
**Received:** 2014/05/30

| Test Description | Instrumentation | Batch | Extracted | Date Analyzed | Analyst |
|---|---|---|---|---|---|
| Petroleum Hydro. CCME F1 & BTEX in Water | HSGC/MSFD | 3627159 | N/A | 2014/06/03 | Yang Yu |
| Petroleum Hydrocarbons F2-F4 in Water | GC/FID | 3629390 | 2014/06/04 | 2014/06/05 | Zhiyue (Frank) Zhu |
| Dissolved Metals by ICPMS | ICP/MS | 3624986 | N/A | 2014/06/02 | Prempal Bhatti |

**Maxxam ID:** WC4480 Dup
**Sample ID:** MW5-14
**Matrix:** Water

**Collected:** 2014/05/29
**Shipped:**
**Received:** 2014/05/30

| Test Description | Instrumentation | Batch | Extracted | Date Analyzed | Analyst |
|---|---|---|---|---|---|
| Dissolved Metals by ICPMS | ICP/MS | 3624986 | N/A | 2014/06/02 | Prempal Bhatti |

**Maxxam ID:** WC4481
**Sample ID:** MW6-14
**Matrix:** Water

**Collected:** 2014/05/29
**Shipped:**
**Received:** 2014/05/30

| Test Description | Instrumentation | Batch | Extracted | Date Analyzed | Analyst |
|---|---|---|---|---|---|
| Petroleum Hydro. CCME F1 & BTEX in Water | HSGC/MSFD | 3627159 | N/A | 2014/06/03 | Yang Yu |
| Petroleum Hydrocarbons F2-F4 in Water | GC/FID | 3629390 | 2014/06/04 | 2014/06/05 | Zhiyue (Frank) Zhu |
| Dissolved Metals by ICPMS | ICP/MS | 3624986 | N/A | 2014/06/02 | Prempal Bhatti |



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Maxxam Job #: B490716
Report Date: 2014/06/16

MTE Consultants Inc
Client Project #: 38750-600
Sampler Initials: JK

## GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

| | |
|---|---|
| Package 1 | 1.0°C |

Revised Report (2014/06/16): Requested regulatory criteria have been included on this report.

**Results relate only to the items tested.**



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Maxxam Job #: B490716
Report Date: 2014/06/16

MTE Consultants Inc
Client Project #: 38750-600
Sampler Initials: JK

## QUALITY ASSURANCE REPORT

| QA/QC Batch | Init | QC Type | Parameter | Date Analyzed | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|---|
| 3624986 | PBA | Matrix Spike [WC4480-04] | Dissolved Antimony (Sb) | 2014/06/02 | | 106 | % | 80 - 120 |
| | | | Dissolved Arsenic (As) | 2014/06/02 | | 99 | % | 80 - 120 |
| | | | Dissolved Barium (Ba) | 2014/06/02 | | 100 | % | 80 - 120 |
| | | | Dissolved Beryllium (Be) | 2014/06/02 | | 103 | % | 80 - 120 |
| | | | Dissolved Boron (B) | 2014/06/02 | | 105 | % | 80 - 120 |
| | | | Dissolved Cadmium (Cd) | 2014/06/02 | | 105 | % | 80 - 120 |
| | | | Dissolved Chromium (Cr) | 2014/06/02 | | 103 | % | 80 - 120 |
| | | | Dissolved Cobalt (Co) | 2014/06/02 | | 101 | % | 80 - 120 |
| | | | Dissolved Copper (Cu) | 2014/06/02 | | 97 | % | 80 - 120 |
| | | | Dissolved Lead (Pb) | 2014/06/02 | | 100 | % | 80 - 120 |
| | | | Dissolved Molybdenum (Mo) | 2014/06/02 | | 104 | % | 80 - 120 |
| | | | Dissolved Nickel (Ni) | 2014/06/02 | | 99 | % | 80 - 120 |
| | | | Dissolved Selenium (Se) | 2014/06/02 | | 103 | % | 80 - 120 |
| | | | Dissolved Silver (Ag) | 2014/06/02 | | 98 | % | 80 - 120 |
| | | | Dissolved Thallium (Tl) | 2014/06/02 | | 102 | % | 80 - 120 |
| | | | Dissolved Uranium (U) | 2014/06/02 | | 99 | % | 80 - 120 |
| | | | Dissolved Vanadium (V) | 2014/06/02 | | 103 | % | 80 - 120 |
| | | | Dissolved Zinc (Zn) | 2014/06/02 | | 101 | % | 80 - 120 |
| 3624986 | PBA | Spiked Blank | Dissolved Antimony (Sb) | 2014/06/02 | | 103 | % | 80 - 120 |
| | | | Dissolved Arsenic (As) | 2014/06/02 | | 96 | % | 80 - 120 |
| | | | Dissolved Barium (Ba) | 2014/06/02 | | 99 | % | 80 - 120 |
| | | | Dissolved Beryllium (Be) | 2014/06/02 | | 99 | % | 80 - 120 |
| | | | Dissolved Boron (B) | 2014/06/02 | | 96 | % | 80 - 120 |
| | | | Dissolved Cadmium (Cd) | 2014/06/02 | | 102 | % | 80 - 120 |
| | | | Dissolved Chromium (Cr) | 2014/06/02 | | 101 | % | 80 - 120 |
| | | | Dissolved Cobalt (Co) | 2014/06/02 | | 101 | % | 80 - 120 |
| | | | Dissolved Copper (Cu) | 2014/06/02 | | 97 | % | 80 - 120 |
| | | | Dissolved Lead (Pb) | 2014/06/02 | | 101 | % | 80 - 120 |
| | | | Dissolved Molybdenum (Mo) | 2014/06/02 | | 101 | % | 80 - 120 |
| | | | Dissolved Nickel (Ni) | 2014/06/02 | | 99 | % | 80 - 120 |
| | | | Dissolved Selenium (Se) | 2014/06/02 | | 100 | % | 80 - 120 |
| | | | Dissolved Silver (Ag) | 2014/06/02 | | 95 | % | 80 - 120 |
| | | | Dissolved Thallium (Tl) | 2014/06/02 | | 101 | % | 80 - 120 |
| | | | Dissolved Uranium (U) | 2014/06/02 | | 99 | % | 80 - 120 |
| | | | Dissolved Vanadium (V) | 2014/06/02 | | 100 | % | 80 - 120 |
| | | | Dissolved Zinc (Zn) | 2014/06/02 | | 99 | % | 80 - 120 |
| 3624986 | PBA | Method Blank | Dissolved Antimony (Sb) | 2014/06/02 | <0.50 | | ug/L | |
| | | | Dissolved Arsenic (As) | 2014/06/02 | <1.0 | | ug/L | |
| | | | Dissolved Barium (Ba) | 2014/06/02 | <2.0 | | ug/L | |
| | | | Dissolved Beryllium (Be) | 2014/06/02 | <0.50 | | ug/L | |
| | | | Dissolved Boron (B) | 2014/06/02 | <10 | | ug/L | |
| | | | Dissolved Cadmium (Cd) | 2014/06/02 | <0.10 | | ug/L | |
| | | | Dissolved Chromium (Cr) | 2014/06/02 | <5.0 | | ug/L | |
| | | | Dissolved Cobalt (Co) | 2014/06/02 | <0.50 | | ug/L | |
| | | | Dissolved Copper (Cu) | 2014/06/02 | <1.0 | | ug/L | |
| | | | Dissolved Lead (Pb) | 2014/06/02 | <0.50 | | ug/L | |
| | | | Dissolved Molybdenum (Mo) | 2014/06/02 | <0.50 | | ug/L | |
| | | | Dissolved Nickel (Ni) | 2014/06/02 | <1.0 | | ug/L | |
| | | | Dissolved Selenium (Se) | 2014/06/02 | <2.0 | | ug/L | |
| | | | Dissolved Silver (Ag) | 2014/06/02 | <0.10 | | ug/L | |
| | | | Dissolved Thallium (Tl) | 2014/06/02 | <0.050 | | ug/L | |
| | | | Dissolved Uranium (U) | 2014/06/02 | <0.10 | | ug/L | |



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Maxxam Job #: B490716
Report Date: 2014/06/16

MTE Consultants Inc
Client Project #: 38750-600
Sampler Initials: JK

## QUALITY ASSURANCE REPORT(CONT'D)

| QA/QC Batch | Init | QC Type | Parameter | Date Analyzed | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|---|
| | | | Dissolved Vanadium (V) | 2014/06/02 | <0.50 | | ug/L | |
| | | | Dissolved Zinc (Zn) | 2014/06/02 | <5.0 | | ug/L | |
| 3624986 | PBA | RPD [WC4480-04] | Dissolved Antimony (Sb) | 2014/06/02 | NC | | % | 20 |
| | | | Dissolved Arsenic (As) | 2014/06/02 | NC | | % | 20 |
| | | | Dissolved Barium (Ba) | 2014/06/02 | 2.1 | | % | 20 |
| | | | Dissolved Beryllium (Be) | 2014/06/02 | NC | | % | 20 |
| | | | Dissolved Boron (B) | 2014/06/02 | NC | | % | 20 |
| | | | Dissolved Cadmium (Cd) | 2014/06/02 | NC | | % | 20 |
| | | | Dissolved Chromium (Cr) | 2014/06/02 | NC | | % | 20 |
| | | | Dissolved Cobalt (Co) | 2014/06/02 | NC | | % | 20 |
| | | | Dissolved Copper (Cu) | 2014/06/02 | NC | | % | 20 |
| | | | Dissolved Lead (Pb) | 2014/06/02 | NC | | % | 20 |
| | | | Dissolved Molybdenum (Mo) | 2014/06/02 | NC | | % | 20 |
| | | | Dissolved Nickel (Ni) | 2014/06/02 | NC | | % | 20 |
| | | | Dissolved Selenium (Se) | 2014/06/02 | NC | | % | 20 |
| | | | Dissolved Silver (Ag) | 2014/06/02 | NC | | % | 20 |
| | | | Dissolved Thallium (Tl) | 2014/06/02 | NC | | % | 20 |
| | | | Dissolved Uranium (U) | 2014/06/02 | NC | | % | 20 |
| | | | Dissolved Vanadium (V) | 2014/06/02 | NC | | % | 20 |
| | | | Dissolved Zinc (Zn) | 2014/06/02 | NC | | % | 20 |
| 3627159 | YY | Matrix Spike | 1,4-Difluorobenzene | 2014/06/03 | | 101 | % | 70 - 130 |
| | | | 4-Bromofluorobenzene | 2014/06/03 | | 100 | % | 70 - 130 |
| | | | D10-Ethylbenzene | 2014/06/03 | | 96 | % | 70 - 130 |
| | | | D4-1,2-Dichloroethane | 2014/06/03 | | 88 | % | 70 - 130 |
| | | | Benzene | 2014/06/03 | | 105 | % | 70 - 130 |
| | | | Toluene | 2014/06/03 | | 94 | % | 70 - 130 |
| | | | Ethylbenzene | 2014/06/03 | | 112 | % | 70 - 130 |
| | | | o-Xylene | 2014/06/03 | | 113 | % | 70 - 130 |
| | | | p+m-Xylene | 2014/06/03 | | 100 | % | 70 - 130 |
| | | | F1 (C6-C10) | 2014/06/03 | | 100 | % | 70 - 130 |
| 3627159 | YY | Spiked Blank | 1,4-Difluorobenzene | 2014/06/03 | | 101 | % | 70 - 130 |
| | | | 4-Bromofluorobenzene | 2014/06/03 | | 102 | % | 70 - 130 |
| | | | D10-Ethylbenzene | 2014/06/03 | | 92 | % | 70 - 130 |
| | | | D4-1,2-Dichloroethane | 2014/06/03 | | 93 | % | 70 - 130 |
| | | | Benzene | 2014/06/03 | | 103 | % | 70 - 130 |
| | | | Toluene | 2014/06/03 | | 93 | % | 70 - 130 |
| | | | Ethylbenzene | 2014/06/03 | | 110 | % | 70 - 130 |
| | | | o-Xylene | 2014/06/03 | | 111 | % | 70 - 130 |
| | | | p+m-Xylene | 2014/06/03 | | 97 | % | 70 - 130 |
| | | | F1 (C6-C10) | 2014/06/03 | | 105 | % | 70 - 130 |
| 3627159 | YY | Method Blank | 1,4-Difluorobenzene | 2014/06/03 | | 102 | % | 70 - 130 |
| | | | 4-Bromofluorobenzene | 2014/06/03 | | 101 | % | 70 - 130 |
| | | | D10-Ethylbenzene | 2014/06/03 | | 92 | % | 70 - 130 |
| | | | D4-1,2-Dichloroethane | 2014/06/03 | | 99 | % | 70 - 130 |
| | | | Benzene | 2014/06/03 | <0.20 | | ug/L | |
| | | | Toluene | 2014/06/03 | <0.20 | | ug/L | |
| | | | Ethylbenzene | 2014/06/03 | <0.20 | | ug/L | |
| | | | o-Xylene | 2014/06/03 | <0.20 | | ug/L | |
| | | | p+m-Xylene | 2014/06/03 | <0.40 | | ug/L | |
| | | | Total Xylenes | 2014/06/03 | <0.40 | | ug/L | |
| | | | F1 (C6-C10) | 2014/06/03 | <25 | | ug/L | |
| | | | F1 (C6-C10) - BTEX | 2014/06/03 | <25 | | ug/L | |
| 3629390 | ZZ | Matrix Spike | o-Terphenyl | 2014/06/05 | | 98 | % | 60 - 130 |



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Maxxam Job #: B490716
Report Date: 2014/06/16

MTE Consultants Inc
Client Project #: 38750-600
Sampler Initials: JK

## QUALITY ASSURANCE REPORT(CONT'D)

| QA/QC Batch | Init | QC Type | Parameter | Date Analyzed | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|---|
| | | | F2 (C10-C16 Hydrocarbons) | 2014/06/05 | | NC | % | 50 - 130 |
| | | | F3 (C16-C34 Hydrocarbons) | 2014/06/05 | | 93 | % | 50 - 130 |
| | | | F4 (C34-C50 Hydrocarbons) | 2014/06/05 | | 97 | % | 50 - 130 |
| 3629390 | ZZ | Spiked Blank | o-Terphenyl | 2014/06/05 | | 98 | % | 60 - 130 |
| | | | F2 (C10-C16 Hydrocarbons) | 2014/06/05 | | 102 | % | 60 - 130 |
| | | | F3 (C16-C34 Hydrocarbons) | 2014/06/05 | | 94 | % | 60 - 130 |
| | | | F4 (C34-C50 Hydrocarbons) | 2014/06/05 | | 99 | % | 60 - 130 |
| 3629390 | ZZ | Method Blank | o-Terphenyl | 2014/06/05 | | 97 | % | 60 - 130 |
| | | | F2 (C10-C16 Hydrocarbons) | 2014/06/05 | <100 | | ug/L | |
| | | | F3 (C16-C34 Hydrocarbons) | 2014/06/05 | <200 | | ug/L | |
| | | | F4 (C34-C50 Hydrocarbons) | 2014/06/05 | <200 | | ug/L | |

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).



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Maxxam Job #: B490716
Report Date: 2014/06/16

MTE Consultants Inc
Client Project #: 38750-600
Sampler Initials: JK

## VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Cristina Carriere

Cristina Carriere, Scientific Services

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



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**RUSH**

tics International Corporation o/a Maxxam Analytics
ello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-653-6266 Fax:(905) 817-5779 www.maxxam.ca

# CHAIN OF CUSTODY RECORD

Page 1 of 1

| | |
|---|---|
| Company Name: | #6868 MTE Consultants Inc |
| Contact Name: | Jennifer Kato |
| Address: | 520 Bingemans Centre Dr<br>Kitchener ON N2B 3X9 |
| Phone: | (519)743-6500 x1356 Fax: (519)743-6513 |
| Email: | JKato@mte85.com |

**REPORT INFORMATION (if differs from invoice):**

| | |
|---|---|
| Company Name: | |
| Contact Name: | Jennifer Kato |
| Address: | |
| Phone: | (519)743-6500 x1356 Fax: |
| Email: | JKato@mte85.com |

**PROJECT INFORMATION:**

| | |
|---|---|
| Quotation #: | B41972 |
| P.O. #: | |
| Project #: | 38750-600 |
| Project Name: | |
| Site #: | |
| Sampled By: | |

**Laboratory Use Only:**

| MAXXAM JOB #: | BOTTLE ORDER #: |
|---|---|
| | 471761 |
| **CHAIN OF CUSTODY #:** | **PROJECT MANAGER:** |
| C#471761-01-01 | Keshani Vijh |

**Regulation 153 (2011)**
- [ ] Table 1
- [X] Table 2
- [ ] Table 3
- [ ] Table ___
- [X] Res/Park
- [ ] Ind/Comm
- [ ] Agri/Other
- [ ] Medium/Fine
- [X] Coarse
- [ ] For RSC

**Other Regulations**
- [ ] CCME
- [ ] Reg. 558
- [ ] MISA
- [ ] PWQO
- [ ] Other
- [ ] Sanitary Sewer Bylaw
- [ ] Storm Sewer Bylaw
- Municipality

**SPECIAL INSTRUCTIONS**

*Include Criteria on Certificate of Analysis (Y/N)?* ✓

*Note: For MOE regulated drinking water samples - please use the Drinking Water Chain of Custody Form*

**SAMPLES MUST BE KEPT COOL ( < 10ºC ) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM**

30-May-14 13:43
Keshani Vijh
B490716
TST
WAT-001

**TURNAROUND TIME (TAT) REQUIRED:**

**PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS**

egular (Standard) TAT: [X]
will be applied if Rush TAT is not specified):
tandard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

**Job Specific Rush TAT (if applies to entire submission)**

Date Required: _____ Time Required: _____ [ ]

Rush Confirmation Number: _____ (call lab for #)

| | Sample Barcode Label | Sample (Location) Identification | Date Sampled | Time Sampled | Matrix | Regulated Drinking Water ? (Y / N) | Metals Field Filtered ? (Y / N) | METALS SCAN | BTEX + PHC FI-TEX | pH | # of Bottles | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | MW4a-14 | 14/05/29 | 9:40 | GW | N | Y | ~~✓~~ | ✓ | ✓ | 7 | HOLD METALS |
| 2 | | MW5-14 | | 10:30 | GW | N | Y | ✓ | ✓ | | 7 | HOLD pH |
| 3 | | MW6-14 | | 12:10 | GW | N | Y | ✓ | ✓ | | 7 | HOLD pH |
| 4 | | MW15-14 | | 10:35 | GW | N | Y | | | | 4 | HOLD ALL |
| 5 | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | REC'D IN WATERLOO |
| 9 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | |

| *RELINQUISHED BY: (Signature/Print) | Date: (YY/MM/DD) | Time: | RECEIVED BY: (Signature/Print) | Date: (YY/MM/DD) | Time: | # Jars Used and Not Submitted |
|---|---|---|---|---|---|---|
| JENNIFER KATO | 2014/05/29 | | | 2014/05/30 | 13:34 | |
| Suzanne Boyle | 2014/05/30 @ 1300 hrs | | H.S Grewal HARMAN GREWAL | 2014/05/30 | 17:45 | |

| Laboratory Use Only | | |
|---|---|---|
| Time Sensitive | Temperature (ºC) on Receipt | Custody Seal Present (Y/N) |
| | | |

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

Maxxam Analytics International Corporation o/a Maxxam Analytics

Max #241378 0/7/10°C

Maxxam Job #: B490716
Report Date: 2014/06/16

MTE Consultants Inc
Client Project #: 38750-600
Sampler Initials: JK

## Exceedence Summary Table – Reg153/04 Table1-GW

### Result Exceedences

| Sample ID | Maxxam ID | Parameter | Criteria | Result | DL | Units |
|---|---|---|---|---|---|---|
| No Exceedences | | | | | | |

The exceedence summary table is for information purposes only and should not be considered a comprehensive listing or statement of conformance to applicable regulatory guidelines.


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Maxxam

Success Through Science®

Your Project #: 38750-600
Your C.O.C. #: 47129701, 471297-01-01

**Attention:Jennifer Kato**

MTE Consultants Inc
520 Bingemans Centre Dr
Kitchener, ON
N2B 3X9

**Report Date: 2014/06/16**
Report #: R3060403
Version: 2R

# CERTIFICATE OF ANALYSIS – REVISED REPORT

**MAXXAM JOB #: B487645**
**Received: 2014/05/27, 10:45**

Sample Matrix: Soil
# Samples Received: 1

| Analyses | Quantity | Date Extracted | Date Analyzed | Laboratory Method | Reference |
|---|---|---|---|---|---|
| Strong Acid Leachable Metals by ICPMS | 1 | 2014/06/09 | 2014/06/09 | CAM SOP-00447 | EPA 6020 |

**Remarks:**

Maxxam Analytics has performed all analytical testing herein in accordance with ISO 17025 and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. All methodologies comply with this document and are validated for use in the laboratory. The methods and techniques employed in this analysis conform to the performance criteria (detection limits, accuracy and precision) as outlined in the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. Reporting results to two significant figures at the RDL is to permit statistical evaluation and is not intended to be an indication of analytical precision.

The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following the 'Alberta Environment Draft Addenda to the CWS-PHC, Appendix 6, Validation of Alternate Methods'. Documentation is available upon request. Maxxam has made the following improvements to the CWS-PHC reference benchmark method: (i) Headspace for F1; and, (ii) Mechanical extraction for F2-F4. Note: F4G cannot be added to the C6 to C50 hydrocarbons. The extraction date for samples field preserved with methanol for F1 and Volatile Organic Compounds is considered to be the date sampled.

Maxxam Analytics is accredited for all specific parameters as required by Ontario Regulation 153/04. Maxxam Analytics is limited in liability to the actual cost of analysis unless otherwise agreed in writing. There is no other warranty expressed or implied. Samples will be retained at Maxxam Analytics for three weeks from receipt of data or as per contract.

* RPDs calculated using r of final results may result in the apparent difference.

Encryption Key

Keshani Vijh
16 Jun 2014 18:31:10 -04:00

Please direct all questior ate of Analysis to your Project Manager.
Keshani Vijh, Project Manager
Email: KVijh@maxxam.ca
Phone# (905) 817-5700

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



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Maxxam Job #: B487645
Report Date: 2014/06/16

MTE Consultants Inc
Client Project #: 38750-600
Sampler Initials: JK

## O.REG 153 ICPMS METALS (SOIL)

| Maxxam ID | | | WA9943 | | |
|---|---|---|---|---|---|
| Sampling Date | | | 2014/05/26 16:35 | | |
| COC Number | | | 471297-01-01 | | |
| | **Units** | **Criteria** | **MW7-14 0-1'** | **RDL** | **QC Batch** |
| **Metals** | | | | | |
| Acid Extractable Antimony (Sb) | ug/g | **1.3** | <0.20 | 0.20 | 3633875 |
| Acid Extractable Arsenic (As) | ug/g | **18** | 1.0 | 1.0 | 3633875 |
| Acid Extractable Barium (Ba) | ug/g | **220** | 10 | 0.50 | 3633875 |
| Acid Extractable Beryllium (Be) | ug/g | **2.5** | <0.20 | 0.20 | 3633875 |
| Acid Extractable Boron (B) | ug/g | **36** | <5.0 | 5.0 | 3633875 |
| Acid Extractable Cadmium (Cd) | ug/g | **1.2** | <0.10 | 0.10 | 3633875 |
| Acid Extractable Chromium (Cr) | ug/g | **70** | 3.6 | 1.0 | 3633875 |
| Acid Extractable Cobalt (Co) | ug/g | **21** | 1.5 | 0.10 | 3633875 |
| Acid Extractable Copper (Cu) | ug/g | **92** | 3.8 | 0.50 | 3633875 |
| Acid Extractable Lead (Pb) | ug/g | **120** | 2.4 | 1.0 | 3633875 |
| Acid Extractable Molybdenum (Mo) | ug/g | **2** | <0.50 | 0.50 | 3633875 |
| Acid Extractable Nickel (Ni) | ug/g | **82** | 2.8 | 0.50 | 3633875 |
| Acid Extractable Selenium (Se) | ug/g | **1.5** | <0.50 | 0.50 | 3633875 |
| Acid Extractable Silver (Ag) | ug/g | **0.5** | <0.20 | 0.20 | 3633875 |
| Acid Extractable Thallium (Tl) | ug/g | **1** | <0.050 | 0.050 | 3633875 |
| Acid Extractable Uranium (U) | ug/g | **2.5** | 0.22 | 0.050 | 3633875 |
| Acid Extractable Vanadium (V) | ug/g | **86** | 9.1 | 5.0 | 3633875 |
| Acid Extractable Zinc (Zn) | ug/g | **290** | 11 | 5.0 | 3633875 |

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
Table 1: Full Depth Background Site Condition Standards
Soil - Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use



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Maxxam Job #: B487645
Report Date: 2014/06/16

MTE Consultants Inc
Client Project #: 38750-600
Sampler Initials: JK

## TEST SUMMARY

**Maxxam ID:** WA9943
**Sample ID:** MW7-14 0-1'
**Matrix:** Soil

**Collected:** 2014/05/26
**Shipped:**
**Received:** 2014/05/27

| Test Description | Instrumentation | Batch | Extracted | Date Analyzed | Analyst |
|---|---|---|---|---|---|
| Strong Acid Leachable Metals by ICPMS | ICP/MS | 3633875 | 2014/06/09 | 2014/06/09 | Viviana Canzonieri |



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Maxxam Job #: B487645
Report Date: 2014/06/16

MTE Consultants Inc
Client Project #: 38750-600
Sampler Initials: JK

## GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

| | |
|---|---|
| Package 1 | 10.0°C |

Revised Report (2014/06/16): Requested regulatory criteria have been included on this report.

**Results relate only to the items tested.**



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Maxxam Job #: B487645
Report Date: 2014/06/16

MTE Consultants Inc
Client Project #: 38750-600
Sampler Initials: JK

## QUALITY ASSURANCE REPORT

| QA/QC Batch | Init | QC Type | Parameter | Date Analyzed | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|---|
| 3633875 | VIV | Matrix Spike | Acid Extractable Antimony (Sb) | 2014/06/09 | | 103 | % | 75 - 125 |
| | | | Acid Extractable Arsenic (As) | 2014/06/09 | | 99 | % | 75 - 125 |
| | | | Acid Extractable Barium (Ba) | 2014/06/09 | | NC (1) | % | 75 - 125 |
| | | | Acid Extractable Beryllium (Be) | 2014/06/09 | | 99 | % | 75 - 125 |
| | | | Acid Extractable Boron (B) | 2014/06/09 | | 95 | % | 75 - 125 |
| | | | Acid Extractable Cadmium (Cd) | 2014/06/09 | | 105 | % | 75 - 125 |
| | | | Acid Extractable Chromium (Cr) | 2014/06/09 | | NC (1) | % | 75 - 125 |
| | | | Acid Extractable Cobalt (Co) | 2014/06/09 | | 102 | % | 75 - 125 |
| | | | Acid Extractable Copper (Cu) | 2014/06/09 | | NC (1) | % | 75 - 125 |
| | | | Acid Extractable Lead (Pb) | 2014/06/09 | | 106 | % | 75 - 125 |
| | | | Acid Extractable Molybdenum (Mo) | 2014/06/09 | | 108 | % | 75 - 125 |
| | | | Acid Extractable Nickel (Ni) | 2014/06/09 | | NC (1) | % | 75 - 125 |
| | | | Acid Extractable Selenium (Se) | 2014/06/09 | | 102 | % | 75 - 125 |
| | | | Acid Extractable Silver (Ag) | 2014/06/09 | | 104 | % | 75 - 125 |
| | | | Acid Extractable Thallium (Tl) | 2014/06/09 | | 95 | % | 75 - 125 |
| | | | Acid Extractable Uranium (U) | 2014/06/09 | | 99 | % | 75 - 125 |
| | | | Acid Extractable Vanadium (V) | 2014/06/09 | | NC (1) | % | 75 - 125 |
| | | | Acid Extractable Zinc (Zn) | 2014/06/09 | | NC (1) | % | 75 - 125 |
| 3633875 | VIV | Spiked Blank | Acid Extractable Antimony (Sb) | 2014/06/09 | | 106 | % | 80 - 120 |
| | | | Acid Extractable Arsenic (As) | 2014/06/09 | | 103 | % | 80 - 120 |
| | | | Acid Extractable Barium (Ba) | 2014/06/09 | | 100 | % | 80 - 120 |
| | | | Acid Extractable Beryllium (Be) | 2014/06/09 | | 101 | % | 80 - 120 |
| | | | Acid Extractable Boron (B) | 2014/06/09 | | 96 | % | 80 - 120 |
| | | | Acid Extractable Cadmium (Cd) | 2014/06/09 | | 103 | % | 80 - 120 |
| | | | Acid Extractable Chromium (Cr) | 2014/06/09 | | 106 | % | 80 - 120 |
| | | | Acid Extractable Cobalt (Co) | 2014/06/09 | | 107 | % | 80 - 120 |
| | | | Acid Extractable Copper (Cu) | 2014/06/09 | | 105 | % | 80 - 120 |
| | | | Acid Extractable Lead (Pb) | 2014/06/09 | | 104 | % | 80 - 120 |
| | | | Acid Extractable Molybdenum (Mo) | 2014/06/09 | | 104 | % | 80 - 120 |
| | | | Acid Extractable Nickel (Ni) | 2014/06/09 | | 105 | % | 80 - 120 |
| | | | Acid Extractable Selenium (Se) | 2014/06/09 | | 107 | % | 80 - 120 |
| | | | Acid Extractable Silver (Ag) | 2014/06/09 | | 105 | % | 80 - 120 |
| | | | Acid Extractable Thallium (Tl) | 2014/06/09 | | 100 | % | 80 - 120 |
| | | | Acid Extractable Uranium (U) | 2014/06/09 | | 101 | % | 80 - 120 |
| | | | Acid Extractable Vanadium (V) | 2014/06/09 | | 104 | % | 80 - 120 |
| | | | Acid Extractable Zinc (Zn) | 2014/06/09 | | 103 | % | 80 - 120 |
| 3633875 | VIV | Method Blank | Acid Extractable Antimony (Sb) | 2014/06/09 | <0.20 | | ug/g | |
| | | | Acid Extractable Arsenic (As) | 2014/06/09 | <1.0 | | ug/g | |
| | | | Acid Extractable Barium (Ba) | 2014/06/09 | <0.50 | | ug/g | |
| | | | Acid Extractable Beryllium (Be) | 2014/06/09 | <0.20 | | ug/g | |
| | | | Acid Extractable Boron (B) | 2014/06/09 | <5.0 | | ug/g | |
| | | | Acid Extractable Cadmium (Cd) | 2014/06/09 | <0.10 | | ug/g | |
| | | | Acid Extractable Chromium (Cr) | 2014/06/09 | <1.0 | | ug/g | |
| | | | Acid Extractable Cobalt (Co) | 2014/06/09 | <0.10 | | ug/g | |
| | | | Acid Extractable Copper (Cu) | 2014/06/09 | <0.50 | | ug/g | |
| | | | Acid Extractable Lead (Pb) | 2014/06/09 | <1.0 | | ug/g | |
| | | | Acid Extractable Molybdenum (Mo) | 2014/06/09 | <0.50 | | ug/g | |
| | | | Acid Extractable Nickel (Ni) | 2014/06/09 | <0.50 | | ug/g | |
| | | | Acid Extractable Selenium (Se) | 2014/06/09 | <0.50 | | ug/g | |
| | | | Acid Extractable Silver (Ag) | 2014/06/09 | <0.20 | | ug/g | |
| | | | Acid Extractable Thallium (Tl) | 2014/06/09 | <0.050 | | ug/g | |
| | | | Acid Extractable Uranium (U) | 2014/06/09 | <0.050 | | ug/g | |
| | | | Acid Extractable Vanadium (V) | 2014/06/09 | <5.0 | | ug/g | |



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Maxxam Job #: B487645
Report Date: 2014/06/16

MTE Consultants Inc
Client Project #: 38750-600
Sampler Initials: JK

## QUALITY ASSURANCE REPORT(CONT'D)

| QA/QC Batch | Init | QC Type | Parameter | Date Analyzed | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|---|
| | | | Acid Extractable Zinc (Zn) | 2014/06/09 | <5.0 | | ug/g | |

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

(1) The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).



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## VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Cristina Carriere

Cristina Carriere, Scientific Services

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



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RUSH

...ternational Corporation o/a Maxxam Analytics
...oad, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-653-6266 Fax:(905) 817-5779 www.maxxam.ca

# CHAIN OF CUSTODY RECORD

Page 1 of 1

| | | REPORT INFORMATION (if differs from invoice): | | PROJECT INFORMATION: | | Laboratory Use Only: | |
|---|---|---|---|---|---|---|---|
| Company Name: | #6868 MTE Consultants Inc | Company Name: | | Quotation #: | B41972 | MAXXAM JOB #: | BOTTLE ORDER #: 471297 |
| Contact Name: | Jennifer Kato | Contact Name: | Jennifer Kato | P.O. #: | | | |
| Address: | 520 Bingemans Centre Dr<br>Kitchener ON N2B 3X9 | Address: | | Project #: | 38750-600 | CHAIN OF CUSTODY #: | PROJECT MANAGER: |
| Phone: | (519)743-6500 x1356 Fax: (519)743-6513 | Phone: | (519)743-6500 x1356 Fax: | Project Name: | | C#471297-01-01 | Keshani Vijh |
| Email: | JKato@mte85.com | Email: | JKato@mte85.com | Site #: | | | |
| | | | | Sampled By: | | | |

**Regulation 153 (2011)**
- [ ] Table 1
- [x] Table 2
- [ ] Table 3
- [ ] Table ___
- [x] Res/Park
- [ ] Ind/Comm
- [ ] Agri/Other
- [ ] Medium/Fine
- [x] Coarse
- [ ] For RSC

**Other Regulations**
- [ ] CCME
- [ ] Reg. 558
- [ ] MISA
- [ ] PWQO
- [ ] Other ___
- [ ] Sanitary Sewer Bylaw
- [ ] Storm Sewer Bylaw
- Municipality ___

SPECIAL INSTRUCTIONS

*Include Criteria on Certificate of Analysis (Y/N)?* Y

*Note: For MOE regulated drinking water samples - please use the Drinking Water Chain of Custody Form*

**SAMPLES MUST BE KEPT COOL ( < 10°C ) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM**

TURNAROUND TIME (TAT) REQUIRED:

**PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS**

**Regular (Standard) TAT:** [x]
*(will be applied if Rush TAT is not specified):*
*Standard TAT = 5-7 Working days for most tests.*
*Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.*

**Job Specific Rush TAT (if applies to entire submission)**
Date Required: ___ Time Required: ___ [ ]
Rush Confirmation Number: ___ *(call lab for #)*

| | Sample Barcode Label | Sample (Location) Identification | Date Sampled | Time Sampled | Matrix | Regulated Drinking Water ? (Y/N) | Metals Field Filtered ? (Y/N) | O.Reg 153 ICPMS Metals (Soil) | O.Reg 153 Petroleum Hydrocarbons (Soil) | O.Reg 153 OC Pesticides (Soil) | O.Reg 153 PAHs (Soil) | pH CaCl2 EXTRACT | O.Reg 153 Dissolved ICPMS Metals | O.Reg 153 Petroleum Hydrocarbons (Water) | PH Water | # of Bottles | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | MW7-14 0-1' | 14/05/26 | 16.35 | SOIL | | | | | | | | | | | | HOLD 2 JARS |
| 2 | | MW7-14 3-4' | | 16.40 | SOIL | | | | | | | | | | | | HOLD 2 JARS |
| 3 | | MW7-14 6-7' | | 16.50 | SOIL | | | | | | | | | | | | HOLD 2 JARS |
| 4 | | MW7-14 8-9' | | 17.00 | SOIL | | | | | | | | | | | | HOLD 1 JAR + 2 VIALS |
| 5 | | | | | SOIL | | | | | | | | | | | | |
| 6 | | | | | SOIL | | | | | | | | | | | | |
| 7 | | | | | SOIL | | | | | | | | | | | | |
| 8 | | | | | SOIL | | | | | | | | | | | | |
| 9 | | | | | SOIL | | | | | | | | | | | | |
| 10 | | | | | SOIL | | | | | | | | | | | | |

27-May-14 10:45
Keshani Vijh
B487645
JGN WAT-001

| *RELINQUISHED BY: (Signature/Print) | Date: (YY/MM/DD) | Time: | RECEIVED BY: (Signature/Print) | Date: (YY/MM/DD) | Time: | # Jars Used and Not Submitted |
|---|---|---|---|---|---|---|
| JKato JENNIFER KATO | 14/05/26 | | [illegible] | 2014-05-27 | 10:45 | |
| | | | RACHEL DEVLIN | 2014/05/27 | 17:45 | |

| Laboratory Use Only | | | | |
|---|---|---|---|---|
| Time Sensitive | Temperature (°C) on Receipt | Custody Seal Present | Yes | No |
| | 2/2/4 C | Intact | | |

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

Maxxam Analytics International Corporation o/a Maxxam Analytics

White: Maxxam Yellow: Client

P.O. MW#2624491

Maxxam Job #: B487645
Report Date: 2014/06/16

MTE Consultants Inc
Client Project #: 38750-600
Sampler Initials: JK

## Exceedence Summary Table – Reg153/04 Table1-Soil/Res

### Result Exceedences

| Sample ID | Maxxam ID | Parameter | Criteria | Result | DL | Units |
|---|---|---|---|---|---|---|
| No Exceedences | | | | | | |

The exceedence summary table is for information purposes only and should not be considered a comprehensive listing or statement of conformance to applicable regulatory guidelines.


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Amendment No. XXX

Amendment Number 144 to the Norfolk Official Plan
Simcoe Urban Area, - Settlement area boundary expansion

## Part A: Preamble to the Amendment

The purpose of this Official Plan Amendment (OPA) is to permit a site-specific amendment to expand the Settlement Area Boundary of the Simcoe Urban Area by approximately 8.86 hectares which is to be designated “Urban Residential” to permit urban residential development in the form of a Plan of Condominium and townhouse dwellings.

The subject lands form part of the area identified as Part 1 lands on Schedule A (Simcoe Urban Area) in OPA 163 and adopted by Council on May 22, 2024 as an appropriate area for expansion of the Simcoe Urban Boundary Area.

On September 5th, 2025 the Ministry of Municipal Affairs approved OPA 163 with modifications. Modification 4 and Part B 7) respectively in the decision, approved the inclusion of all Part 1 lands identified in the OPA into the Simcoe Urban Area Boundary subject to Special Policy 6.4.k) and then withheld the final decision on both Part 1 and 7 lands pending further consideration and/or information.

This amendment satisfies the policy direction of OPA 163, providing the necessary technical studies and analysis under Site Specific Policy 6.4.k 7) to support the lands inclusion for an urban boundary expansion area. The amendment satisfies the policy direction of the Provincial Planning Statement 2024, Chapter 2: Building Homes, Sustaining Strong and Competitive Communities, Chapter 3: Infrastructure and Facilities and Chapter 4 Wise Use and Management of Resources. The amendment is consistent with the County’s comprehensive visioning and strategic planning conducted under the Grow Norfolk Project and promotes an efficient development and land use pattern to that accommodate an appropriate range residential densities that does not impact significant natural heritage features, cultural resources or impact the existing agricultural area.

The expansion implements the Growth Strategy adopted by Norfolk County by amending the Simcoe Urban Area Boundary and adding a land use designation. The additional lands to the settlement area will assist to accommodate forecasted population growth to the planning horizon of 2051, consistent with Official Plan Amendment 163 and the Provincial Planning Statement (PPS, 2024)

The amendment redesignates the subject lands from “Agricultural Area” to “Urban Residential,” enabling future mixed – density residential development through subsequent planning approvals.

**Location of the Lands Affected**

As shown on the attached Schedule “A”, the subject lands are approximately 8.86 hectares, and are located west of Virgina Steet, south of West Street, at the western limit of the Simcoe Urban Area Boundary and are legally described Part of Lot 18, Concession Gore, former Township of Woodhouse, in Norfolk County in the Province of Ontario.

**Basis of the Amendment**

It is the is the intent of this amendment to include the land identified on Schedule “A” into the Urban Area Boundary for Simcoe and apply an ‘Urban Residential’ designation which will permit the medium and high-density residential uses.

The size and scale of the residential dwellings will be established through a Zoning By-law and the site layout is subject to Site Plan Control.

**Part B: The Amendment**

That the Norfolk County Official Plan is hereby amended as follows:

**Map Schedule Amendment**

Schedule ‘A-1’, Community Structure, in the Norfolk Official Plan is amended by expanding the Simcoe Urban Area Boundary to include approximately 8.86ha and shown on Schedule ‘A’, attached hereto, with Special Policy Area 6.4.k).

That Schedule B-15, Land Use, in the Norfolk County Official Plan is amended by adding approximately 8.86ha shown on Schedule ‘A’, attached hereto, to within the Simcoe Urban Area Boundary with Special Policy Area 6.4.k).

That Schedule C-4, Natural Heritage, in the Norfolk County Official Plan is amended by adding the lands shown on Schedule ‘A’, attached hereto, to within the Simcoe Urban Area.

That Schedule D-4, Water Resources, in the Norfolk County Official Plan is amended by adding the lands shown on Schedule ‘A’, attached hereto, to within the Simcoe Urban Area.

That Schedule E-2, Transportation, in the Norfolk County Official Plan is amended by adding the lands shown as Schedule ‘A’, attached hereto, to within the Simcoe Urban Area.

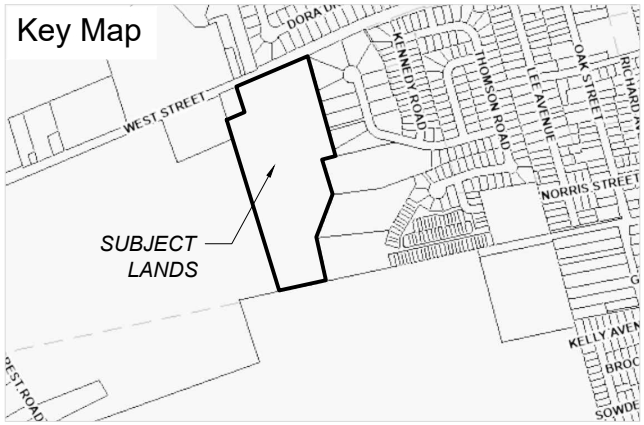
That Schedule I-2, Active Transportation, in the Norfolk County Official Plan is amended by adding the lands shown as Schedule ‘A’, attached hereto, to within the Simcoe Urban Area.

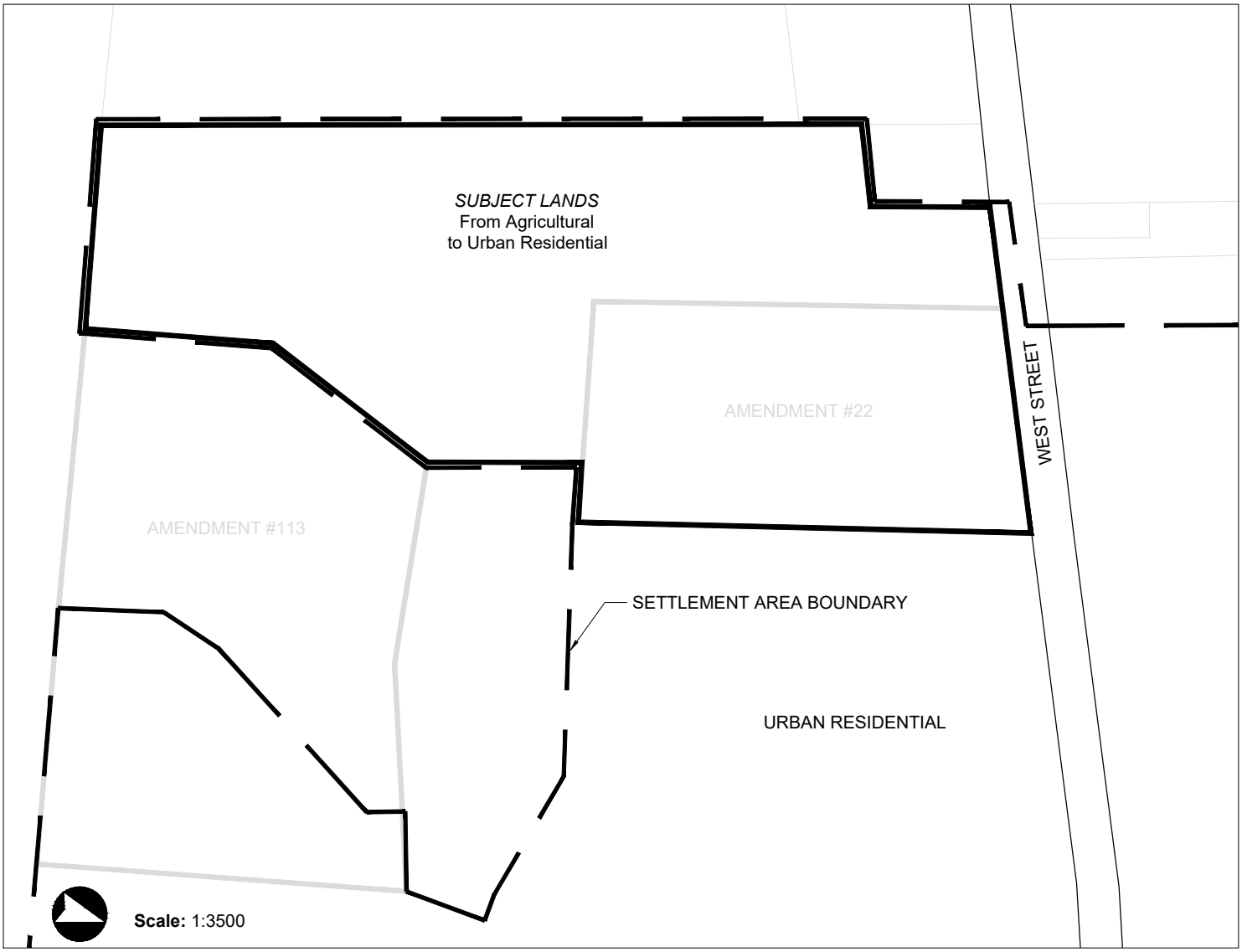
That Schedule J-4, Natural Resources, in the Norfolk County Official Plan is amended by

adding the lands shown as on Schedule ‘A’, attached hereto, to within the Simcoe Urban Area.

Amendment No. XXX

to the
OFFICIAL PLAN
for
NORFOLK COUNTY




# Schedule 'A'

# The Corporation of Norfolk County

## By-Law X-X-2026

Being a By-Law to Amend Zoning By-Law 1-Z-2014, as amended, for property described as Part of Lot 18, Concession Gore, former Township of Woodhouse, Town of Simcoe, Norfolk County, Urban Area of Simcoe, Norfolk County.

Whereas Norfolk Council is empowered to enact this By-Law, by virtue of the provisions of Section 34 and Section 36(1) of the *Planning Act, R.S.O. 1990, CHAPTER P.13*, as amended; and

Whereas this By-Law conforms to the Norfolk County Official Plan; and

Now therefore the Council of The Corporation of Norfolk County hereby enacts as follows:

1. That Schedule A of By-Law 1-Z-2014, as amended, is hereby further amended by changing the zoning of the subject lands identified as Part of Lot 18, Concession Gore, former Township of Woodhouse, Town of Simcoe, Norfolk County on Schedule A (attached to and forming part of this By-Law), in accordance with the following:

   From Agriculture to Urban Residential Type 4 Zone (R4) with a Holding (H) provision and a new special provision 14.XXX;

   From Agriculture to Urban Residential Type 4 Zone (R4) with a Holding (H) provision and a new special provision 14.XXX;

   From Agriculture to Urban Residential Type 6 (R6) Zone

   From Agriculture to Open Space (OS) Zone.

2. That Subsection 14.0 Special Provisions is hereby further amended by adding 14.XXX; in accordance with the following:

   14.XXX In the R4 Zone, a “lot” shall be defined as lots within the condominium plan. In lieu of the corresponding provisions in the R4 Zone, the following shall apply for the lands amended to Urban Residential Type 4 (R4-XX)(H) Zone:

   a) Minimum *Lot Frontage:*
      - *i) Interior lot – 6.5m*
      - *ii) Corner Lot* – 9 metres

   b) Minimum *interior side* yard – 1.2m

c) Minimum *exterior side yard* – 1.6m

d) Minimum rear yard

i) Attached garage 6.0m

In lieu of the parking provisions in Subsection 4.2.4 d) – Location of Parking on a *Lot* The following shall apply:

i) No parking lot shall be closer than 1.2m from a dwelling on the lot or any interior lot line abutting another residential Zone

3. That Subsection 14.0 Special Provisions is hereby further amended by adding 14.XXX; in accordance with the following:

14.XXX In lieu of the corresponding provisions in the R4 Zone, the following shall apply for the lands amended to Urban Residential Type 4 (R4-XX)(H) Zone:

a) THAT The parking provisions in Subsection 4.1.3 b) – *Residential Parking Area for Urban Residential Type 1 to 4 Zones [R1 to R4]* - Shall not apply

4. Holding Prefix

a) That the holding (H) provision of this by-law shall be removed upon the approval of a Draft Plan of Subdivision to the satisfaction of the General Manager of Community Development (or designate).

Enacted and passed this ___ day of _____, 2026.

_____

Mayor: A. Martin

_____

County Clerk: W. Tigert

# Schedule 'A'

**Legend**

TOTAL LANDS TO BE AMENDED

LANDS TO BE REZONED FROM AGRICULTURAL [A] ZONE TO URBAN RESIDENTIAL TYPE 4 [R4-XX] ZONE WITH A HOLDING [H], AND SPECIAL PROVISIONS

LANDS TO BE REZONED FROM AGRICULTURAL [A] ZONE TO URBAN RESIDENTIAL TYPE 4 [R4-XX] ZONE WITH A HOLDING [H], AND SPECIAL PROVISIONS

LANDS TO BE REZONED FROM AGRICULTURAL [A] ZONE TO URBAN RESIDENTIAL TYPE 6 [R6]

LANDS TO BE REZONED FROM AGRICULTURAL [A] ZONE TO OPEN SPACE [OS] ZONE

**Scale:** 1:3500

**File Number:**

This is Schedule 'A' to By-law No. ____- 2026
to amend Zoning Bylaw No. 1-Z-2014 Schedule 'A-25'

Passed the ____ day of _____, 2026.

_____
MAYOR

_____
CLERK

# Stage 1 Archaeological Background Study

506 West Street
Part of Lot 18, Gore Concession
(Geographic Township of Woodhouse)
City of Simcoe
County of Norfolk
Ontario

Original Report

**Prepared For:**
Westwood Trail Developments Inc.

&

Ontario Ministry of Citizenship
and Multiculturalism (MCM)
*Citizenship, Inclusion and Heritage Division,*
*Heritage Branch*
401 Bay Street, Suite 1700
Toronto, ON M7A 0A7
Tel: 416-212-8886
Archaeology@Ontario.ca

**Archaeological License:** #P1311 (Alex Cassidy-Neumiller)
**MCM PIF#:** P1311-0075-2025
**Apex Archeology Inc. Project #:** 25-68

**Apex Archaeology Inc.**
2 – 177 Hachborn Road
Brantford, ON
N3S 7W7

Email: acn@apexarchaeology.ca
Phone: 519-717-4697

26 February 2026

APEX ARCHAEOLOGY INC.

CONSULTATION | EVALUATION | PRESERVATION

## EXECUTIVE SUMMARY

Apex Archaeology Inc. (AAI) was contracted by Westwood Trail Developments Inc. to undertake a Stage 1 Archaeological Background Study of 506 West Street, Part of Lot 18, Gore Concession (Geographic Township of Woodhouse), City of Simcoe, County of Norfolk, Ontario. The entirety of the study area is approximately 8.90 hectares (ha) in size and includes within it areas of mixed forest, small clearings and existing walking trails. AAI was granted permission to carry out all activities necessary to complete the archaeological background study.

The entirety of the subject property was subject to a desktop Stage 1 Archaeological Background Study on 16 February 2026.

The study area has been identified as a property that exhibits potential to yield archaeological deposits of Cultural Heritage Value or Interest (CHVI). Consequently, the objectives of the Stage 1 Background Study have been met and, in accordance with the results of this investigation, the following recommendations are made:

1. *Portions of the study area exhibit potential for archaeological resources, and a Stage 2 Archaeological Assessment is recommended (see Map 7).*
2. *The areas that exhibit potential for archaeological resources should be subject to test pit survey at 5m intervals (see Map 7).*
3. *A Property Inspection must be conducted concurrently with the Stage 2 Archaeological Assessment to confirm the current conditions within the study area.*
4. *No soil disturbances or removal of vegetation shall take place within the study area prior to the MCM acceptance of a report into the Provincial Registry of Archaeological Reports that recommends all archaeological concerns for the proposed undertaking have been addressed and no further archaeological investigations are required.*

# PROJECT PERSONNEL

## APEX ARCHAEOLOGY INC.

| | |
|---|---|
| PROJECT MANAGER: | ALEX CASSIDY-NEUMILLER, M.A. (P1311) |
| PROJECT ARCHAEOLOGIST: | ALEX CASSIDY-NEUMILLER, M.A. (P1311) |
| LICENSED FIELD DIRECTOR(S): | PETER ASH CUTAJAR, M.A. (R1429) |
| FIELD TECHNICIANS: | N/A |
| REPORT PREPARATION & MAPPING: | PETER ASH CUTAJAR, M.A. (R1429) |
| REPORT REVIEW: | ALEX CASSIDY-NEUMILLER, M.A. (P1311) |

# TABLE OF CONTENTS

**EXECUTIVE SUMMARY**

| | | |
|---|---|---|
| **1.0** | Project Context | **1** |
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# 1.0 PROJECT CONTEXT

## 1.1 DEVELOPMENT CONTEXT

Apex Archaeology Inc. (AAI) was contracted by Westwood Trail Developments Inc. to undertake a Stage 1 Archaeological Background Study of 506 West Street, Part of Lot 18, Gore Concession (Geographic Township of Woodhouse), City of Simcoe, County of Norfolk, Ontario. The entirety of the study area is approximately 8.90 hectares (ha) in size and includes within it areas of mixed forest, small clearings and existing walking trails. AAI was granted permission to carry out all activities necessary to complete the archaeological background study.

This assessment was undertaken as a requirement under the Planning Act (RSO 1990b) and was conducted under Professional Archaeologist License # P1311 issued to Alex Cassidy-Neumiller by the Minister of Citizenship and Multiculturalism (MCM) for the Province of Ontario. All activities carried out during this assessment were completed as part of the pre-development planning and approvals process. All work carried out was conducted in conformity with Ontario Ministry of Tourism and Culture Standards and Guidelines for Consultant Archaeologists (MTC 2011) and the Ontario Heritage Act (RSO 1990a).

AAI was granted permission to carry out all activities necessary to complete the archaeological background study. The entirety of the subject property was subject to a desktop Stage 1 Archaeological Background Study on 16 February 2026.

The proposed development of the study area includes 298 residential units. The proposed development contains 180 apartments, 106 townhouse units, 12 bungalows, and parking areas with associated services and landscape modifications. A preliminary plan of the proposed development has been submitted together with this report to MCM for review and reproduced within this report as Map 2.

## 1.2 HISTORICAL CONTEXT

Per Section 7.5.7 (1) of the *Standards and Guidelines for Consultant Archaeologist*, this section is meant to describe the past and present land use of the study area, as well as the settlement history and any other relevant land-use information that is gathered through Stage 1 background research (MTC 2011). This section is broken up into two sub-sections: Indigenous Settlement & Land Use, followed by Euro-Canadian Settlement & Land Use.

### 1.2.1 INDIGENOUS SETTLEMENT & LAND-USE

The subject property is located on the traditional lands of the Anishinaabek, Haudenosaunee, and Attawandaron peoples. This land continues to be home to diverse Indigenous peoples (e.g., First Nations, Métis, and Inuit) whom we recognize as contemporary stewards of the land and vital contributors to our society.

Todays' Norfolk County was previously utilized for Indigenous settlement in the past. However, our knowledge of the Indigenous settlement and land use in the area is incomplete. Nevertheless, based on previous archaeological study, it is possible to provide a basic summary of Indigenous settlement in the region and evaluate the potential for the discovery of Indigenous sites within the subject property.

Table 1 illustrates the chronological development of cultures within southern Ontario. This general cultural outline is based on archaeological data and represents a synthesis and summary of research over a long period of time. It is offered here as a general outline to illustrate the relationships of broad cultural groups and time periods.

TABLE 1 PREHISTORIC CHRONOLOGY OF SOUTHERN ONTARIO

| Period | Material Culture | Date Range | Attributes |
|---|---|---|---|
| **Paleo-Indian** | | | |
| Early | Gainey, Barnes, Crowfield | 9,000 – 8,500B.C. | Big Game Hunters |
| Late | Hi-Lo, Holcombe, Lanceolate | 8,500 – 7,500B.C. | Small Nomadic Groups |
| **Archaic** | | | |
| Early | Nettling | 7,500 – 6,000B.C. | Nomadic Hunters & Gatherers |
| Middle | Kirk, Stanly, Brewerton, Laurentian | 6,000. – 2,000B.C. | Territorial Settlements |
| Late | Genesee, Lamoka, Crawford Knoll, Innes | 2,500B.C. – 500B.C. | Polished & Ground Stone Tools (Small Stemmed) |
| **Woodland** | | | |
| Early | Meadowood | 800 – 400B.C | First Use of Pottery |
| Middle | Point Peninsula, Saugeen | 400B.C. – 800A.D. | Horticulture Develops |
| Late | Algonkian, Iroquoian | 800 – 1,300A.D. | Transition to Agriculture & Villages |
| | Algonkian, Iroquoian | 1,300 – 1,400A.D. | Start of Large Palisaded Villages |
| | Algonkian, Iroquoian | 1,400 – 1,600A.D. | Tribal Variation & Warfare |
| **Historic** | | | |
| Early | Huron, Neutral, Petun, Odawa, Ojibwa | 1,600 – 1,650A.D. | Displacement of Tribes |
| Late | Six Nations Iroquois, Ojibwa | 1,650 – 1,800A.D. | |

| | | | |
|---|---|---|---|
| | Euro-Canadian | 1,800A.D. – Present | European Settlement |

### 1.2.2 EURO-CANADIAN SETTLEMENT & LAND USE

The study area is located at 506 West Street, Part of Lot 18, Gore Concession (Geographic Township of Woodhouse), City of Simcoe, County of Norfolk, Ontario.

#### *The County of Norfolk*

Norfolk County was established in July 1792. In 1798, the county became part of the London District; it was reduced in size with parts going to the surrounding counties of Oxford, Middlesex and Haldimand. In 1837, Norfolk County was separated from the London District to form the Talbot District with the town of Simcoe as the district town. Talbot District was later abolished (1850) and replaced by Norfolk County (Fothergill 1954).

Being heavily forested, logging was the first major industry in Norfolk County. Agriculture, however, became the most important industry, producing an abundance of wheat, corn and oats through the first half of the 19th century. In the second half of the 19th century, the focus shifted to the growth of tobacco and orchard fruits. Today, Norfolk County is still well-known for its fruit production (Fothergill 1954).

#### *The Township of Woodhouse*

In 1669, two French priests from Montreal – Dollier and Galinee – were the first Europeans to visit the area. The two eventually reached Lake Erie near present-day Port Dover where they spent the winter. During their stay, the two remarked on the areas "stately forests, abundant wild game and fine quality fruits." Prior to the American Revolution, only a small number of settlers resided in Woodhouse Township. After the American Revolution, however, the Imperial government gave large land grants to United Empire Loyalists coming to Canada from the United States. In 1823, the Talbot road was opened which ran through Woodhouse Township, bringing an influx of settlers to the area. Prior to 1851, Irish settlers were the most prevalent in the township followed by English and United Empire Loyalists; English settlers became the most prevalent after 1871. Today, agriculture is the dominant industry in the township (Fothergill 1954).

### 1.2.3 LAND REGISTRY RECORDS

The Abstract Index of the Land Registry Office was examined online at Service Ontario for the County of Norfolk to determine a sequence of ownership for the original Township Lot 18, Gore Concession, which the current study area is within (Ontario Land Registry, n.d.). Deeds,

bonds, bargains and sales, and wills are the only transactions that were considered for transcription, as they indicate the transfer of land ownership. Regarding the current study area, only transactions involving the east half of Lot 18, Gore Concession have been transcribed from the original record since the current study area is situated in the eastern half of the lot. The available information for Lot 18, Gore Concession in the Geographic Township of Woodhouse is presented in Table 2 below.

TABLE 2 LAND REGISTRY ABSTRACT FOR LOT 18, GORE CONCESSION, GEOGRAPHIC TOWNSHIP OF WOODHOUSE

| Instrument | Date | Grantor | Grantee | Quantity of Land | Remarks |
|---|---|---|---|---|---|
| Crown | 14 May 1802 | The Crown | John Smith | 200 ac; all | |
| Sheriff Deed | 21 Oct 1824 | Sheriff of London District | Sherman Wright | 95 ac; E | South of E. Part |
| Quitclaim | 22 June 1824 | Sherman Wright | Adam Bowlby | 95 ac E | |
| Quitclaim | 18 Aug 1830 | Adam Bowlby | John Henshaw | 95 ac E | |
| B&S | 24 Nov 1819 | Benjamin Garyl | Ezekiel Foster | 95 ac E | |
| Quitclaim | 5 Sept 1829 | Joseph Smith | John Henshaw | 95 ac E | |
| B&S | 10 July 1834 | Joseph Smith and James Smith | David Smith | 5ac Cen. | |

| | | | | | |
|---|---|---|---|---|---|
| B&S | 4 Oct 1845 | Sarah Shemild Husband | Thomas Beau | 5 ac SE Corner | |
| B&S | 24 Mar 1849 | David Smith Wife | Joseph Dunkin | 50 ac pt | |
| B&S | 24 July 1850 | John Dean Wife | Howard H. Walsh | 5 ac; SE Corner | |
| B&S | 18 Oct 1850 | Joseph Dunkin Wife | David Smith<br><br>John Dean | 50ac pt | |
| B&S | 12 May 1845 | Thomas Beau | William Sowhall<br><br>Eliza Showhall | 5ac; SE Corner | |
| B&S | 5 July 1851 | William Sowhall | Thomas W. Walsh | ½ of 5ac; SE Corner | |
| Release of Dower | 1 Nov 1851 | Charlotte Sowhall Husband | Thomas W. Walsh | 5 ac pt | |
| Release of Part | 21 Aug 1876 | Zebulon London | Thomas W. Walsh | S.E. Corner 5 ac | |
| B&S | 14 Aug 1876 | Thomas W. Walsh Wife | Margaret L Potts | SE Corner 5 ac | |

| | | | | | |
|---|---|---|---|---|---|
| Release of Part | 5 June 1878 | Leonard Sovereign | Thomas W. Walsh | SE pt 5 ac | Release of part of 29574 |
| B&S | 8 April 1878 | Margaret L Potts & Husband | Jane Adam Walsh | SE corner 5 ac | |
| Bond | 10 Oct 1884 | John C. Schemild | Charles Schemild<br><br>John Allgeo | parts | |
| Quitclaim | 17 Dec 1885 | Charles Shemild | Joseph H. Johnson | NE pt 95 ac less 5 ac pt al | |
| Deed | 27 Feb 1886 | Real Rep Co. of Norfolk | Joseph H. Johnson | N.E. pt 95 ac Less 5 ac West of Cent of pt | |
| B&S | 5 Jan 1887 | Joseph H. Johnson & Wife | Jacob L. Sherk | NE pt 95 ac Less 5 ac S.E. Cn. Land N of Road | |
| B&S | 27 Sept 1887 | Abram Shively and wife<br><br>and<br><br>Joseph Shively and wife | Thomas Hart | NW pt of E pt 2 95/100 ac | |

| | | | | | |
|---|---|---|---|---|---|
| Agreement | 7 Aug 1888 | Joseph H. Johnson | Prudence P. Shemild | do.do.do | |
| Deed | 1 Nov 1889 | Jacob L. Sherk and Wife | Thomas S. Schram | E pt less 20 ac E pt and pt N of Road | |
| Release of Dower | 21 July 1890 | Eliza Walsh and mom | William T. Hydd | SE Corner 5 ac | |
| Deed | 24 July 1890 | Jane Adams Walsh (Widow) | William T. Hydd | do. | |
| Deed | 20 Jan 1890 | Thomas S. Schram and wife | Jacob L. Sherk | As in 73081 | |
| Deed | 11 May 1897 | William T. Hydd and Wife | Mem. Corporation of the Town of Simcoe | 5 ac SE Cor. | See reservation |

### 1.2.4 REVIEW OF NINETEENTH AND TWENTIETH CENTURY HISTORIC MAPS

A review of the 1856 *Tremaine Map of the County of Norfolk* (Map 3) indicates that the owner of this lot was C. Schemeld, but no structures are shown to be within the study area. One structure and an orchard are shown to be within the study area. This map also illustrates an unnamed a settlement road adjacent to the study area to the north. This road is the current West Street.

A review of the 1877 *Illustrated Historical Atlas of the County of Norfolk* (Map 4) indicates that the owner of this lot was Charles Shemeld *(sic)*, but no structures are shown to be within the study area. One structure and an orchard are shown to be within the study area. This map also illustrates an unnamed a settlement road adjacent to the study area to the north. This road is the current West Street.

A review of the 1909 historic topographic mapping (see Map 5) indicates that there were three historic residences adjacent to the northern and northeastern sides of the study area, while the town of Simcoe is depicted east of the study area. A settlement road is depicted along the northern edge of the study area, which is the current West Street. A stream is also depicted north of the study area, which is the current Spring Creek.

A review of the 1939 historic topographic mapping (see Map 6) also indicates that there were three historic residences adjacent to the northern and northeastern sides of the study area, while the town of Simcoe is depicted east of the study area. A settlement road is depicted along the northern edge of the study area, which is the current West Street. A stream is also depicted north of the study area, which is the current Spring Creek.

### 1.2.5 Summary of Historical Context

The study area has a history of land use by Euro-Canadians beginning in the last decade of the eighteenth century when the County of Norfolk was established. The land that comprises the study area was originally granted to John Smith in 1802.

### 1.2.6 REVIEW OF HISTORIC ARCHAEOLOGICAL POTENTIAL

Background research indicates that the study area is situated within an area that was close to a historic transportation route during the nineteenth century. Background research also indicates that the study area was situated near a natural source of potable water in the past. Therefore, the study area exhibits the potential to encounter both 19th century historic archaeological resources and Indigenous archaeological resources, depending on the degree and extent of more recent land disturbances.

## 1.3 ARCHAEOLOGICAL CONTEXT

### 1.3.1 REGISTERED ARCHAEOLOGICAL SITES

The Ontario Archaeological Sites Database administered by the MCM indicates that there are three (3) previously documented sites within 1 kilometre of the subject property. Of these sites, all three (3) are pre-contact Indigenous sites. No sites (0) are within 300m of the subject property and no sites (0) are within 50m of the subject property. Therefore, they have no impact on the determination of archaeological potential for further archaeological resources related to Pre-contact activity and occupation with respect to the archaeological assessment of the study area.

All of the archaeological sites within 1km of the subject property are listed in Table 3 below.

TABLE 3 REGISTERED ARCHAEOLOGICAL SITES WITHIN 1KM

| Borden # | Site Name | Time Period | Affinity | Site Type | Current Development Review Status |
|---|---|---|---|---|---|
| AfHb-135 | | Archaic, Middle | | hunting, hunting loss | No Further CHVI |
| AfHb-108 | Chanyi Pit #2 Property | Pre-Contact | Aboriginal | | |
| AeHb-124 | P1 | Pre-Contact | | scatter | Further CHVI |

### 1.3.2 PREVIOUS ARCHAEOLOGICAL ASSESSMENTS

Background research indicates that one (1) archaeological assessment has been conducted within 50 metres of the subject property, and on part of the subject property. This assessment is summarized below.

#### 1.3.2.1 AMICK CONSULTANTS LTD. (2013)

In 2013, AMICK Consultants Ltd. conducted a Stage 1-2 Archaeological Property Assessment of part of the subject property and the adjacent parcels. The findings of this assessment are summarized below.

> *This report describes the results of the 2013 Stage 1-2 Archaeological Assessment of Westwood Trail Thomson Rd., Lot 18, Gore (Geographic Township of Woodhouse), City of Simcoe, County of Norfolk, conducted by AMICK Consultants Limited. This study was conducted under Archaeological Consulting License #P384 issued to MSc by the Minister of Tourism, Culture and Sport for the Province of Ontario. This assessment was undertaken as a requirement under the Planning Act (RSO 1990b) in order to support a Draft Plan of Subdivision application and companion Zoning By-law Amendment application as part of the pre-submission process. All work was conducted in conformity with Ontario Ministry of Tourism and Culture (MTC) Standards and Guidelines for Consultant Archaeologists (MTC 2011), the Ontario Heritage Act (RSO 1990a), and the Ontario Heritage Amendment Act (SO 2005).*
>
> *AMICK Consultants Limited was engaged by the proponent to undertake a Stage 1-2 Archaeological Assessment of lands potentially affected by the proposed undertaking and was*

*granted permission to carry out archaeological work on 09 April 2013. The entirety of the study area was subject to reconnaissance, photographic documentation and physical assessment on 29 April and 1 May 2013, consisting of high-intensity test pit survey at an interval of five metres between individual test pits. All records, documentation, field notes, photographs and artifacts (as applicable) related to the conduct and findings of these investigations are held at the Lakelands District corporate offices of AMICK Consultants Limited until such time that they can be transferred to an agency or institution approved by the Ontario Ministry of Tourism, Culture and Sport (MTCS) on behalf of the government and citizens of Ontario.*

*As a result of the physical assessment of the study area, no archaeological resources were encountered. Consequently, it is recommended no further archaeological assessment of the property is required.*

(AMICK 2013)

### 1.3.3 PHYSIOGRAPHIC REGION

The study area is within the Norfolk sand plain; this is a wedge shaped area with a broad, curved base along the shore of Lake Erie and tapers northward to a point at Brantford on the Grand River. The plain declines southward from about 850 feet to the level of Lake Erie (572 feet) or in the west to the top of the shore cliff 100 feet or more above the lake. In good-sized sections of the plain the slope is only a foot or two to the mile, while a noticeable break in the slope occurs five to ten miles from the shore of Lake Erie. The sands and silts of this region were deposited as a delta in glacial Lakes Whittlesey and Warren. The drainage is through small rivers flowing directly to Lake Erie, except in a small area in the north, which is tributary to the Grand River (Chapman and Putnam 1984: 153-156).

### 1.3.4 LITHIC SOURCES

The closest known chert formation to the study area is the Bois Blanc limestone formation which is located approximately 7 kilometers to the northeast. Bois Blanc chert is a member of the Early Devonian Bois Blanc Formation and occurs in thin beds or nodules located in several areas in the vicinity of Hagersville, Innerkip and Fort Erie Ontario (Eley and von Bitter 1989:29). This material is characterized by a diversity of texture, colour, and composition (Eley and von Bitter 1989:19), ranging from light to dark grey, grey blue, or brown and sometimes exhibit mottling (Eley and von Bitter 1989:19). Types of chert within the Bois Blanc formation include Haldimand, Colbourne, and Saugeen (Armstrong 2018: 64). Bois Blanc and Onondaga cherts share similarities in their colours and since this study relied on macroscopic analysis of lithic materials, there may be an error in representative chert frequencies.

### 1.3.5 HISTORIC PLAQUES

There are no relevant plaques associated with the study area, which would suggest an activity or occupation within, or near, the study area that may indicate potential for associated archaeological resources of significant CHVI.

### 1.3.6 REGIONAL ARCHAEOLOGICAL POTENTIAL MODELLING

The study area is situated in an area not yet subject to an archaeological management plan. Nonetheless, the County of Norfolk has developed policies within its Official Plan to identify, conserve, and manage archaeological resources. These policies discourage the disturbance of known archaeological sites and areas of archaeological potential, promoting the mapping of such resources to inform development decisions. (Norfolk County 2023). Additionally, the Official Plan states that the county may begin the process of collaboration with Indigenous communities to prepare an Archaeological Management Plan (AMP) that identifies and maps known archaeological sites and areas of potential, outlining strategies for their conservation. (Norfolk County 2023).

### 1.3.7 EXISTING CONDITIONS

The subject property is approximately 8.90 ha in size. It is bounded on the east by forest and existing residential development, on the north by West Street, and the south and west by existing agricultural lands. Based on aerial satellite imagery, the study area is approximately 8.90 hectares includes within it areas of mixed forest, small clearings and existing walking trails.

# 2.0 PROPERTY INSPECTION

A property inspection or field reconnaissance is not required as part of a Stage 1 Background Study unless there is reason to believe that portions of the study area may be excluded from physical assessment on the basis of the conditions of the property or portions thereof and it is desired by the proponent to formally exclude any such areas from a Stage 2 Property Assessment. As this study was undertaken during winter conditions, a Stage 1 Property Inspection was not viable. Therefore, no part of the study area may be excluded from the Stage 2 Property Assessment. The Stage 1 Property Inspection will have to be undertaken concurrently with the Stage 2 Property Assessment.

## 2.1 AREAS OF NO ARCHAEOLOGICAL POTENTIAL

In accordance with Section 2.1, Standard 2b of the *Standards and Guidelines for Consultant Archaeologists* (2011), areas where existing disturbances are considered to be too deep and/or extensive to warrant further survey do not retain any archaeological potential and, therefore, are not required physical assessment. Based on aerial satellite imagery, the study area exhibits areas that do not retain archaeological potential. The study area contains areas of surface disturbance from the creation of walking trails and parking areas, as well as a low-lying wet area. However, these conditions will have to be confirmed following a property inspection by a licenced archaeologist.

# 3.0 ANALYSIS AND CONCLUSIONS

Apex Archaeology Inc. (AAI) was contracted by Westwood Trail Developments Inc. to undertake a Stage 1 Archaeological Background Study of 506 West Street, Part of Lot 18, Gore Concession (Geographic Township of Woodhouse), City of Simcoe, County of Norfolk, Ontario. The entirety of the study area is approximately 8.90 hectares (ha) in size and includes within it areas of mixed forest, small clearings and existing walking trails. AAI was granted permission to carry out all activities necessary to complete the archaeological background study.

The Stage 1 Archaeological Background Study considered 19th and 20th century settlement trends, proximity of previously registered archaeological sites and the original environmental setting of the study area. Research was supplemented by existing documentation and historical records pertaining to the study area. The Stage 1 Archaeological Background Study also included a property inspection of the study area to document and confirm the existing property conditions.

## 3.1 CHARACTERISTICS INDICATING ARCHAEOLOGICAL POTENTIAL

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

1) Previously Identified Archaeological Sites

2) Water Sources
    a. Primary Water Sources (lakes, rivers, streams, creeks)
    b. Secondary Water Sources (intermittent streams and creeks, springs, marshes, swamps)
    c. Features Indicating Past Water Sources (e.g., glacial lake shorelines indicated by the presence of raised sand or gravel beach ridges, relic river or stream channels indicated by clear dip or swale in the topography, shorelines of drained lakes or marshes, cobble beaches)
    d. Accessible or Inaccessible shoreline (e.g., high bluffs, swamp or marsh fields by the edge of a lake, sandbars stretching into marsh)

3) Elevated Topography (e.g., eskers, drumlins, large knolls, and plateaux)

4) Pockets of Well-drained Sandy Soil, especially near areas of heavy soil or rocky ground

5) Distinctive Land Formations that might have been special or spiritual places, such as waterfalls, rock outcrops, caverns, mounds, and promontories and their bases. There may be physical indicators of their use, such as burials, structures, offerings, rock paintings or carvings.

6) Resource Areas, including:
    a. food or medicinal plants (e.g., migratory routes, spawning areas, and prairie)
    b. scarce raw materials (e.g., quartz, copper, ochre or outcrops of chert)
    c. Early Euro-Canadian industry (e.g., fur trade, logging, prospecting, and mining)

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

8) Early Historical Transportation Routes (e.g., trails, passes, roads, railways, portage routes)

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

10) Property that local histories or informants have identified with possible archaeological sites, historical events, activities, or occupations

The study area is situated 250 metres south of Kent Creek which is a primary water source. The study area is situated within 100m of an early settlement road that appears on the historic atlas maps of 1856 and 1877. This historic road corresponds to the road presently known as West Street which is directly adjacent to the study area on its northern edge.

Consequently, the study area exhibits potential for both Pre-contact Indigenous and historic Euro-Canadian archaeological resources.

## 3.2 FEATURES INDICATING THAT ARCHAEOLOGICAL POTENTIAL HAS BEEN REMOVED ('DISTURBED')

Section 1.3.2 of the Standards and Guidelines for Consultant Archaeologists specifies the property characteristics which indicate no archaeological potential or for which archaeological potential has been removed (MTC 2011). These characteristics include:

1) Quarrying

2) Major Landscaping Involving Grading Below Topsoil

3) Building Footprints

4) Sewage and Infrastructure Development

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

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

Based on aerial satellite imagery, the study area contains areas of surface disturbance from the creation of walking trails and parking areas. However, this will have to be confirmed following a property inspection by a licenced archaeologist.

## 4.0 RECOMMENDATIONS

The study area has been identified as a property that exhibits potential to yield archaeological deposits of Cultural Heritage Value or Interest (CHVI). Consequently, the objectives of the Stage 1 Background Study have been met and, in accordance with the results of this investigation, the following recommendations are made:

1. *Portions of the study area exhibit potential for archaeological resources, and a Stage 2 Archaeological Assessment is recommended (see Map 7).*
2. *The areas that exhibit potential for archaeological resources should be subject to test pit survey at 5m intervals (see Map 7).*
3. *A Property Inspection must be conducted concurrently with the Stage 2 Archaeological Assessment to confirm the current conditions within the study area.*
4. *No soil disturbances or removal of vegetation shall take place within the study area prior to the MCM acceptance of a report into the Provincial Registry of Archaeological Reports that recommends all archaeological concerns for the proposed undertaking have been addressed and no further archaeological investigations are required.*

## 5.0 ADVICE ON COMPLIANCE WITH LEGISLATION

Advice on compliance with legislation is not part of the archaeological record. However, for the benefit of the proponent and approval authority in the and use planning and development process, the report must include the following standard statements:

a. *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 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 licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed archaeological fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeological Reports referred to in Section 65.1 of the Ontario Heritage Act.*

c. *Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the Ontario Heritage Act. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed archaeologist to carry out archaeological fieldwork, in compliance with sec. 48 (1) of the Ontario Heritage Act.*

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

e. *Archaeological sites recommended for further archaeological fieldwork or protection remain subject to Section 48 (1) of the Ontario Heritage Act and may not be altered, or have artifacts removed from them, except by a person holding an archaeological licence.*

## 6.0 REFERENCES

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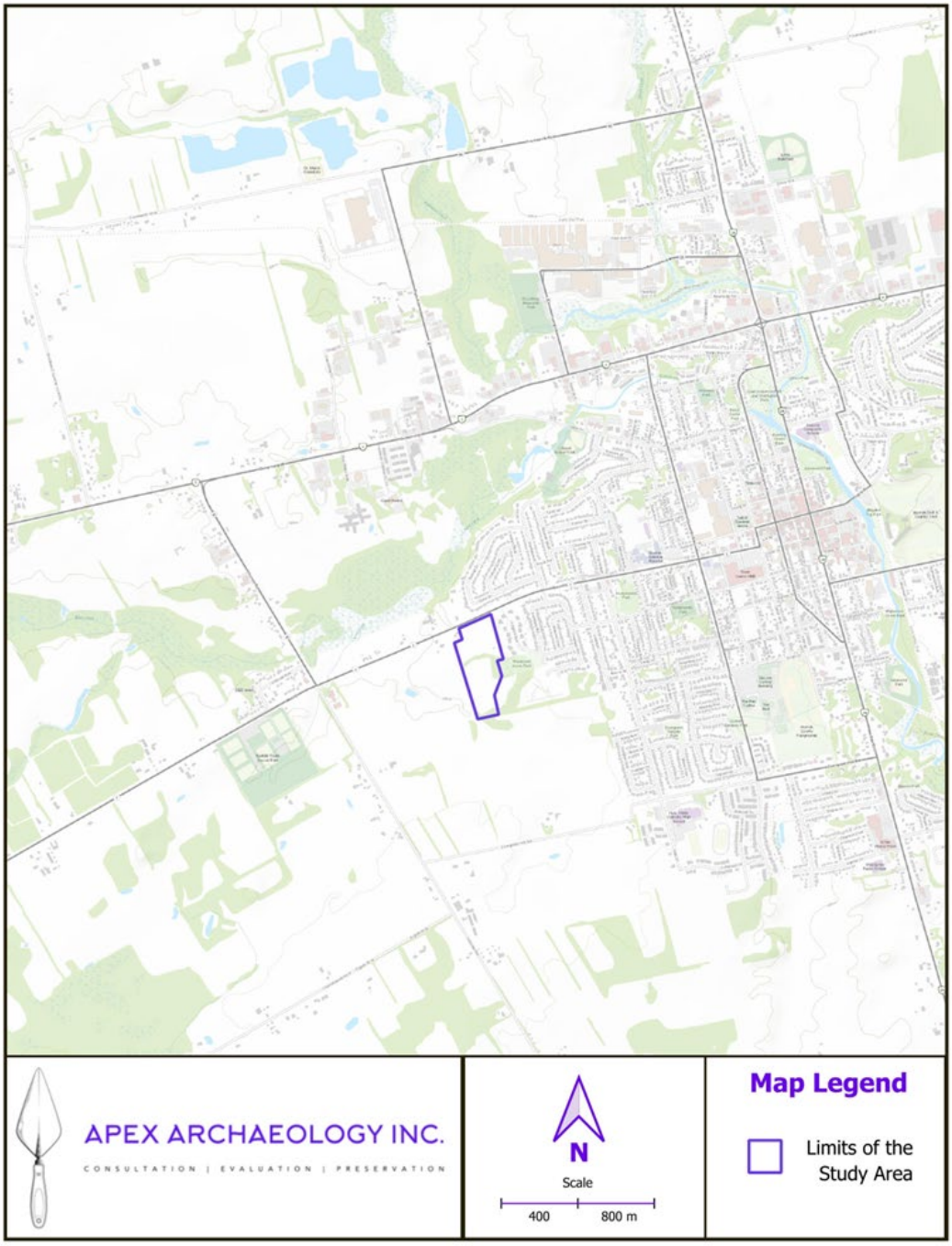
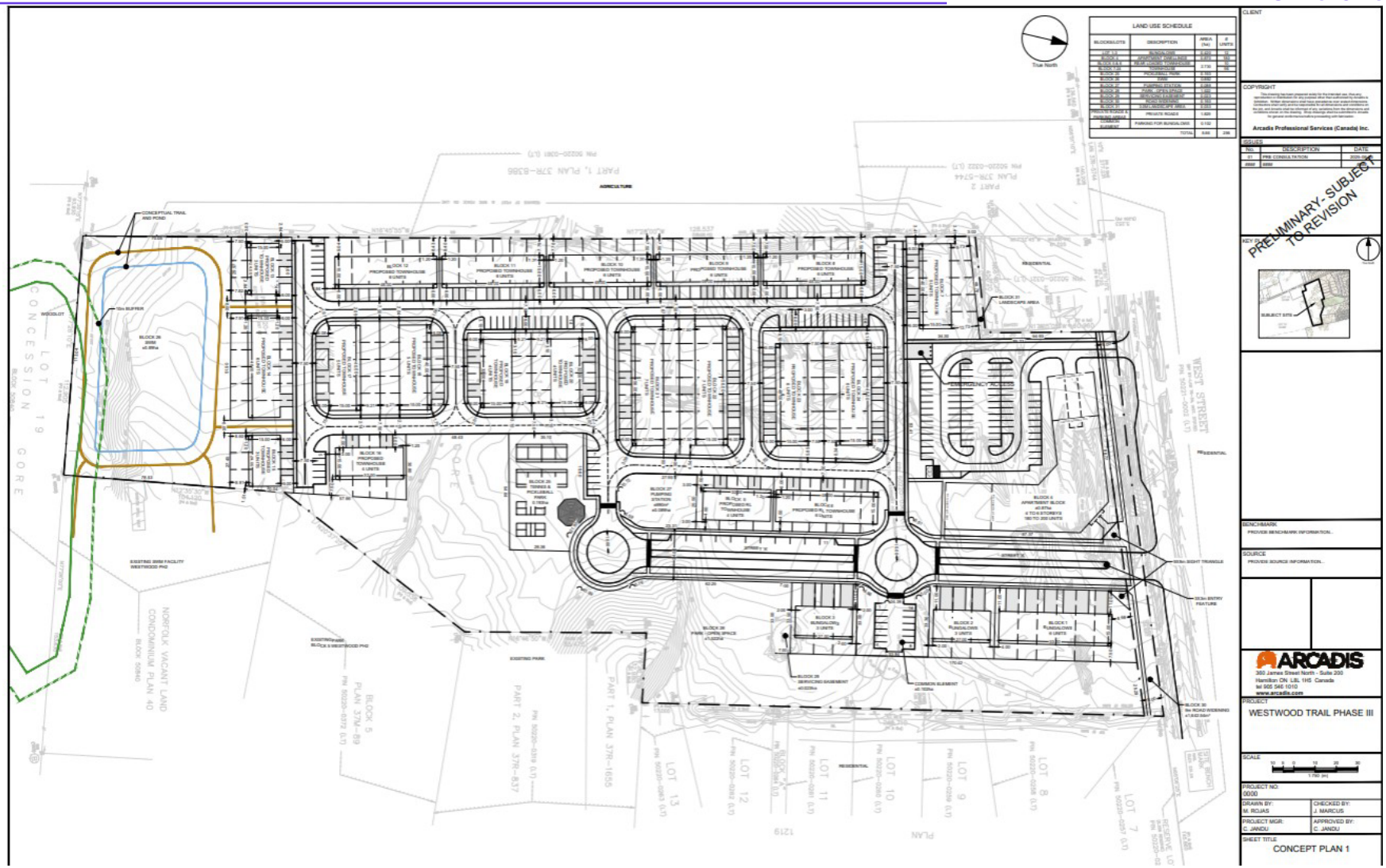
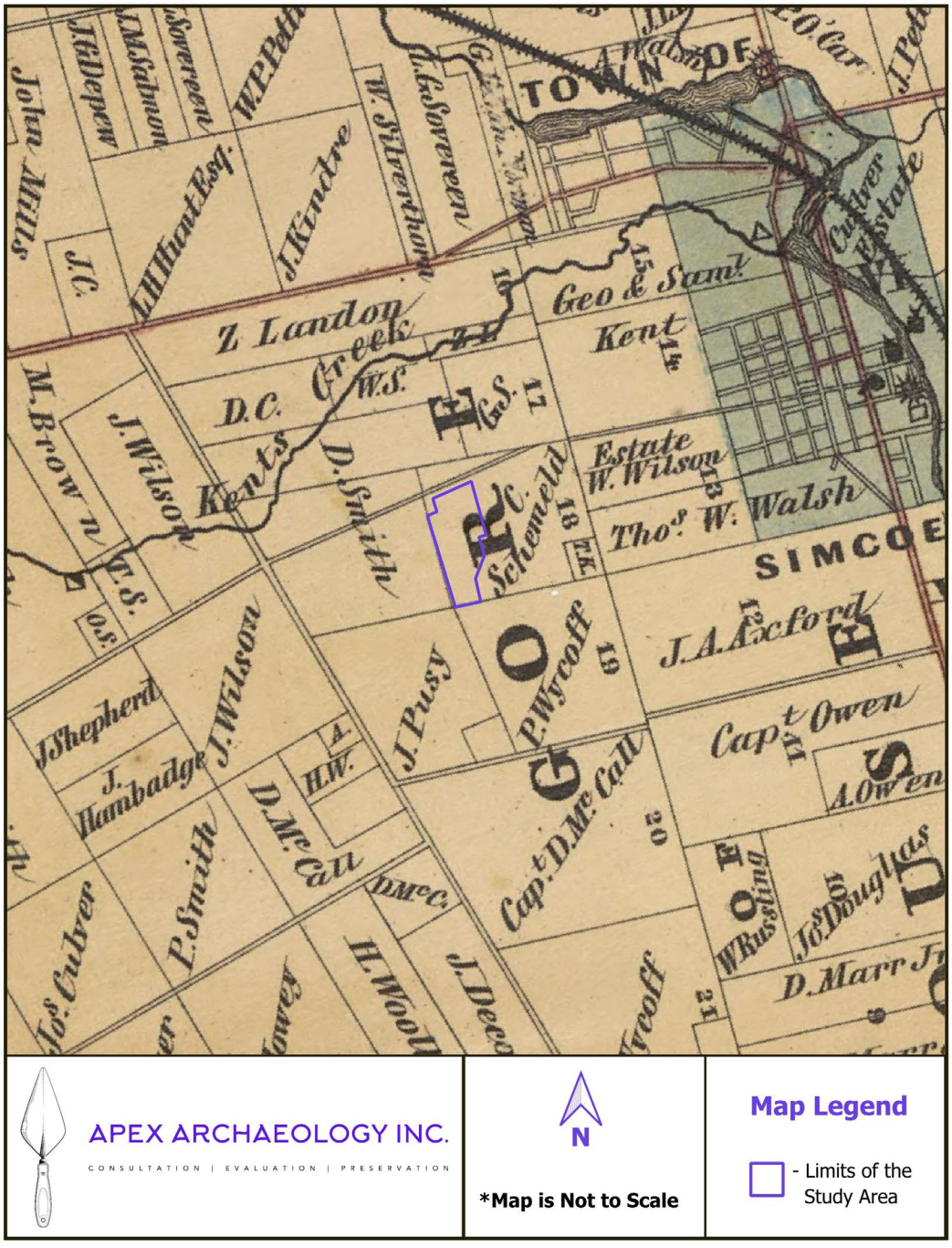
# 7.0 MAPS



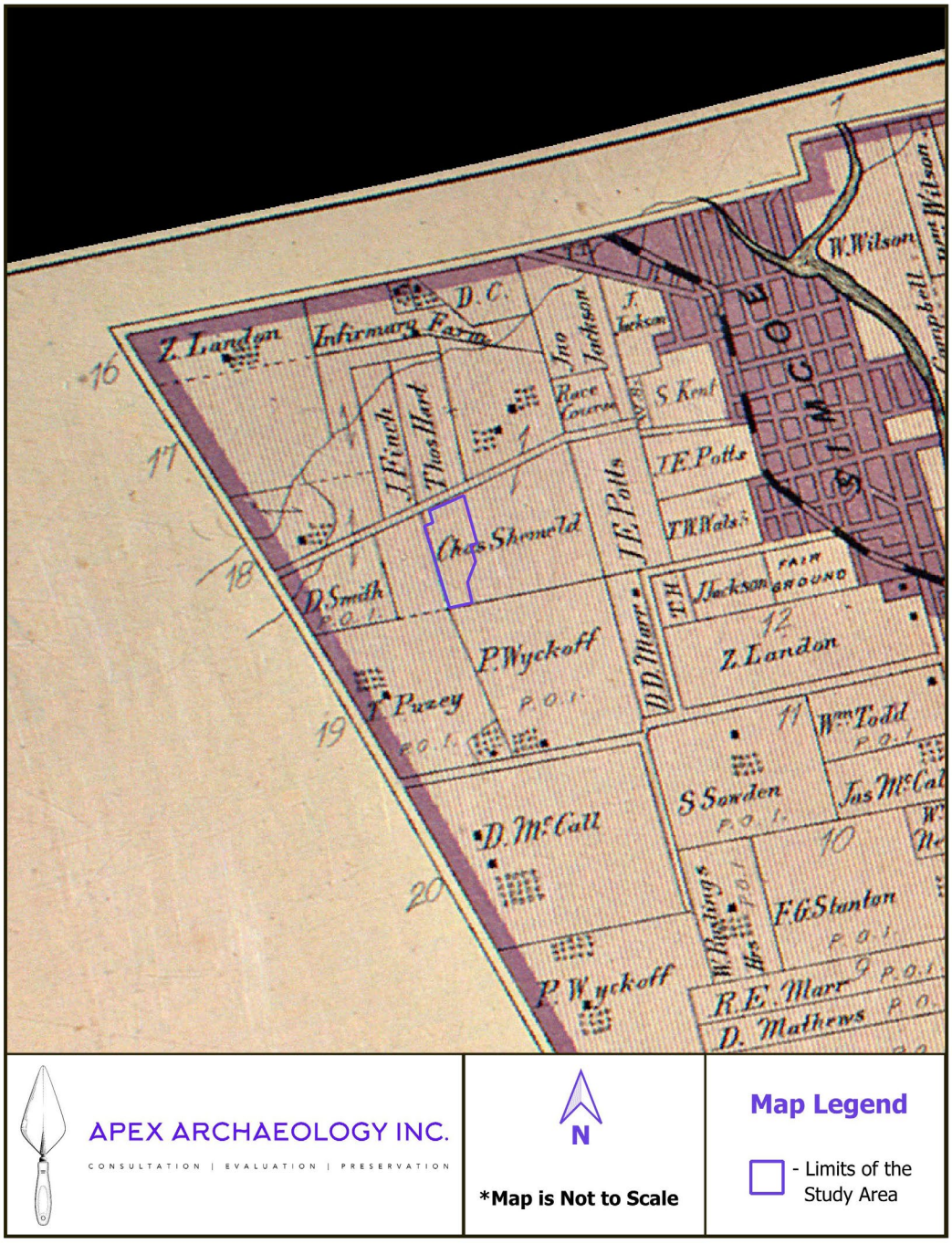

MAP 1 LOCATION OF THE STUDY AREA (ESRI 2022)



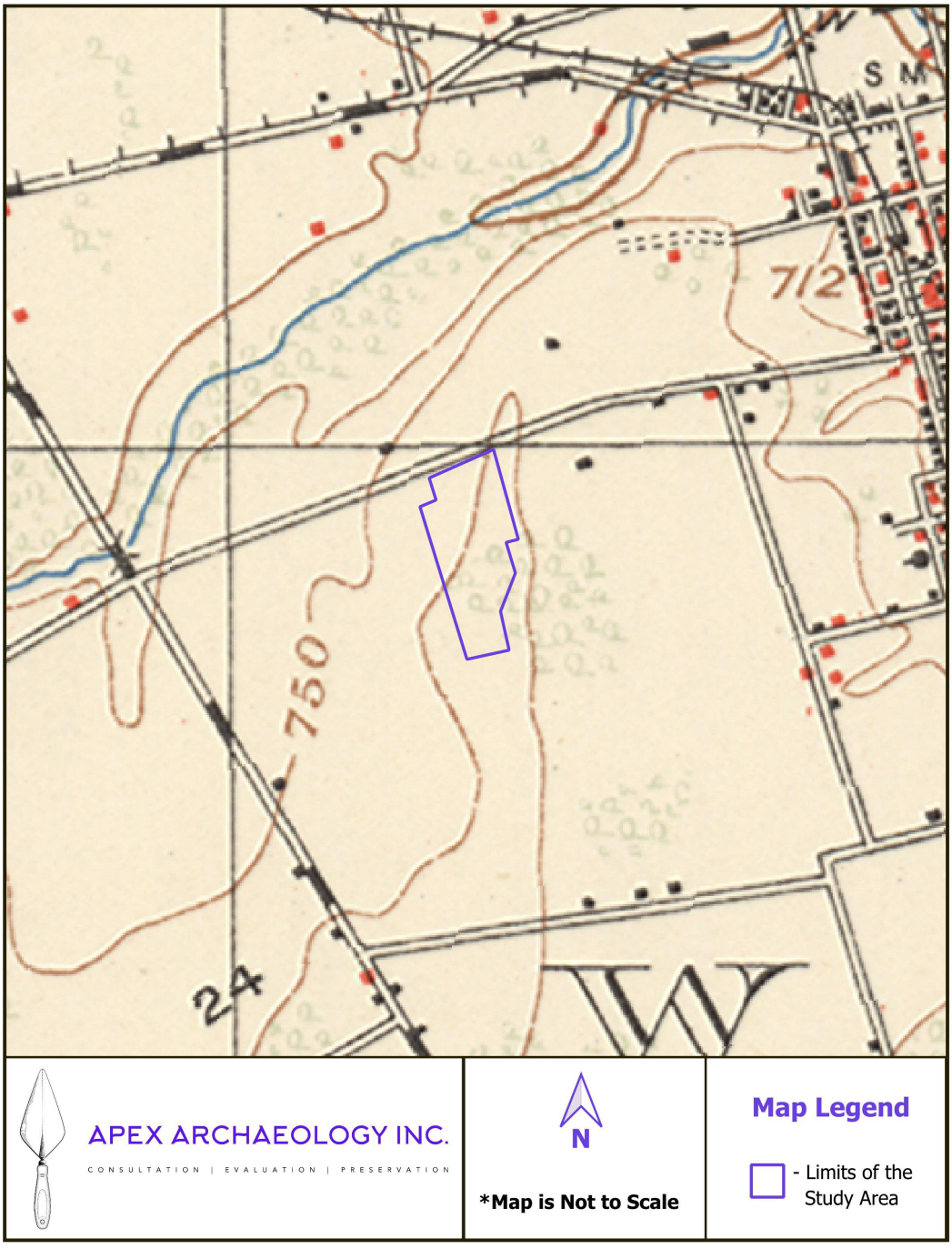

MAP 2 SITE PLAN (ARCADIS PROFESSIONAL SERVICES INC. 2024)




MAP 3 FACSIMILE SEGMENT OF TREMAINE'S MAP OF THE COUNTY OF NORFOLK (TREMAINE 1856)

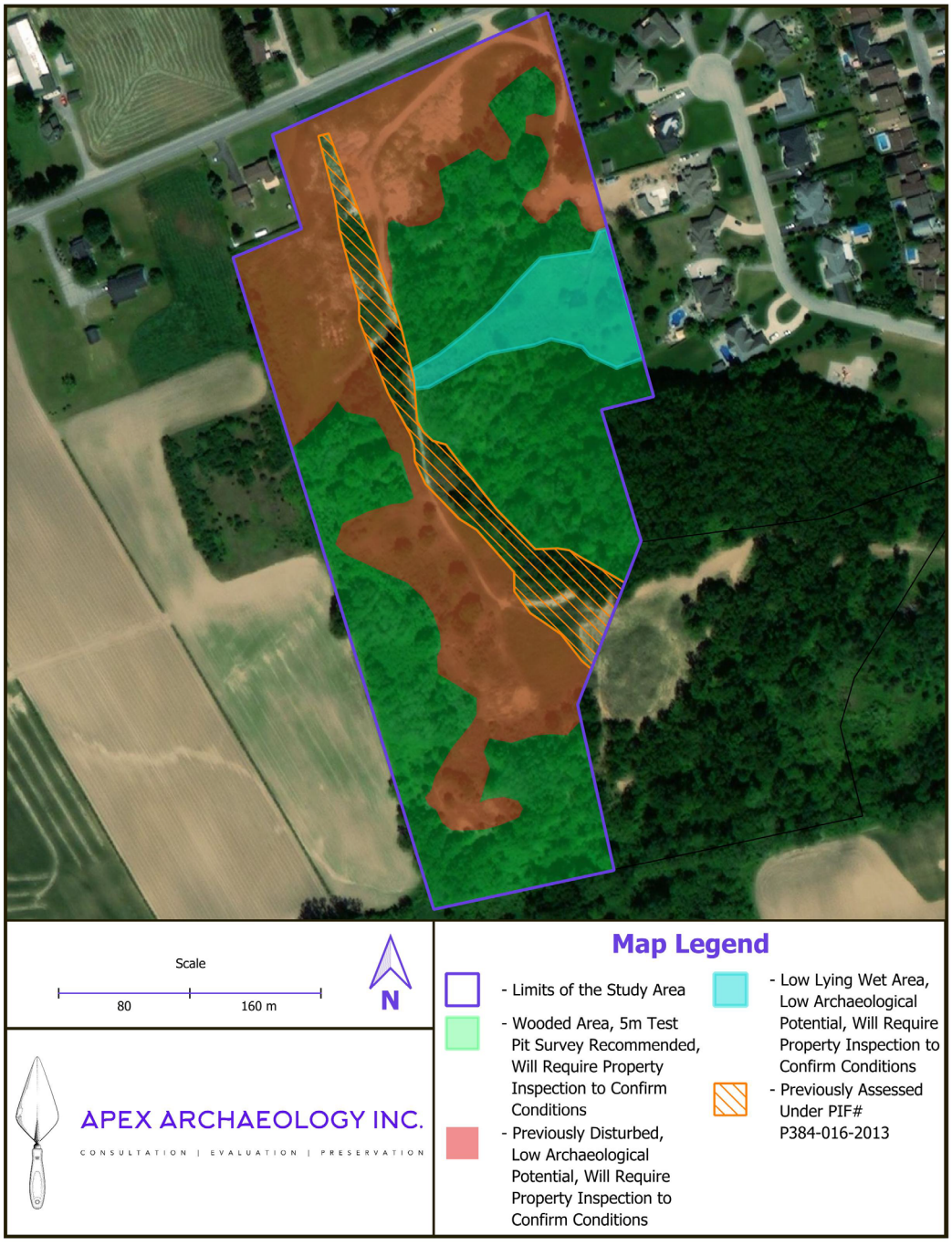



MAP 4 FACSIMILE SEGMENT OF THE HISTORIC ATLAS MAP OF THE TOWNSHIP OF WOODHOUSE (H.R. PAGE & CO. 1877)

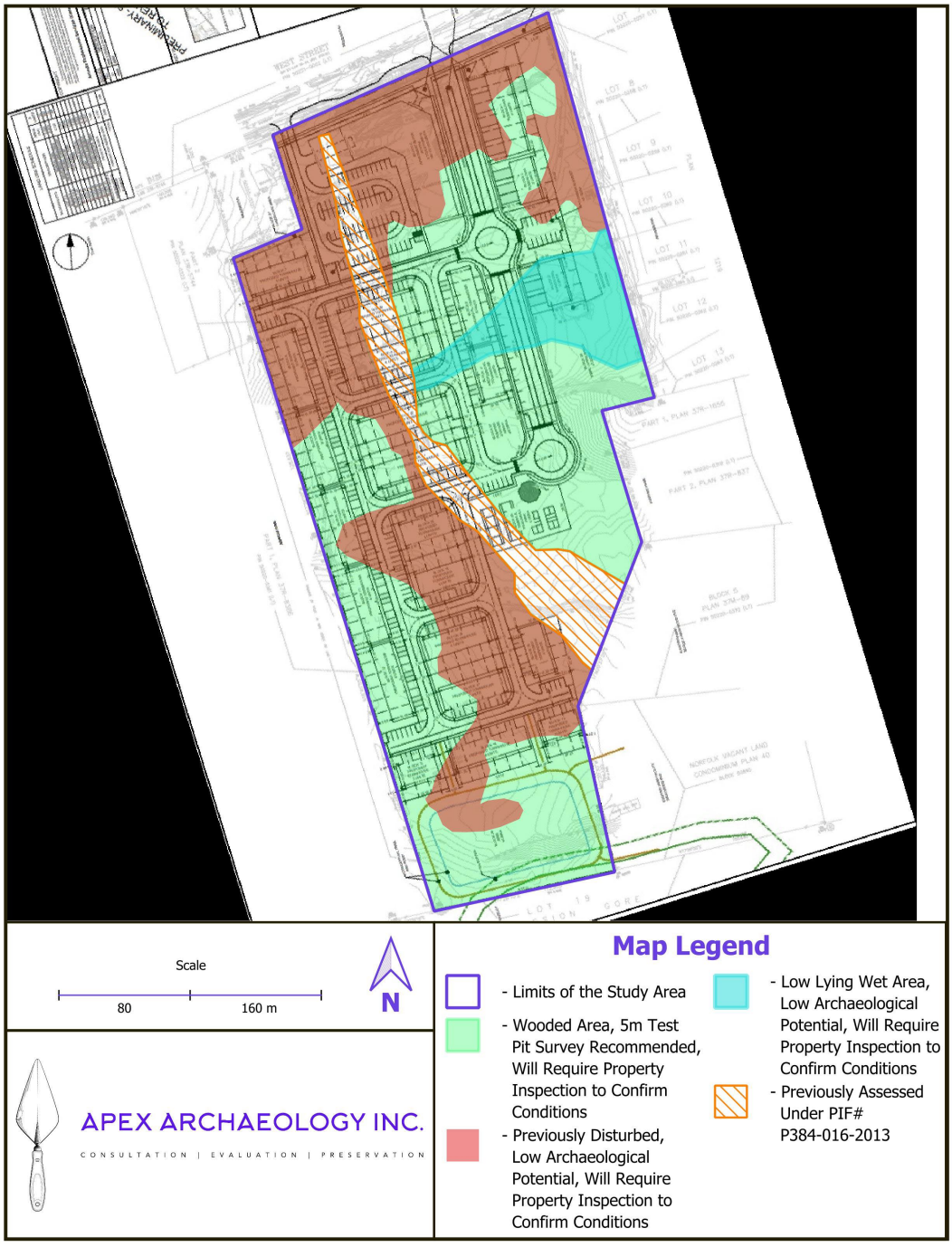



MAP 5 1909 DEPARTMENT OF NATIONAL DEFENCE TOPOGRAPHIC MAP

MAP 6 1939 DEPARTMENT OF NATIONAL DEFENCE TOPOGRAPHIC MAP




MAP 7 AERIAL PHOTO OF THE STUDY AREA (ESRI 2017)




MAP 8 DETAILED PLAN OF THE STUDY AREA

# Westwood Subdivision Phase 3, Simcoe

Environmental Impact Study

Prepared for:

Westwood Trail Developments Inc.
222 Deer Ridge Drive
Kitchener, Ontario  N28 2KS

Project No. 3616 | May 2026

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

**Westwood Subdivision Phase 3, Simcoe**

**Environmental Impact Study**

## Project Team

| | |
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Report submitted on May 1, 2026

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## 1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained by Westwood Trail Developments Inc. to complete an Environmental Impact Study (EIS) associated with the planned development of Phase 3 of the Westwood residential subdivision in Simcoe, Ontario. See Map 1 for the subject property location.

The subject property is currently vacant and contains a mix of more mature and relatively younger natural feature cover, including forest, cultural woodland, and open cultural meadow communities. The areas of more recent re-naturalization have established in areas that were historically cleared for the purposes of a tobacco farm. Portions of the subject property have also experienced anthropogenic disturbance. This includes soil stripping to provide fill for construction of the earlier subdivision phase to the east, and stockpiling of soils, stones and mulch on the property. The far north end of the subject property was previously cleared of vegetation and was used as a staging area as part of adjacent sewer installation and road reconstruction work undertaken by Norfolk County (M. McArthur, Westwood Trail Developments, pers. comm., September 2025).

A portion of woodland on and adjacent to the subject property is identified on Schedule C-4 of the Norfolk County Official Plan (OP) (2025) as Significant Woodland. Significant Woodlands represent a type of County Natural Heritage Feature as described in Section 3.5.2 of the OP. The subject property may also provide Significant Wildlife Habitat (SWH), which is also considered to represent a form of Natural Heritage Feature. The subject property may provide habitat for Endangered and Threatened species, which represents a form of Provincially Significant Feature in the OP. An EIS is therefore required to demonstrate that the proposed development will not negatively impact the form or ecological functions of County Natural Heritage Features or Provincially Significant Features.

The subject property does not contain hazard lands that are regulated by the Long Point Region Conservation Authority (LPRCA). However, as described below, NRSI biologists identified the presence of previously unmapped swamp and meadow marsh communities within the subject property. It is NRSI's understanding that these wetland features arose as a result of an unmaintained municipal drainage system that exists on the property, including two ditch inlet structures that convey water off-site to the west (J. Ariens, pers. comm., August 2025). Consequently, these wetlands are understood to have relatively recent anthropogenic origins.

For the purposes of this EIS, the “study area” is considered the subject property plus adjacent lands within 120m as shown on Map 1. The study area includes the entirety of the natural features that fall inside, or within 120m, of the subject property.

This report summarizes background information on natural heritage features, as well as results of field surveys completed within the subject property. This information was used to identify and delineate natural environment development constraints based on significance and sensitivity of the features, to inform the design of the development. An impact assessment has been completed based on the comparison of the existing natural features to the grading and site plan details as prepared by MTE Consulting Inc. and Arcadis Professional Services (Canada) Inc. Recommendations have been provided to avoid, or otherwise suitably mitigate impacts to the existing natural features.

## 2.0 Project Scoping

### 2.1 Background Information Review

In order to determine a study approach for the EIS, existing natural heritage information was first gathered and reviewed to identify key natural heritage features and species that are known or have potential to occur within the study area.

Background information on the natural environment features within the study area vicinity (within up to 10km) was also gathered from the Ministry of Natural Resources (MNR) Natural Heritage Information Centre (NHIC) online database of provincially-tracked species (MNR 2025), the MNR's Land Information Ontario mapping, and relevant taxa-specific databases, as listed below.

Initial wildlife species lists were compiled to provide information on species reported from the vicinity of the study area (within a 10x10km survey square (17NH54) containing the subject property) using various atlases including the Ontario Mammal Atlas (Dobbyn 1994), the Ontario Breeding Bird Atlas (BSC et al. 2008), the Ontario Reptile and Amphibian Atlas (ORAA) (Ontario Nature 2019), the Ontario Butterfly Atlas (Macnaughton et al. 2025), and the Ontario Odonata Atlas Database (OOAD 2023).

Other information sources that were reviewed to inform project scoping included the following:

- Norfolk County Official Plan (2025);
- *Fernwood Drive, Town of Simcoe Environmental Impact Study* (Dillon Consulting 2018);
- eBird (eBird 2025); and,
- iNaturalist (iNaturalist 2025).

### 2.2 Significant Species and Habitat Screening

Species at Risk (SAR) are those listed on the Protected Species in Ontario List (MECP 2026). These include species identified by the Committee on the Status of Species at Risk in Ontario (COSSARO) as provincially Endangered or Threatened. Species listed as Endangered or Threatened are protected under the *Species Conservation Act* (SCA), which includes protection of their habitat. SAR also include those species that are listed under Schedule 1 of the federal *Species at Risk Act* (SARA) (Government of Canada 2026). Since the study area does not include federal lands, only migratory birds and aquatic species that are listed under Schedule 1 of the SARA receive protection within the study area. For the purposes of this report, the term

"SAR" will refer to provincially or federally Threatened and Endangered species regulated under the SCA or SARA.

Based on NRSI's examination of background sources and federally or provincially significant species with occurrence records in the study area vicinity (within 10km), an assessment of SAR and SCC suitable habitat presence within the study area was completed. Assessments of habitat suitability in the study area were made by cross-referencing each species' known habitat preferences or requirements (e.g., MNR 2000) with habitat availability based on satellite imagery interpretation, background information sources (e.g., Dillon Consulting 2018) and available mapping. See Section 5.3 for the results of the SAR assessment that was completed, incorporating the results of background information review and field surveys.

The NHIC was consulted to request additional information about two restricted species records that were identified for the vicinity of the study area through review of NHIC provincially-tracked species records (MNR 2025). The restricted species records correspond to a herpetofauna species and a vegetation species. Due to the sensitivity of the records, the specific species are not identified here. The restricted herpetofauna species was already identified through Ontario Nature (2019) records as having occurrence records within the 10x10km atlas square containing the study area and is already represented in the SAR/SCC screening through this background information source. The restricted vegetation species derives from a historic record (>70 years) and the record location has a "high uncertainty distance" (>10km) (C. Morphy, NHIC, pers. comm., September 2025). However, it is included in the SAR/SCC screening (specific species not identified) since suitable habitat for the species may occur within the study area.

A preliminary screening for the presence of SWH was also completed for the study area. The Significant Wildlife Habitat Technical Guide (SWHTG) outlines the types of habitats that the MNR considers significant in Ontario as well as criteria to identify these habitats for Ecoregion 6E, in which the study area is located (MNR 2000, MNRF 2015). The SWHTG groups SWH into four broad categories: seasonal concentration areas, rare vegetation communities and specialized wildlife habitat, habitats of Species of Conservation Concern (SCC), and animal movement corridors.

The definition of SCC includes the following:

- species that are listed as Special Concern in Ontario by COSSARO,

- species that have been assigned a conservation status (S-Rank) of S1 to S3 or SH by the Natural Heritage Information Centre (MNRF 2021), and
- species that are designated federally as Threatened or Endangered by the Committee for the Status of Endangered Wildlife in Canada (COSEWIC) but not provincially by the COSSARO. These species may be protected by the federal SARA if they are listed as Threatened or Endangered on Schedule 1 of the SARA.

Habitat for SCC is considered Significant Wildlife Habitat (SWH) (MNR 2010), which is afforded protection under the Provincial Planning Statement (MMAH 2024) and municipal natural heritage protection policies.

See Section 5.4 for the results of the SWH assessment that was completed, incorporating the results of background information review and field surveys.

## 2.3 Relevant Policies, Legislation and Planning Studies

Table 1 provides an overview of natural heritage-based policies, regulations and legislation that were considered and informed the EIS. To help inform suitable land-use concepts, guide the layout of development, and identify areas to be protected, inventoried natural features were evaluated against relevant policies, regulations and legislation outlined in the following sections. The specific implications of these policies to the proposed development are discussed in further in Section 5.0.

**Table 1. Relevant Policies, Legislation and Regulations**

| Policy/Legislation | Description | Project Relevance |
|---|---|---|
| Provincial Planning Statement (MMAH 2024). | • Issued under the authority of Section 3 of the Planning Act and came into effect on October 20, 2024, replacing the 2020 Provincial Policy Statement.<br>• Section 4.1 of the PPS – Natural Heritage establishes clear direction on the adoption of an ecosystem approach and the protection of resources that have been identified as 'significant'.<br>• The Natural Heritage Reference Manual (MNR 2010) and the Significant Wildlife Habitat Technical Guide (MNR 2000, MNRF 2015) were prepared by the MNR to provide guidance on identifying natural features and in interpreting the Natural Heritage sections of the PPS. | • Natural features that occur or may occur within the study area, and which receive protection under the PPS, include:<br>o Significant Woodland,<br>o Potential Significant Wildlife Habitat, and<br>o Potential habitat for Endangered and Threatened species.<br>• Section 4.1.5 of the PPS states that development or site alteration shall not be permitted in Significant Woodlands or Significant Wildlife Habitat unless it has been demonstrated that there will be no negative impacts on the features or their ecological functions.<br>• Section 4.1.8 of the PPS states that development and site alteration shall not be permitted on adjacent lands to the natural features described above unless it is demonstrated that there will be no negative impacts to the natural features or their ecological functions.<br>• Section 4.1.7 of the PPS states that development or site alteration shall not be permitted in habitat of Endangered or Threatened species except in accordance with provincial or federal requirements.<br>• Section 4.1.2 of the PPS states that the connectivity of natural features in an area should be maintained, restored, or where possible, improved. |
| *Species Conservation Act* | • The SCA came into force in April 2026, replacing the earlier Endangered Species Act<br>• The SCA prohibits killing or harming of SAR and protects their defined habitats from damage and destruction.<br>• Species that are subject to protections under the SCA are listed in the Protected Species in Ontario list (Ontario Regulation 60/26). | • Based on a preliminary assessment, multiple SAR were identified as having the potential to occur within the study area based on presence of suitable habitat. |
| *Species at Risk Act* | • The SARA is a federal piece of legislation that protects species listed as Endangered, | • Species at risk protected by the SARA were identified as occurring or potentially occurring in the vicinity of |

| Policy/Legislation | Description | Project Relevance |
|---|---|---|
| | Threatened or Special Concern on Schedule 1 of the *Act*.<br>• SARA prohibits killing, harming, harassing, capturing, or taking of individuals.<br>• Under SARA, prohibitions regarding individuals and residences for migratory birds and aquatic species at risk apply wherever they occur in Canada (including private lands).<br>• For terrestrial species at risk, these prohibitions only apply on federal lands.<br>• In the case of a migratory bird species listed under the *Migratory Birds Convention Act*, certain SARA prohibitions protecting individuals and residences (e.g., nests or dens) of endangered, threatened and extirpated species apply automatically. Additionally, Critical Habitat for these species, where identified, is protected.<br>• In the case of aquatic species at risk, SARA prohibitions protect individuals, residence (e.g., fish spawning areas, mussel beds or burrows) and identified critical habitat. | the study area. The field program was scoped to confirm if habitat for these species is present.<br>• If species at risk protected by the SARA and/or their Critical Habitat are confirmed within the study area a mitigation plan or permit from Environment and Climate Change Canada (ECCC) may be required.<br>• DFO SAR mapping (Government of Canada 2025) indicates that Critical Habitat for the SAR Redside Dace is present within the watercourse within the study area.<br>• For projects that may affect aquatic SAR, their residences, or Critical Habitat, a Fisheries and Oceans Canada (DFO) Request for Review is required. The required authorization from DFO typically falls under one or more of the following legal instruments: SARA permit, Letter of Advice or Fisheries Act Authorization |
| *Migratory Birds Convention Act* | • The *Migratory Birds Convention Act* (MBCA) protects migratory game birds, insectivorous birds, and several other migratory non-game birds from persecution in the form of harassment.<br>• The schedule of on-site work must consider MBCA windows, with timing of breeding bird season typically occurring between April 1 and August 31; however, this is a guideline, since the MBCA applies anytime a migratory bird is nesting.<br>• "Incidental take" (unintentional harming, killing, disturbance, or destruction of migratory birds, their nests, or eggs as a result of an activity that is not specifically | • Any vegetation removal required for construction of the proposed development must have regard for this legislation in the form of timing window restrictions or other suitable mitigation measures. |

| Policy/Legislation | Description | Project Relevance |
|---|---|---|
| | targeting the bird or nest) is considered illegal, with the exception of a permit obtained by the Canadian Wildlife Service.<br>• Schedule 1 of the MBR 2022 provides year-round nest protection for 18 species that are known to re-use nests annually. | |
| Norfolk County Official Plan (2025) | • The County Official Plan describes and outlines protection policies for the Natural Heritage System in Norfolk County.<br>• The Official Plan categorizes the County Natural Heritage System into the following three classifications: Provincially Significant Features, Natural Heritage Features, and Hazard Lands. | • Schedule C-4 of the Official Plan maps the presence of Significant Woodland on and adjacent to the subject property. Significant Woodland represents a form of Natural Heritage Feature<br>• Potential SWH may occur within the study area. This habitat type represents a form of Natural Heritage Feature.<br>• In accordance with Section 3.5.2, development or site alteration are not permitted within or adjacent to a County Natural Heritage Feature unless it can be demonstrated that there will be no negative impact to the natural feature or its ecological functions that cannot be adequately mitigated.<br>• Potential habitat for Endangered and Threatened Species, may occur within the study area. This habitat type represents a form of Provincially Significant Feature.<br>• In accordance with Section 3.5.1, development and site alteration shall not be permitted in Provincially Significant Features unless in accordance with provincial and federal requirements. Development and site alteration shall not be permitted adjacent to these features unless the ecological function of the adjacent land has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions that cannot be adequately mitigated. |
| *Fish and Wildlife Conservation Act* | • The *Fish and Wildlife Conservation Act* (FWCA) provides protection for certain bird species not protected under the MBCA (e.g., raptors), as well as furbearing mammals and their dens or habitual dwellings, aside from the Red Fox (*Vulpes* | • The timing of construction activities, especially vegetation clearing and site grading must have consideration for bird nesting and den sites for furbearing mammals.<br>• Wildlife sweeps by a qualified biologist are recommended in advance of any vegetation clearing |

| Policy/Legislation | Description | Project Relevance |
|---|---|---|
| | *vulpes*) and Striped Skunk (*Mephitis mephitis*) | and site grubbing during the bird active season to ensure that no active nests/dens are present. |

## 3.0 Field Methods

Table 2 provides a summary of field surveys undertaken in support of the EIS. In total, three site visits were completed between July and September 2025 to characterize and map the study area natural features.

## 3.1 Vegetation Surveys

Vegetation communities were described and mapped according to the Ecological Land Classification (ELC) system for southern Ontario (Lee et al. 1998). The surveys included the compilation of a stand description to note the dominant species and cover within each community. Vegetation community mapping was completed on July 31, 2025 and further refined during the September 10, 2025 site investigation.

In conjunction with vegetation community mapping, NRSI biologists completed a comprehensive two-season (summer and fall) inventory of vascular flora for each of the mapped vegetation communities. The vascular plant list was compiled by ELC polygon with an abundance code assigned (dominant, abundant, occasional, rare) in one or more strata (canopy, sub-canopy, shrub layer, groundcover). This inventory also recorded any federally, provincially, or regionally significant vegetation species that were observed.

During the September 10, 2025 site visit, the NRSI biologist GPS-surveyed the boundaries of the wetland communities where shown on Map 2. The wetland boundaries were delineated according to the Ontario Wetland Evaluation System methodology (MNRF 2022) and were surveyed to sub-metre accuracy using a GNSS backpack GPS unit.

## 3.2 Breeding Bird Survey

Due to the date at which NRSI was retained by the proponent to complete the EIS, the standard two breeding bird surveys required by the Ontario Breeding Bird Atlas (OBBA) protocol (Birds Canada et al. 2021) could not be completed. In order to gather some information on breeding bird habitat use within the study area, one breeding bird survey was completed on July 9, 2025. This survey was completed through use of wandering transects to comprehensively survey throughout the subject property natural features. Birds were recorded according to their OBBA breeding evidence codes (Birds Canada et al. 2021).

**Table 2. Field Survey Summary**

| Survey Type | Survey Protocol | Dates | Time (24-h) | Approx. Person Hours | Weather Conditions | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Air Temp. (°C) | Precip. | Cloud Cover (%) | Wind (Beaufort Scale) | Staff |
| Breeding bird survey | Birds Canada et al. 2021 | July 9, 2025 | 6:00 | -- | 15 | None | 70 | 1 | E. Woodman<br>N. Joakim |
| Vegetation community mapping and inventory | Lee et al. 1998<br><br>Comprehensive area search of each vegetation community. | July 31, 2025 | 13:00 | 3.5 | 21 | None | 100 | 2 | M. Douglas |
| | | September 10, 2025 | 10:30 | 4.5 | 20 | None | 20 | 1 | M. Douglas |
| Snake habitat assessment | N/A | July 31, 2025 | 13:00 | 3.5 | 21 | None | 100 | 2 | R. Archer |

## 3.3 Snake Habitat Assessment

Due to the identification of SAR snake species occurrence within the general vicinity of the study area based on background information (Ontario Nature 2019; see Section 2.2), NRSI biologists examined the subject property and adjacent natural areas to generally identify and map features and areas that represent suitable or potential habitat for SAR snakes. This included a desktop-level review of the existing natural features identified through background information, and as supplemented through the site investigation completed on July 31, 2025. The habitat suitability assessment was informed by background information on species' habitat preferences and requirements (e.g., Seburn 2009, Rowell 2012). Habitat features and characteristics that were noted included, but were not limited to, the size, configuration, and aspect of open habitat and adjacent wooded natural features, the presence of sun-exposed sandy soils and sandy mounds suitable for Eastern Hog-nosed Snake (*Heterodon platirhinos*) nesting, the presence of soil or mulch piles, and other microhabitat features that may be used for thermoregulation or cover functions (e.g., logs, rock or woody debris piles).

## 3.4 Incidental Wildlife Observations

All incidental observations of wildlife (e.g., birds, reptiles, amphibians, mammals, butterflies, odonates (dragonflies and damselflies)) were documented during all field visits. This included both direct and indirect (e.g., tracks, scat, dens, nests, etc.) observations of wildlife presence.

# 4.0 Existing Conditions

## 4.1 Soil, Terrain and Drainage

The study area is located within the physiographic region known as the Norfolk Sand Plain. This region is characterized by medium to coarse sands that are well drained. The study area more specifically falls within an area comprising coarse-textured glaciolacustrine sands and gravels with minor silt and clay (MTE 2026a). Borehole investigations within the subject property yielded soil strata that consisted of a top layer of topsoil and fill material overlying native sand and silt deposits. The surficial fill deposits ranged in composition from sand with trace silt to sandy silt with trace gravel (MTE 2026b). The subject property contains flat to rolling terrain that generally slopes downward from the northeast to the south.

The study area does not include any watercourses or surface drainage features. However, it is understood that historically when the property was used a tobacco farm, it contained channelized surface drainage features. These features connected to two ditch inlets, which still exist along the west property boundary, and directed flows westward via a tile drainage system on the agricultural property to the west. Following the cessation of agricultural activities and the gradual re-naturalization of the property, maintenance of the drainage features ceased and this is believed to have created surface water impounding effects within topographic low areas that has led to the formation of small wetland features on the property. Wetlands did not previously exist on the subject property when it was in agricultural use (J. Ariens, pers. comm., September 2025).

The study area is underlain by two main aquifers: the Surficial Sand Aquifer and the Intermediate Aquifer. The groundwater table ranges between approximately 10.9-15.2m below ground surface within the Surficial Sand Aquifer and/or the Intermediate Aquifer within the subject property. Much of the surrounding study area, including a portion of the subject lands, contain an upper layer of soils containing silt with some clay and trace sands that forms an aquitard. In eastern portions of the study area, the Surficial Sand Aquifer and/or Intermediate Aquifer reaches the surface and comprises primarily fine- to medium-grained sands. Groundwater is interpreted to generally flow in a north to northeastward direction under the study area toward Kent Creek (MTE 2026a).

## 4.2 Vegetation

### 4.2.1 Vegetation Communities

The majority of the subject property is naturalized, and comprises a mix of more mature deciduous forest with younger and earlier successional cultural woodland and cultural meadow communities. The more mature natural communities on the property generally comprise the Dry-Fresh Sugar Maple-Oak Deciduous Forest (FOD5-3) and eastern portions of the adjoining Fresh-Moist Poplar Deciduous Forest (FOD8-1) community. The earlier successional communities have established over the past 20 years or more, and have arisen on lands that were previously used as a tobacco farm (M. McArthur, Westwood Trail Developments, pers. comm., August 2025). A network of off-road vehicle tracks still exist within the subject property, highlighting its previous land use. More recently, the Dry-Moist Old Field Meadow (CUM1-1) extending off-site to the southeast has re-established following earlier construction activities associated with the installation of a stormwater management infiltration cell to service the Westwood subdivision phase to the immediate east.

The north end of the subject property has experienced significant disturbance over past years. It is understood that soil stripping occurred within the property to provide fill for construction of the Westwood subdivision phase to the east, and that Jack Pine (*Pinus banksiana*) removal occurred approximately six years ago with approval from the County. The northeast end of the subject property was also recently used to support County road works activities associated with the reconstruction of West Street between Queen Street and Holden Avenue (M. McArthur, Westwood Trail Developments, pers. comm., September 2025). This northeast area is now largely devoid of vegetation growth and comprises an exposed gravel-dominated surface. The north end of the property has also long been used for the purposes of stockpiling soils, stone and mulch materials. Several small stockpiles were observed on-site by NRSI biologists.

During the July 31, 2025 site investigation, NRSI biologists identified the presence of previously un-mapped wetland features, shown on Map 2 as a Mineral Thicket Swamp/Mineral Meadow Marsh (SWT2/MAM2) complex, with a small Green Ash Mineral Deciduous Swamp (SWD2-2) inclusion, and an isolated Swamp Maple Mineral Deciduous Swamp (SWD3-3) inclusion within the Mineral Cultural Woodland (CUW1) to the west. These features are not mapped on provincial LIO mapping (MNR 2025), nor are they mapped by the LPRCA in their online regulation mapping (LPRCA 2025). It is understood that these wetlands coincide with the location of old municipal drainage infrastructure that were installed during the property's

previous agricultural use and are located near two ditch inlet structures that divert surface flows to an agricultural tile drain system on lands to the west (J. Ariens, pers. comm., August 2025). Remnants of that system were observed in the form of a dug channel that spanned an off-road track via a culvert (now failed and non-functional). The wetlands are understood to have established as a result of this drainage system no longer being maintained following cessation of on-site agricultural activities several years ago. This has resulted in wetter conditions within impounded and topographical low points in the property. It has also resulted in the formation of a small pond feature within the eastern wetland community. This pond is a temporary feature that exists under seasonally wet periods and results from impounded water that slowly drains via infiltration. An NRSI biologist refined the boundaries of these wetland communities through use of a GNSS backpack GPS unit capable of sub-metre accuracy during the September 10, 2025 site investigation, as shown on Map 2.

Vegetation community and other land cover mapping for the study area is shown on Map 2. Additional details of the ELC vegetation communities are provided in Table 3 below.

**Table 3. Vegetation Communities Within the Study Area**

| ELC Ecosite Type | ELC Description | Environmental Characteristics |
|---|---|---|
| **Forest** | | |
| FOD5-3 | Dry - Fresh Sugar Maple - Oak Deciduous Forest Type | The eastern edge of the subject property contains a narrow portion of the large and mature Sugar Maple (*Acer saccharum*) and Oak (*Quercus* sp.) forest feature that extends mainly off property. This feature is located upland from the FOD8-1 and SWT2/MAM2 communities and contains denser patches of Red Oak (*Quercus rubra*) and White Oak (*Quercus alba*) along the edges. The ground layer is relatively sparse with a dense leaf litter. The dominant shrub species is Witch Hazel (*Hamamelis virginiana*), while the dominant groundcover species are Eastern Star Sedge (*Carex radiata*) and Enchanter's Nightshade (*Circaea canadensis*). |
| FOD8-1 | Fresh - Moist Poplar Deciduous Forest Type | This feature extends off the unevaluated wetland communities that bisect the eastern half of the property and blends into the adjacent Sugar Maple - Oak deciduous forest. The canopy includes Eastern Cottonwood (*Populus deltoides*) and Freeman's Maple (*Acer x freemani*) with lesser proportions of Red Oak and White Oak. The understorey contains a diversity of shrub species most of which are non-native. The dominant species was Gray Dogwood (*Cornus racemosa*) and Red Raspberry (*Rubus idaeus*). Groundcover was also dominated by Eastern Star Sedge and Enchanter's Nightshade. |

| ELC Ecosite Type | ELC Description | Environmental Characteristics |
|---|---|---|
| FOD8 | Fresh - Moist Poplar - Sassafras Deciduous Forest Ecosite | The canopy of this feature is comprised mainly of Eastern Cottonwood. Wet tolerant species such as White Meadowsweet (*Spirea alba*), Sensitive Fern (*Onoclea sensibilis),* Spotted Jewelweed (*Impatiens capensis*) were observed growing along the southern edges of the feature as it blended with the unevaluated wetland that bisects the eastern half of the property. The ground layer of this feature was mounded in areas and contained evidence of garbage dumping. |
| **Cultural** | | |
| CUW1 | Mineral Cultural Woodland Ecosite | This feature occupies the majority of the southwestern portion of the property and is characterized by patches of open canopy. The canopy is comprised of dense clusters of Eastern Cottonwood interspersed with patches of Scots Pine (*Pinus sylvestris*), White Spruce (*Pinus strobus*) and White Pine (*Picea glauca*). There are also rare occurrences of medium-mature Red Oak. |
| CUP | Plantation | This plantation is located off property to the west and was planted around 2010. It is comprised of Scots Pine. |
| CUS1 | Mineral Cultural Savannah Ecosite | The canopy is sparse and comprised of Eastern Cottonwood and Silver Maple (*Acer saccharinum*). Ground cover includes White Sweetclover (*Melilotus alba*), Black Medic (*Medicago lupulina*) and Orchard Grass (*Dactylis glomerata*).<br>There are piles of fill and gravel throughout this feature. |
| CUM1-1 | Dry – Moist Old Field Meadow Type | Cultural meadow is present along the northwestern extent of the property and is connected to the meadow along the southeastern extent by an off-road trail feature. The meadow is forb dominant and species included Frost Aster (*Symphyotrichum pilosum*), New England Aster (*Symphyotrichum novae-angliae),* Grass-leaved Goldenrod (*Euthamia graminifolia*), Wild Carrot (*Daucus carota*), and Common Milkweed (*Asclepias syriaca*). Sparse and immature tree and shrub cover consist of Black Walnut (*Juglans nigra*), Eastern Cottonwood, American Elm (*Ulmus americana*), Multiflora Rose (*Rosa multiflora*), Black Raspberry (*Rubus occidentalis*), and Allegheny Blackberry (*Rubus allegheniensis*). |
| **Wetland** | | |
| SWT2/MAM2 | Mineral Thicket Swamp Ecosite/ Mineral Meadow Marsh Ecosite | This feature bisects the eastern half of the subject property and is associated with historical site drainage. The western half of the feature is more thicket-dominated, comprised of Sandbar Willow (*Salix interior*), Pale Dogwood (*Cornus obliqua*), Heart-leaved Willow (*Salix eriocephala*), and Common Elderberry (*Sambucus canadensis*). The eastern half is more open and is comprised of Sensitive Fern, Rice Cutgrass (*Leersia oryzoides*), Fowl Manna Grass (*Glyceria striata*) and Swamp Aster (*Symphyotrichum puniceum*). Certain areas of this feature were seasonally inundated, with standing water present |

| ELC Ecosite Type | ELC Description | Environmental Characteristics |
|---|---|---|
| | | during the summer months and dry conditions observed in the fall. A PVC pipe drain was observed in this feature. |
| SWD2-2 | Green Ash Deciduous Swamp Type | This feature is a small inclusion to the SWT2/MAM2 community and experiences high levels of saturation in the spring and summer months becoming dry in the fall. The canopy is comprised of dead Green Ash (*Fraxinus pennsylvanica*). |
| SWD3-3 | Swamp Maple Mineral Deciduous Swamp Type | This feature is an inclusion to the cultural woodland and contains mature Silver Maple trees. Other wetland indicator species include Spotted Jewelweed, Sensitive Fern, Swamp Aster, Fowl Manna Grass, and Pale Dogwood. |

### 4.2.2 Vascular Flora

In total, 150 plant species were inventoried within the study area. A complete list of these species is appended to this report (Appendix I). Note that because the CUW1 cultural woodland shown on Map 2 was initially coded as a Fresh-Moist Poplar Deciduous Forest (FOD8-1) community at the time of the field surveys, and because there are multiple FOD8-1 communities present within the study area, the data are presented as "FOD8-1/CUW1" in Appendix I.

No plant SAR or SCC were inventoried within the subject property. All of the inventoried species that are native to Ontario are common with secure populations in Ontario (MNRF 2021). However, certain inventoried species are considered significant within Norfolk County (Oldham 2017):

- White Spruce (*Picea glauca*) – Rare in Norfolk County; located in the Fresh-Moist Poplar-Sassafras Deciduous Forest (FOD8);
- Annual Fleabane (*Erigeron annuus*) – Uncommon in Norfolk County; located in the Mineral Cultural Savannah (CUS1) and the CUM1-1 cultural meadow;
- Gray Dogwood (*Cornus racemosa*) – Uncommon in Norfolk County; located in the FOD8-1 and/or CUW1 communities, the SWT2/MAM2 complex with SWD2-2 inclusion, and the FOD5-3 forest;
- Hairy Bush-Clover (*Lespedeza hirta*) – Uncommon in Norfolk County; located in the FOD5-3 forest;
- Purple-veined Willowherb (*Epilobium coloratum*) – Rare in Norfolk County; located in the SWT2/MAM2 wetland complex with SWD2-2 swamp inclusion;

- Common Evening-primrose (*Oenothera biennis*) – Rare in Norfolk County; located in the CUM1-1 meadow;
- Woodland Strawberry (*Fragaria vesca*) – Uncommon in Norfolk County; located in the SWT2/MAM2 wetland complex with SWD2-2 swamp inclusion, FOD5-3 forest, and the FOD8 forest;
- Lesser Clearweed (*Pilea fontana*) – Uncommon in Norfolk County; located in the SWT2/MAM2 wetland complex with SWD2-2 swamp inclusion;
- Eastern Star Sedge (*Carex radiata*) – Uncommon in Norfolk County; located in the FOD8-1 and/or CUW1 communities and the FOD5-3 forest.

The coefficient of conservatism (CC) is a value ranging from 0 (low) to 10 (high), which is based on a species' tolerance of disturbance and fidelity to a specific habitat integrity (Oldham et al. 1995). Higher values are assigned to species that have specific environmental growing requirements and are less tolerant of disturbance. The highest average CC values were associated with the FOD5-3 community (3.76) followed by FOD8 (2.78), SWT2/MAM2 with SWD2-2 inclusion (2.75), FOD8-1/CUW1 (2.47), and the SWD3-3 inclusion (2.45). These generally represent moderate CC values that are typical of natural features in developed landscapes. The FOD5-3 forest community was noted as containing several relatively conservative vegetation species (less tolerant of environmental change) and contained the highest CC-value species observed within the subject property (Hairy Bush-clover; value of 9). The other communities are indicative of species assemblages that are largely generalist in their habitat preferences and have tolerance for ecologically disturbed conditions. By contrast, the CUM1-1 community had an average CC value of 1.63, while the CUS1 community had a value of 0.62. These values are indicative of these communities' cultural/early successional origins and/or ecologically disturbed conditions, with species that are highly tolerant of environmental variability. Of the 150 inventoried species, 99 (66%) had CC values of 0-3. Overall, 32% of the inventoried species are non-native in Ontario. The greatest proportion of these was found in the CUS1 cultural savannah community, where 56% of inventoried species are non-native, followed by CUM1-1 (37%) and FOD8-1/CUW1 (24%). By contrast, only 11% of the FOD8 forest community comprised non-native species, followed by FOD5-3 (12%), SWT2/MAM2 with SWD2-2 inclusion (13%) and the SWD3-3 inclusion (18%).

In order to quantify the floristic quality of the subject property natural features, a Floristic Quality Index (FQI) was calculated. The FQI is calculated by establishing a mean (average) CC value

for all plant species (including non-native species), which is then multiplied by the square root of the total number of plant species, as shown in the formula below.

$$FQI = X\sqrt{N}$$

N = total number of native species

X = mean coefficient of conservatism

Generally speaking, FQI values of 1-19 represent low quality habitat, 20-35 represent high quality habitat, and above 35 is considered to be of exceptional quality (Spyreas 2019). See below for a summary of FQI values for the subject property's vegetation communities:

**Table 4. FQI values for the study area vegetation communities.**

| ELC Community | Mean CC | No. Native Species | FQI Value |
|---|---|---|---|
| FOD5-3 | 3.76 | 29 | 20.25 |
| SWT2/MAM2 w/ SWD2-2 incl. | 2.75 | 45 | 18.45 |
| FOD8-1/CUW1 | 2.47 | 29 | 13.30 |
| FOD8 | 2.78 | 16 | 11.20 |
| CUM1-1 | 1.63 | 37 | 9.91 |
| SWD3-3 incl. | 2.45 | 18 | 6.64 |
| CUS1 | 0.62 | 17 | 2.56 |

The FQI results demonstrate that the FOD5-3 forest community represents the highest floristic quality habitat within the study area, followed by the SWT2/MAM2 wetland complex with SWD2-2 swamp inclusion. The FOD8-1/CUW1 and FOD8 communities are moderate by comparison, reflecting their earlier successional growth conditions that are influenced by the past land use. By contrast, the CUM1-1 cultural meadow, SWD3-3 swamp inclusion and CUS1 cultural savannah represent relatively low quality floristic habitats.

## 4.3 Wildlife

### 4.3.1 Birds

In total, 96 bird species are reported from within 10km of the study area based on the OBBA (BSC et al. 2008). Thirty (30) bird species were documented within the study area during site investigations. As described in Section 3.2, only one breeding bird survey was completed; therefore, assessments of bird species' breeding status within the study area could not definitively be made. Refer to Appendix II for a list of bird species recorded within in the study area.

No bird SAR or SCC were observed within the study area during site investigations. However, since only one breeding bird survey was completed, the presence of bird SAR or SCC with potential to occur in the study area could not be ruled out.

Following the completion of site investigations, the following bird SAR have potential to occur in the study area based on background information review and presence of suitable habitat:

- Red-headed Woodpecker (*Melanerpes erythrocephalus*)
- Eastern Whip-poor-will (*Antrostomus vociferus*)
- Wood Thrush (*Hylocichla mustelina*)

The following bird SCC have potential to occur within the study area:

- Tufted Titmouse (*Baeolophus bicolor*)
- Common Nighthawk (*Chordeiles minor*)
- Eastern Wood-Pewee (*Contopus virens*)

See Section 5.3 for further discussion about potential bird SAR habitat and Section 5.4 for further discussion about potential bird SCC habitat in the context of SWH.

Of the observed species, the majority are relatively common and ubiquitous on the landscape and are typical of species occupying woodlots in agricultural or suburban environments (e.g., Cedar Waxwing (*Bombycilla cedrorum*), Gray Catbird (*Dumetella carolinensis*), Northern Cardinal (*Cardinalis cardinalis*), Northern Flicker (*Colaptes auratus*)). All observed species have secure or apparently secure populations in Ontario (MNRF 2021). Notable observed species included Great Blue Heron (*Ardea herodias*), which was observed with possible breeding evidence in the study area. Additionally, Green Heron (*Butorides virescens*) was observed within the open water pond within the SWT2/MAM2 wetland community complex; it was observed on July 31 but was likely using the habitat for breeding purposes. The presence of Green Heron is of relevance to the identification of Marsh Bird Breeding SWH (see Section 5.4).

### 4.3.2 Herpetofauna

In total, 24 herpetofauna (reptile and amphibian) species are reported from within 10km of the study area based on the Ontario Reptile and Amphibian Atlas (Ontario Nature 2019). These specifically comprise four turtle species, nine snake species, three salamander species, and

eight anuran (frog and toad) species. A complete list of herpetofauna species reported from the study area vicinity is provided in Appendix III.

No targeted herpetofauna surveys were completed as part of the EIS scope and no herpetofauna species were incidentally observed during the site investigations. Herpetofauna habitat characteristics were further assessed through the site investigations to inform the assessment of SAR herpetofauna habitat availability and potential presence of herpetofauna-related SWH.

Following the completion of site investigations, the following herpetofauna SAR have potential to occur in the study area based on background information review and presence of suitable habitat:

- Eastern Hog-nosed Snake (*Heterodon platirhinos*)
- Eastern Foxsnake (*Pantherophis gloydi*)

Potential Eastern Hog-nosed Snake and Eastern Foxsnake habitat is widespread throughout the study area due to the variety of habitat types that they utilize. See Section 5.3 for further discussion about potential snake SAR habitat.

No suitable habitats for herpetofauna SCC were identified within the study area.

Various other herpetofauna species that are more common and widespread on the landscape also likely occur within the study area. These include species such as Eastern Gartersnake (*Thamnophis sirtalis sirtalis*), DeKay's Brownsnake (*Storeria dekayi*), and multiple anuran species that may breed within the subject property wetlands. Calling male Spring Peepers (*Pseudacris crucifer*) have been recorded within the subject property as identified through background information review (iNaturalist 2025).

### 4.3.3 Mammals

According to the Mammal Atlas of Ontario (Dobbyn 1994), 42 mammal species are reported from within 100km of the study area. Of these, evidence of three mammal species was observed: Eastern Gray Squirrel (*Sciurus carolinensis*) (direct observation), Eastern Cottontail (*Sylvilagus floridanus*) (direct observation), and White-tailed Deer (*Odocoileus virginianus*) (tracks). These species are common with secure populations in Ontario (MNRF 2021). No mammal burrows with characteristics suggestive of SAR American Badger use were observed

within the subject property. A complete list of mammals reported from the study area and vicinity is included in Appendix IV.

A bat habitat assessment of treed features was not undertaken as part of the EIS fieldwork scope. Therefore, any of the treed features on the subject property represent potential habitat for the six bat SAR that were screened as having potential to occur within the study area. See Section 5.3 for further discussion about the presence of potential SAR bat habitat in the study area.

### 4.3.4 Insects

According to the Ontario Butterfly Atlas (Macnaughton et al. 2024), 52 butterfly species are known to occur within 10km of the study area. Six butterfly species were documented during site investigations: Clouded Sulphur (*Colias philodice*), Cabbage White (*Pieris rapae*), Monarch, Viceroy (*Limenitis archippus*), Pearl Crescent (*Phyciodes tharos*), and Great Spangled Fritillary (*Speyeria cybele*). Of these species, Monarch is considered a SCC due to being listed as nationally Endangered by the Committee on the Status of Endangered Wildlife in Canada (Government of Canada 2026). At least approximately five Monarchs were observed within the subject property during the July 31 site investigation, as well as one Monarch caterpillar on a milkweed plant. See Section 5.4 for further discussion about the significance of Monarch habitat within the study area. All of the other observed butterfly species are common with secure populations in Ontario (MNRF 2021). A complete list of butterfly species reported from the study area vicinity is provided in Appendix V.

In total, 26 odonate (dragonfly and damselfly) species have been recorded for the 10x10km square containing the study area in the Ontario Odonate Atlas Database (OOAD 2023). No odonate species were incidentally recorded during site investigations. Four odonate species that are ranked by NHIC as being provincially rare, and therefore represent SCC, have occurrence records in the vicinity of the study area: Unicorn Clubtail (*Arigomphus villosipes*), Swamp Darner (*Epiaeschna heros*), Painted Skimmer (*Libellula semifasciata*), and Clamp-tipped Emerald (*Somatochlora tenebrosa*) (OOAD 2023; see Appendix VI). Of these species, Painted Skimmer and Swamp Darner are considered to have potentially suitable habitat within the study area, associated with site's swamp features and its small open water pond. See Section 5.4 for further discussion about the significance of odonate habitat within the study area. A complete list of odonate species reported from the study area vicinity is provided in Appendix VI.

## 5.0 Natural Environment Significance and Sensitivity

Analysis of the significance of existing natural features was used to identify those features and habitats that are sensitive to disturbance based on the rarity or sensitivity of the feature or the functions/processes that contribute toward their significance. These areas are identified as "constraints" to the proposed development and are discussed in the context of natural heritage policies governing their protection. Conversely, opportunities for development may occur outside of these natural environment constraints within the subject property. Development or site alteration within certain natural feature constraints may be permitted by the regulatory agencies subject to permitting and/or implementation of recommended measures to appropriately mitigate anticipated impacts as discussed below.

### 5.1 Significant Woodlands

Significant Woodlands represent a form of Natural Heritage Feature, which in turn represent a component of Norfolk County's Natural Heritage System as described in the OP (Norfolk County 2025). In accordance with Section 3.5.2 (b) of the OP, development and site alteration is not permitted in Natural Heritage Features (including Significant Woodlands) unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions that cannot be adequately mitigated.

Table 2 of the OP further specifies that the boundaries of Significant Woodlands are based on evaluation criteria that were established and conducted by the County as illustrated on Schedule C of the OP. The OP does not provide the criteria by which the Significant Woodlands shown on Schedule C were identified and mapped. Therefore, the identification of Significant Woodland within the study area was interpreted to represent the mapped features identified in Schedule C. Schedule C appears to map woodland that roughly corresponds to the Dry-Fresh Sugar Maple-Oak Deciduous Forest (FOD5-3), as well as portions of the adjacent Fresh-Moist Poplar Deciduous Forest (FOD8-1) to its immediate west. These features represent the oldest and most mature forest growth in the study area as observed during site investigations, validating the woodland significance mapping identified on Schedule C. In refining the limits of Significant Woodland on the subject property, the entirety of the FOD8-1 community, as well as the adjoining Green Ash Mineral Deciduous Swamp (SWD2-2) inclusion, were included due to their contiguity to the more mature woodland features. This also recognizes the successional trajectory of the younger growth within the western edge of the FOD8-1 community and the SWD2-2 inclusion as new western and northern edges of the

contiguous Significant Woodland feature, which has been allowed to establish over several years since farming activities on the property ceased.

The FOD8-1 community immediately south of the subject property is also identified as Significant Woodland due to its inclusion in Significant Woodland mapping shown on Schedule C of the OP (Norfolk County 2025). Previously, this off-site woodland community formed a southern extent of the broader Significant Woodland that was contiguous with the FOD5-3 forest. However, an adjoining section of woodland was removed approximately seven years ago to accommodate construction of a stormwater management system for the adjacent residential development to the east, resulting in the isolation of the forest community to the south. NRSI biologists could not access the off-site woodland to refine its vegetation community classification, although historical satellite imagery suggests that it contains some mature tree growth interspersed with younger successional woodland. Following a precautionary approach and in accordance with the Schedule C mapping, it is identified as Significant Woodland.

## 5.2 Wetlands

Wetlands have not previously been mapped within the study area (MNR 2025, LPRCA 2025), indicating that naturally-occurring wetlands have likely been historically absent within these lands. However, NRSI biologists confirmed and mapped the presence of a Mineral Thicket Swamp/Mineral Meadow Marsh complex (SWT2/MAM2) with an associated inclusion of a Green Ash Mineral Deciduous Swamp (SWD2-2). This community was observed to contain a small pond with standing water during the July 31, 2025 site visit; the pond had dried up by the time of the September 10, 2025 site visit, reflecting its existence as a seasonal/temporary feature. A small Swamp Maple Mineral Deciduous Swamp (SWD3-3) inclusion was also observed within the Mineral Cultural Woodland (CUW1) at the west side of the property. These wetland features seasonally collect surface water runoff which then infiltrates into the soils. Their boundaries were refined to sub-metre accuracy by an NRSI biologist using a GNSS GPS backpack unit during the September 10 site visit (Map 3). It is understood that these wetland features approximately correspond to the location of a former private agricultural drainage feature that traversed the subject property and exited to the west via a ditch inlet structure at the west subject property boundary. This drainage infrastructure has been left unmaintained since the property ceased operation as a tobacco farm several years ago (J. Ariens, pers. comm., August 2025). It is therefore expected that these wetlands have arisen as a result of the drainage features being unmaintained, with wet depressional areas of seasonal water impounding and associated establishment of wetland vegetation across several years.

These wetlands therefore have relatively recent anthropogenic origins that have arisen due to previous human land use and drainage channel construction. For this reason and due to their relatively small sizes, the wetlands in and of themselves are not considered to be Locally Significant Wetlands that fall under the classification of Natural Heritage Features in the County's Natural Heritage System (Norfolk County 2025). However, the SWD2-2 inclusion is considered a contiguous portion of the Significant Woodland, and see below with respect to identification of the wetland features as Candidate SWH.

These wetlands were also considered against the *Conservation Authorities Act* definition of wetlands that is used to establish whether these wetlands are regulated by the LPRCA. In this context, wetlands are defined according to four criteria. They comprise lands that are:

1) seasonally or permanently covered by shallow water or have a water table close to or at the surface;
2) directly contributes to the hydrological function of a watershed through connection with a surface watercourse;
3) has hydric soils, the formation of which has been caused by the presence of abundant water; and
4) has vegetation dominated by hydrophytic plants or water tolerant plants, the dominance of which has been favoured by the presence of abundant water (LPRCA 2024).

Criteria #1, #3 and #4 are considered met with respect to these wetlands. Criterion #1 is specifically met due to the presence of seasonal standing water within the wetlands. The wetlands overlie lower-permeability soils that receive surface runoff from adjacent areas. These wetland areas are slower to infiltrate water and result in temporarily or seasonally wet areas, such as after snowmelt or significant rainfall events. Groundwater monitoring data collected at the site indicates that the surface wetland features are not directly connected to or influenced by the groundwater regime. Water movement through the soils follows a downward hydraulic gradient across the site. The groundwater table has been measured to be approximately 10.9-15.2m below ground surface and hydrologically separated from the surface features by a silt-dominated soil layer that acts as an aquitard (MTE 2026a). Further, no groundwater indicator vegetation species were observed on-site.

However, Criterion #2 is not met for the on-site wetlands. These wetlands have established as isolated features within lower-lying areas that occur near the route of the former agricultural

drainage channel. The drainage channel was historically diverted into a subsurface agricultural tile drainage system via a ditch inlet structure at the west property boundary. No surface watercourses or drainage features therefore connect the on-site wetlands with downstream hydrological features. For this reason, the on-site wetlands are considered to not represent LRPCA-regulated wetlands.

## 5.3 Species at Risk

No SAR were identified within the study area based on the EIS site investigations. However, based on the scope of EIS fieldwork completed, certain forms of SAR habitat screened as having potential to occur within the study area could not be ruled out. See Appendix VII for the complete results of the SAR/SCC habitat assessment completed for the study area based on background information review and field survey results, including rationale with respect to the confirmed/potential presence or assumed absence of SAR within the study area. Note that SCC are addressed as components of SWH within the category of Special Concern/Rare Species, as discussed below. See below for additional discussion about potential SAR habitats within the study area.

### 5.3.1 Eastern Foxsnake and Eastern Hog-nosed Snake

Given the general similarities in habitat preferences and biological requirements of these species, they are addressed together for the purposes of this report. Eastern Foxsnake and Eastern Hog-nosed Snake are each designated as Threatened in Ontario (MECP 2026); they and their defined habitats are therefore protected under the SCA.

Eastern Foxsnake was identified through the SAR habitat screening process due to record of the species having occurred in areas that fall within the 10x10km ORAA atlas square that contains the study area. Specifically, one record of Eastern Foxsnake from 2014 within the atlas square has been reported (Ontario Nature 2019). However, the majority of known Eastern Foxsnake records are located within more southern portions of Norfolk County closer to Lake Erie, particularly in the Turkey Point and Long Point areas (MNR 2010, iNaturalist 2025). Eastern Foxsnake has not been recorded within 1km of the study area according to NHIC (MNR 2025).

Eastern Foxsnakes generally use a mosaic of habitat types to meet their different life stage requirements. They are often associated with open and early successional habitats such as old fields, savannahs, prairies, shorelines, marshes and rock barrens, but also make use of forests.

They are tolerant of anthropogenic habitats and areas of low-level human activity such as hedgerows, canals and abandoned buildings. In the Carolinian zone they are strongly associated with marsh, and natural and semi-natural open habitats. They are often found near watercourses, drainage channels or water bodies (Eastern Foxsnake Recovery Team 2010). They use microhabitat features such as root wads, rotting logs, and wood chip and compost piles for cover and nesting.

By contrast, Eastern Hog-nosed Snake has been observed more frequently within the 1x1km ORAA atlas square containing the study area, with a total of 14 records (Ontario Nature 2019). It also has a generally broader distribution across Norfolk County than Eastern Foxsnake (Ontario Nature 2019, iNaturalist 2025).

Eastern Hog-nosed Snake is also fairly generalist in its habitat associations. They largely use open natural areas such as open woodlands, thickets and meadows, as well as forests and forest edges (Kraus 2011). They are typically found in areas of well-drained, sandy soil and often near wetlands or ponds that contain their primary prey source, American Toad (*Anaxyrus americanus*).

Given the varied habitat preferences of both of these species, the entirety of natural land cover within the study area represents potential habitat for Eastern Foxsnake and Eastern Hog-nosed Snake. Within the subject property itself, the mosaic of natural features represents suitable habitat for both species. However, the highly disturbed area in the northeast corner of the subject property, which is largely devoid of vegetation growth and has been subject to soil stripping, is not considered suitable for either. If the wetlands, including the pond feature, contain a suitable hydroperiod through the spring amphibian breeding period, they may provide habitat for American Toad that is favoured by Eastern Hog-nosed Snakes.

The habitats for these species that are protected under the SCA are defined based on the following:

> *"A dwelling place, such as a den, nest, or similar place, occupied or habitually occupied by one or more members of a species for the purposes of breeding, rearing, staging, wintering or hibernating in the area immediately surrounding a dwelling place described above that is essential for the purposes mentioned."*

In the context of Eastern Foxsnake and Eastern Hog-nosed Snake, a "dwelling place" generally consists of hibernacula, gestation, and egg-laying sites. Areas immediately around these

dwelling places that are essential to support their function generally include the natural areas that are within 200m of a hibernaculum and within 30m of a gestation or egg-laying site.

Furthermore, the subject property contains several piles of sand, sandy soils or fill, mulch and woody debris that could be used by these species for nesting, cover or thermoregulation. Although the presence of snake overwintering habitat is difficult to discern without targeted survey work, it can be surmised that there is an increased potential for on-site overwintering habitat where other key habitat functions, such as nesting, are provided. The potential for nesting and overwintering, which represent two of the most sensitive life-stage habitat functions and which are protected as "dwellings" under the SCA, is greatest within the open Dry-Moist Old Field Meadow (CUM1-1) habitat and adjacent woodland edge areas. In accounting for the areas adjacent to "dwelling" habitats (which must be assumed could include hibernaculum habitat), all study area natural feature cover, excluding the northeast subject property disturbed area, can be considered potential SCA-protected habitat. See Map 3b for the extent of potential SAR Eastern Foxsnake and Eastern Hog-nosed Snake habitat in the study area.

Based on the known species distribution data and occurrence records of these species, it is more likely that Eastern Hog-nosed Snake could occupy the study area, whereas it's considered unlikely that Eastern Foxsnake would occur within this area. However, following a precautionary approach, both species are considered to potentially exist within the study area.

### 5.3.2 Species at Risk Bats

Targeted bat habitat assessments were not completed to evaluate and refine the locations of good quality bat roosting habitat within the subject property. However, it can generally be assumed that the woodlands and other treed features within the study area provide potential habitat for the SAR bats that were screened as having potential to occur on-site: Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), Tri-colored Bat (*Perimyotis subflavus*), Eastern Small-footed Myotis (*Myotis leibii*), Silver-haired Bat (*Lasionycteris noctivagans*), Hoary Bat (*Lasiurus cinereus*) and Eastern Red Bat (*Lasiurus borealis*). These species are designated as Endangered in Ontario; they and their defined habitats are therefore protected under the ESA.

The SCA defines protected habitat for SAR bats as including "dwelling" places such as maternity roosting habitat and migratory bat stop-over habitat, which are of relevance and have potential to exist within the study area. In the cases of both maternity roosting and migratory

stop-over habitat within the study area, the “dwelling” place comprises the tree feature itself as well as natural features within a radius of 1000m of the tree feature. Since individual habitat trees are unknown within the study area, it must be assumed that all treed features may provide these protected habitat features. Thus, all portions of the study area, excluding the disturbed lands in the northeast subject property, represent potential SAR bat habitat when also accounting for the lands adjacent to habitat trees. See Map 3b for the extent of potential SAR bat habitat in the study area.

### 5.3.3 Red-headed Woodpecker

Red-headed Woodpecker is designated as Endangered in Canada (Government of Canada 2026); as a migratory bird, this species and its defined Critical Habitat are subject to protection under the SARA. Red-headed Woodpeckers are primarily associated with mature lowland and upland deciduous forests with low canopy cover, open understories, and large tall trees such as maples and oaks. They also occur in other sparsely treed habitats, including near human-occupied landscapes, such as orchards, parks, golf courses and agricultural landscapes. They prefer relatively open woodlands with coarse woody debris and with large tree snags (MECP 2022).

All of the study area woodland features may provide suitable habitat for Red-headed Woodpecker, although the species may be more likely to use the more open and earlier successional Mineral Cultural Woodland (CUW1), Mineral Cultural Savannah (CUS1), Fresh-Moist Poplar-Sassafras Deciduous Forest (FOD8), and Fresh-Moist Poplar Deciduous Forest (FOD8-1) where scattered tall/mature trees occur within them. Following a precautionary approach, and because the complete breeding bird survey protocol has not been completed, the study area woodlands are considered potential SAR habitat for Red-headed Woodpecker (Map 3b).

### 5.3.4 Eastern Whip-poor-will

Eastern Whip-poor-will is designated as Threatened in Canada (Government of Canada 2026); as a migratory bird, this species and its defined Critical Habitat are subject to protection under the SARA. This species primarily uses early successional forests or forest edges, rock or sand barrens with scattered trees, savannahs, old burns, and sparse conifer plantations as nesting habitat. It prefers well-drained soils and moderate tree cover, and moderate to sparse shrub and herbaceous cover (ECCC 2018).

Within the study area, potential Eastern Whip-poor-will habitat is primarily associated with younger/earlier successional woodland communities that contain open clearings or more open canopy (i.e., CUW1, CUS1, FOD8-1) (Map 3b).

### 5.3.5 Wood Thrush

Wood Thrush is designated as Threatened in Canada (Government of Canada 2026); as a migratory bird, this species and its defined Residence (i.e., the nest) are subject to protection under the SARA. Wood Thrush breeding habitat comprises moist, deciduous or mixed forests with dense deciduous undergrowth and tall trees. They tend to prefer second-growth forests over more mature forests and are often associated with Sugar Maple-dominated stands (COSEWIC 2012).

Within the study area, the FOD5-3 forest represents the most suitable habitat for this species. This community should therefore be assumed to represent habitat for the species pending the completion of additional targeted field surveys (Map 3b).

### 5.3.6 Species at Risk Plants

Three SAR plant species were identified through background information review (MNR 2025) as having potential to exist within the study area due to records in the immediate vicinity (within 1km) and having suitable habitat in the study area. These three species comprise Butternut (*Juglans cinerea*) (designated as Endangered in Ontario (MECP 2026)), Virginia Goat's-rue (*Tephrosia virginiana*) (designated as Endangered in Ontario), and an unnamed restricted plant species identified by NHIC (designated as Threatened in Ontario). The unnamed species is restricted due to its high sensitivity to disturbance or harvest. Butternut is considered to likely be absent within the study area (see below). However, Virginia Goat's-rue and the restricted plant species cannot be fully ruled out pending the completion of a spring vegetation inventory. Therefore, these two species are considered potentially present. Specifically, Virginia Goat's-rue may be located within CUW1 cultural woodland and CUM1-1 cultural meadow communities in the study area, while the unnamed restricted plant species may be located within the FOD5-3 forest community.

### 5.3.7 Species at Risk Considered Absent

One additional SAR that was initially screened has having potential to occur within the study area was American Badger. This species is known to use open habitats including grasslands, oak savannahs, and farmland (MNR 2000), particularly along field edges. The species is

generally known to be present in Norfolk County. However, no evidence of American Badger den use within the subject property was observed during site investigations, including burrows with features that are diagnostic of the species. Evidence of American Badger was also not noted within the lands to the immediate east prior to their development (Dillon Consulting 2018) and does not have NHIC records within 1km of the study area (MNR 2025) or other publicly documented observations (iNaturalist 2025). American Badger is therefore considered to likely be absent within the study area.

Butternut has been recorded in the immediate vicinity (within 1km) of the study area according to NHIC records (MNR 2025). Although suitable habitat occurs on site, no Butternuts were observed during NRSI site investigations. For this reason, Butternut is likely absent within the subject property. Although its presence cannot be ruled out within study area natural features that fall outside of the subject property and which were not investigated, these trees are unlikely to be negatively impacted by the proposed development. For these reasons, Butternut is not considered further in this report.

## 5.4 Significant Wildlife Habitat

No forms of SWH were confirmed within the study area based on the field surveys completed. However, various categories of SWH were identified as Candidate SWH due to the presence of potentially suitable habitat and because they could not be ruled out based on the scope of fieldwork completed. See below for further discussion about the Candidate SWH types identified for the study area.

SWH represents a form of Natural Heritage Feature within the County's Natural Heritage System. In accordance with Section 3.5.2 of the OP, development and site alteration in, or adjacent to, SWH is prohibited unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions that cannot be adequately mitigated (Norfolk County 2025). Candidate SWH must be assumed to represent Confirmed SWH until or unless it is demonstrated through additional fieldwork that these SWH features and functions can be ruled out. See Map 3c for the locations of Candidate SWH within the study area. See Appendix VIII for the complete results of the SWH assessment completed for the study area based on background information review and field survey results, including rationale with respect to the confirmed/potential presence or absence of SWH within the study area.

### 5.4.1 Bat Maternity Colonies

Bat maternity colonies represent a form of seasonal wildlife concentration area, and bat species maintain a high fidelity to these areas which are selected due to their optimal habitat conditions. Bat maternity colony habitat is highly sensitive and the success of colonies is critical to the survival of local bat populations (MNRF 2014). These habitats are used by females for giving birth and raising young.

This SWH type is confirmed based on the presence of either a Big Brown Bat (*Eptesicus fuscus*) or Silver-haired Bat maternity colony (MNRF 2015). Although Silver-haired Bat has recently (2025) been uplisted to Endangered in Ontario and is now treated as a SAR (see Section 5.4.1), it is still considered here in conformance with the MNR (2015) criteria to assess Bat Maternity Colonies SWH in the absence of more recent/updated SWH guidance from the MNR.

Bat Maternity Colony SWH can be located within any forest community, or in deciduous, mixed or coniferous swamps. Based on the information identified in the *Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E* (MNRF 2015), Candidate SWH for Bat Maternity Colonies is identified where ≥10/ha large-diameter (≥25cm DBH) potential roost trees (i.e. containing cavities, crevices or exfoliating bark) occur within mature deciduous or mixed forest stands (FOD, FOM, SWD, SWM). If Candidate SWH for Bat Maternity Colonies is present, it is considered significant if a maternity colony is present which consists of >10 adult female Big Brown Bats (*Eptesicus fuscus*) or >5 adult female Silver-haired Bats (MNRF 2015).

A bat habitat assessment was not completed as part of the EIS fieldwork scope. Therefore, all of the forest communities comprising the Swamp Maple Mineral Deciduous Swamp (SWD3-3) inclusion, the Fresh-Moist Poplar Deciduous Forest (FOD8-1) communities, the Green Ash Mineral Deciduous Swamp (SWD2-2) inclusion, the Fresh-Moist Poplar-Sassafras Deciduous Forest (FOD8), and the Dry-Fresh Sugar Maple-Oak Deciduous Forest (FOD5-3) represent Candidate SWH for Bat Maternity Colonies. Of these communities, the FOD5-3 forest presents the greatest likelihood of providing this habitat function due to its greater density of large-diameter trees that may be used as bat maternity roosting habitat.

### 5.4.2 Snake Hibernaculum

Snakes rely on suitable underground overwintering hibernacula to survive the winter. Depending on species, these hibernacula may be communal, and snakes show a strong fidelity

to them, returning year after year. Snakes often access hibernacula through features such as mammal burrows, fissures in the ground, and other means of access subterranean areas below the frost line. For this reason, identification of snake hibernacula on the surface can be difficult and their locations may be widespread throughout the study area. However, they are sometimes associated with the presence of rock piles, south-facing slopes, old wells and crumbling stone foundations.

As described above for SAR snakes, overwintering hibernacula may exist within the study area although potential locations are unknown. Targeted snake visual encounter surveys would be required to further understand where snake hibernacula may occur, such as due to the presence of congregating snakes during the spring emergence period. However, snake hibernacula are most likely to occur within open habitats, along forest edges or in open woodlands or woodland clearings where suitable sun exposure occurs to allow snakes to bask on objects near their hibernaculum entrance. For this reason, the potential habitat is most likely associated with the CUM1-1 cultural meadow and adjoining forest edges, the CUW1 cultural woodland, and the Mineral Cultural Savannah (CUS1).

### 5.4.3 Amphibian Breeding Habitat (Woodland)

Most amphibians require a source of water to reproduce and during the spring, many of these species concentrate in woodland ponds or swamps to mate and lay eggs. Adults of some amphibian species either live in the pond or at its edge, disperse away from the pond once they emerge to live in terrestrial habitats some distance from the pond, returning in spring to breed or in autumn to hibernate in bottom sediments while other amphibians only return to ponds to breed and hibernate below the frost line in terrestrial habitats (MNRF 2014). Breeding habitats may be within swamps, in floodplains, in groundwater seeps, or in vernal pools within upland forests. Certain amphibian species prefer larger, semi-permanent to permanently wet breeding habitats that include shallow marshes and larger open water ponds. Several species utilize seasonally wet open habitat features; these may include meadow marshes or even terrestrial meadows and fields that seasonally collect standing water. Amphibian Breeding Habitat SWH (woodlands and wetlands) represents a form of Specialized Wildlife Habitat (MNRF 2015, MNR 2000).

Potential amphibian breeding habitat within the study area is associated with the wetland features comprising the Mineral Thicket Swamp/Mineral Meadow Marsh (SWT2/MAM2) complex with SWD2-2 deciduous swamp inclusion as well as the SWD3-3 deciduous swamp

inclusion of the CUW1 cultural meadow. The SWT2/MAM2 and SWD2-2 features were observed to temporarily hold standing water, including the existence of a small pond in the SWD2-2 feature. Although the SWD3-3 feature has not been investigated during the spring period, it may also contain seasonal standing water in low points. Anuran call surveys would be required to confirm if these features provide amphibian breeding habitat at an abundance that would meet SWH criteria (MNRF 2015). Pending additional surveys, these wetland features are considered Candidate SWH for amphibian breeding. Suitable vernal pooling that could support amphibian breeding SWH is not likely to occur in the other study area terrestrial features. However, since terrestrial features surrounding a breeding pond or wetland represent important supporting habitat for breeding sites (e.g., for dispersal and cover), the MNR criteria (2015) define this SWH category to include woodlands within a 230m radius of the wetland. Therefore, the Candidate SWH also includes the majority of the surrounding woodland communities (CUW1, FOD8-1, FOD5-3, FOD8) within the subject property.

### 5.4.4 Marsh Bird Breeding Habitat

Marsh bird breeding habitat represents a type of habitat for species of conservation concern (MNRF 2015). Although marsh habitat is highly limited within the study area (restricted to small areas of meadow marsh as part of the SWT2/MAM2 complex), this SWH category also includes habitat for Green Heron, which is a species more often associated with ponds, waterways, and adjacent deciduous and thicket swamps. Marsh Bird Breeding SWH is considered confirmed, in part, when one breeding pair of Green Herons is considered probable or is confirmed to be breeding within a wetland habitat (MNRF 2015).

During the July 31, 2025 site investigation, one Green Heron individual was observed perched adjacent to the pond located within the SWD2-2 deciduous swamp inclusion. This observation occurred outside of the core bird breeding period (late May-early July) that represents the OBBA survey period, and therefore the observation cannot be assigned a breeding evidence code according to OBBA criteria (Birds Canada et al. 2021). However, the observation occurred within the broader bird breeding period (roughly May 1-August 31) and it is possible that the observed Green Heron represented one part of a nesting pair. For this reason, the SWD2-2 inclusion, as well as its contiguous SWT2/MAM3 wetland community, is considered Candidate SWH pending additional survey work to confirm the breeding status of Green Heron on site.

### 5.4.5 Special Concern and Rare Species

Species that are listed as species of Special Concern by COSSARO (MECP 2026), provincially rare (i.e., ranked S1-S3 by NHIC; MNRF 2021) or species that are designated federally as Threatened or Endangered by COSEWIC but not provincially by COSSARO, are considered SCC in Ontario (MNR 2010). Several SCC were identified as having potential to occur within the study area due to the presence of suitable habitat and because their presence could not be ruled out based on the EIS fieldwork scope. See Appendix VII for details of the SAR/SCC habitat assessment for the study area.

The following SCC are considered to have potential habitat within the study area, which is considered Candidate SWH pending the completion of future targeted surveys.

- Grasshopper Sparrow – associated with open agricultural lands outside of the subject property but within the study area.
- Tufted Titmouse – associated with any of the treed natural features within the study area.
- Common Nighthawk – primarily associated with open CUM1-1 cultural meadow and adjacent open woodlands with clearings (i.e., CUW1, CUS1, FOD8-1).
- Eastern Wood-Pewee – associated with any of the treed natural features within the study area.
- Wood Thrush – associated with the more mature FOD5-3 forest.
- Monarch – associated with the open CUM1-1 cultural meadow, particularly where its host plant Common Milkweed is more abundant.
- Southern Cloudywing – associated with the open CUM1-1 cultural meadow.
- Painted Skimmer – associated with the SWT2/MAM2 with SWD2-2 inclusion, including its pond feature.
- Swamp Darner - associated with the SWT2/MAM2 with SWD2-2 inclusion, including its pond feature.
- Carolina Vetch – associated with the FOD5-3 forest community.
- Palmate-leaved Violet – associated with the FOD5-3 forest community.

## 5.5 Regionally Significant Species

Nine vegetation species that are considered significant in Norfolk County were inventoried within the subject property. Of these, six are considered uncommon while three are considered rare in the county (Oldham 2017). Significant species locations are widespread around the subject property and were recorded in all of the natural ELC vegetation communities with the exception of the Mineral Cultural Savannah (CUS1).

While regionally significant species are not in and of themselves protected under County OP policy, their presence renders additional significance to the features in which they are located. Measures should be taken to avoid impacts to regionally significant vegetation and to protect individual trees during construction where necessary.

# 6.0 Impact Assessment

## 6.1 Description of the Proposed Development

Westwood Trail Developments Inc. proposes to construct a residential development that would represent Phase 3 of the broader Westwood residential subdivision that exists to the east of the subject property. The development will include multi-residential condominium and freehold townhouses that will front onto a private road network and a public road right-of-way, respectively. The public road will connect to West Street in the north and end in a cul-de-sac in the south, with connections to the private condominium road network. The development will also include a residential apartment building that fronts onto West Street in the north end of the property with its own surface-level parking lot. A stormwater block will be located at the south end of the property and will comprise a stormwater wet pond with forebay as well as an infiltration cell. A sanitary sewer pumping station and a condominium common amenity area will be located centrally within the property. The subject property's retained woodland features will be contained within a public open space block that will be conveyed to the County for use as a public park. The open space block will be contiguous with the existing County park (Westwood Acres Park) that is located to the immediate east of the property and comprises the remaining off-property portions of the Significant Woodland.

A conceptual pedestrian trail plan has been identified for the proposed development that includes a trail connection through the on-site woodland to an existing pedestrian trail within the off-site portion of woodland, and a separate trail that would loop around the stormwater management block. A trail branch would also extend north along the east side of the property and connect with West Street.

See Appendix IX for the conceptual development plan for the subject lands, which is overlaid onto the existing conditions as presented in Map 4.

## 6.2 Approach to Impact Assessment

Potential impacts arising from the proposed development are determined by comparing the details of the proposed undertaking with the characteristics of the existing natural features and their ecological functions. Where the development limits overlap with the natural features or indirectly affect their functions, impacts may arise. The following is a description of the types of impacts which will be discussed.

- Direct impacts to the natural features within the subject property associated with disruption or displacement caused by the actual proposed 'footprint' of the development, including impacts caused by site grading and vegetation removal.
- Indirect impacts associated with changes in site conditions such as drainage, water balance and water quantity/quality, and effects of construction on adjacent natural features and habitats.
- Induced impacts associated with post-construction use of the development such as disturbance or degradation of adjacent natural features and species habitats caused by increased human habitation/use of the area.

## 6.3 Direct Impacts

### 6.3.1 Recommended Buffer

The approach to identifying and delineating the study area natural features was used to avoid or minimize direct impacts from development on significant and sensitive natural features. Since the majority of the subject property consists of natural feature cover, a pragmatic approach was required to identify and focus impact avoidance measures on the most sensitive and significant natural features. Within the study area, the Dry-Fresh Sugar Maple-Oak Deciduous Forest (FOD5-3), which comprises the majority of the mapped Significant Woodland complex, is considered the most ecologically significant and sensitive natural feature within the study area. The FOD5-3 community contains the most mature forest cover and represents the highest quality habitat compared to the adjacent features that are relatively younger and earlier-successional. The subject property portion of the FOD5-3 community also represents a smaller western end of a much larger extent of this forest community that extends off-property to the east. Typically, an ecological buffer would be recommended from the western boundary of the on-site portion of the FOD5-3 community to set-back development and to mitigate impacts. However, the proposed development plan does not afford the opportunity for a buffer since development is proposed to more closely approach or to encroach into the edge of the FOD5-3 feature as shown on Map 4. Although no formal buffer is shown for FOD5-3, residual areas of existing natural area will be retained within areas that fall between the FOD5-3 limit and the development limit in specific locations.

As described in Section 5.1, the mapped Significant Woodland also includes the off-site Fresh-Moist Poplar Deciduous Forest (FOD8-1) located immediately south of the subject property due to its identification as a component of the Significant Woodland illustrated on Schedule C of the

OP (Norfolk County 2025). Furthermore, since NRSI biologists were not able to directly access this woodland community, a precautionary approach was taken in identifying it as a significant feature. For these reasons, a buffer is recommended to be applied to the boundaries of this feature extending into the subject property.

Woodland buffers are prescribed with a primary purpose of protecting the edge trees and their root zones as well as providing associated open habitats required by forest wildlife species or for movement. Buffers from woodland boundaries are important in maintaining the condition and function of trees within the woodland while protecting them from impacts of adjacent site alteration. A buffer of 10m width from the edge of the FOD8-1 woodland, where it extends into the subject property, is therefore recommended. The 10m buffer ensures that existing root zones from woodland edge trees will be sufficiently protected while allowing room for future growth. It also provides areas of natural woodland edge regeneration and active restoration to enhance the buffering capacity of the features. Open buffer areas also provide movement corridors for bats moving in and out of the woodland habitat as well as woodland edge foraging habitat.

See Map 4 for the location of the recommended 10m woodland buffer. The buffer is based on an approximated boundary of the edge of the FOD8-1 forest community that was coarsely delineated for the purposes of ELC vegetation community mapping. It is recommended that a more detailed woodland dripline survey for the FOD8-1 limit (based on what is accessible along the property boundary) be completed during the detailed design phase of development approvals to refine the recommended buffer limit.

### 6.3.2 Vegetation Removal and Site Grading

The proposed development will require the removal of the majority of the natural feature cover on the subject property. This will include the entire removal of the on-site portions of the Mineral Cultural Woodland (CUW1) and the inclusions of Green Ash Mineral Deciduous Swamp (SWD2-2) and Swamp Maple Mineral Deciduous Swamp (SWD3-3). The majority of the on-site portions of the Dry-Moist Old Field Meadow (CUM1-1), Cultural Savannah (CUS1), the on-site FOD8-1 forest community, the Fresh-Moist Poplar-Sassafras Deciduous Forest (FOD8), and the Mineral Thicket Swamp/Mineral Meadow Marsh complex (SWT2/MAM2) will be removed, with residual portions of these communities being retained in the east end (Map 4). The development would remove a western fringing portion of the on-site FOD5-3 community. Table 5 below summarizes the total areas of natural feature removal by ELC community:

**Table 5. Estimated vegetation community removal by total area and as a proportion of its total size.**

| Vegetation Community | Total Development Encroachment Area (ha) | Proportion of Vegetation Community Requiring Removal |
|---|---|---|
| CUM1-1 | 1.86 | 55% |
| CUS1 | 0.57 | 79% |
| CUW1 | 2.54 | 68% |
| FOD5-3 | 0.11 | 3% |
| FOD8 | 0.56 | 92% |
| FOD8-1 (on-site) | 0.60 | 84% |
| FOD8-1 (off-site)* | 0.04 | 3% |
| SWT2/MAM2 | 0.43 | 89% |
| SWD2-2 inclusion | 0.12 | 100% |
| SWD3-3 inclusion | 0.17 | 100% |
| Eastern Hedgerow | 0.00 | 0% |
| Western Hedgerow | 0.12 | 77% |
| Cleared/Disturbed Area | 0.74 | 92% |

* While primarily off-site, a small fringing edge or dripline extends into the subject property as shown on Map 2

The proposed development has been designed to preserve the majority of the FOD5-3 forest community. Specifically, 97% of the existing FOD5-3 community, including the off-site portion, would remain intact following the proposed removal of 0.11ha for the proposed development.

Although the majority of the FOD5-3 community will be retained, the proposed development will nonetheless negatively impact a County-mapped Significant Woodland due to the proposed development encroachment into the FOD5-3 community as well as the removal of the FOD8-1 community and SWD2-2 inclusion that form part of the contiguous Significant Woodland. In total, 0.83ha of the Significant Woodland will require removal. Particularly with consideration for the age and maturity of the FOD5-3 community, this impact cannot be feasibly mitigated in the short-term. It is therefore recommended that the Significant Woodland impact be compensated through the establishment of woodland compensation plantings following an offsetting ratio of 2:1 in terms of area of woodland removed (i.e., totalling an area of 1.66 ha). The establishment of at least twice the area of woodland habitat that was removed helps to offset the time lag that will be required for the new compensation woodland community to mature.

Other natural feature communities that are outside of the Significant Woodland that would require removal are relatively younger, have experienced more anthropogenic disturbance, and are not considered to be as significant or sensitive from a floristic quality standpoint. However, as described below, the remainder of the subject property's woodland features outside of the Significant Woodland that will require removal also represent potential SAR habitat and

Candidate SWH as described further in Section 6.3.3. It is recommended that future surveys be completed to assess whether these natural features represent SWH. If any of these other natural features that were identified as Candidate SWH (i.e., comprising the areas of FOD8, FOD8-1, CUW1, and CUS1 (see below with respect to the wetland communities/inclusions)) are confirmed as SWH, it is recommended that these features also be compensated at a 2:1 ratio as part of the broader off-site woodland compensation strategy.

As described in Section 5.2, the wetlands to be removed are small, isolated, have anthropogenic origins, and are not considered significant features. Nonetheless, at a minimum it is recommended that these wetland features that are removed for development (i.e., totalling 0.72ha) be compensated as part of the off-site woodland compensation strategy at a 1:1 area-based ratio with the aim of replacing the lost wetland functions. If, through completion of future targeted field surveys, it is confirmed that the wetland features represent SWH, they should be compensated on a 2:1 basis (see Section 6.3.3). In establishing compensation wetland habitat, the existing wetland features on the subject proeprty should be emulated to the extent feasible with the goal of establishing similar deciduous/thicket swamp and meadow marsh habitats. The wetland compensation area total will represent a subset of the total woodland compensation area requirement, not in addition to it.

It is therefore recommended that a woodland compensation area be established in one or more suitable off-site locations, and that this area will contain wetland compensation areas if the conditions allow to support wetland hydrology. The total size of this off-site woodland compensation area will be subject to the completion of future field surveys to confirm the presence of SWH within the subject property. See Section 6.3.4 for further discussion about the total woodland compensation recommendations for the proposed development.

The proposed development will result in the creation of a newly cut edge to the FOD5-3 Significant Woodland feature, as well as the retention of a block of residual FOD8 forest and CUS1 cultural savannah communities along the northeast end of the development. While tree growth along the new edges of the relatively younger FOD8 and CUS1 wooded communities are expected to be relatively resilient, the cut woodland edge within the FOD5-3 community may stress newly exposed woodland edge trees that grew and established inside the forest edge. These effects may include increased susceptibility to windthrow, sun scalding or winter ice damage. Woodland areas along the new edge will also be subject to stronger ecological edge effects (e.g., via increased penetration of wind, dust, noise; reduced moisture) associated with

the adjacent land use, as well as increased susceptibility to non-native/invasive species colonization.

Construction immediately adjacent to the forest edge may also damage tree limbs and root zones of new edge trees. Trees located immediately adjacent to constructed elements of the subdivision (e.g., road, common amenity area) may be structurally weakened and subject to tree disease or structural failure over time. It is therefore recommended that a tree risk assessment be completed for trees along the new woodland edge abutting the development be inspected for the presence of tree hazards (i.e., trees that are in poor health or dead and trees at risk of structural failure toward the development). The methods, timing and frequency of the tree risk assessment will be defined as part of a Woodland Edge Management Plan (see below). Identified hazard trees will be recommended for management (e.g., complete removal or tree-topping to removal the hazard situation). Hazard trees that are removed should be replaced with new native woody growth that is better suited to the post-development conditions.

A Tree Protection Plan should be prepared to further inform tree removal, retention and protection requirements if required by the County. Tree removals may be subject to additional compensation requirements in accordance with County policies and guidelines. Tree protection measures, including but not limited to the installation of tree protection fencing, must be installed in accordance with the Tree Protection Plan or otherwise as directed by a Certified Arborist or Registered Professional Forester. A Woodland Edge Management Plan should also be prepared to prescribe actions that will stabilize and increase the resiliency of the newly cut woodland edge. This will include the implementation of an Invasive Species Management Plan for the woodland edge area to mitigate species colonization effects and to increase the success rate of newly planted native species along the transitional woodland edge. See Section 7.0 for further discussion about the recommended Woodland Edge Management Plan.

*Proposed Pedestrian Trails*

The proposed development includes the creation of a pedestrian trail network as shown on Map 4. One separate trail would be confined to the south property stormwater management block. This southern trail would be located entirely outside of natural features under the post-development condition, but a segment of the trail will traverse the outer limit of southern FOD8-1 woodland buffer that extends into the subject property. It is recommended that the trail segment that passes through the woodland buffer comprise a fully pervious surface (e.g., crushed limestone screenings) and that its width be minimized to the extent possible. By aligning the

trail to the outer limit of the buffer, space will be afforded within the inner buffer section to establish a dense vegetation planting design (e.g., comprising thicket-forming woody shrubs, including thorn-bearing species) to enhance the woodland edge while mitigating unauthorized human encroachment into the off-property woodland feature (see Section 6.5 for further discussion).

A more extensive trail network is proposed to connect the proposed development with lands to the east and to the West Street ROW to the north (Map 4). An east-west trail segment will connect with an existing public pedestrian trail that exists within the FOD5-3 woodland to the east of the subject property and which falls within the municipal Westwood Park. A north-south branching trail segment will connect with an additional east-west trail that will pass through a northern fringe of the FOD5-3 woodland limit, and further north to West Street. North of the FOD5-3 woodland, the north-south trail segment will traverse a residual area of SWT2/MAM2, FOD8 and CUS1 natural features that will be retained within an Open Space block along the eastern boundary of the development.

The proposed pedestrian trail alignments are conceptual at this time and subject to further refinement. It is recommended that the areas of proposed trail construction be further investigated during the detailed design stage to assess the relative sensitivity of the vegetation communities and species growth in those areas. Based on this assessment, an alternative trail plan, with altered routes or alignments, may be recommended. In general, it is recommended that pedestrian trails avoid the most ecologically sensitive areas (e.g., with respect to wildlife habitat functions and significant vegetation species growth) and preferentially align with routes that minimize tree and other vegetation removal requirements. Where vegetation removals are required, they should preferentially comprise undesirable species such as non-native and invasive species. See Section 6.5.1 for additional recommendations to mitigate human disturbances to the natural features via the woodland trail use.

*Provincially Significant Plant Species*

Two SAR vegetation species were identified as having potential to occur within the study area due to the presence of suitable habitat, pending the completion of a spring-based vegetation inventory to fully assess their presence or absence. These include the provincially Endangered Virginia Goat's-rue and an unnamed restricted plant species identified by NHIC that is designated as Threatened in Ontario (see Section 5.3.5). Virginia Goat's-rue may be located within CUW1 cultural woodland and CUM1-1 cultural meadow communities in the study area,

while the unnamed restricted plant species may be located within the FOD5-3 forest community. Of these two species, Virginia Goat's-rue is therefore more at risk of direct impact associated with removal of its on-site suitable habitat. However, the NHIC-restricted plant species may also be directly impacted due to the proposed removal of a western edge of the FOD5-3 forest community. This species may also be vulnerable to illegal harvesting due to increased human access to the FOD5-3 forest as a result of the adjacent development and pedestrian trail construction through the feature (see Section 6.5).

It is recommended that a spring-based vegetation inventory be completed to fully assess the presence or absence of these species within the subject property. At a minimum, it is recommended that a comprehensive vegetation inventory be completed during a seasonally appropriate period within the limits of planned construction, prior to the onset of site alteration and construction activities. Individuals that would be directly impacted should be relocated to suitable alternate habitat by a qualitied biologist. The relocation site should be in a location where the individuals will not be subject to future habitat removal and should be away from areas of human activity and disturbance. Plant individuals that are located near but outside of the planned construction limits and can be retained should be flagged by a biologist to ensure that they are appropriately protected and maintained outside of the construction limit fencing.

Two SCC plant species, Carolina Vetch and Palmate-leaved Violet, also have potential to occur within the FOD5-3 forest community. These species therefore have potential to be impacted if they occur within the western edge of the forest that is proposed to be removed or within the footprint of the proposed pedestrian trail. As was recommended for the SAR plants, it is recommended that a detailed inventory be completed to identify the presence of these species within areas of proposed development. Any identified individuals that fall within the development footprint should be relocated to a suitable alternate planting site.

*Regionally Significant Plant Species*

The proposed development has the potential to negatively impact all of the nine regionally significant vegetation species that were observed within the subject property. Where possible, such as within the areas of woodland to be retained, impacts to significant vegetation should be avoided. This should be achieved by maintaining construction activities within authorized areas (i.e., no disturbance outside of construction limit fencing; see Section 6.4.1). Several other significant vegetation species may require removal to accommodate site development. Where feasible, individuals should be relocated to a suitable nearby habitat area, or seeds should be

collected for redistribution in existing or restored habitat areas. Prior to the initiation of construction activities, a qualified biologist should re-identify and flag the locations of regionally significant vegetation species that are feasible for relocation or seed collection, identify suitable relocation sites, and undertake or oversee the necessary relocations.

### 6.3.3 Impacts to Wildlife and Their Habitats

*Potential Eastern Foxsnake and Eastern Hog-nosed Snake Species at Risk Habitat*

As described in Section 5.3.1, the entirety of the subject property, with the exception of the disturbed/cleared northeastern corner, represents potential habitat of Eastern Foxsnake and Eastern Hog-nosed Snake that is protected under the SCA. This includes potential gestation, egg-laying (i.e., "nesting") and hibernaculum habitat that is sensitive to disturbance. The proposed development will remove the majority (85%) of this habitat within the subject property. The proposed development will therefore cause a negative impact to the habitat of these species. The activities that would impact the SAR habitat will require registration with the provincial Species Conservation Registry in accordance with Ontario Regulation 75/26 pursuant to the SCA. Prior to registration, a Conservation Plan must be prepared that describes the planned development activities, species and habitats affected, and how the effects will be adequately mitigated. The Conservation Plan must include at least one Conservation Measure that will provide an overall benefit to the species and their habitats.

Functional habitat for the species is not expected to exist within the subject property post-development, although a small area of residual suitable habitat may continue to exist within the CUM1-1 meadow located to the immediate east of the property. To offset the loss of habitat on the subject property, it is recommended that suitable off-site habitat creation and/or enhancement be implemented. This habitat compensation would represent the Conservation Measure that is required under the Conservation Plan. The off-site habitat creation/enhancement area will comprise open habitats used by the species (e.g., open meadow, restored tallgrass prairie). The suitable habitat must be located in an area that will be accessible to the species based on the species' known regional distribution and presence of existing ecological connectivity to the site. The habitat will be enhanced through the placement of microhabitat features required by the species' for their life cycle and ecological strategies (e.g., cover, thermoregulation, nesting) and may include features such as rock piles, woody brush piles, concrete slabs and sandy mounds for Eastern Hog-nosed Snake nesting in accordance with provincial Best Management Practices and guidelines (MNRF 2018). A long-

term monitoring program will also be required to track the successful establishment and use of the compensation habitat by the target species. Details of these requirements will be determined in completion of the Conservation Plan.

Construction of the proposed development has the potential to kill or harm Eastern Foxsnake or Eastern Hog-nosed Snake individuals unless appropriate mitigation measures are implemented. It is recommended that the following measures be undertaken to ensure that the SAR snake species, and other small/medium-sized wildlife, are maintained outside of the construction zone and are not directly impacted:

- Vegetation removal should be completed during the period December 1-March 14 to avoid injury or mortality of active reptile species. The limits of vegetation removal must be clearly marked with fencing or flagging, and construction activities must be maintained outside of the retained suitable habitat areas. Vegetation should only be removed at the surface and no grubbing should occur (see recommended timing for grubbing and grading activities below).
- Temporary (construction-stage) wildlife exclusion fencing must be installed along the limits of the development area. The exclusion fencing should be 1m high, buried 20cm, and may comprise hardware cloth or similar material with ¼" mesh or less (MNR 2013, CVC 2017).
    - Stakes securing the exclusion fencing should be placed on the construction side of the fence, to avoid wildlife climbing up the stakes to scale the fence.
    - The top edge of the fencing should be folded with a "lip" extending into the retained habitat side of the fence, to inhibit small wildlife from climbing over the fence.
    - Fencing should be installed prior to the snake spring emergence period (prior to March 30).
    - The wildlife exclusion fencing should be inspected on a daily basis when construction activity is occurring during the period of March 30-November 1. Any observed deficiencies in the fencing should be repaired or replaced within 24 hours.
- Following the installation of fencing but prior to construction activities, targeted wildlife salvages and relocations should be completed within the construction zone containing the suitable habitat area, for a duration that will be specified in the Conservation Plan. Due to the size of the proposed development, the wildlife salvage zones should be limited to match a phased approach to development of certain spatial areas of the property; wildlife salvages

will occur prior to the initiation of each development phase. The wildlife salvage must be completed by qualified biologists and should be completed during a period of time and under temperature/weather conditions when the species are reasonably anticipated to be present (e.g., during ideal basking conditions). All captured wildlife will be documented and released into a designated suitable habitat area outside of the construction zone.

- Grubbing, site grading, or any other activities that require excavation or earth-moving should be completed after surface vegetation has been cut and during the period May 1-September 30 to avoid impacts to underground overwintering snakes that may occur on-site.
- Construction personnel should be provided with a construction sightings protocol, outlining steps to take should the SAR snake species be observed within the construction zone as well as full-colour photographs and descriptions of the species. If any of the target SAR snakes are observed within the construction zone, activity should cease in the immediate area until the individual leaves the area under its own power.

The above mitigation measures, with the exception of the SAR-specific construction sightings protocol, will also apply to non-SAR snakes for the purposes of mitigating impacts associated with Candidate Snake Hibernaculum SWH in the study area (see below).

*Potential Species at Risk Bat Habitat and Candidate Bat Maternity Colonies Significant Wildlife Habitat*

Since bat habitat assessments and targeted bat surveys were not completed as part of the EIS scope, the entirety of the subject property excluding the northeast cleared/disturbed area is considered potential habitat for SAR bats (i.e., Little Brown Myotis, Northern Myotis, Tri-colored Bat, Silver-haired Bat, Hoary Bat and/or Eastern Red Bat). Specifically, this may include maternity roosting habitat within the woodland features that is sensitive to disturbance and which is protected under the SCA. Adjacent natural habitat (e.g., adjacent meadow areas) that support the maternity roosting habitat within 1000m is also considered protected habitat.

The proposed development will require the removal of most (83%) of the potential SAR bat habitat within the subject property. The proposed development will therefore negatively impact SAR bat habitat. The activities that would impact the SAR habitat will require registration with the provincial Species Conservation Registry in accordance with Ontario Regulation 75/26. Prior to registration, a Conservation Plan must be prepared that describes the planned development activities, species and habitats affected, and how the effects will be adequately

mitigated. The Conservation Plan must include at least one Conservation Measure that will provide an overall benefit to the species and their habitats.

To offset the loss of habitat on the subject property, it is recommended that suitable off-site habitat creation be implemented. This habitat compensation would represent the Conservation Measure that is required under the Conservation Plan. This off-site habitat creation is expected to include, but may not be limited to, the requirement for off-site woodland compensation planting to offset the removal of Significant Woodland and SWH (see Sections 6.3.2 and 6.3.3). In general, it is recommended that the off-site woodland compensation represent an area that is at least 1.5 times the size of the SAR habitat that requires removal. The specific compensation target may be revised based on the completion of subsequent targeted surveys (e.g., via acoustic monitoring) that determine the relative sensitivity of the bat habitat functions within the subject property.

Any proposed bat SAR habitat offsetting should be located in as close a proximity to the affected area as possible to minimize negative effects on the local landscape. To promote the continued use of the study area as bat foraging and flyway habitat, woodland edges with high vegetation structural diversity that provide sheltered areas and support higher insect concentrations and diversity should be considered along new treed edges created as a result of vegetation removal or habitat restoration. Incorporating small openings in the canopy as part of the design of the off-site woodland compensation planting can also be considered to support the presence of foraging habitat. Recognizing that the off-site woodland plantings will require several years to mature, it is further recommended to consider temporary habitat compensation through the installation and monitoring of artificial roost structures (e.g., pole-mounted rocket boxes). However, recommendations for artificial roosting structures should be informed through future bat acoustic monitoring within the study area to determine which SAR bats are present and which might make use of artificial roosting structures (e.g., Little Brown Myotis). See Section 6.3.4 for further discussion about the recommended strategy for establishment of off-site woodland compensation habitat.

The proposed development will also result in the removal of 1.6ha of Bat Maternity Colonies Candidate SWH that is associated with the FOD5-3, FOD8-1, FOD8, SWD2-2 and SWD3-3 communities and inclusions. This impact cannot be mitigated within the subject property. It is therefore recommended that the off-site woodland compensation plantings identified above to offset for the removal of Significant Woodland and SAR bat habitat also be used to recreate

suitable bat maternity colony habitat over the long-term as the feature matures. The general objectives guiding the compensation of suitable SAR bat habitat will also apply to the compensation of Bat Maternity Colonies SWH.

Direct impacts to bats can be avoided by avoiding removal of potential roosting habitat during the bat active period. Specifically, all woody vegetation (i.e., tree and shrubs) that is >1m in height should be removed outside of the period March 15-November 30.

*Potential Species at Risk Habitat for Birds*

Potential habitat for three bird species that are subject to protections under the SARA was identified within the study area: Red-headed Woodpecker, Eastern Whip-poor-will, and Wood Thrush. See below for an assessment of impact potential associated with these species and their habitats.

Red-headed Woodpecker

All of the study area woodland features represent potential habitat for SAR Red-headed Woodpecker (see Section 5.3.4). The proposed development will remove 4.71ha of this habitat, representing 83% of the suitable habitat within the subject property. This will represent a negative impact to the habitat of the species. Although this impact cannot be mitigated within the subject property, this habitat impact can be mitigated on the broader landscape scale, over a long-term period, through the establishment of the off-site woodland compensation plantings. The restoration design of the off-site woodland compensation plantings should therefore include habitat elements that would increase attractiveness and use by Red-headed Woodpecker, such as through the incorporation of more open canopy/less dense tree planting zones with more open understories, and open clearings. This species also requires some large-diameter trees including standing snags. These will take decades to establish naturally and cannot feasibly be incorporated into the woodland compensation planting design within the shorter term. It is therefore recommended that the selected woodland compensation site(s) build off of existing woodland features that already incorporate large-diameter trees and standing snags in order to increase the likelihood of Red-headed Woodpeckers occupying and benefiting from the planted woodland area as part of a broader habitat area.

Although suitable habitat for Red-headed Woodpecker will largely be removed within the subject property, the suitability of adjacent natural features such as retained forest edges south and east of the development can be maintained through the retention of large standing tree snags

where they do not pose a hazard to adjacent human-occupied areas or land uses. The identification of suitable candidate tree snags for retention should be confirmed by a Certified Arborist or Registered Professional Forester based on an assessment of potential for structural failure and fall hazard.

Eastern Whip-poor-will

The proposed development will remove the entirety of suitable habitat for Eastern Whip-poor-will in the subject property. The suitable habitat for this is associated with the CUW1, CUS1, FOD8-1 communities where lower density tree growth and open clearings exist. The proposed removal of these communities will represent a negative impact to the habitat of the species. This direct habitat impact cannot be mitigated within the subject property, but can be mitigated on the broader landscape scale, in conjunction with the establishment of the off-site woodland compensation plantings. In particular, suitable habitat for Eastern Whip-poor-will can be created through the incorporation of open clearings and areas of lower density tree growth with open understories (e.g., see above with respect to Red-headed Woodpecker) within the off-site woodland compensation planting site. See Section 6.3.4 for additional discussion about the off-site woodland compensation planting strategy.

Wood Thrush

A relatively small portion of the FOD5-3 forest that provides suitable Wood Thrush habitat within the study area will require removal to accommodate the proposed development. The remainder of the FOD5-3 community is expected to remain as functional habitat for Wood Thrush. Nonetheless, the recommended off-site woodland compensation planting will provide additional habitat for this species on the broader landscape over the long-term. See Section 6.3.4 for additional discussion about the off-site woodland compensation planting strategy.

Mitigation of Impact to Bird Individuals

The proposed development has the potential to cause injury or mortality of SAR Red-headed Woodpecker, Eastern Whip-poor-will and Wood thrush individuals if not appropriately mitigated. At a minimum, removal of all trees and shrubs >1m in height is to be completed outside of the period March 15-November 30 to avoid impacts to both breeding birds and to tree-roosting bats. Removal of herbaceous growth and shrubs <1m in height should be completed outside of the period April 1-August 31 to avoid impacts to breeding birds, their nests and eggs. Implementation of these timing windows is expected to effectively avoid impacts to the SAR bird individuals.

It is recommended that future breeding bird surveys be completed to confirm or rule out the presence of Red-headed Woodpecker, Eastern Whip-poor-will and Wood Thrush within the study area. Otherwise, the Canadian Wildlife Service (CWS) should be consulted to determine the need for permitting under the SARA.

*Candidate Snake Hibernaculum Significant Wildlife Habitat*

The potential presence of snake hibernacula was not investigated as part of the EIS scope. Candidate Snake Hibernaculum SWH is therefore identified for the portions of the study area that generally provide suitable conditions for snake overwintering, specifically comprising the CUM1-1 cultural meadow and adjoining forest edges, the CUW1 cultural woodland, and the Mineral Cultural Savannah (CUS1). If present, the proposed development is expected to eliminate at least most of the Snake Hibernaculum SWH on the subject property. It is recommended that snake visual encounter surveys and artificial cover object surveys be completed on the property, timed to coincide with the spring and/or fall periods when snakes congregate around their hibernacula. Otherwise, in the absence of these surveys the Candidate SWH should be assumed to be present and the following mitigation recommendations should be implemented.

In order to avoid injury or mortality of individual overwintering snakes, it is recommended that a timing window be observed for the initiation of any site alteration activities that would disturb the soils (e.g., grubbing, earth-moving, soil excavation). Specifically, soil disturbance activities should be avoided during the general overwintering period of approximately October 1-April 30, with specific timing dependent on seasonal temperatures in a given year. This timing window would apply throughout the development limits, given the uncertainty on the precise locations of snake hibernacula within that zone. Vegetation removal activities must be coordinated with appropriate timing windows for migratory birds and bats (see above). Any vegetation removals during the December 1-March 15 period (which aligns with the vegetation removal timing window for migratory birds and bats) must be limited to surface cuts. See the recommendations above with respect to mitigating impacts to SAR Eastern Foxsnake and Eastern Hog-nosed Snake for further details to avoid impacts to overwintering snakes.

To mitigate the loss of on-site Candidate Snake Hibernaculum SWH, it is recommended that an artificial snake hibernaculum be constructed in a suitable location outside of the subject property. If feasible, it is recommended that this hibernaculum be located on County-owned lands immediately adjacent to the subject property to the east, which will increase the likelihood

that local snake populations find suitable alternate overwintering habitat. The artificial hibernaculum should be constructed in a suitable location (e.g., sun-exposed CUM1 cultural meadow habitat; in a properly drained area; away from areas of human activity such as houses or pedestrian trails; away from roads). Candidate locations for a snake hibernaculum should be investigated to confirm seasonal groundwater elevations and depths of surficial frost penetration to confirm that adequate hibernaculum "life zones" exist and to avoid creating a habitat feature that could cause mortality of individuals.

The hibernaculum should be constructed according to provincial guidelines (MNRF 2018), and hibernaculum design and construction activities should be overseen by qualified biologists. The habitat surrounding the hibernaculum feature should be enhanced through the placement of cover and basking objects, such as wooden boards and woody debris. It is recommended that the artificial hibernaculum be constructed prior to the removal of habitat on the subject property to allow overwintering snakes to use the alternate habitat and to mitigate winter mortality effects caused by the need for individuals to find new suitable habitat.

*Candidate Amphibian Breeding Habitat (Woodland) Significant Wildlife Habitat*

The proposed development will require removal of the SWT2/MAM2 wetland complex and the SWD2-2 and SWD3-3 inclusions, as well as much of the surrounding 230m radius woodland habitat, that collectively represents Candidate Amphibian Breeding (Woodland) SWH. The removal of these features will represent a loss of habitat function within the study area, since other wetlands are not known to exist on the adjacent lands. It is recommended that anuran call surveys be completed to assess the significance of these wetlands as amphibian breeding habitat. Otherwise, it is recommended that measures be taken to mitigate impacts to the habitat and to wildlife species that occupy the habitat.

In order to mitigate this habitat impact on a broader landscape scale, it is recommended that the off-site woodland compensation area be designed to incorporate small wetland features and vernal pools that would be conducive to spring amphibian breeding. This recommendation aligns with the general recommendation for 1:1 wetland offsetting described in Section 6.3.2. The feasibility of wetland creation within the woodland feature will require investigation to determine how the hydrological regime can support these features. For example, this may be achieved through creation of irregular undulating terrain within an area of seasonally high groundwater or creation of small graded catchments to facilitate surface runoff into topographic depressions. Soil amendments under the depressional areas (e.g., through application of

tighter soils) may be required for retention of standing surface water and to achieve appropriate spring hydroperiods to allow for amphibian breeding, egg development and juvenile dispersal. These wetland features should be located within or immediately adjacent to existing or planted woodland areas to create conditions that will support the full life-cycle of woodland-breeding amphibians.

Removal of the wetland features may cause injury and mortality of herpetofauna species that occupy the habitats, either as a result of the habitat removal activities themselves or due to their displacement from the habitats. To mitigate these impacts, wetland removal should be timed to occur after the pond or any other standing water features have naturally drained, by which time any amphibian breeding, egg/larval development and juvenile dispersal will likely have been completed if these features provide suitable breeding habitat. If wetland/pond removal must be completed while standing water is still present, it is recommended that a wildlife salvage be completed for these features, timed to occur just prior to the initiation of site alteration and construction activities. This should be completed in conjunction with the drainage of the ponds and wetland areas. Captured individuals will be relocated to a suitable off-site habitat that is identified and authorized via landowner permission prior to the wildlife salvage activities. The wildlife salvage will be completed following standard guidelines and in accordance with the requirements of an MNR Wildlife Scientific Collectors Authorization pursuant to the *Fish and Wildlife Conservation Act* and an Ontario Animal Care Committee authorization.

*Candidate Marsh Bird Breeding Significant Wildlife Habitat (Green Heron Habitat)*

The temporary pond habitat that exists within the SWD2-2 inclusion during the spring/early summer period was identified as Candidate SWH for Marsh Bird Breeding Habitat, specifically associated with the likely presence of breeding Green Herons. The proposed development will require the removal of this habitat, resulting in a loss of habitat function within the study area. It is recommended that the standard two breeding bird surveys (Birds Canada et al. 2021) be completed to further assess and confirm the presence or absence of Green Heron breeding within this wetland feature and within the study area more broadly. Otherwise, it is recommended that measures be taken to mitigate impacts to Green Herons and their habitat.

Although the habitat impact cannot be mitigated within the study area itself, the habitat function can be replaced on a broader landscape scale through the creation of seasonally (spring) inundated wetlands and vernal pools within the recommended off-site woodland compensation habitat (see above discussion regarding wetland offsetting; amphibian breeding habitat

compensation). Created wetland and pond features within the woodland can be designed to attract use by Green Herons through planting of native thicket-forming shrub species around the water's edge, which are favoured by the species.

Injury or mortality of individual Green Herons can be avoided by maintaining vegetation removal outside of the period March 15-November 30 for trees and shrubs >1m in height, which corresponds to the vegetation removal window for SAR bats.

*Candidate Significant Wildlife Habitat for Special Concern/Rare Wildlife Species*

As listed in Section 5.4.5, several SCC have potential to occur within the study area. It is recommended that targeted surveys be completed to further confirm or rule out the presence of these species within the study area. Otherwise, it is recommended that measures be taken to mitigate impacts to the species and/or their habitats where necessary. See below for a summary of recommended mitigation actions associated with SCC with potential to occur on-site:

- Common Nighthawk
    - The proposed development will remove the entirety of suitable habitat for this species in the subject property. Suitable habitat is associated with the CUW1, CUS1, FOD8-1 communities where lower density tree growth and open clearings exist.
    - Direct habitat impacts on the subject property should be mitigated through the incorporation of open clearings and areas of lower density tree growth with open understories (e.g., see above with respect to Red-headed Woodpecker and Eastern Whip-poor-will) within the off-site woodland compensation planting site.
    - Direct impacts to individuals, their nests and eggs should be mitigated by maintaining vegetation removal outside of the period March 15-November 30 for trees and shrubs >1m in height, or otherwise April 1-August 31 for other vegetation growth.
- Tufted Titmouse and Eastern Wood-Pewee
    - The majority of suitable habitat for Tufted Titmouse and Eastern Wood-Pewee on the subject property will require removal (i.e., all woodland features outside of the

FOD5-3 area that will be retained) and represents a direct impact to the habitat of these species within the study area.

  - The direct habitat impact will be mitigated on the broader landscape scale through the recommended off-site woodland compensation planting.
  - Direct impacts to individuals, their nests and eggs should be mitigated by maintaining vegetation removal outside of the period March 15-November 30 for trees and shrubs >1m in height, or otherwise April 1-August 31 for other vegetation growth.

- Painted Skimmer and Swamp Darner
  - The proposed development will remove suitable habitat for these species within the study area through the removal of the wetland and pond features.
  - The direct habitat impact can be mitigated through the incorporation of small wetland features within the off-site woodland compensation planting site (e.g., see above with respect to Amphibian Breeding Habitat (Woodland) Candidate SWH).
- Monarch and Southern Cloudywing
  - The proposed development will remove cultural meadow habitat for these species within the subject property. However, suitable habitat will continue to exist in the study area, within cultural meadow habitat immediately east of the subject property, and is relatively widespread outside of the study area.
  - To mitigate the reduction in habitat in the study area, it is recommended that areas of the off-site woodland compensation site that contain lower density tree growth and clearings be seeded with a native seed mix containing Monarch's host plant Common Milkweed. Within the subject property, Common Milkweed should also be included in a native seed mix that is applied within meadow restoration areas (e.g., south of the on-site portion of FOD5-3 forest) (see Section 7.0).
- Grasshopper Sparrow
  - Suitable habitat for this species is restricted to agricultural lands outside of the subject property. Direct impacts to this species or its habitat are not expected.

*Other Wildlife Species*

The majority of the wildlife species that were observed within the study area are common and ubiquitous on the landscape and have secure or apparently secure populations in Ontario (MNRF 2021). These species are generally tolerant and adaptable to urbanized conditions, and are expected to continue using the subject lands and the adjacent natural features post-development. Species such as Great Blue Heron (*Ardea herodias*), which uses deciduous and thicket swamp habitat, and Killdeer (*Charadrius vociferus*), which prefers open and agricultural habitats, are expected to be displaced from the subject property when it is developed. However, the majority of the observed wildlife species will continue using the study area, including woodland bird species that utilize the adjacent FOD5-3 forest community that extends off-site.

Vegetation clearing has the potential to directly impact bird breeding activity through damage and destruction of nests, eggs and young, or avoidance of the area by breeding adults. Vegetation removal should therefore occur outside of the period March 15-November 30 so as to limit disturbances to nesting activities of birds and to avoid destruction of active nests while also avoiding impacts to SAR bats (as described above). Vegetation that is <1m in height that is not subject to SAR bat habitat protections should be removed outside of the bird nesting period of April 1-August 31 to avoid damage or destruction to bird nests and or disturbance to bird nesting activities. The destruction of migratory birds and their nests is prohibited under the federal *Migratory Birds Convention Act* (MBCA).

*Wildlife Movement*

The study area natural features are relatively isolated on the local landscape, being surrounded by modern subdivision residential lands to the east, rural residential lands to the north, and open agricultural lands to the west and south. Only narrow agricultural hedgerows offer any natural connectivity to adjacent wooded natural features, and these connections would only be utilized by wildlife species that are relatively tolerant of human-occupied landscapes. The proposed development will therefore not interrupt a key ecological linkage or movement corridor for land-based wildlife movements within the study area vicinity. White-tailed Deer, which is known to use or move through the study area, does not require naturalized movement corridors and will continue to move across the landscape via adjacent agricultural lands. Birds and bats will continue to use the remaining study area wooded features as “stepping stone” movement

habitat across the landscape, such as to or from the natural features within the Kent Creek corridor to the north.

### 6.3.4 Woodland Compensation

The following is a summary of off-site woodland compensation requirements that were identified as a means to mitigate the loss of Significant Woodland, wetland, SAR habitat, and Candidate SWH habitat functions that are anticipated on the subject property as described in Sections 6.3.2 and 6.3.3. SAR habitat compensation requirements (i.e., for SAR bats, Red-headed Woodpecker, Eastern Whip-poor-will, Wood Thrush) that form part of the off-site woodland compensation strategy are subject to future determination through the completion and submission of Conservation Plans that are submitted to the provincial Species Conservation Registry (for provincially-listed SAR) and/or may be subject to consultation with CWS to determine permitting or other mitigation requirements (for federally-listed SAR). Habitat compensation for SAR Eastern Hog-nosed Snake and Eastern Foxsnake, which will generally comprise open meadow habitat, will be undertaken separately and is not addressed here. However, SAR snake compensation habitat may be integrated with the off-site woodland compensation as part of a larger habitat offsetting initiative.

- The total area of the off-site woodland compensation planting is to be determined at a future date subject to the completion of additional targeted surveys to assess the presence of SWH in the study area. However, at a minimum, it should comprise the 1.66ha area that is recommended in compensation for the Significant Woodland area removal, plus any additional woodland compensation that is required to offset impacts to SAR habitats.
- The total compensation requirement may be split between separate properties if the total area cannot be accommodated on a single property, subject to further review of the total woodland areas that would be established on each compensation property. The woodland compensation should be designed to ultimately create a deciduous forest community, with a lower proportion of coniferous tree plantings, and incorporating components of more open woodland condition and small wetland, pond or vernal pool features.
    - The ultimate total compensation value will be based on a 2:1 area-based offsetting ratio for removal of Significant Woodland and a 2:1 area-based

offsetting ratio for other vegetation communities outside of the Significant Woodland that are identified as SWH on the subject property.

- The woodland compensation area should contain wetland features comprising a combination of deciduous swamp, thicket swamp, small pond and vernal pool habitat, subject to what can be created given the local compensation site conditions. At a minimum, it is recommended that the total area of wetland creation represent a 1:1 offset of wetland area removed on the subject property (i.e., totalling 0.72ha). However, if the study area wetlands are confirmed to represent SWH through completion of future studies, this offsetting ratio should be increased to 2:1. These should be created as relatively small wetland features contained within and/or immediately adjacent to the woodland compensation feature and can count toward the total requirement of 10.28ha of woodland compensation.
- The woodland compensation planting area(s) should be located on lands as close to the subject property as possible. Doing so will help to maintain the landscape-level functions of the woodland features. In selecting an off-site compensation property, it is recommended that a site be selected that would allow woodland compensation plantings to build off of an existing wooded vegetation community so as to enhance its ecological value and functions.
- Trees that are planted in compensation for the woodland removal must be of a number and density that exceeds the *Forestry Act* definition of "woodland" (i.e., 1,000 trees/ha) anticipating that some tree plantings will die-off. Compensation woodland plantings must comprise exclusively native species that are suitable to the site conditions and reflective of the adjacent vegetation community composition. Tree plantings should be of as large a size as feasible to help accelerate the maturation and ecological value of the compensation feature, and to mitigate negative effects caused by deer browse. Woodland compensation requirements will be planned and implemented with regard to existing guidance and literature, such as Ontario Nature's principles and recommendations for biodiversity offsetting (Ontario Nature 2016).
- The recommended woodland compensation will, over the long-term, provide habitat for SAR bats, SAR Wood Thrush, and the SCC Tufted Titmouse.
- Notwithstanding the above tree density requirement for the woodland generally, it is recommended that certain portions of the woodland compensation feature contain more

open canopy/less densely planted tree growth as well as scattered small clearings within the feature. This will enhance the suitability of the feature as habitat for SAR Red-headed Woodpecker and SCC Eastern Wood-Pewee, provide foraging habitat for SAR bats, and create habitat for the SAR Eastern Whip-poor-will and SCC Common Nighthawk. Especially where located near woodland edges adjacent to more open habitat lands, the creation of clearings will also provide habitat for the SCC Monarch (with seeding of its host plant Common Milkweed) and Southern Cloudywing.

- To enhance flyway and foraging habitat for SAR bats, the woodland edges should be designed to incorporate a high structural diversity including sheltered areas and to create a higher diversity of insect prey species.
- Creation of the wetland features will require a hydrological/hydrogeological assessment to determine whether they can be sustained through shallow groundwater inputs and/or surface water runoff and how they will achieve a suitable hydroperiod to support amphibian breeding, egg development and juvenile dispersal. For example, this may include use of soil amendments under proposed wetland locations to incorporate tighter soils that retain standing water for suitable durations.
- The created wetland/pond features will provide compensation habitat for the SCC Painted Skimmer and Swamp Darner. By establishing native thicket-forming shrub species around the perimeters of wetland and pond features, these features are also expected to provide suitable habitat for Green Heron in compensation for the loss of Candidate Marsh Bird Breeding SWH on the subject property.

The woodland compensation planting will be guided by a compensation strategy and planting plan that is approved in consultation with Norfolk County and other third parties (e.g., owner of additional compensation property) as required. The planting plan will include details including specific species selections; specific planting zones; herbaceous seed mix application locations, rates and species compositions; land preparation activities (e.g., pit-and-mound topography, soil amendment where required); and other habitat enhancement features. The compensation area(s) will be subject to a Monitoring Plan and retained as a natural area(s) in perpetuity.

## 6.4 Indirect Impacts

### 6.4.1 Construction Disturbance to Adjacent Natural Features and Habitats

Vegetation clearing, site grading and other construction activities have the potential to inadvertently destroy, damage and degrade existing vegetation along the development limits unless the development limit boundaries are clearly marked. For example, construction activities can cause scarring and decreased health of adjacent trees whose branches or root systems have been damaged by machinery or affected by construction-related dust and sedimentation. Damage to trees and other vegetation can also be caused by the compaction of soils within tree rooting zones along woodland edges.

Direct damage and indirect disturbances can cause stresses on the natural features that weaken their ecological integrity. In these states, natural features are more prone to establishment and proliferation of invasive, non-native species such as Common Buckthorn (*Rhamnus cathartica*). Proliferation of invasive, non-native species within natural communities decreases their ecological value such as by suppressing native species, diminishing biodiversity and reducing habitat suitability.

Where development is to be set-back from woodland edges, such as along the south edge of the FOD5-3 forest on the subject property and within the 10m woodland buffer to the southern FOD8-1 woodland, disturbance to the woodland edges will be avoided by clearly delineating the limits of construction along the buffer limit/grading limit and ensuring that construction activity is maintained outside of this area. This fencing is expected to take the form of a combined Erosion and Sediment Control (ESC)/tree protection fencing, subject to the completion of a future ESC Plan and Tree Protection Plan (TPP). This fencing may also coincide with the temporary wildlife exclusion fencing where feasible.

Tree protection fencing must be installed where directed by a TPP and must conform to municipal guidelines in terms of fencing type, signage requirements, etc. Protective tree fencing should be installed at least 1m from the dripline of retained trees where possible to adequately protect the root zone from soil compaction and other disturbances, unless otherwise specified in the TPP. All tree protection fencing must be installed prior to site alteration and construction activities, and inspected by a Certified Arborist/Registered Professional Forester or environmental inspector. Where tree protection fencing is not required along construction area limits, other forms of boundary demarcation should be used which may include silt fencing for ESC purposes or brightly-coloured snow fencing.

Combination ESC/tree protection fencing will also be installed along the limits of development where construction will encroach into the woodland features to be retained within the eastern portion of the subject property. It is recommended that a Certified Arborist or Registered Professional Forester mark the trees that are to be removed in accordance with an approved TPP. The Certified Arborist/Registered Professional Forester should also be on site during vegetation removal and grading activities within the woodland encroachment areas to ensure that damage does not occur to the adjacent trees to be retained, and to immediately respond with arboricultural remedial measures (e.g., pruning damaged limbs or roots) if any damage does occur. Additional tree protection and mitigation measures will be identified in the future TPP report.

Designated areas for construction lay-down, vehicle access and parking, equipment storage, materials stockpiling, and any on-site construction offices should be located at least 10m away from the retained on-site and adjacent woodland features to limit potential to indirectly impact this feature.

When construction equipment is moved from one site to another, it has the potential of inadvertently transporting seeds and other vegetative material of non-native and invasive plant species. This may therefore lead to the introduction and colonization of a site's natural features with invasive plants. Construction vehicles and machinery should therefore be properly cleaned of soils, mud and water to ensure that invasive plant species are not transported to the subject property where they can establish within the natural features. The following general steps should be taken:

- Vehicles and equipment should be inspected before leaving the site, or if moving from one part of the site to another where one area is known to contain a concentration of invasive plant species;
- Vehicles and equipment should be inspected after having transported soil that has the potential to contain invasive plant species;
    - Vehicles and equipment should be inspected for dirt, plant material and seeds that may be lodged in or adhered to surfaces;
- Based on the above inspections, vehicles and equipment should be thoroughly cleaned in an area where there is no risk of spreading invasive species. The interior and exterior

of vehicles and equipment should be cleaned to remove mud and debris, including along undersides and around wheels.

See the Clean Equipment Protocol for Industry (Halloran et al. 2016) for additional details of methods that should be followed to mitigate the spread of invasive plant species between natural areas.

During construction activities such as vegetation clearing and site grading, dust can potentially result in the following:

- Changes in vegetation due to increased heat absorption and decreased transpiration,
- Immediate visual impacts.

Impacts due to dust should be mitigated by moistening areas of bare, dry soil with water as needed during construction activities to reduce the amount of dust produced.

Excessive noise, vibrations, artificial lighting and human presence as a result of site preparation and construction activities may cause wildlife to temporarily avoid the area. These impacts can be mitigated by restricting the daily timing of construction activities to between 7:00hr and 19:00hr. This timing restriction should also apply to the use of generators or pumps insofar as possible. Any artificial lighting used for construction purposes should be turned off or directed away from the adjacent natural features following the completion of daily construction activities.

Such impacts resulting from dust, noise, and vibrations are expected to be temporary, minimal and localized during the construction of the proposed development. Significant effects on wildlife are not anticipated and it is expected that displaced wildlife species will return to the vicinity of the subject property following construction.

### 6.4.2 Changes to Hydrological Regime

*Surface Water Drainage and Quantity Control*

The surface drainage regime on the subject property has likely been influenced through historic use of the property for agricultural purposes and the creation of ditch inlet drainage outlets along the west property boundary that direct water further westwards. The southern and western portions of the subject property currently drain to two ditch inlet structures, one of which is located in the southwest property corner and the other of which is located approximately centrally along the west property boundary. Water conveyed to these structures is then diverted

underground into an agricultural tile drainage system to the west. The north portion of the subject property, which has been historically disturbed through land clearing and materials stockpiling activities, drains northwards toward the West Street ROW under the existing condition. The central and eastern property wooded features that largely comprise the Significant Woodland drain towards an internal catchment that is approximately centred on the Green Ash Mineral Deciduous Swamp (SWD2-2) wetland inclusion. This feature also contains the temporary pond that contains seasonal standing water (approximately December-June based on 2025 measurements) due to it representing a topographical low point on the property that is underlain by low permeability soils. See the Stormwater Management Report (MTE 2026c) for additional information about the site's existing surface water catchments and surface flow characteristics.

Under the post-development condition, the majority of surface runoff within the subject property will be directed toward the stormwater management block in the south end of the property, and ultimately to an infiltration cell located within the block. Only small portions of the west side of the property will drain uncontrolled toward the property to the west (MTE 2026c). The proposed development will remove the subject property's topographical low point and its associated SWD2-2 wetland feature which currently collects and slowly infiltrates runoff. Among the remaining woodland features that will be retained along the east side of the development, surface flows will continue follow existing natural grades in a general westward direction toward the development. Any surface flows that do not naturally infiltrate or are subject to evapotranspiration within the natural area will be captured within the development's stormwater drainage system. Since drainage patterns within the retained natural features are not expected to change, no negative impact associated with site drainage characteristics are expected. A retained portion of the northern Mineral Cultural Savannah (CUS1) along the east property boundary, which currently drains toward West Street, will be directed into the development's stormwater management system and ultimately southwards to the stormwater management block. However, since the existing northward drainage is not supporting an ecological receptor of that drainage, the minor change in flow pattern in the northeast portion of the property is not expected to cause any negative impacts.

Since the vast majority of surface runoff generated within the proposed development (up to the 100-year storm event) will be infiltrated on-site, no surface discharge to a receiving natural feature is proposed. Therefore, no stormwater quantity impacts to natural features are anticipated.

*Infiltration and Groundwater Recharge*

Hydrogeological data collected for the site indicates that groundwater follows a general downward vertical gradient throughout the subject property and that the site infiltrates groundwater to recharge the shallow aquifer units. Based on this general downward gradient and a measured groundwater table that is approximately 10.8-15.2m below ground surface, there is no evidence of direct groundwater connectivity between the study area's natural features and the groundwater regime (MTE 2026a). Seasonal ponding of surface water that occurs within the site was determined to be the result of surface runoff to a topographically low area (i.e., within the SWD2-2 inclusion) that overlies low permeability fine-grained sediments. Ponded surface water slowly infiltrates such that by July 2025, no standing surface water was recorded within the pond (MTE 2026a). Therefore, natural features within the study area are not influenced by or reliant upon a shallow groundwater regime.

The majority of stormwater runoff generated within the proposed development, up to the 100-year storm event, will be directed toward the stormwater management block and ultimately the infiltration cell at the south end of the subject property. The infiltration cell has been designed to ensure that the post-development infiltration volumes meet or exceed the pre-development infiltration volumes to ensure a continuation of local aquifer recharge from the site. Since the study area natural features do not maintain a direct connection to the underlying groundwater regime, the redirection and capture of surface runoff for infiltration at the south end of the site is not expected to negatively impact the existing natural features. Furthermore, by maintaining site-wide groundwater recharge rates, no effects on the broader groundwater flow regime, or its contributions to the Kent Creek PSW system to the north, are anticipated.

*Interference with Groundwater Flow*

Based on the measured water table elevations and expected depths of excavation, major construction interaction with the groundwater table or dewatering requirements are not expected to occur (MTE 2026a). Consequently, alterations to the prevailing groundwater flows within the site or more broadly through the study area are not anticipated. Ongoing groundwater monitoring will be undertaken through the spring freshet period to verify vertical separation between the seasonal high water table and base of excavations within the site (MTE 2026a).

### 6.4.3 Sedimentation and Erosion

During vegetation removal and site grading activities, areas of bare soil will be exposed which have the potential to erode during rainfall events and impact the adjacent natural features. Increased stormwater surface flow and erosion processes may cause the deposition of sediments onto down-slope vegetation, ultimately causing vegetation die-back or impaired health.

Soil compaction also has potential to occur as a result of heavy machinery in the area of development. Soil compaction can greatly reduce the permeability of soils and affect their ability to retain water during rain/snow melt events. This will result in an increase in surface water run-off which will ultimately increase the erosion potential and the amount of sediment being transported into the adjacent natural features.

In order to protect the adjacent natural features from potential impacts due to sediment, an ESC Plan must be developed prior to any construction activities on-site. The primary principles associated with sedimentation and erosion protection measures are to: (1) minimize the duration of soil exposure, (2) retain existing vegetation, where feasible, (3) encourage re-vegetation, (4) divert runoff away from exposed soils, (5) keep runoff velocities low, and (6) trap sediment as close to the source as possible.

A detailed ESC Plan will be prepared during the detailed design stage of the development application.

The following general recommendations should be implemented to mitigate erosion and sedimentation impacts, to be refined within the detailed ESC Plan as required:

- Installation of silt fencing along the construction limits in all locations where run-off will discharge to adjacent lands and natural features. At a minimum, silt fencing will be installed along the limits of grading adjacent to the retained and off-site woodland features. Geotextile material can be attached to tree protection fencing where this fencing type overlaps with silt fencing requirements.
- ESC measures must be regularly inspected and repaired or replaced in a timely manner. Accumulated sediment must be removed as needed.
- Placement of topsoil and seeding of all graded areas not subject to active construction must be undertaken within 30 days. A native seed mix, appropriate to the site conditions

and supplemented with a nurse crop, should be applied in areas adjacent to existing natural features.

- It is also recommended that topsoil piles be located >30m from the adjacent woodland and that silt fencing be installed around piles to prevent off-site migration of water-borne sediments.

The impact resulting from soil compaction can be mitigated by minimizing the use of construction vehicles and equipment within 10m of adjacent retained or off-site woodlands except where required, and by locating material stockpile and equipment storage locations >10m away from the woodlands.

### 6.4.4 Water Quality

Decreases in water quality, such as through discharge of deleterious substances in stormwater runoff, can cause both acute and chronic toxicity impacts within biological communities. These impacts include increased mortality rates, impaired health conditions, decreased reproductive productivity and other reproductive impairments in wildlife. Environmental contaminants are also known to biomagnify along increasing biological trophic levels, where higher-level predators are particularly susceptible to impacts. Water quality impairments can also pose health risks to humans wherever there is potential to come into contact with untreated or inadequately treated water discharge.

The majority of stormwater generated on the subject property will be directed toward the stormwater management block at the south end of the property via an internal storm sewer network. Runoff will be directed into a sediment forebay and wet pond which will collectively function to provide an Enhanced level of water quality treatment (at least 80% removal of total suspended solids) before being infiltrated within the infiltration cell (MTE 2026c). No stormwater will be discharged to natural features on or adjacent to the proposed development. Only small post-development catchments along the west property boundary will direct surface runoff uncontrolled into the property to the west. Runoff from these catchments will be limited to clean surface runoff from sodded rear yards and will drain into open agricultural land to the west. Therefore, no water quality impacts to natural features as a result of the development's stormwater management system are anticipated.

Construction-stage measures should be implemented to ensure that spills, debris and other deleterious substances are prevented from migrating off-site into the adjacent natural features.

These measures should be incorporated into the ESC Plan for the development. Vehicle refueling and equipment stockpiling should not occur within 30m of the woodland boundaries. A Spill Response Plan should be prepared and be ready to be implemented on-site if required.

Since no uncontrolled flow from surfaces that will receive road salt applications will occur into adjacent natural features, direct contamination of the adjacent natural features by road salt is not expected. Nonetheless, in consideration of the site's location within a Significant Groundwater Recharge Area and Wellhead Protection Area, and the sensitivity of groundwater resources to contamination, the preparation of a Salt Management Plan and implementation of a road salt monitoring program (i.e., measurement of sodium and chloride parameters) has been recommended (MTE 2026a). Salt management and monitoring measures are important to ensure the quality of any ecological groundwater receptors outside of the study area, such as within the Kent Creek PSW and associated natural features. Since on-site salt treatment methods are infeasible, proper control and application rates for road salt represent the best methods to mitigate this potential impact. Salt loading on the development's paved surfaces should be minimized by limiting the application of winter road salts and/or applying non-chloride de-icing alternatives (e.g., sand) where feasible. Contractors carrying out salting activities should also be familiar with best practices to limit salt application to conditions in which its use will be effective, and to ensure equipment is not over-applying salt.

## 6.5 Induced Impacts

Establishment of the proposed residential development will increase the potential for human disturbances to the adjacent natural features if not appropriately mitigated. In particular, the development may lead to increased off-trail human access to the Dry-Fresh Sugar Maple-Oak Deciduous Forest (FOD5-3) that will comprise (and does comprise east of the property) part of the municipal Westwood Park. It may also lead to increased human access to the Fresh-Moist Poplar Deciduous Forest (FOD8-1) to the south of the property relative to existing conditions. Uncontrolled human access to the woodland features can cause habitat degradation, such as through vegetation trampling or damage, garbage or yard waste dumping, wearing of informal paths and associated soil erosion. Disturbance-sensitive vegetation species that have been inventoried within the FOD5-3 forest could be impacted, while the NHIC-restricted SAR vegetation species that may also occur within the feature could be more vulnerable to disturbance or harvesting. Habitat degradation may lead to the further establishment of non-native, invasive species such as Common Buckthorn. Yard waste dumping can also readily result in establishment of non-native species (e.g., Garlic Mustard (*Alliaria petiolata*); garden

escapees). Increased human population in the immediate vicinity will also increase the potential for domestic animal (e.g., cat (*Felis catus*)) and other development-tolerant and human-subsidized mammal (e.g., Northern Raccoon) access to adjacent natural areas. Easier access provided to these animal groups may impact nesting success and direct mortality among certain small-size wildlife, such as passerine birds, amphibians and reptiles.

To mitigate uncontrolled human access into the FOD5-3 woodland, it is recommended that permanent fencing with no gates be installed along the eastern limit of the subject property, including around the south and east limits of the common amenity area that is to be located west of the feature, along the limits of the townhouse block to the south, and southwards along the limits of the stormwater management block. It is also recommended that restored graded slopes along the east side of Street A where it abuts the woodland be planted with a dense configuration of thicket-forming shrubs, including thorn-bearing species, to further mitigate uncontrolled access into the woodland from the roadside.

As described in Section 6.3.2, dense shrub growth is also proposed to be established within the FOD8-1 buffer adjacent to the proposed trail to prevent unauthorized access into that feature. To further mitigate human encroachment effects on the FOD8-1 woodland, it is recommended that signage be installed along the trail at the south end of the property to state that the woodland is located on private property and that trespassing is prohibited.

Since portions of the proposed development will be located immediately adjacent to woodland at the east end of the property, there is potential for incidental nighttime illumination of the woodland features caused by building exterior and outdoor lighting (i.e., “lightwash” effects). This may negatively impact bird and bat roosting habitat functions within the woodland. Lightwash effects can be mitigated by ensuring that exterior lighting fixtures installed on houses that are adjacent to woodlands, lighting systems installed within the common amenity area, and street lighting, be downward casting. Outdoor lighting within the common amenity area should be timed to turn off when it is closed for use at night. Other specific measures include the following:

- Use covered bulbs that light facing downward. Ensure that the cone of light does not extend beyond the development footprint into natural areas;
- If LEDs are selected, use “warm” or filtered LEDs (CCT < 3,000 K; S/P ratio < 1.2) to minimize blue emission;

- Use International Dark Sky Association-approved fixtures top mitigation light pollution (https://www.darksky.org/).

The wildlife species recorded within the study area, and for which suitable habitat is expected to be retained in the study area post-development, are relatively tolerant and adaptable to human-occupied landscapes such as residential subdivisions. These species are likely already acclimatized to some degree of human influence associated with the existing adjacent Westwood subdivision phase to the east and the presence of existing public pedestrian trails. Species that occupy the woodland, such as Northern Cardinal, Cedar Waxwing, Black-capped Chickadee (*Poecile atricapillus*), Baltimore Oriole (*Icterus galbula*), and Great Crested Flycatcher (*Myiarchus crinitus*), are generally tolerant of human-occupied areas (Halkin et al. 2021, Witmer et al. 2020, Foote et al. 2020, Rising and Flood 2019, Miller and Lanyon 2020) and are expected to persist within the study area woodlands post-development.

Of the SAR and SCC wildlife species for which potentially suitable habitat is expected to be retained within the study area post-development, varying induced impact potential and associated mitigation recommendations are identified:

- SAR Eastern Hog-nosed Snake and Eastern Foxsnake:
    - Residual suitable habitat is associated with the off-property Dry-Moist Old Field Meadow (CUM1-1)
    - SAR snakes may enter the development lands from the adjacent suitable habitat, where they will be vulnerable to road mortality, human persecution, and other hazards.
    - It is recommended that permanent wildlife exclusion fencing be installed to prevent entry of SAR snakes into the development lands. The permanent exclusion fencing can take the form of smooth, flat barrier material (e.g., vinyl) that can be attached to the bottom end (facing the habitat side) of the recommended chain-link fencing along the southeast side of the development where it abuts the off-site CUM1-1 habitat. The north ends of the fencing can tie in to the woodland boundaries at each end. The vinyl material should be at least 0.6m high, keyed into the ground, and be of a smooth texture to ensure that it can’t be climbed by the SAR snakes. The poles for the fencing should be installed on the development side of the fence so that the barrier material can

attach flush to the chain-link on the habitat side. It is recommended that the material be opaque in order to prevent wildlife individuals from seeing areas on the other side, and therefore lessening their efforts to try to reach it.

    - The above mitigation strategy is subject to future consultation with MECP.

- SAR bats
    - Nighttime lightwash effects into the adjacent woodlands may negatively impact use of the features as roosting habitats by bats. See above for recommended measures to mitigate lightwash into woodland areas.
- SAR Red-headed Woodpecker
    - Suitable habitat may be retained within the off-site and residual on-site woodland features.
    - Red-headed Woodpeckers are relatively tolerant of human-occupied landscapes (Frei et al. 2020) and, if present, are expected to persist post-development provided suitable large-diameter and standing snag trees remain.
- SAR Wood Thrush
    - Studies have demonstrated the effects of adjacent urbanization on Wood Thrush relative abundance within woodland fragments, but that these effects are primarily associated with urbanization at the larger scale (i.e., within 1km) of the woodland than with more localized effects (within 100m) (Heide et al. 2023). If the species is present, the proposed development may cause Wood Thrush to abandon the study area woodlands. However, measures have been recommended above that would mitigate these effects by controlling human access and mitigating disturbance within the woodland.
- SCC Eastern Wood-Pewee and Tufted Titmouse
    - Suitable habitat will be retained within the off-site and residual on-site woodland features.
    - These species are not expected to be negatively affected or displaced by human use of the proposed development. These species are generally tolerant of adjacent human-altered landscapes, occur within areas of fragmented woodland

habitat and make use of woodland edges (Watt et al. 2020, Ritchison et al. 2020).

- SCC Monarch and Southern Cloudywing
    - These species are expected to continue using the existing off-site CUM1-1 meadow habitat and induced impacts to these species are not expected.

It is recommended that all new residents of the development be provided with an information brochure that highlights the significance and sensitivity of the adjacent natural features, as well as the potential presence of SAR snakes in the area. The brochure would describe how these features and habitat functions can be disturbed through certain human activities, and how these impacts can be avoided or minimized. Recommendations will be provided to homeowners, such as to keep cats indoors, to avoid activities that would attract raccoons and other human-subsidized wildlife (e.g., by properly securing garbage in waste receptacles), limiting the use of fertilizers and using native garden plantings.

### 6.5.1 Pedestrian Trails

The proposed development incorporates the creation of a pedestrian trail network into the FOD5-3 woodland. This will encourage human access and use of the woodland, which can potentially lead to negative effects such as altered wildlife behaviours near the trails, the creation of unauthorized side-trails off of the main trails, damage to trees and other vegetation immediately adjacent to the trails, and yard waste dumping and littering. However, the creation of dedicated pedestrian trails encourages residents and members of the public to follow those routes, which can be designed to avoid more ecologically sensitive areas or significant vegetation growth, while lessening the potential for individuals to create their own unauthorized paths through the woodland.

The potential negative effects of woodland trails can also be mitigated through implementation of the following measures:

- The precise route and alignment of the proposed pedestrian trails shall be refined during the detailed design stage through site-based investigation of the features, such that the trails will avoid more ecologically sensitive areas, areas of significant vegetation growth or species habitat use, and such that tree and other vegetation removals are avoided or minimized.

- Pedestrian trails are to comprise a pervious surface material (e.g., native soils or wood chips).
- The width of the pedestrian trails should be minimized to the extent possible while meeting municipal standards.
- The pedestrian trails should follow the existing topography and minimize grading requirements to the extent possible while meeting municipal standards.
- No artificial lighting shall be installed along portions of the trails that pass through natural areas.
- Garbage receptacles shall be installed within trailhead locations on the subject property. Maintenance of the garbage receptacles will be the responsibility of the County once the trail system is conveyed to municipal ownership.
- Signage shall be installed at the trailhead locations on the subject property encouraging users to stay on the trail, to keep dogs leashed at all times, and to refrain from littering.

The proposed development provides an opportunity to integrate with the existing public trail network within Westwood Park to the east, and can represent an ecological benefit by allowing residents to engage with and appreciate the natural features that fall within the park. As a municipal trail, periodic monitoring and maintenance of the trail will be the responsibility of the County. This should include monitoring to identify any negative effects to the natural features caused by trail use, and implementation of mitigative measures where feasible.

## 7.0 Restoration and Enhancement

The south property buffer to the off-site Fresh-Moist Poplar Deciduous Forest (FOD8-1) should retain as much residual native vegetation growth from the existing on-site Mineral Cultural Woodland (CUW1) edge as possible with the exception of what is required to accommodate the proposed pedestrian trail segment. The outer portion of the buffer that is disturbed and graded for trail construction should be naturally restored through application of a suitable native seed mix and native shrub plantings to restore and enhance the FOD8-1 woodland edge. As described in Section 6.5, it is recommended that this area be planted with a denser grouping of colony-forming shrub species to inhibit unauthorized public access into the adjacent woodland.

Areas of grading and construction disturbance that extend along the eastern limits of the development must be adequately restored to natural land cover. Areas of disturbed soil must first be stabilized, such as through the application of a nurse crop (e.g., Annual Oats (*Avena sativa*), Annual Rye (*Lolium multiflorum*), or White Millet (*Panicum miliaceum*)) as required. The nurse crop application should be completed in conjunction with, or be followed by, application of a native herbaceous seed mix that is appropriate for the local site conditions. Where spacing allows, disturbed areas should also be planted with native tree or shrub species where the development abuts wooded natural features. The selection of suitable native species should reflect the species assemblage within the adjacent vegetation community, be suitable to the site conditions, and should establish a robust and resilient new woodland edge in accordance with the recommendations of a future Woodland Edge Management Plan.

A Woodland Edge Management Plan will be required to restore and stabilize the new woodland edge that is created along the east side of the development. This plan will generally include, but not be limited to, the following:

- a detailed planting plan for native tree and shrub plantings, and native seed mix application, to create a new and robust natural woodland edge that transitions out from the cut edge;
    - inclusion of woodland edge design measures that benefit bats, including vegetation structural diversity;
- removal of hazard trees, including newly exposed trees that are susceptible to wind throw;

- thinning of tree growth, where necessary, to incorporate the above plantings and to increase diversity;
- invasive species management, if warranted; and,
- installation of wildlife habitat features as a form of habitat enhancement, where beneficial (e.g., potential bat roosting structures; see Section 6.3.3).

## 7.1 Snake Habitat Enhancement

Residual suitable habitat for SAR Eastern Hog-nosed Snake and Eastern Foxsnake in the study area associated with potential key habitat functions such as nesting, overwintering, foraging and thermoregulation is primarily limited to the off-site CUM1-1 cultural meadow community. Subject to MECP consultation, it is recommended that the County (as landowner) be consulted to explore opportunities to enhance the snake habitat functions of the meadow habitat. This may be undertaken as a means of mitigating impacts to SAR snakes pursuant to requirements under the *Endangered Species Act* or future *Species Conservation Act*. Snake enhancement measures may include the installation of microhabitat features such as rock piles, woody debris piles and/or concrete slabs with adjacent low-growing shrubs to provide basking and cover habitat for snakes. This may also include the installation of one or more sandy mounds to provide alternate nesting habitat for Eastern Hog-nosed Snake. As described in Section 6.3.2, it is also recommended that a snake hibernaculum be constructed within this habitat, subject to County approval, to mitigate impacts to Snake Hibernaculum SWH on the subject property (see Section 6.3.2). All snake habitat features are to be installed in accordance with provincial Best Management Practices and guidelines for SAR snakes (MNRF 2018).

Pending future consultations with MECP and the County, a detailed Restoration and Enhancement Plan should be produced for the off-site CUM1-1 feature to detail the proposed habitat enhancement measures.

## 8.0 Monitoring

Pre-, during-, and post-construction monitoring is recommended to ensure that the adjacent woodland is not impacted throughout all stages of property development. The recommended monitoring components are described below.

### 8.1 Pre-Construction Monitoring

Prior to any construction activity on-site, including vegetation clearing and site grading, on-site inspections of the following should be undertaken to ensure proper installation:

- Sediment and erosion control measures (e.g., silt fencing) in accordance with a future ESC Plan;
- Proper installation of tree protection fencing in accordance with a future TPP;
- Temporary wildlife exclusion fencing as directed by a qualified biologist; and,
- Marking of trees to be removed along the east side of the development where it will extend into existing wooded natural features by a Certified Arborist/Registered Professional Forester.

### 8.2 Construction Monitoring

Construction monitoring is the responsibility of the proponent and is to be undertaken by a designated environmental inspector or qualified delegate. Generally, construction monitoring must occur to ensure compliance with the conditions of various permits. Construction monitoring measures are to include the following:

- Regular monitoring of the above fencing measures to ensure maintenance and effectiveness;
- Inspection of tree removal and grading activities where the development encroaches into the wooded natural features, by a Certified Arborist/Registered Professional Forester, to ensure no negative impact to trees that are to be retained, and to implement arboricultural remedial measures (e.g., limb pruning) if needed;
- Inspection of the south woodland buffer and all woodland edges to ensure no unauthorized construction encroachments, damage to trees, or other disturbances caused by construction activities outside of the construction limits; and

- Monitoring for snake incursions into the construction zone and inspections for snakes along the habitat side of the temporary wildlife exclusion fence.

## 8.3 Post-Construction Monitoring

The post-construction period is assumed to begin once at least 80% of the residential units are occupied or as otherwise determined by the County. A post-construction monitoring plan will be implemented to include the following components:

- Inspection of the vegetative restoration zones to ensure proper growth and establishment by a qualified biologist or Certified Arborist/Registered Professional Forester. An initial inspection should be completed one year after seed mix application to ensure that the desired herbaceous species are growing in successfully, and to inform the need for any supplementary seeding. An additional inspection should be completed two years after tree/shrub planting, which typically conforms to the warranty period for tree and shrub materials. Dead tree/shrub stock should be replaced on a 1:1 basis. Remedial measures should be taken as necessary to address declining or poor-condition stock (e.g., enhanced watering schedule, installation of tree guards to mitigate deer browse, cutting back competing vegetation). All tree staking is to be removed just prior to final inspection. Note that this monitoring component is tied to the timing of seeding/vegetation planting establishment and may be initiated prior to the formal pre-construction monitoring phase.

- Inspections of the southern woodland buffer and the on-property woodland features will be completed in conjunction with the above inspections to identify any post-construction human use impacts. If impacts are observed, additional mitigation measures may be considered. See Section 8.4 with respect to the woodland pedestrian trails.

- Hazard tree inspections along the newly cut woodland edge will be completed in accordance with the recommendations of the Woodland Edge Management Plan. Hazard tree management recommendations (e.g., tree felling or tree topping) will be made based on the results of the inspections.

- The SAR snake habitat features within the adjacent County-owned lands, if installed, should be monitored to determine their use by the target species and other wildlife species. Consultation with the MECP may be required to determine appropriate monitoring methods, frequency and timing.

- Monitoring of the off-site woodland compensation planting area should be undertaken in accordance with the detailed Woodland Compensation Plan that is prepared for the site. This will include, but not be limited to, monitoring to ensure that restoration plantings are surviving and establishing satisfactorily and toward their intended vegetation community condition. The specific timing and duration of the woodland compensation monitoring plan will be determined during the detailed design stage of the development approvals process. However, it is expected that this will include at least 3 years of post-restoration monitoring with monitoring events occurring biennially.

## 8.4 Pedestrian Trail Monitoring

Pedestrian trail monitoring should be completed as a component of the overall natural environment monitoring plan for the development, and comprise pre-, during-, and post-construction phases. It should be noted that disturbances associated with use of the public pedestrian trails within the woodland will not likely be attributable to the proposed development itself, but would instead represent a reflection of the cumulative impact of trail use associated with the proposed development and the existing residential development to the east.

An inspection of the woodland should be completed by a biologist during the pre-construction phase to serve as a baseline against which during- and post-construction monitoring will be compared. Monitoring will include assessments of disturbance that may occur, such as vegetation damage and trampling, creation of ad-hoc trails, and debris dumping and littering. During-construction monitoring will comprise regular inspections by the designated environmental inspector to ensure that construction activities are being maintained within authorized areas, that any protective fencing is being maintained, and that no unauthorized materials storage or dumping within the woodland is occurring. Post-construction monitoring of any trail use impacts is to be completed by a biologist in conjunction with post-construction monitoring for the development as a whole, as discussed above.

Following Year 2 of post-construction monitoring, it is anticipated that the County will assume responsibility for future monitoring of natural feature disturbance along the public trail network.

## 9.0 Summary

NRSI was retained by Westwood Trail Developments Inc. to complete an EIS associated with the proposed construction of Phase 3 of the Westwood subdivision, to the west of the earlier subdivision phase developments in Simcoe, Ontario. The development would comprise condominium and freehold townhouses as well as an apartment building with associated surface-level parking. A public road ROW would extend into the subject property from West Street and connect to a private road network associated with the condominium. The development would also include stormwater management facilities, a common amenity area and pumping station. A public pedestrian trail network is proposed that would extend around the stormwater management pond and a trail that would connect through the woodland to the existing Westwood Park pedestrian trail network as well as north to West Street. The subject property is currently vacant and predominantly comprised of natural feature cover with the exception of a disturbed open area in the northeast end. The natural features include a mature forest community, and a smaller woodland abutting the south side of the property, that are identified as Significant Woodland in the County OP. The study area natural features, including the earlier successional woodlands and areas of open cultural meadow in addition to the Significant Woodland, were identified as potential habitat for multiple SAR and Candidate SWH categories. Previously unmapped wetlands were identified on the subject property and are understood to have originated from previous agricultural drainage features on the property that have gone unmaintained for several years and where seasonal water impounding has occurred.

This report has been prepared to meet requirements under the County OP to demonstrate that the proposed development will not negatively impact the County-defined Provincially Significant Features and Natural Heritage Features, and their ecological functions. It provides a characterization of the existing natural features and species habitats, and assesses their significance and sensitivity to inform the design of the proposed development. Potential impacts to natural features and functions were assessed based on development details provided by the Project Team.

A development plan has been prepared that will require removal of the majority of the subject property's natural features, but which will retain the majority of the FOD5-3 forest community, which represents the most significant and sensitive natural community on the property. However, the proposed development will require removal of portions of the mapped Significant Woodland complex, including encroachment into the outer fringe of the FOD5-3 community. The development will also require removal of the on-site wetlands and the other natural features

that represent potential SAR habitat and Candidate SWH. It is therefore recommended that an off-site woodland compensation planting be established to mitigate the loss of natural feature form and functions on the subject property. The total size of the off-site woodland compensation planting area will be confirmed at a future date following the completion of additional field surveys to assess the presence of SWH within the study area. However, at a minimum, the woodland compensation area should comprise an area of 1.66ha (representing a 2:1 offset ratio for Significant Woodland area requiring removal) and should include 0.72ha of wetland if feasible (representing a 1:1 offset ratio for wetland area requiring removal on the subject property. The compensatory wetland features would comprise deciduous and thicket swamp, meadow marsh and/or open pond features. Subject to the completion of additional field surveys, other natural features on the subject property requiring removal should be compensated at a ratio of 2:1 if confirmed to represent SWH. Similarly, the wetland removals should be compensated at a 2:1 ratio if confirmed to represent SWH. Portions of the woodland compensation area should also be planted with a more open canopy structure and clearings to provide suitable habitat conditions for certain significant species for which habitat will be removed (e.g., Red-headed Woodpecker, Eastern Whip-poor-will, Monarch). The off-site woodland compensation area should build off of existing natural areas and be located as close to the subject property as possible. Certain aspects of the woodland compensation area are subject to consultation with the MECP (e.g., with respect to SAR bats).

Additional off-site habitat compensation is expected to be required to mitigate the loss of assumed on-site habitat for the SAR Eastern Hog-nosed Snake and Eastern Foxsnake. This habitat compensation will largely comprise suitable open meadow habitats (e.g., restored tallgrass prairie) and must be located in an area that is anticipated to be accessible to the target SAR snakes. Consultation with the County should also be considered to explore the opportunity to enhance adjacent meadow habitat for SAR snake habitat use. Requirements associated with off-site habitat for these SAR snakes will be subject to future determination through the completion of a Conservation Plan for these SAR that is submitted to the Province in accordance with SCA requirements.

It is recommended that additional targeted surveys be completed to further assess the presence of various significant species and habitat functions that have been identified for the study area. Additional actions that are necessary to mitigate impacts or to provide an ecological benefit to SAR that may be impacted by the development may be necessary. This will be determined through the preparation of Conservation Plans that are submitted to the Province via the

Species Conservation Registry (for provincially-listed SAR, in accordance with the SCA) and/or through possible consultation with CWS to determine permitting or other requirements (for federally-listed SAR, in accordance with the SARA). Measures are also recommended to mitigate impacts to Candidate SWH identified on the subject property, including aspects of habitat design and enhancement at the off-site woodland compensation site, enhancement of residual natural features on the subject property, and creation of a snake hibernaculum structure on the adjacent County-owned property if possible.

The proposed development will directly impact elements of the County's Natural Heritage System, including Significant Woodland, assumed Habitat for Endangered and Threatened Species, and assumed Significant Wildlife Habitat. Recommendations have been provided to mitigate potential negative effects caused by the development, including direct, indirect and induced impacts that may arise through construction and human use of the proposed development. Mitigation of direct impacts will be achieved through the off-site compensation strategy; this mitigation will be achieved at a landscape scale and over long-term periods as the woodland compensation site establishes and matures. Targeted tree protection measures should be determined as part of a future Tree Protection Plan. Stabilization and restoration of the newly cut woodland edges along the east side of the development is recommended in accordance with a Woodland Edge Management Plan. Restoration of a south property woodland buffer is also recommended to enhance the adjacent feature edge while mitigating unauthorized human encroachment. Monitoring measures have been recommended to ensure that construction-stage mitigation measures are functioning as intended, that ecological restoration measures have been successfully established, and that the woodland buffer and adjacent natural features are being respected and maintained during and following construction. Pre-, during-, and post-construction monitoring is also recommended with respect to the pedestrian trail construction. It is expected that trail monitoring will ultimately be assumed by the County following transferral of the Open Space lands to the County as an expansion of Westwood Park.

## 9.1 Summary of EIS Recommendations

The following is a summary of EIS recommendations to mitigate and offset impacts, to restore and enhance, and to monitor the existing natural features and their ecological functions within the study area. Please refer to the relevant section of the report for additional details about each recommendation.

**Table 6. Summary of EIS Recommendations**

| Number | Recommendation |
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| *Direct Impact Mitigations* | |
| 1. | A 10m buffer should be established from the limits of the southern off-site FOD8-1 woodland to set-back development from the woodland edge and to mitigate adjacent land use impacts |
| 2. | The subject property's woodland natural features that are identified as Significant Woodland, potential SAR habitat and/or Candidate SWH and that require removal to accommodate the proposed development should be offset through the establishment of woodland compensation planting at an off-property location. Significant Woodland removal should be compensated at a 2:1 area-based ratio, based on the area of removal required on the subject property. Areas that are confirmed to represent SWH, or are otherwise considered Candidate SWH, should also be compensated at a 2:1 ratio. The total area of woodland compensation will be confirmed subject to the completion of future targeted surveys to assess the presence of SWH in the study area. |
| 3. | Wetlands requiring removal within the subject property should be offset at a 1:1 area-based ratio, at minimum, through the creation of wetlands within the off-site woodland compensation planting site. If the wetlands are confirmed to represent SWH, or are otherwise identified as Candidate SWH following completion of future targeted field surveys, they should be compensated at a 2:1 ratio. The created wetlands should be designed to emulate the removed wetland community characteristics to the extent feasible. Created wetlands should include features that incorporate plantings of native thicket-forming shrubs to enhance habitat for Green Heron and other wildlife species. |
| 4. | The woodland compensation area should be located as close as possible to the subject property and the woodland compensation plantings should build off of an existing natural heritage feature. If possible, the existing natural feature should include large-diameter trees and standing snags to encourage use of the compensation woodland by the SAR Red-headed Woodpecker. The compensation planting may be located on more than one property if it cannot be accommodated on a single property, provided the woodland compensation on each property appropriately meets the woodland form and function offsetting goals. |
| 5. | The woodland compensation area should be designed to establish a deciduous forest community with smaller wetland inclusions that is suitable to the site conditions and achieves the habitat offsetting objectives. Trees must be planted at a density to meet the *Forestry Act* definition of "woodland" and with a species diversity to emulate a natural woodland community. However, portions of the woodland should be planted to achieve a more open canopy condition, and should include tree clearings, to offset habitat for significant species that prefer these conditions and for which habitat will be removed on the subject property. Tree plantings should be of as large a size as feasible to accelerate the maturation of the feature and to mitigate herbivory effects. |
| 6. | The edges of the off-site woodland compensation plantings, and of the restored on-site woodland edges, should be designed to incorporate a high structural diversity including sheltered areas to enhance habitat for SAR bats. |
| 7. | A Woodland Compensation Plan should be created to guide the planting details, site preparation activities (e.g., pit-and-mound topography, soil amendments if required), and monitoring plan for the off-site compensation planting area. |
| 8. | Artificial bat roosting structures (e.g., pole-mounted rocketbox; tree-mounted bat boxes) should be installed on the subject property and/or on adjacent County-owned lands (subject to County approval) to mitigate impacts to SAR bat habitat. |
| 9. | Additional targeted surveys should be completed to further assess the presence or absence of SAR and SWH functions within the subject property. |
| 10. | Additional actions must be completed as required to ensure conformance with the *Species Conservation Act* and the *Species at Risk Act*. |
| 11. | An artificial snake hibernaculum should be created in a suitable habitat location outside of the subject property. If possible, the artificial snake hibernaculum should be located within open meadow habitat on the County-owned land to the east. The artificial snake hibernaculum must be constructed according to provincial Best Management Practices and guidelines, and should be appropriately located |

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| | with consideration for factors such as disturbance potential, site drainage, seasonal groundwater levels and depth of frost penetration. The hibernaculum should be constructed prior to the removal of all potential snake overwintering habitat on the subject property. |
| 12. | Wetland and pond features should be removed after they have naturally drained if possible. Otherwise, prior to the removal of wetland features that contains standing water, a wildlife salvage should be completed by qualified biologists. The wildlife salvage will be completed in accordance with standard protocols and provincial authorizations. |
| 13. | Common Milkweed should be included in herbaceous seed mixes for open meadow habitats where appropriate within restored habitat areas on the subject property and at the off-site woodland compensation site (e.g., adjacent to woodland edge or within open clearings) to enhance habitat for the SCC Monarch. |
| 14. | A Woodland Edge Management Plan should be prepared and implemented to stabilize, restore and enhance the newly cut woodland edge along the east side of the development. The Woodland Edge Management Plan will include, but not be limited to, the following components that should be implemented within the subject property:<br>• Tree Risk Assessment and hazard tree management plan<br>• Invasive Species Management Plan<br>• Restoration and Enhancement Plan for the woodland edge<br>• Associated monitoring and reporting requirements |
| 15. | A Tree Protection Plan should be prepared to identify specific tree removal, protection and impact mitigation requirements associated with site alteration and construction activities. This will include detailed mapping of tree removals and retentions, tree protection fencing locations and specifications, and guidelines for the protection of adjacent trees to be retained during tree felling. The Tree Protection Plan is to be prepared in accordance with County guidelines. |
| 16. | The pedestrian trail segment passing through the southern woodland buffer should be located within the outer limit of the buffer, comprise a pervious surface, with a minimized width to accommodate buffer restoration plantings. |
| 17. | The routes and alignments of the proposed pedestrian trails through the wooded natural areas should be refined through site-level investigation such that the trail avoids areas of sensitive habitat and vegetation growth, and such that tree and other native vegetation removal requirements are avoided or minimized. |
| 18. | The woodland pedestrian trail segments should comprise a pervious surface (e.g., native soils or wood chips), their widths should be minimized to the extent possible, and grading for trail construction should be avoided or minimized to the extent possible. |
| 19. | A comprehensive vegetation inventory should be completed during a seasonally appropriate period to further assess the presence of provincially and regionally significant vegetation growth within the subject property. |
| 20. | Prior to vegetation clearing and site alteration activities, a qualified biologist should re-identify and flag provincially and regionally significant vegetation species that will require removal or may otherwise be impacted. Where feasible, significant vegetation species should be relocated to, or seed collected and dispersed within, suitable alternate locations where they will not be subject to additional impacts or disturbances. |
| 21. | Suitable off-site habitat should be created and/or enhanced for Eastern Hog-nosed Snake and Eastern Foxsnake. The off-site habitat should comprise suitable open habitats used by the species, be located in an area where the species can be reasonably expected to access the site, and should be enhanced for use by the target SAR snakes through enhancement of microhabitat features in accordance with provincial Best Management Practices and guidelines. |
| 22. | Temporary wildlife exclusion fencing should be installed around the limits of the development area to prevent entry of SAR snake and other small wildlife species into the construction zone. The temporary wildlife exclusion fencing must be designed in accordance with provincial guidelines to prevent entry by the target SAR snakes. Installation of the fencing should be overseen by a qualified biologist and be completed prior to the initiation of site alteration and construction activities. |

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| 23. | Removal of trees and shrubs >1m in height should be completed during the period December 1-March 14, or as otherwise directed by MECP, to avoid injury or mortality of active reptile species; to avoid impacts to migratory birds, and their nests and eggs in accordance with the *Migratory Birds Convention Act*; and to avoid impacts to individual SAR bats in accordance with the *Species Conservation Act*. This vegetation removal should be limited to surface cuts with no grubbing or disturbance of the soil layer. |
| 24. | Other vegetation removal (i.e., shrubs <1m in height and herbaceous vegetation species) should be removed during the period September 1-March 30 to avoid impacts to migratory birds, and their nests and eggs in accordance with the *Migratory Birds Convention Act*. |
| 25. | Following temporary wildlife exclusion fencing installation and just prior to the initiation of construction activities, targeted wildlife capture and relocation should be completed by qualified biologists. Captured wildlife should be relocated to suitable habitat areas outside of the construction zone. |
| 26. | Grubbing, site grading, or other activities that require soil disturbance should be completed after vegetation has been cut and during the period May 1-September 30 to avoid impacts to overwintering snakes. |
| 27. | Construction personnel should be provided with a construction sightings protocol, outlining steps that should be taken if SAR snakes are encountered and how to identify the SAR snakes. |
| *Indirect Impact Mitigations* | |
| 28. | Erosion and Sediment Control fencing, tree protection fencing, temporary wildlife exclusion fencing, or combinations thereof, should be installed along the limits of grading or construction adjacent to the natural features to clearly demarcate the construction limits, to mitigate run-off and sedimentation effects within the features, to mitigate inadvertent damage to vegetation caused by construction activities, and to exclude SAR snakes and other small wildlife from entering the construction zone. |
| 29. | Areas of tree removal within the woodland features should be marked by a Certified Arborist or Registered Professional Forester. The Certified Arborist/Registered Professional Forester should be on site during vegetation removal and grading activities within the woodland encroachment areas to ensure that damage does not occur to the adjacent trees to be retained, and to immediately respond with arboricultural remedial measures |
| 30. | Designated areas for construction lay-down, vehicle access and parking, equipment storage, materials stockpiling, and any on-site construction offices should be located >10m from adjacent natural feature edges. |
| 31. | The Clean Equipment Protocol (Halloran et al. 2016) should be implemented during construction to mitigate the potential spread of invasive plant species from one site to another during construction. |
| 32. | Impacts due to dust should be mitigated for by moistening areas of bare, dry soil with water as needed during site grading and construction activities to reduce the amount of dust produced. |
| 33. | Daily construction activity should be limited to the period 7:00hr to 19:00hr, and artificial lighting should be turned off or directed away from the adjacent natural features, to avoid disturbance to night-time wildlife habitat use. |
| 34. | A site-wide infiltration water balance (post-development rates meeting or exceeding pre-development conditions) is to be achieved through direction of the majority of surface runoff volumes within the site toward the stormwater management facility and its infiltration cell, as described in the Stormwater Management Plan (MTE 2026c). |
| 35. | No stormwater is to be discharged into adjacent natural features, in accordance with the stormwater management plan. |
| 36. | Construction-stage Erosion and Sediment Control measures must be implemented in accordance with an approved ESC Plan to effectively mitigate erosion and sedimentation impacts on the adjacent natural features. |
| 37. | An “enhanced” level of water quality treatment (at least 80% removal of total suspended solids) must be achieved through the proposed stormwater management system, as described in the Stormwater Management Plan (MTE 2026c). |
| 38. | A Spill Response Plan should be developed, and a spill kit should be kept on-site during construction activities. |

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| 39. | Vehicle refueling and equipment stockpiling should not occur within 30m of the adjacent natural features. |
| 40. | A Salt Management Plan should be developed and implemented for the site. |
| *Induced Impact Mitigations* | |
| 41. | Permanent chain-link fencing with no gates should be installed along the eastern limits of the development, between the common amenity area southwards to the stormwater management facility, to mitigate uncontrolled human access into the FOD5-3 woodland and adjacent natural features. |
| 42. | The permanent chain-link fence should include an affixed sheet vinyl material along its lower side to serve as a permanent wildlife exclusion fencing, to inhibit SAR snakes from entering the development from adjacent meadow habitat to the east. |
| 43. | Restored graded areas along the east side of Street A where abuts the woodland, as well as portions of the south woodland buffer outside of the proposed trail footprint, should be planted with a dense configuration of native thicket-forming shrubs, including thorn-bearing species, to mitigate uncontrolled human access to the woodlands. |
| 44. | 'No Trespassing' or similar signage should be installed along the southern property boundary to mitigate entry into the adjacent off-property woodland. |
| 45. | Exterior light fixtures and outdoor lighting structures should be designed to be down-ward casting and to prevent lightwash effects within the adjacent natural features. Outdoor lighting should use International Dark Sky Association-approved designs. Outdoor lighting for the common amenity area should be timed to turn off when it is closed for the night. |
| 46. | New residents of the subdivision should be provided with an information brochure that highlights the significance and sensitivity of the adjacent natural feature, informs them about the potential presence of SAR snakes in the area, and how they can be good stewards of the environment in their community. |
| 47. | No artificial lighting should be installed along the woodland segments of the pedestrian trail. |
| 48. | Garbage receptacles should be installed at trailhead locations on the subject property and should be maintained by the County upon conveyance of the trails and Open Space lands to the County. |
| 49. | Signage should be installed at trailhead locations on the subject property encouraging users to stay on the trail, to keep dogs leashed at all times, and to refrain from littering. |
| *Restoration and Enhancement* | |
| 50. | Areas of soil adjacent to natural features that are disturbed through site alteration and grading activities should be stabilized, such as through use of suitable a nurse crop. |
| 51. | The south woodland buffer, and newly cut woodland edges along the east side of the development, should be ecologically restored and enhanced with native seed mix application and native vegetation plantings that are suitable to the local site conditions and reflective of the adjacent vegetation communities. Restoration and enhancement plantings will be completed in accordance with the Woodland Edge Management Plan and its associated Restoration and Enhancement Plan. |
| 52. | Subject to approval by the County, snake habitat enhancement features (e.g., rock piles, woody brush piles, concrete slabs, sandy mound nesting habitat for Eastern Hog-nosed Snake) should be installed within the meadow habitat to the east of the subject property. Habitat features are to be installed in accordance with provincial Best Management Practices and guidelines. |
| *Monitoring* | |
| 53. | Pre-construction and construction-stage inspections of tree protection and silt fencing must be completed in accordance with Tree Protection Plan and ESC Plan requirements, respectively, to ensure proper installation and function. |

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| 54. | Temporary wildlife exclusion fencing is to be reviewed by a qualified biologist for correct installation. The temporary wildlife exclusion fencing is to be regularly inspected during the construction period by a designated environmental monitor, in accordance with applicable permitting or mitigation plans, to ensure functionality and to identify the presence of any snakes along the fenceline. |
| 55. | Any limbs or roots of trees to be retained that are damaged during construction must be inspected by a Certified Arborist or Registered Professional Forester and pruned where necessary. |
| 56. | Construction- and post-construction inspections of the woodland buffer and adjacent on-site natural features, including along the woodland pedestrian trail segments, should be completed to ensure no unauthorized entry into or vegetative damage within these areas. |
| 57. | Areas receiving native seed mix application should be inspected one year after application to ensure proper growth results. Areas of deficient growth should be re-seeded as required. |
| 58. | Tree and shrub plantings should be inspected for survival and health condition at the end of the two-year warranty period. Remedial actions should be taken where planted individuals show signs of impaired growth (e.g., through enhanced watering during drought, installing tree guards, cutting away competing vegetation); dead individuals should be replaced on a 1:1 basis. |
| 59. | Hazard tree inspections are to be completed along the newly cut woodland edge in accordance with the Woodland Edge Management Plan. |
| 60. | Monitoring of off-site SAR snake habitat creation and enhancement habitats and their associated microhabitat features should be undertaken in accordance with SAR permitting or regulatory requirements. |
| 61. | Monitoring of the off-site woodland compensation planting area should be completed in accordance with the detailed Woodland Compensation Plan and with SAR permitting or regulatory requirements, as applicable. |

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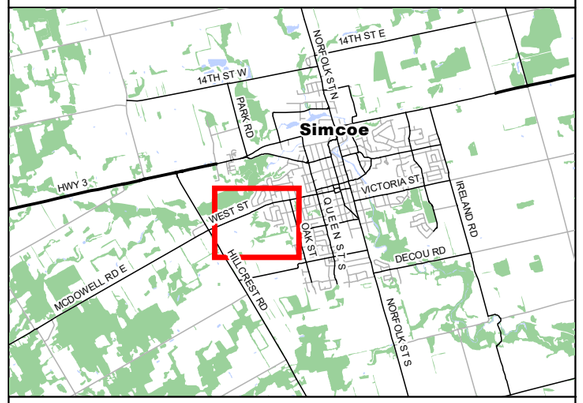
# Maps

Map 1

# Westwood Subdivision Phase 3

## Study Area




**Legend**

- Study Area
- Subject Property
- Intermittent Watercourse
- Waterbody
- Provincially Significant Wetland (PSW)
- Wooded Area (LIO-mapped)

554700 555000 555300 555600 555900

4742800 4742500 4742200 4741900 4741600

Kent Creek Complex Wetland (LR-1)

Path: X:\3616_WestwoodPhase3EIS\NRSI_3616_Map1_StudyArea_5K_2026_04_10_DNH.mxd

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Project: 3616
Date: April 10, 2026

NAD83(CSRS)v7 - UTM Zone 17
Size: 11x17"
**1:5,000**

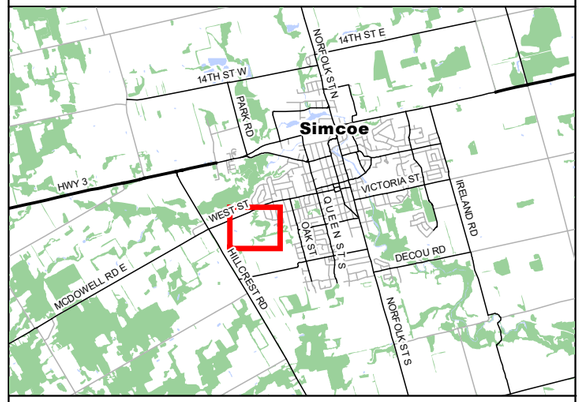
0 100 200 300 Metres

N

Map 2

# Westwood Subdivision Phase 3

## Vegetation Communities




554800 555000 555200 555400 555600

4742400 4742200 4742000 4741800

Kent Creek

Cleared/Disturbed
CUS1
H
FOD8
CUM1-1
H
SWT2/MAM2
SWD2-2
CUP
SWD3-3
FOD8-1
FOD5-3
CUW1
CUM1-1
FOD8-1

**Legend**

- Subject Property
- Intermittent Watercourse
- Ecological Land Classification (ELC)
- (CUM1-1) Dry - Moist Old Field Meadow Type
- (CUP) Plantation
- (CUS1) Mineral Cultural Savannah Ecosite
- (CUW1) Mineral Cultural Woodland Ecosite
- (FOD5-3) Dry - Fresh Sugar Maple - Oak Deciduous Forest Type
- (FOD8) Fresh - Moist Poplar - Sassafras Deciduous Forest Ecosite
- (FOD8-1) Fresh - Moist Poplar Deciduous Forest Type
- (H) Hedgerow
- (SWD2-2) Green Ash Mineral Deciduous Swamp Type
- (SWD3-3) Swamp Maple Mineral Deciduous Swamp Type
- (SWT2) Mineral Thicket Swamp Ecosite/(MAM2) Mineral Meadow Marsh Ecosite
- ELC Inclusion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Project: 3616
Date: April 10, 2026

NAD83(CSRS)v7 - UTM Zone 17
Size: 11x17"
**1:3,000**

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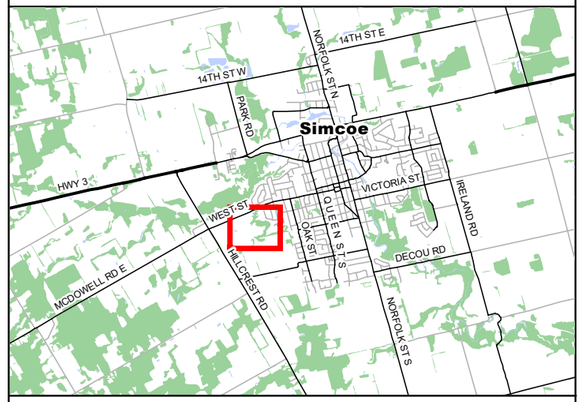
N

Path: X:\3616_WestwoodPhase3EIS\NRSI_3616_Map2_VegetationCommunities_2K_2026_04_10_DNH.mxd

Map 3a

# Westwood Subdivision Phase 3

## Significant and Sensitive Natural Features




554800 555000 555200 555400 555600

4742400 4742200 4742000 4741800

Kent Creek

WEST STREET

KENNEDY ROAD

ATWOOD CRESCENT

VIRGINIA AVENUE

THOMSON ROAD

TAMARACK WAY

IRONWOOD STREET

SERVICEBERRY LANE

Cleared/Disturbed

CUS1

H

FOD8

CUM1-1

SWT2/MAM2

SWD2-2

CUP

SWD3-3

FOD8-1

FOD5-3

CUW1

CUM1-1

FOD8-1

### Legend

- Subject Property
- Intermittent Watercourse
- Significant Woodland
- Wetland
- Ecological Land Classification (ELC)
- (CUM1-1) Dry - Moist Old Field Meadow Type
- (CUP) Plantation
- (CUS1) Mineral Cultural Savannah Ecosite
- (CUW1) Mineral Cultural Woodland Ecosite
- (FOD5-3) Dry - Fresh Sugar Maple - Oak Deciduous Forest Type
- (FOD8) Fresh - Moist Poplar - Sassafras Deciduous Forest Ecosite
- (FOD8-1) Fresh - Moist Poplar Deciduous Forest Type
- (H) Hedgerow
- (SWD2-2) Green Ash Mineral Deciduous Swamp Type
- (SWD3-3) Swamp Maple Mineral Deciduous Swamp Type
- (SWT2) Mineral Thicket Swamp Ecosite/(MAM2) Mineral Meadow Marsh Ecosite
- ELC Inclusion

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Project: 3616
Date: April 2, 2026

NAD83(CSRS)v7 - UTM Zone 17
Size: 11x17"
**1:3,000**

0 50 100 150 200 Metres

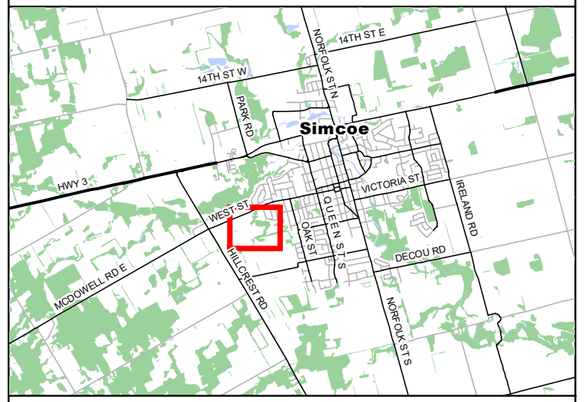
N

Path: X:\3616_WestwoodPhase3EIS\NRSI_3616_Map3a_SignificantSensitiveNaturalFeatures_2K_2026_04_02_DNH.mxd

Map 3b

# Westwood Subdivision Phase 3

## Potential Species at Risk Habitat




554800 555000 555200 555400 555600

4742400 4742200 4742000 4741800

Kent Creek

WEST STREET

KENNEDY ROAD

ATWOOD CRESCENT

VIRGINIA AVENUE

THOMSON ROAD

TAMARACK WAY

SERVICEBERRY LANE

IRONWOOD STREET

Cleared/Disturbed

CUS1

H

FOD8

CUM1-1

SWT2/MAM2

SWD2-2

CUP

SWD3-3

FOD8-1

FOD5-3

CUW1

CUM1-1

FOD8-1

### Legend

- Subject Property
- Intermittent Watercourse
- Potential Red-headed Woodpecker Habitat
- Potential Species at Risk Bat Habitat
- Potential Wood Thrush Habitat
- Potential Eastern Whip-poor-will Habitat
- Potential Eastern Hog-nosed Snake Habitat and Eastern Foxsnake Habitat - Adjacent 200m Lands
- Potential Eastern Hog-nosed Snake Habitat and Eastern Foxsnake Habitat - Nesting and Overwintering Habitat
- Ecological Land Classification (ELC)
- (CUM1-1) Dry - Moist Old Field Meadow Type
- (CUP) Plantation
- (CUS1) Mineral Cultural Savannah Ecosite
- (CUW1) Mineral Cultural Woodland Ecosite
- (FOD5-3) Dry - Fresh Sugar Maple - Oak Deciduous Forest Type
- (FOD8) Fresh - Moist Poplar - Sassafras Deciduous Forest Ecosite
- (FOD8-1) Fresh - Moist Poplar Deciduous Forest Type
- (H) Hedgerow
- (SWD2-2) Green Ash Mineral Deciduous Swamp Type
- (SWD3-3) Swamp Maple Mineral Deciduous Swamp Type
- (SWT2) Mineral Thicket Swamp Ecosite/(MAM2) Mineral Meadow Marsh Ecosite
- ELC Inclusion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Project: 3616
Date: April 17, 2026

NAD83(CSRS)v7 - UTM Zone 17
Size: 11x17"
1:3,000

0 50 100 150 200 Metres

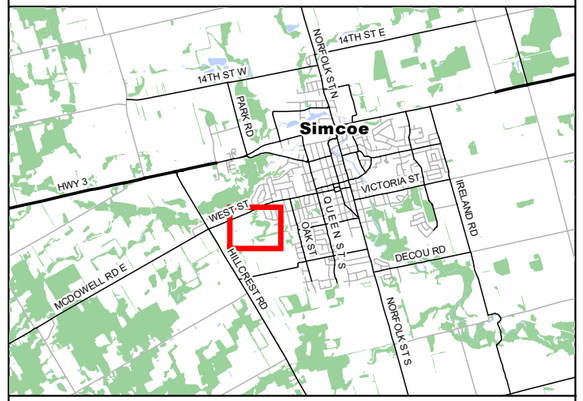
N

Path: X:\3616_WestwoodPhase3EIS\NRSI_3616_Map3b_PotentialSARHabitat_3K_2026_04_17_DNH.mxd

Map 3c

# Westwood Subdivision Phase 3

## Candidate Significant Wildlife Habitat




**Legend**

- Subject Property
- Intermittent Watercourse
- Ecological Land Classification (ELC)

(CUM1-1) Dry - Moist Old Field Meadow Type
(CUP) Plantation
(CUS1) Mineral Cultural Savannah Ecosite
(CUW1) Mineral Cultural Woodland Ecosite
(FOD5-3) Dry - Fresh Sugar Maple - Oak Deciduous Forest Type
(FOD8) Fresh - Moist Poplar - Sassafras Deciduous Forest Ecosite
(FOD8-1) Fresh - Moist Poplar Deciduous Forest Type
(H) Hedgerow
(SWD2-2) Green Ash Mineral Deciduous Swamp Type
(SWD3-3) Swamp Maple Mineral Deciduous Swamp Type
(SWT2) Mineral Thicket Swamp Ecosite/(MAM2) Mineral Meadow Marsh Ecosite

- ELC Inclusion

**Candidate Significant Wildlife Habitat (SWH)**

- Candidate Marsh Bird Breeding SWH
- Candidate Amphibian Breeding Habitat (Woodland) SWH
- Candidate Snake Hibernaculum SWH
- Candidate Bat Maternity Colonies SWH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Project: 3616
Date: April 17, 2026

NAD83(CSRS)v7 - UTM Zone 17
Size: 11x17"
1:3,000

0 50 100 150 200 Metres

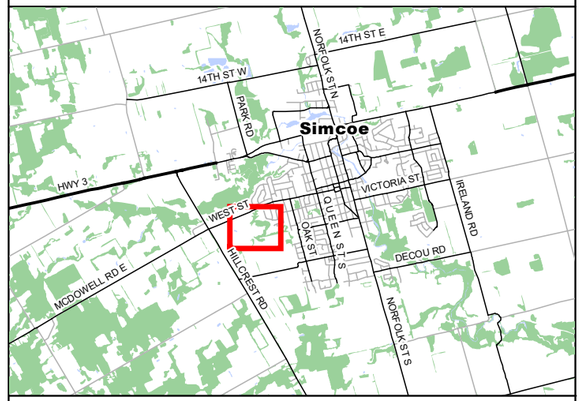
N

Path: X:\3616_WestwoodPhase3EIS\NRSI_3616_Map3c_CandidateSWH_5K_2026_04_17_DNH.mxd

Map 3d

# Westwood Subdivision Phase 3

## Candidate Significant Wildlife Habitat Special Concern/Rare Species Habitats




554800 555000 555200 555400 555600

4742400 4742200 4742000 4741800

Kent Creek

WEST STREET

KENNEDY ROAD

ATWOOD CRESCENT

VIRGINIA AVENUE

THOMSON ROAD

TAMARACK WAY

IRONWOOD STREET

SERVICEBERRY LANE

Cleared/Disturbed

CUS1

H

FOD8

CUM1-1

H

SWT2/MAM2

SWD2-2

CUP

SWD3-3

FOD8-1

FOD5-3

CUM1-1

CUW1

FOD8-1

## Legend

- Subject Property
- Intermittent Watercourse
- Ecological Land Classification (ELC)
- (CUM1-1) Dry - Moist Old Field Meadow Type
- (CUP) Plantation
- (CUS1) Mineral Cultural Savannah Ecosite
- (CUW1) Mineral Cultural Woodland Ecosite
- (FOD5-3) Dry - Fresh Sugar Maple - Oak Deciduous Forest Type
- (FOD8) Fresh - Moist Poplar - Sassafras Deciduous Forest Ecosite
- (FOD8-1) Fresh - Moist Poplar Deciduous Forest Type
- (H) Hedgerow
- (SWD2-2) Green Ash Mineral Deciduous Swamp Type
- (SWD3-3) Swamp Maple Mineral Deciduous Swamp Type
- (SWT2) Mineral Thicket Swamp Ecosite/(MAM2) Mineral Meadow Marsh Ecosite
- ELC Inclusion

**Candidate Significant Wildlife Habitat (SWH)**

- Candidate Painted Skimmer, Swamp Darner SWH
- Candidate Carolina Vetch, Palmate-leaved Violet SWH
- Candidate Common Nighthawk SWH
- Candidate Monarch, Southern Cloudywing SWH
- Candidate Tufted Titmouse, Eastern Wood-Pewee SWH

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Project: 3616
Date: April 17, 2026

NAD83(CSRS)v7 - UTM Zone 17
Size: 11x17"
1:3,000

0 50 100 150 200 Metres

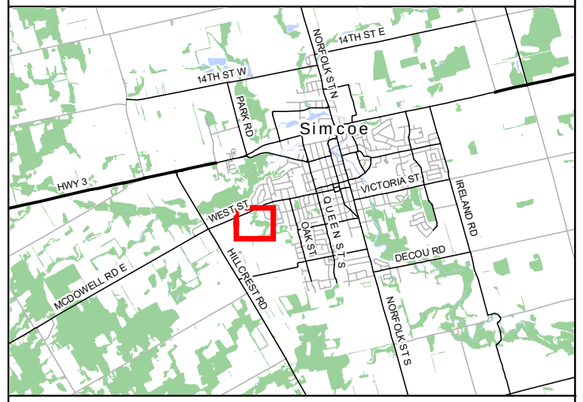
N

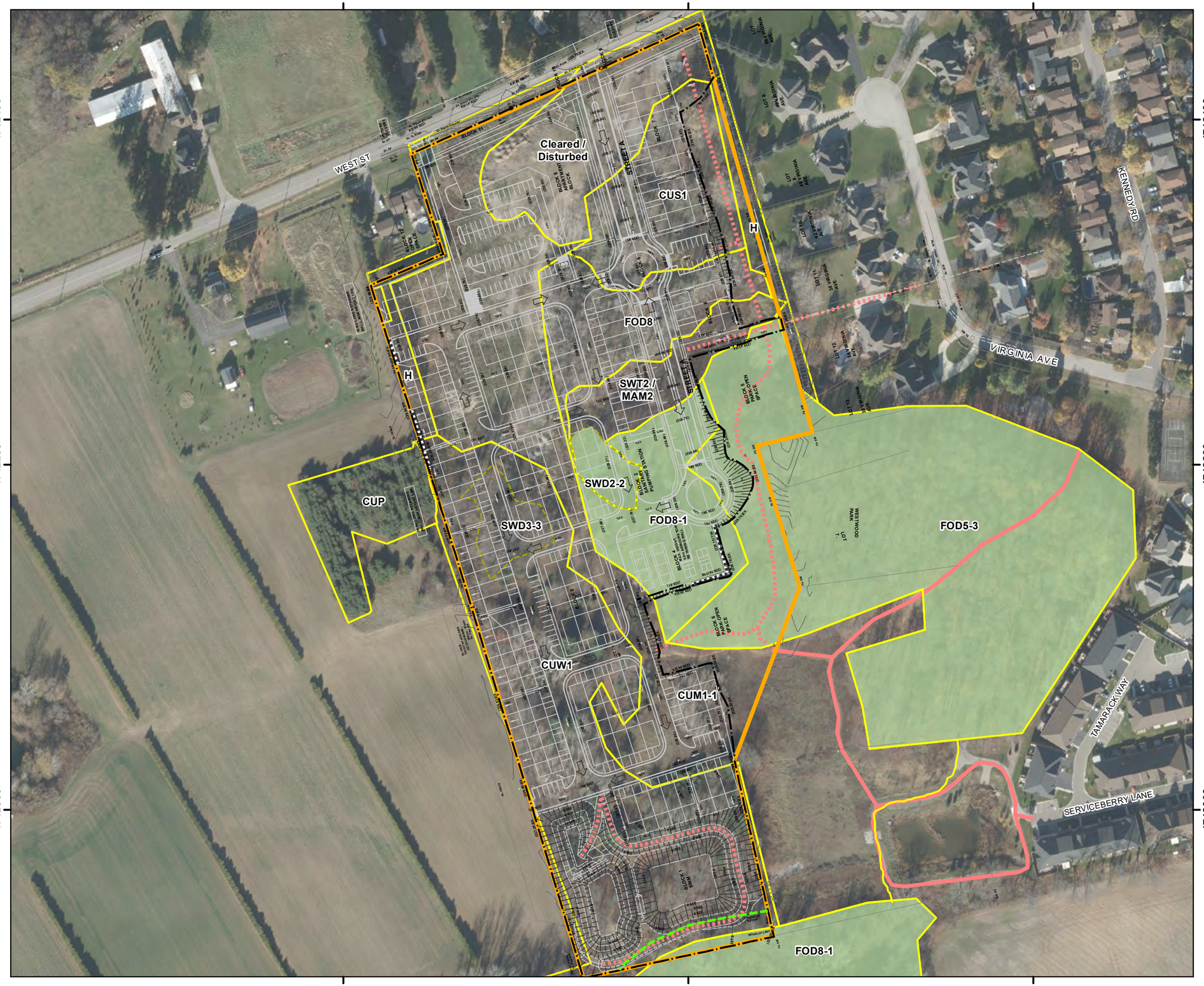
Path: X:\3616_WestwoodPhase3EIS\NRSI_3616_Map3d_CandidateSWH_SpecialConcernRareSpeciesHabitats_3K_2026_04_17_DNH.mxd

**Map 4**

# Westwood Subdivision Phase 3

## Proposed Development




### Legend

- Subject Property
- Limit of Grading
- Proposed Site Plan
- Proposed Grading
- Proposed Retaining Wall
- Proposed Services
- Existing Conditions
- Existing Contours
- Woodland Buffer (10m)
- Conceptual Pedestrian Trail Alignment
- Existing County Pedestrian Trail
- Significant Woodland
- Ecological Land Classification
- (CUM1-1) Dry - Moist Old Field Meadow Type
- (CUP) Plantation
- (CUS1) Mineral Cultural Savannah Ecosite
- (CUW1) Mineral Cultural Woodland Ecosite
- (FOD5-3) Dry - Fresh Sugar Maple - Oak Deciduous Forest Type
- (FOD8) Fresh - Moist Poplar - Sassafras Deciduous Forest Ecosite
- (FOD8-1) Fresh - Moist Poplar Deciduous Forest Type
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- (SWD2-2) Green Ash Mineral Deciduous Swamp Type
- (SWD3-3) Swamp Maple Mineral Deciduous Swamp Type
- (SWT2) Mineral Thicket Swamp Ecosite/(MAM2) Mineral Meadow Marsh Ecosite
- Cleared/Disturbed
- ELC Inclusion


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Project: 3616
Date: March 2, 2026

NAD83 - UTM Zone 17
Size: 11x17"
**1:2,200**

0 20 40 60 80 100 120 140 Metres

N

Path: X:\3616_WestwoodPhase3EIS\NRSI_3616_Map4_ProposedDevelopment_3K_2026_03_02_GCS.mxd

## Appendix I
## Vascular Flora Species Inventoried within the Study Area

**Plant Species Reported from the Study Area - Westwood Phase 3 (Project #3616)**

| Scientific Name | Common Name | CC | SRANK | SCA | COSEWIC | SARA | SARA Schedule | Haldimand-Norfolk | NRSI Observed | CUS1 | FOD8-1/CUW1 | SWT2/MAM2 w/ SWD2-2 | CUM1-1 | FOD5-3 | FOD8 | SWD3-3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Oldham et al. 1995 | MNRF 2024a | MECP 2026 | Government of Canada 2026 | Government of Canada 2026 | Government of Canada 2026 | Oldham 2017 | NRSI Results From 2025 | | | | | | | |
| **Pteridophytes** | **Ferns & Allies** | | | | | | | | | | | | | | | |
| **Dryopteridaceae** | **Wood Fern Family** | | | | | | | | | | | | | | | |
| *Athyrium filix-femina var. angustum* | Northeastern Lady Fern | 4 | S5 | | | | | | X | | | X | X | X | X | X |
| *Onoclea sensibilis* | Sensitive Fern | 4 | S5 | | | | | C | X | | X | X | | | X | X |
| **Equisetaceae** | **Horsetail Family** | | | | | | | | | | | | | | | |
| *Equisetum hyemale* | Common Scouring-rush | 2 | S5 | | | | | C | X | | X | | X | | | |
| **Gymnosperms** | **Conifers** | | | | | | | | | | | | | | | |
| **Cupressaceae** | **Cypress Family** | | | | | | | | | | | | | | | |
| *Juniperus virginiana* | Eastern Red Cedar | 4 | S5 | | | | | C | X | | X | | X | | | |
| **Pinaceae** | **Pine Family** | | | | | | | | | | | | | | | |
| *Picea glauca* | White Spruce | 6 | S5 | | | | | R | X | | | | | | X | |
| *Pinus strobus* | Eastern White Pine | 4 | S5 | | | | | C | X | | X | | | X | | |
| *Pinus sylvestris var. sylvestris* | Scots Pine | | SE5 | | | | | | X | | X | | | | | |
| **Dicotyledons** | **Dicots** | | | | | | | | | | | | | | | |
| **Aceraceae** | **Maple Family** | | | | | | | | | | | | | | | |
| *Acer negundo* | Manitoba Maple | 0 | S5 | | | | | C | X | X | | | | | | |
| *Acer platanoides* | Norway Maple | | SE5 | | | | | IU | X | X | | | | | | |
| *Acer saccharinum* | Silver Maple | 5 | S5 | | | | | C | X | X | X | | | | | |
| *Acer saccharum* | Sugar Maple | 4 | S5 | | | | | C | X | | | | | X | | |
| *Acer x freemanii* | Freeman's Maple | 6 | SNA | | | | | hyb | X | | X | X | | | | X |
| **Anacardiaceae** | **Sumac or Cashew Family** | | | | | | | | | | | | | | | |
| *Rhus typhina* | Staghorn Sumac | 1 | S5 | | | | | C | X | X | X | X | X | | X | |
| *Toxicodendron radicans var. rydbergii* | Western Poison Ivy | 2 | S5 | | | | | C | X | | X | | X | X | | X |
| **Apiaceae** | **Carrot or Parsley Family** | | | | | | | | | | | | | | | |
| *Daucus carota* | Wild Carrot | | SE5 | | | | | IC | X | X | | | X | | | |
| **Asclepiadaceae** | **Milkweed Family** | | | | | | | | | | | | | | | |
| *Asclepias incarnata* | Swamp Milkweed | 6 | S5 | | | | | C | X | | | X | | | | |
| *Asclepias syriaca* | Common Milkweed | 0 | S5 | | | | | C | X | | | | X | | | |
| **Asteraceae** | **Composite or Aster Family** | | | | | | | | | | | | | | | |
| *Achillea millefolium* | Common Yarrow | | SE5? | | | | | | X | | | | X | | | |
| *Ambrosia artemisiifolia* | Common Ragweed | 0 | S5 | | | | | C | X | X | | | X | | | |
| *Arctium minus* | Common Burdock | | SE5 | | | | | IC | X | X | | | | | | |
| *Bidens sp.* | Beggarticks sp. | | | | | | | | X | | | X | | | | |
| *Bidens cernua* | Nodding Beggarticks | 2 | S5 | | | | | C | X | | | X | | | | X |
| *Centaurea jacea* | Brown Knapweed | | SE5 | | | | | IR | X | X | | | X | | | |
| *Cichorium intybus* | Chicory | | SE5 | | | | | IC | X | X | | | X | | | |
| *Cirsium arvense* | Creeping Thistle | | SE5 | | | | | IC | X | | | | X | | | |
| *Cirsium vulgare* | Bull Thistle | | SE5 | | | | | IC | X | X | | | X | | | |
| *Erigeron annuus* | Annual Fleabane | 0 | S5 | | | | | U | X | X | | | X | | | |
| *Erigeron canadensis* | Canada Horseweed | 0 | S5 | | | | | C | X | X | | | X | | | |
| *Eupatorium perfoliatum* | Common Boneset | 2 | S5 | | | | | C | X | | | X | X | | X | |
| *Euthamia graminifolia* | Grass-leaved Goldenrod | 2 | S5 | | | | | C | X | | | X | X | | X | |
| *Eutrochium maculatum* | Spotted Joe Pye Weed | 3 | S5 | | | | | | X | | | X | | | | X |
| *Helianthus tuberosus* | Jerusalem Artichoke | 1 | SU | | | | | IU | X | | | | X | | | |
| *Pseudognaphalium obtusifolium* | Fragrant Cudweed | 4 | S5 | | | | | C | X | | | | X | | | |
| *Rudbeckia hirta* | Black-eyed Susan | 0 | S5 | | | | | C | X | X | | | | | | |
| *Solidago sp.* | Goldenrod sp. | | | | | | | | X | | | | X | | | |
| *Solidago altissima* | Tall Goldenrod | 1 | S5 | | | | | | X | X | | | | | | |
| *Solidago canadensis var. canadensis* | Canada Goldenrod | 1 | S5 | | | | | C | X | X | | X | X | | | X |
| *Solidago nemoralis* | Gray-stemmed Goldenrod | 2 | S5 | | | | | | X | | X | | X | | | |
| *Solidago rugosa* | Rough-stemmed Goldenrod | 4 | S5 | | | | | C | X | | X | X | | | X | |
| *Sonchus arvensis* | Field Sow-thistle | | SE5 | | | | | IC | X | X | | | | | | |
| *Symphyotrichum lanceolatum* | Panicled Aster | 3 | S5 | | | | | C | X | X | | | X | | | |
| *Symphyotrichum novae-angliae* | New England Aster | 2 | S5 | | | | | C | X | | | | X | | | |
| *Symphyotrichum pilosum var. pilosum* | Old Field Aster | 1 | S5 | | | | | C | X | X | | | X | | | |
| *Symphyotrichum puniceum* | Swamp Aster | 6 | S5 | | | | | C | X | | | X | | | | X |
| *Symphyotrichum urophyllum* | Arrow-leaved Aster | 6 | S4 | | | | | C | X | | | | X | X | | |
| *Taraxacum officinale* | Common Dandelion | | SE5 | | | | | IC | X | X | | | | | | |
| *Tussilago farfara* | Colt's-foot | | SE5 | | | | | IC | X | X | | | | | | |
| **Balsaminaceae** | **Touch-me-not Family** | | | | | | | | | | | | | | | |
| *Impatiens capensis* | Spotted Jewelweed | 4 | S5 | | | | | C | X | | X | X | | | X | X |
| **Betulaceae** | **Birch Family** | | | | | | | | | | | | | | | |
| *Alnus glutinosa* | European Black Alder | | SE4 | | | | | IC | X | | | X | | | | |
| *Corylus americana* | American Hazelnut | 5 | S5 | | | | | C | X | | | | | X | | |
| **Boraginaceae** | **Borage Family** | | | | | | | | | | | | | | | |
| *Hackelia virginiana* | Virginia Stickseed | 5 | S5 | | | | | C | X | | | | X | | | |
| **Brassicaceae** | **Mustard Family** | | | | | | | | | | | | | | | |
| *Alliaria petiolata* | Garlic Mustard | | SE5 | | | | | IC | X | | | | | X | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Berteroa incana* | Hoary False-alyssum | | SE5 | | | | | IC | X | | | | X | | | |
| **Caprifoliaceae** | **Honeysuckle Family** | | | | | | | | | | | | | | | |
| *Lonicera morrowii* | Morrow's Honeysuckle | | SE3 | | | | | IR | X | X | X | | | | | |
| *Lonicera tatarica* | Tatarian Honeysuckle | | SE5 | | | | | IC | X | | | | X | | | X |
| *Sambucus canadensis* | Common Elderberry | 5 | S5 | | | | | C | X | | | X | | | | |
| *Viburnum opulus var. opulus* | Cranberry Viburnum | | SE4? | | | | | IU | X | X | X | X | | | | |
| **Celastraceae** | **Staff-tree Family** | | | | | | | | | | | | | | | |
| *Celastrus orbiculatus* | Oriental Bittersweet | | SE2 | | | | | IR | X | | X | | | X | | X |
| *Euonymus obovatus* | Running Strawberry Bush | 6 | S4 | | | | | C | X | | | | | X | | |
| **Clusiaceae** | **St. John's-wort Family** | | | | | | | | | | | | | | | |
| *Hypericum perforatum* | Common St. John's-wort | | SE5 | | | | | IC | X | | | | X | | | |
| *Hypericum punctatum* | Spotted St. John's-wort | 5 | S5 | | | | | C | X | | | X | | | | |
| **Cornaceae** | **Dogwood Family** | | | | | | | | | | | | | | | |
| *Cornus obliqua* | Pale Dogwood | 2 | S5 | | | | | C | X | | | X | | X | X | |
| *Cornus racemosa* | Gray Dogwood | 2 | S5 | | | | | U | X | | X | X | | X | | |
| *Cornus sericea* | Red-osier Dogwood | 2 | S5 | | | | | C | X | | | X | | | | |
| **Fabaceae** | **Pea Family** | | | | | | | | | | | | | | | |
| *Amphicarpaea bracteata* | American Hog-peanut | 4 | S5 | | | | | C | X | | | | | X | | |
| *Lespedeza capitata* | Round-headed Bush-clover | 7 | S4 | | | | | C | X | | | | X | | | |
| *Lespedeza hirta* | Hairy Bush-clover | 9 | S4 | | | | | U | X | | | | | X | | |
| *Lotus corniculatus* | Garden Bird's-foot Trefoil | | SE5 | | | | | IC | X | | | | X | | | |
| *Medicago lupulina* | Black Medic | | SE5 | | | | | IC | X | X | | | X | | | |
| *Melilotus albus* | White Sweet-clover | | SE5 | | | | | IC | X | X | | | X | | | |
| *Robinia pseudoacacia* | Black Locust | | SE5 | | | | | IC | X | | | X | | | X | |
| *Trifolium pratense* | Red Clover | | SE5 | | | | | IC | X | X | | | X | | | |
| *Trifolium repens* | White Clover | | SE5 | | | | | IC | X | X | | | | | | |
| *Vicia americana* | American Vetch | 5 | S5 | | | | | | X | | | | X | | | |
| *Vicia cracca* | Tufted Vetch | | SE5 | | | | | IU | X | | | | X | | | |
| **Fagaceae** | **Beech Family** | | | | | | | | | | | | | | | |
| *Fagus grandifolia* | American Beech | 6 | S4 | | | | | C | X | | | | | X | | |
| *Quercus alba* | White Oak | 6 | S5 | | | | | C | X | | X | | | X | | |
| *Quercus rubra* | Northern Red Oak | 6 | S5 | | | | | C | X | | X | | X | X | | |
| **Grossulariaceae** | **Currant Family** | | | | | | | | | | | | | | | |
| *Ribes americanum* | Wild Black Currant | 4 | S5 | | | | | C | X | | | X | | | | |
| *Ribes rubrum* | Northern Red Currant | | SE5 | | | | | IU | X | | X | | | | | |
| **Hamamelidaceae** | **Witch-hazel Family** | | | | | | | | | | | | | | | |
| *Hamamelis virginiana* | American Witch-hazel | 6 | S4S5 | | | | | C | X | | | | | X | | |
| **Juglandaceae** | **Walnut Family** | | | | | | | | | | | | | | | |
| *Juglans nigra* | Black Walnut | 5 | S4? | | | | | C | X | | | | X | | | |
| **Lamiaceae** | **Mint Family** | | | | | | | | | | | | | | | |
| *Lycopus uniflorus* | Northern Water-horehound | 5 | S5 | | | | | C | X | | | X | | | | |
| **Moraceae** | **Mulberry Family** | | | | | | | | | | | | | | | |
| *Morus alba* | White Mulberry | | SE5 | | | | | IU | X | X | | | | | | |
| **Oleaceae** | **Olive Family** | | | | | | | | | | | | | | | |
| *Fraxinus americana* | White Ash | 4 | S4 | | | | | C | X | X | X | | | X | | |
| *Fraxinus pennsylvanica* | Green Ash | 3 | S4 | | | | | C | X | | | X | X | | X | X |
| *Ligustrum vulgare* | European Privet | | SE5 | | | | | IR | X | | X | | | | | |
| **Onagraceae** | **Evening-primrose Family** | | | | | | | | | | | | | | | |
| *Circaea canadensis* | Broad-leaved Enchanter's Nightshade | 2 | S5 | | | | | C | X | | X | | | X | | X |
| *Epilobium coloratum* | Purple-veined Willowherb | 3 | S5 | | | | | R | X | | | X | | | | |
| *Oenothera biennis* | Common Evening-primrose | 0 | S5 | | | | | R | X | | | | X | | | |
| **Oxalidaceae** | **Wood Sorrel Family** | | | | | | | | | | | | | | | |
| *Oxalis stricta* | Upright Yellow Wood-sorrel | | SE5 | | | | | C | X | X | | | | | | |
| **Plantaginaceae** | **Plantain Family** | | | | | | | | | | | | | | | |
| *Plantago major* | Common Plantain | | SE5 | | | | | IC | X | X | | | X | | | |
| **Polygonaceae** | **Smartweed Family** | | | | | | | | | | | | | | | |
| *Persicaria maculosa* | Spotted Lady's-thumb | | SE5 | | | | | IC | X | | | X | | | | X |
| *Rumex crispus* | Curly Dock | | SE5 | | | | | IC | X | X | | | X | | | |
| **Primulaceae** | **Primrose Family** | | | | | | | | | | | | | | | |
| *Lysimachia nummularia* | Creeping Jennie | | SE5 | | | | | IU | X | | X | | | | | |
| **Pyrolaceae** | **Wintergreen Family** | | | | | | | | | | | | | | | |
| *Pyrola elliptica* | Shinleaf | 5 | S5 | | | | | C | X | | | | | X | | |
| **Rosaceae** | **Rose Family** | | | | | | | | | | | | | | | |
| *Fragaria vesca* | Woodland Strawberry | 4 | S5 | | | | | U | X | | | X | | X | X | |
| *Fragaria virginiana* | Wild Strawberry | 2 | S5 | | | | | C | X | X | | | X | | | |
| *Geum canadense* | White Avens | 3 | S5 | | | | | C | X | | | X | | | | |
| *Geum urbanum* | Wood Avens | | SE3 | | | | | IR | X | X | | | | X | | |
| *Prunus serotina* | Black Cherry | 3 | S5 | | | | | C | X | | X | | | X | | |
| *Rosa multiflora* | Multiflora Rose | | SE5 | | | | | IU | X | | X | X | X | X | X | X |
| *Rubus allegheniensis* | Allegheny Blackberry | 2 | S5 | | | | | C | X | | | | X | | | |
| *Rubus flagellaris* | Northern Dewberry | 4 | S4 | | | | | C | X | | X | | | | | |
| *Rubus idaeus* | Common Red Raspberry | 2 | S5 | | | | | | X | | X | | | | X | X |
| *Rubus occidentalis* | Black Raspberry | 2 | S5 | | | | | C | X | X | | | X | X | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Sorbus aucuparia* | European Mountain-ash | | SE4 | | | | | IR | X | | X | | | | | |
| *Spiraea alba* | White Meadowsweet | 3 | S5 | | | | | C | X | | | X | | | | X |
| **Rubiaceae** | **Madder Family** | | | | | | | | | | | | | | | |
| *Galium aparine* | Cleavers | 4 | S5 | | | | | C | X | | | X | | X | | |
| **Salicaceae** | **Willow Family** | | | | | | | | | | | | | | | |
| *Populus deltoides* | Eastern Cottonwood | 4 | S5 | | | | | C | X | X | X | X | X | | | X |
| *Salix discolor* | Pussy Willow | 3 | S5 | | | | | C | X | | | X | | | | |
| *Salix eriocephala* | Heart-leaved Willow | 4 | S5 | | | | | C | X | | | X | | | | |
| *Salix interior* | Sandbar Willow | 1 | S5 | | | | | C | X | | | X | | | X | |
| *Salix x fragilis* | *(Salix alba X Salix euxina)* | | SNA | | | | | hyb | X | | X | X | | | | X |
| **Scrophulariaceae** | **Figwort Family** | | | | | | | | | | | | | | | |
| *Verbascum thapsus* | Common Mullein | | SE5 | | | | | IC | X | X | | | | | | |
| **Solanaceae** | **Nightshade Family** | | | | | | | | | | | | | | | |
| *Solanum dulcamara* | Bittersweet Nightshade | | SE5 | | | | | IC | X | | | X | | | | |
| **Ulmaceae** | **Elm Family** | | | | | | | | | | | | | | | |
| *Ulmus americana* | American Elm | 3 | S5 | | | | | C | X | | | | X | X | | |
| **Urticaceae** | **Nettle Family** | | | | | | | | | | | | | | | |
| *Pilea fontana* | Lesser Clearweed | 5 | S4 | | | | | U | X | | | X | | | | |
| *Pilea pumila* | Dwarf Clearweed | 5 | S5 | | | | | C | X | | | X | | | | |
| *Urtica gracilis* | Slender Stinging Nettle | | S5 | | | | | C | X | | | X | | | | |
| **Vitaceae** | **Grape Family** | | | | | | | | | | | | | | | |
| *Parthenocissus vitacea* | Thicket Creeper | 4 | S5 | | | | | C | X | | X | | | X | | |
| *Vitis riparia* | Riverbank Grape | 0 | S5 | | | | | C | X | X | X | | | X | | |
| **Monocotyledons** | **Monocots** | | | | | | | | | | | | | | | |
| **Alismataceae** | **Water-plantain Family** | | | | | | | | | | | | | | | |
| *Alisma triviale* | Northern Water-plantain | 1 | S5 | | | | | X | X | | | X | X | | | |
| **Cyperaceae** | **Sedge Family** | | | | | | | | | | | | | | | |
| *Carex sp.* | Sedge sp. | | | | | | | | X | | | X | | | | |
| *Carex cristatella* | Crested Sedge | 3 | S5 | | | | | C | X | | X | | | | | |
| *Carex pellita* | Woolly Sedge | 2 | S5 | | | | | C | X | | | X | | | | |
| *Carex radiata* | Eastern Star Sedge | 4 | S5 | | | | | U | X | | X | | | X | | |
| *Carex tenera* | Tender Sedge | 4 | S5 | | | | | C | X | | X | | | | | |
| *Cyperus lupulinus* | Hop Flatsedge | 7 | S4 | | | | | C | X | | | | X | | | |
| *Schoenoplectus tabernaemontani* | Soft-stemmed Bulrush | 5 | S5 | | | | | C | X | | | X | | | | |
| *Scirpus atrocinctus* | Black-girdled Bulrush | 5 | S5 | | | | | | X | | | X | | | | |
| *Scirpus cyperinus* | Cottongrass Bulrush | 4 | S5 | | | | | C | X | | | X | | | | |
| **Dioscoreaceae** | **Yam Family** | | | | | | | | | | | | | | | |
| *Dioscorea villosa* | Wild Yam | 5 | S4 | | | | | C | X | | X | X | | X | X | X |
| **Juncaceae** | **Rush Family** | | | | | | | | | | | | | | | |
| *Juncus tenuis* | Path Rush | 0 | S5 | | | | | C | X | | X | | | | | X |
| **Liliaceae** | **Lily Family** | | | | | | | | | | | | | | | |
| *Maianthemum canadense* | Wild Lily-of-the-valley | 5 | S5 | | | | | C | X | | | | | X | | |
| *Maianthemum racemosum* | Large False Solomon's Seal | 4 | S5 | | | | | C | X | | | | | X | | |
| **Poaceae** | **Grass Family** | | | | | | | | | | | | | | | |
| *Agrostis gigantea* | Redtop | | SE5 | | | | | IC | X | | | | X | | | |
| *Bromus inermis* | Smooth Brome | | SE5 | | | | | IC | X | | | | X | | | |
| *Dactylis glomerata* | Orchard Grass | | SE5 | | | | | IC | X | X | | | | | | |
| *Dichanthelium oligosanthes* | Few-flowered Panicgrass | 7 | S4 | | | | | | X | | | | X | | | |
| *Elymus repens* | Creeping Wildrye | | SE5 | | | | | IC | X | | | | X | | | |
| *Glyceria striata* | Fowl Mannagrass | 3 | S5 | | | | | C | X | | X | X | | | X | X |
| *Leersia oryzoides* | Rice Cutgrass | 3 | S5 | | | | | C | X | | | X | | | X | |
| *Panicum capillare* | Common Panicgrass | 0 | S5 | | | | | C | X | | | | X | | | |
| *Phleum pratense* | Common Timothy | | SE5 | | | | | IC | X | X | | | | | | |
| *Phragmites australis* | Common Reed | 0 | SU | | | | | | X | | | X | | | | |
| *Poa pratensis* | Kentucky Bluegrass | 0 | S5 | | | | | | X | | | | X | | | |
| *Setaria faberi* | Giant Foxtail | | SE4 | | | | | IC | X | | | | X | | | |
| *Setaria pumila* | Yellow Foxtail | | SE5 | | | | | IC | X | | | | X | | | |
| **Typhaceae** | **Cattail Family** | | | | | | | | | | | | | | | |
| *Typha latifolia* | Broad-leaved Cattail | 1 | S5 | | | | | C | X | | | X | | | | |
| **Total** | | | | | | | | | **150** | **39** | **38** | **52** | **59** | **33** | **18** | **22** |

## Appendix II
## Bird Species Reported from the Study Area and Vicinity

**Bird Species Reported from the Study Area - Westwood Phase 3 EIS (Project #3616)**

| Scientific Name | Common Name | SRANK | COSSARO | SCA | COSEWIC | SARA | OBBA* | NRSI Observed: Highest Level of Breeding Evidence |
|---|---|---|---|---|---|---|---|---|
| | | MNRF 2024a | MECP 2026 | MECP 2026 | Government of Canada 2026 | Government of Canada 2026 | BSC et al. 2006 | NRSI Results from 2025 |
| **Anatidae** | **Ducks, Geese & Swans** | | | | | | | |
| *Aix sponsa* | Wood Duck | S5B,S3N | | | | | CO | |
| *Anas platyrhynchos* | Mallard | S5 | | | | | CO | **PO** |
| *Branta canadensis* | Canada Goose | S5 | | | | | CO | |
| **Odontophoridae** | **New World Quails** | | | | | | | |
| *Colinus virginianus* | Northern Bobwhite | S1? | END | | E | E | PO | |
| **Phasianidae** | **Partridges, Grouse & Turkeys** | | | | | | | |
| *Bonasa umbellus* | Ruffed Grouse | S5 | | | | | CO | |
| *Meleagris gallopavo* | Wild Turkey | S5 | | | | | CO | |
| *Phasianus colchicus* | Ring-necked Pheasant | SNA | | | | | PO | |
| **Columbidae** | **Pigeons & Doves** | | | | | | | |
| *Columba livia* | Rock Pigeon | SNA | | | | | CO | **OB** |
| *Zenaida macroura* | Mourning Dove | S5 | | | | | CO | **PO** |
| **Cuculiformes** | **Cuckoos & Anis** | | | | | | | |
| *Coccyzus erythropthalmus* | Black-billed Cuckoo | S4S5B | | | | | CO | |
| **Caprimulgidae** | **Goatsuckers** | | | | | | | |
| *Antrostomus vociferus* | Eastern Whip-poor-will | S4B | SC | | SC | T | PR | |
| *Chordeiles minor* | Common Nighthawk | S4B | SC | | SC | SC | PO | |
| **Apodidae** | **Swifts** | | | | | | | |
| *Chaetura pelagica* | Chimney Swift | S3B | THR | | T | T | PR | |
| **Trochilidae** | **Hummingbirds** | | | | | | | |
| *Archilochus colubris* | Ruby-throated Hummingbird | S5B | | | | | CO | |
| **Charadriidae** | **Plovers & Lapwings** | | | | | | | |
| *Charadrius vociferus* | Killdeer | S4B | | | | | CO | **OB** |
| **Scolopacidae** | **Sandpipers & Allies** | | | | | | | |
| *Actitis macularius* | Spotted Sandpiper | S5B | | | | | CO | |
| *Scolopax minor* | American Woodcock | S4B | | | | | PR | |
| **Ardeidae** | **Herons & Bitterns** | | | | | | | |
| *Ardea herodias* | Great Blue Heron | S4 | | | | | | **PO** |
| *Butorides virescens* | Green Heron | S4B | | | | | PR | **OB** |
| **Cathartidae** | **Vultures** | | | | | | | |
| *Cathartes aura* | Turkey Vulture | S5B,S3N | | | | | PO | **OB** |
| **Accipitridae** | **Hawks, Kites, Eagles & Allies** | | | | | | | |
| *Accipiter cooperii* | Cooper's Hawk | S4 | | NAR | NAR | NS | PR | |
| *Buteo jamaicensis* | Red-tailed Hawk | S5 | | NAR | NAR | NS | PR | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| *Buteo platypterus* | Broad-winged Hawk | S5B | | | | | PR | |
| *Circus hudsonius* | Northern Harrier | S5B,S4N | | NAR | NAR | NS | PO | |
| **Strigidae** | **Typical Owls** | | | | | | | |
| *Bubo virginianus* | Great Horned Owl | S4 | | | | | PR | |
| *Megascops asio* | Eastern Screech-Owl | S4 | | NAR | NAR | NS | CO | |
| **Alcedinidae** | **Kingfishers** | | | | | | | |
| *Megaceryle alcyon* | Belted Kingfisher | S5B,S4N | | | | | CO | |
| **Picidae** | **Woodpeckers** | | | | | | | |
| *Colaptes auratus* | Northern Flicker | S5 | | | | | CO | **PO** |
| *Dryobates pubescens* | Downy Woodpecker | S5 | | | | | CO | **PO** |
| *Dryobates villosus* | Hairy Woodpecker | S5 | | | | | CO | |
| *Dryocopus pileatus* | Pileated Woodpecker | S5 | | | | | CO | |
| *Melanerpes carolinus* | Red-bellied Woodpecker | S5 | | | | | CO | |
| *Sphyrapicus varius* | Yellow-bellied Sapsucker | S5B,S3N | | | | | PR | |
| **Falconidae** | **Caracaras & Falcons** | | | | | | | |
| *Falco columbarius* | Merlin | S5 | | NAR | NAR | NS | PR | |
| *Falco sparverius* | American Kestrel | S4 | | | | | PO | |
| **Tyrannidae** | **Tyrant Flycatchers** | | | | | | | |
| *Contopus virens* | Eastern Wood-Pewee | S4B | SC | | SC | SC | PR | |
| *Empidonax minimus* | Least Flycatcher | S5B | | | | | PO | |
| *Empidonax traillii* | Willow Flycatcher | S4B | | | | | PR | |
| *Myiarchus crinitus* | Great Crested Flycatcher | S5B | | | | | PR | **PO** |
| *Sayornis phoebe* | Eastern Phoebe | S5B | | | | | CO | |
| *Tyrannus tyrannus* | Eastern Kingbird | S4B | | | | | CO | **OB** |
| **Vireonidae** | **Vireos** | | | | | | | |
| *Vireo gilvus* | Warbling Vireo | S5B | | | | | PR | |
| *Vireo olivaceus* | Red-eyed Vireo | S5B | | | | | CO | |
| **Corvidae** | **Crows & Jays** | | | | | | | |
| *Corvus brachyrhynchos* | American Crow | S5 | | | | | CO | **PO** |
| *Cyanocitta cristata* | Blue Jay | S5 | | | | | CO | **PO** |
| **Alaudidae** | **Larks** | | | | | | | |
| *Eremophila alpestris* | Horned Lark | S4 | | | | | PO | |
| **Hirundinidae** | **Swallows** | | | | | | | |
| *Hirundo rustica* | Barn Swallow | S4B | SC | | SC | T | CO | |
| *Progne subis* | Purple Martin | S3B | | | | | PO | |
| *Riparia riparia* | Bank Swallow | S4B | THR | | T | T | CO | |
| *Stelgidopteryx serripennis* | Northern Rough-winged Swallow | S4B | | | | | CO | |
| *Tachycineta bicolor* | Tree Swallow | S4S5B | | | | | CO | |
| **Paridae** | **Chickadees & Titmice** | | | | | | | |
| *Poecile atricapillus* | Black-capped Chickadee | S5 | | | | | CO | **OB** |
| **Sittidae** | **Nuthatches** | | | | | | | |
| *Sitta canadensis* | Red-breasted Nuthatch | S5 | | | | | PR | |
| *Sitta carolinensis* | White-breasted Nuthatch | S5 | | | | | CO | **OB** |
| **Troglodytidae** | **Wrens** | | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| *Thryothorus ludovicianus* | Carolina Wren | S4 | | | | | CO | **PO** |
| *Troglodytes aedon* | House Wren | S5B | | | | | CO | |
| **Turdidae** | **Thrushes** | | | | | | | |
| *Catharus fuscescens* | Veery | S5B | | | | | PR | |
| *Hylocichla mustelina* | Wood Thrush | S4B | SC | | T | T | CO | |
| *Sialia sialis* | Eastern Bluebird | S5B,S4N | | NAR | NAR | NS | CO | |
| *Turdus migratorius* | American Robin | S5 | | | | | CO | **PR** |
| **Mimidae** | **Mockingbirds, Thrashers & Allies** | | | | | | | |
| *Dumetella carolinensis* | Gray Catbird | S5B,S3N | | | | | CO | **PO** |
| *Mimus polyglottos* | Northern Mockingbird | S4 | | | | | CO | |
| *Toxostoma rufum* | Brown Thrasher | S4B | | | | | CO | |
| **Sturnidae** | **Starlings** | | | | | | | |
| *Sturnus vulgaris* | European Starling | SNA | | | | | CO | |
| **Bombycillidae** | **Waxwings** | | | | | | | |
| *Bombycilla cedrorum* | Cedar Waxwing | S5 | | | | | CO | **PO** |
| **Passeridae** | **Old World Sparrows** | | | | | | | |
| *Passer domesticus* | House Sparrow | SNA | | | | | CO | |
| **Fringillidae** | **Finches & Allies** | | | | | | | |
| *Haemorhous mexicanus* | House Finch | SNA | | | | | CO | **PO** |
| *Haemorhous purpureus* | Purple Finch | S5 | | | | | PO | |
| *Spinus tristis* | American Goldfinch | S5 | | | | | CO | **PO** |
| **Passerellidae** | **New World Sparrows & Allies** | | | | | | | |
| *Ammodramus savannarum* | Grasshopper Sparrow | S4B | SC | | SC | SC | CO | |
| *Melospiza georgiana* | Swamp Sparrow | S5B,S4N | | | | | PR | |
| *Melospiza melodia* | Song Sparrow | S5 | | | | | CO | **PO** |
| *Passerculus sandwichensis* | Savannah Sparrow | S5B,S3N | | | | | CO | |
| *Pipilo erythrophthalmus* | Eastern Towhee | S4B,S3N | | | | | CO | |
| *Pooecetes gramineus* | Vesper Sparrow | S4B | | | | | PR | |
| *Spizella passerina* | Chipping Sparrow | S5B,S3N | | | | | CO | **PO** |
| *Spizella pusilla* | Field Sparrow | S4B,S3N | | | | | PR | |
| **Icteridae** | **Troupials & Allies** | | | | | | | |
| *Agelaius phoeniceus* | Red-winged Blackbird | S5 | | | | | CO | **PO** |
| *Dolichonyx oryzivorus* | Bobolink | S4B | THR | | SC | T | PR | |
| *Icterus galbula* | Baltimore Oriole | S4B | | | | | CO | **PO** |
| *Icterus spurius* | Orchard Oriole | S4B | | | | | PO | |
| *Molothrus ater* | Brown-headed Cowbird | S5 | | | | | CO | **PO** |
| *Quiscalus quiscula* | Common Grackle | S5 | | | | | CO | **PO** |
| *Sturnella magna* | Eastern Meadowlark | S4B,S3N | THR | | T | T | PR | |
| **Parulidae** | **Wood Warblers** | | | | | | | |
| *Geothlypis trichas* | Common Yellowthroat | S5B,S3N | | | | | PR | **PO** |
| *Parkesia noveboracensis* | Northern Waterthrush | S5B | | | | | PO | |
| *Seiurus aurocapilla* | Ovenbird | S5B | | | | | CO | |
| *Setophaga citrina* | Hooded Warbler | S4B | | NAR | NAR | NS | CO | |
| *Setophaga pensylvanica* | Chestnut-sided Warbler | S5B | | | | | PR | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| *Setophaga petechia* | Yellow Warbler | S5B | | | | | PR | |
| *Setophaga pinus* | Pine Warbler | S5B,S3N | | | | | PR | |
| *Setophaga ruticilla* | American Redstart | S5B | | | | | PO | |
| *Vermivora cyanoptera* | Blue-winged Warbler | S4B | | | | | PR | |
| **Cardinalidae** | **Cardinals, Grosbeaks & Allies** | | | | | | | |
| *Cardinalis cardinalis* | Northern Cardinal | S5 | | | | | CO | **PO** |
| *Passerina cyanea* | Indigo Bunting | S5B | | | | | CO | **PO** |
| *Pheucticus ludovicianus* | Rose-breasted Grosbeak | S5B | | | | | CO | |
| *Piranga olivacea* | Scarlet Tanager | S5B | | | | | PR | |
| **Total** | | | | | | | **96** | **30** |

*OBBA Atlas Square: 17TNH54

## Appendix III
## Herpetofauna Species Reported from the Study Area and Vicinity

**Reptile and Amphibian Species Reported from the Study Area - Westwood Phase 3 EIS (Project #3616)**

| Scientific Name | Common Name | SRANK | COSSARO | SCA | COSEWIC | SARA | ORAA* | NRSI Observed |
|---|---|---|---|---|---|---|---|---|
| | | MNRF 2024a | MECP 2026 | MECP 2026 | Government of Canada 2026 | Government of Canada 2026 | Ontario Nature 2019 | NRSI Results from 2025 |
| **Turtles** | | | | | | | | |
| *Chelydra serpentina* | Snapping Turtle | S4 | SC | | SC | SC | X | |
| *Chrysemys picta marginata* | Midland Painted Turtle | S4 | | | SC | SC | X | |
| *Emydoidea blandingii* | Blanding's Turtle (Great Lakes / St. Lawrer | S3 | THR | THR | E | E | X | |
| *Graptemys geographica* | Northern Map Turtle | S3 | SC | | SC | SC | X | |
| **Snakes** | | | | | | | | |
| *Pantherophis vulpinus pop. 1* | Eastern Foxsnake (Georgian Bay populatic | S3 | THR | THR | T | E | X | |
| *Heterodon platirhinos* | Eastern Hog-nosed Snake | S3 | THR | THR | T | T | X | |
| *Lampropeltis triangulum* | Eastern Milksnake | S4 | | NAR | SC | SC | X | |
| *Opheodrys vernalis* | Smooth Greensnake | S4 | | | | | X | |
| *Sistrurus catenatus pop. 1* | Massasauga (Great Lakes / St. Lawrence | S3 | THR | THR | T | T | X | |
| *Storeria dekayi* | Dekay's Brownsnake | S5 | | NAR | NAR | NS | X | |
| *Storeria occipitomaculata* | Red-bellied Snake | S5 | | | | | X | |
| *Thamnophis saurita septentrionalis* | Northern Ribbonsnake | S4 | SC | | SC | SC | X | |
| *Thamnophis sirtalis sirtalis* | Eastern Gartersnake | S5 | | | | | X | |
| **Salamanders** | | | | | | | | |
| *Ambystoma laterale* | Blue-spotted Salamander | S4 | | | | | X | |
| *Notophthalmus viridescens viridescens* | Red-spotted Newt | S5 | | | | | X | |
| *Plethodon cinereus* | Eastern Red-backed Salamander | S5 | | | | | X | |
| **Frogs and Toads** | | | | | | | | |
| *Anaxyrus americanus* | American Toad | S5 | | | | | X | |
| *Dryophytes versicolor* | Gray Treefrog | S5 | | | | | X | |
| *Pseudacris crucifer* | Spring Peeper | S5 | | | | | X | |
| *Lithobates catesbeianus* | American Bullfrog | S4 | | | | | X | |
| *Lithobates clamitans* | Green Frog | S5 | | | | | X | |
| *Lithobates palustris* | Pickerel Frog | S4 | | NAR | NAR | NS | X | |
| *Lithobates pipiens* | Northern Leopard Frog | S5 | | NAR | NAR | NS | X | |
| *Lithobates sylvaticus* | Wood Frog | S5 | | | | | X | |
| **Total** | | | | | | | **24** | **0** |

*ORAA Atlas Square: 17NH54

## Appendix IV
## Mammal Species Reported from the Study Area and Vicinity

**Mammal Species Reported from the Study Area - Westwood Phase 3 EIS (Project #3616)**

| Scientific Name | Common Name | SRANK | COSSARO | SCA | COSEWIC | SARA | Ontario Mammal Atlas | NRSI Observed |
|---|---|---|---|---|---|---|---|---|
| | | MNRF 2024a | MECP 2026 | MECP 2026 | Government of Canada 2026 | Government of Canada 2026 | Dobbyn 1994 | NRSI Results from 2025 |
| **Didelphimorphia** | **Opossums** | | | | | | | |
| *Didelphis virginiana* | Virginia Opossum | S4 | | | | | X | |
| **Eulipotyphla** | **Shrews, Moles, Hedgehogs, and Allies** | | | | | | | |
| *Blarina brevicauda* | Northern Short-tailed Shrew | S5 | | | | | X | |
| *Condylura cristata* | Star-nosed Mole | S5 | | | | | X | |
| *Parascalops breweri* | Hairy-tailed Mole | S4 | | | | | X | |
| *Sorex cinereus* | Masked Shrew | S5 | | | | | X | |
| *Sorex fumeus* | Smoky Shrew | S5 | | | | | X | |
| **Chiroptera** | **Bats** | | | | | | | |
| *Eptesicus fuscus* | Big Brown Bat | S4 | | | | | X | |
| *Lasionycteris noctivagans* | Silver-haired Bat | S3 | END | END | E | NS | X | |
| *Lasiurus borealis* | Eastern Red Bat | S3 | END | END | E | NS | X | |
| *Lasiurus cinereus* | Hoary Bat | S3 | END | END | E | NS | X | |
| *Myotis leibii* | Eastern Small-footed Myotis | S2S3 | END | END | | | X | |
| *Myotis lucifugus* | Little Brown Myotis | S3 | END | END | E | E | X | |
| *Myotis septentrionalis* | Northern Myotis | S3 | END | END | E | E | X | |
| *Perimyotis subflavus* | Tri-colored Bat | S3? | END | END | E | E | X | |
| **Lagomorpha** | **Rabbits and Hares** | | | | | | | |
| *Lepus europaeus* | European Hare | SNA | | | | | X | |
| *Sylvilagus floridanus* | Eastern Cottontail | S5 | | | | | X | X |
| **Rodentia** | **Rodents** | | | | | | | |
| *Castor canadensis* | Beaver | S5 | | | | | X | |
| *Erethizon dorsatum* | Porcupine | S5 | | | | | X | |
| *Glaucomys volans* | Southern Flying Squirrel (Great Lakes Pla | S4 | | NAR | NAR | NS | X | |
| *Marmota monax* | Woodchuck | S5 | | | | | X | |
| *Microtus pennsylvanicus* | Meadow Vole | S5 | | | | | X | |
| *Microtus pinetorum* | Woodland Vole | S3? | SC | | SC | SC | X | |
| *Mus musculus* | House Mouse | SNA | | | | | X | |
| *Napaeozapus insignis* | Woodland Jumping Mouse | S5 | | | | | X | |
| *Ondatra zibethicus* | Muskrat | S4 | | | | | X | |
| *Peromyscus leucopus* | White-footed Mouse | S5 | | | | | X | |
| *Peromyscus maniculatus* | Deer Mouse | S5 | | | | | X | |
| *Rattus norvegicus* | Norway Rat | SNA | | | | | X | |
| *Sciurus carolinensis* | Eastern Gray Squirrel | S5 | | | | | X | X |
| *Tamias striatus* | Eastern Chipmunk | S5 | | | | | X | |
| *Tamiasciurus hudsonicus* | Red Squirrel | S5 | | | | | X | |
| *Zapus hudsonius* | Meadow Jumping Mouse | S5 | | | | | X | |
| **Canidae** | **Canines** | | | | | | | |
| *Canis latrans* | Coyote | S5 | | | | | X | |
| *Urocyon cinereoargenteus* | Gray Fox | S2 | THR | THR | T | T | X | |
| *Vulpes vulpes* | Red Fox | S5 | | | | | X | |
| **Mephitidae** | **Skunks and Stink Badgers** | | | | | | | |
| *Mephitis mephitis* | Striped Skunk | S5 | | | | | X | |
| **Mustelidae** | **Weasels and Allies** | | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| *Mustela richardsonii* | American Ermine | S5 | | | | | X | |
| *Neogale frenata* | Long-tailed Weasel | S4 | | | | | X | |
| *Neogale vison* | American Mink | S4 | | | | | X | |
| *Taxidea taxus jacksoni* | American Badger (Southwestern Ontario | S1 | END | END | E | E | X | |
| **Procyonidae** | **Raccoons and Allies** | | | | | | | |
| *Procyon lotor* | Northern Raccoon | S5 | | | | | X | |
| **Artiodactyla** | **Deer and Bison** | | | | | | | |
| *Odocoileus virginianus* | White-tailed Deer | S5 | | | | | X | X |
| **Total** | | | | | | | **42** | **3** |

*Mammal Atlas Square Number: 17NT54

## Appendix V
## Butterfly Species Reported from the Study Area and Vicinity

**Butterfly Species Reported from the Study Area - Westwood Phase 3 EIS (Project #3616)**

| Scientific Name | Common Name | SRANK | COSSARO | SCA | COSEWIC | SARA | Ontario Butterfly Atlas* | NRSI Observed |
|---|---|---|---|---|---|---|---|---|
| | | MNRF 2024a | MECP 2026 | MECP 2026 | Government of Canada 2026 | Government of Canada 2026 | Macnaughton et al. 2023 | NRSI Results from 2025 |
| **Hesperiidae** | **Skippers** | | | | | | | |
| *Ancyloxypha numitor* | Least Skipper | S5 | | | | | X | |
| *Epargyreus clarus* | Silver-spotted Skipper | S4 | | | | | X | |
| *Erynnis baptisiae* | Wild Indigo Duskywing | S4 | | | | | X | |
| *Erynnis icelus* | Dreamy Duskywing | S5 | | | | | X | |
| *Erynnis juvenalis* | Juvenal's Duskywing | S5 | | | | | X | |
| *Euphyes vestris* | Dun Skipper | S5 | | | | | X | |
| *Hesperia leonardus* | Leonard's Skipper | S4 | | | | | X | |
| *Hesperia sassacus* | Indian Skipper | S4 | | | | | X | |
| *Pholisora catullus* | Common Sootywing | S4 | | | | | X | |
| *Polites mystic* | Long Dash Skipper | S5 | | | | | X | |
| *Polites themistocles* | Tawny-edged Skipper | S5 | | | | | X | |
| *Thorybes bathyllus* | Southern Cloudywing | S3 | | | | | X | |
| *Thorybes pylades* | Northern Cloudywing | S5 | | | | | X | |
| **Papilionidae** | **Swallowtails** | | | | | | | |
| *Battus philenor* | Pipevine Swallowtail | SNA | | | | | X | |
| *Heraclides cresphontes* | Giant Swallowtail | S4 | | | | | X | |
| *Papilio polyxenes* | Black Swallowtail | S5 | | | | | X | |
| **Pieridae** | **Whites and Sulphurs** | | | | | | | |
| *Colias eurytheme* | Orange Sulphur | S5 | | | | | X | |
| *Colias philodice* | Clouded Sulphur | S5 | | | | | X | X |
| *Pieris rapae* | Cabbage White | SNA | | | | | X | X |
| *Pontia protodice* | Checkered White | SNA | | | | | X | |
| **Lycaenidae** | **Harvesters, Coppers, Hairstreaks, Blues** | | | | | | | |
| *Callophrys henrici* | Henry's Elfin | S4 | | | | | X | |
| *Celastrina neglecta* | Summer Azure | S5 | | | | | X | |
| *Celastrina sp.* | Azure species | SNA | | | | | X | |
| *Cupido comyntas* | Eastern Tailed Blue | S5 | | | | | X | |
| *Glaucopsyche lygdamus* | Silvery Blue | S5 | | | | | X | |
| *Lycaena hypophlaeas* | American Copper | S5 | | | | | X | |
| *Satyrium acadica* | Acadian Hairstreak | S4 | | | | | X | |
| *Satyrium calanus* | Banded Hairstreak | S4 | | | | | X | |
| *Satyrium edwardsii* | Edwards' Hairstreak | S4 | | | | | X | |
| *Satyrium liparops* | Striped Hairstreak | S5 | | | | | X | |
| **Nymphalidae** | **Brush-footed Butterflies** | | | | | | | |
| *Aglais milberti* | Milbert's Tortoiseshell | S5 | | | | | X | |
| *Cercyonis pegala* | Common Wood-Nymph | S5 | | | | | X | |
| *Chlosyne harrisii* | Harris's Checkerspot | S4 | | | | | X | |
| *Coenonympha california* | Common Ringlet | S5 | | | | | X | |
| *Danaus plexippus* | Monarch | S2N,S4B | SC | | E | E | X | X |
| *Euphydryas phaeton* | Baltimore Checkerspot | S4 | | | | | X | |
| *Lethe anthedon* | Northern Pearly-Eye | S5 | | | | | X | |
| *Lethe eurydice* | Eyed Brown | S5 | | | | | X | |
| *Limenitis archippus* | Viceroy | S5 | | | | | X | X |
| *Limenitis arthemis arthemis* | White Admiral | S5 | | | | | X | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| *Limenitis arthemis astyanax* | Red-spotted Purple | S5 | | | | | X | |
| *Megisto cymela* | Little Wood-Satyr | S5 | | | | | X | |
| *Nymphalis antiopa* | Mourning Cloak | S5 | | | | | X | |
| *Nymphalis l-album* | Compton Tortoiseshell | S5 | | | | | X | |
| *Phyciodes cocyta* | Northern Crescent | S5 | | | | | X | |
| *Phyciodes tharos* | Pearl Crescent | S4 | | | | | X | X |
| *Polygonia comma* | Eastern Comma | S5 | | | | | X | |
| *Polygonia interrogationis* | Question Mark | S5 | | | | | X | |
| *Polygonia progne* | Gray Comma | S5 | | | | | X | |
| *Speyeria cybele* | Great Spangled Fritillary | S5 | | | | | | X |
| *Vanessa atalanta* | Red Admiral | S5B | | | | | X | |
| *Vanessa cardui* | Painted Lady | S5B | | | | | X | |
| *Vanessa virginiensis* | American Lady | S5 | | | | | X | |
| **Total** | | | | | | | **52** | **6** |

## Appendix VI
## Odonata Species Reported from the Study Area and Vicinity

**Odonate Species Reported from the Study Area - Westwood Phase 3 EIS (Project #3616)**

| Scientific Name | Common Name | SRANK | COSSARO | SCA | COSEWIC | SARA | Odonate Atlas* | NRSI Observed |
|---|---|---|---|---|---|---|---|---|
| | | MNRF 2024a | MECP 2026 | MECP 2026 | Government of Canada 2026 | Government of Canada 2026 | OOAD 2023 | |
| **Calopterygidae** | **Broadwinged Damselflies** | | | | | | | |
| *Calopteryx maculata* | Ebony Jewelwing | S5 | | | | | X | |
| **Lestidae** | **Spreadwings** | | | | | | | |
| *Lestes congener* | Spotted Spreadwing | S5 | | | | | X | |
| *Lestes dryas* | Emerald Spreadwing | S5 | | | | | X | |
| *Lestes rectangularis* | Slender Spreadwing | S5 | | | | | X | |
| **Coenagrionidae** | **Narrow-winged Damselflies** | | | | | | | |
| *Argia fumipennis violacea* | Violet Dancer | S5 | | | | | X | |
| *Ischnura verticalis* | Eastern Forktail | S5 | | | | | X | |
| **Aeshnidae** | **Darners** | | | | | | | |
| *Aeshna umbrosa* | Shadow Darner | S5 | | | | | X | |
| *Basiaeschna janata* | Springtime Darner | S5 | | | | | X | |
| *Boyeria vinosa* | Fawn Darner | S5 | | | | | X | |
| *Epiaeschna heros* | Swamp Darner | S3S4 | | | | | X | |
| *Nasiaeschna pentacantha* | Cyrano Darner | S4 | | | | | X | |
| **Gomphidae** | **Clubtails** | | | | | | | |
| *Arigomphus villosipes* | Unicorn Clubtail | S3 | | | | | X | |
| **Cordulegasteridae** | **Spiketails** | | | | | | | |
| *Cordulegaster maculata* | Twin-spotted Spiketail | S4 | | | | | X | |
| **Corduliidae** | **Emeralds** | | | | | | | |
| *Epitheca cynosura* | Common Baskettail | S5 | | | | | X | |
| *Somatochlora tenebrosa* | Clamp-tipped Emerald | S3 | | | | | X | |
| **Libellulidae** | **Skimmers** | | | | | | | |
| *Celithemis elisa* | Calico Pennant | S5 | | | | | X | |
| *Celithemis eponina* | Halloween Pennant | S4 | | | | | X | |
| *Leucorrhinia intacta* | Dot-tailed Whiteface | S5 | | | | | X | |
| *Libellula luctuosa* | Widow Skimmer | S5 | | | | | X | |
| *Libellula pulchella* | Twelve-spotted Skimmer | S5 | | | | | X | |
| *Libellula quadrimaculata* | Four-spotted Skimmer | S5 | | | | | X | |
| *Libellula semifasciata* | Painted Skimmer | S3 | | | | | X | |
| *Plathemis lydia* | Common Whitetail | S5 | | | | | X | |
| *Sympetrum obtrusum* | White-faced Meadowhawk | S5 | | | | | X | |
| *Sympetrum rubicundulum* | Ruby Meadowhawk | S5 | | | | | X | |
| *Tramea lacerata* | Black Saddlebags | S4 | | | | | X | |
| **Total** | | | | | | | **26** | **0** |

**Odonate Atlas Square Numbers: 17NH54*

## Appendix VII
## Species at Risk/Species of Conservation Concern Habitat Assessment

| Scientific Name | Common Name | S-RANK | SCA | COSEWIC | SARA | SARA Schedule | Background Source | Habitat Requirements | Suitable Habitats within Study Area | Rationale |
|---|---|---|---|---|---|---|---|---|---|---|
| **Birds** | | | | | | | | | | |
| *Ammodramus savannarum* | Grasshopper Sparrow | S4B | | SC | SC | Schedule 1 | BSC et al. 2008 | Well-drained grassland or prairie with low cover of grasses, taller weeds or sandy soil; hayfields or weedy fallow fields; uplands with ground vegetation of various densities. Requires perches for singing and tracts of grassland generally >5ha. | Yes | Large open land habitat may exist within the study area's agricultural lands but is absent within the subject property itself |
| *Antrostomus vociferus* | Eastern Whip-poor-will | S4B | | SC | T | Schedule 1 | BSC et al. 2008 | Areas with a mix of open and forested areas, such as open woodlands, savannas, pine plantations, woodland edges, or openings in more mature deciduous, coniferous and mixed forests. Forages in open areas and uses forested areas for roosting and nesting. | Yes | The study area contains some open woodland and woodland clearings that may provide suitable habitat |
| *Ardea alba* | Great Egret | S2B, S3M | | | | | eBird 2025 | Open swamp woods or willow thickets; offshore islands; mudflats for feeding; nests in standing trees in open water | No | Suitable habitat is not present within the study area |
| *Baeolophus bicolor* | Tufted Titmouse | S3 | | | | | eBird 2025 | Mixed or deciduous forests; moist bottomlands and swamps; orchards; agricultural or urban-forested areas | Yes | Suitable woodland habitat exists within the study area |
| *Chaetura pelagica* | Chimney Swift | S3B | | T | T | Schedule 1 | OMNR 2025; BSC et al. 2008; eBird 2025 | Commonly found in urban areas near buildings; nests in chimneys, hollow trees,and crevices of rock cliffs. Feeds over open water. | No | Suitable nesting or roosting structures are absent within the study area |
| *Chordeiles minor* | Common Nighthawk | S4B | | SC | SC | Schedule 1 | BSC et al. 2008; eBird 2025 | Open ground; clearings in dense forests (including burns and logged areas); rock barrens; peat bogs; ploughed fields; gravel beaches or barren areas with rocky soils; open woodlands; flat gravel roofs. | Yes | The study area contains woodland with open clearings that may provide suitable habitat |
| *Contopus virens* | Eastern Wood-Pewee | S4B | | SC | SC | Schedule 1 | OMNR 2025; BSC et al. 2008 | Mid-canopy layer of forest clearings and edges of deciduous and mixed forest. Abundant in intermediate-age mature forest stands with little understory vegetation. | Yes | The study area woodlands provide suitable habitat |
| *Dolichonyx oryzivorus* | Bobolink | S4B | | T | T | Schedule 1 | BSC et al. 2008 | Large (>10 ha), open expansive grasslands, pastures, hayfields, meadows or fallow fields with dense ground cover. Occassionally nest in large (>50 ha) fields of winter wheat and rye in southwestern Ontario. [3,4] | Possibly | Suitable habitat may exist within the agricultural lands outside of the subject property, but is absent within the subject property itself |
| *Euphagus carolinus* | Rusty Blackbird | S4B, S3N | | SC | SC | Schedule 1 | eBird 2025 | Breeds in habitats dominated by coniferous forest with wetlands including bogs, marshes, swamps and beaver ponds. | No | Suitable habitat is not present within the study area |
| *Falco peregrinus* | Peregrine Falcon | S4 | | NAR | SC | Schedule 1 | eBird 2025 | Usually nest on tall, steep cliff ledges close to large bodies of water. Can also nest on the ledges of tall buildings. | No | Suitable habitat is not present within the study area |
| *Hirundo rustica* | Barn Swallow | S4B | | SC | T | Schedule 1 | OMNR 2025; BSC et al. 2008; eBird 2025 | Farmlands, rural areas and other open or semi-open areas near body of water. Nests almost exclusively on human-made structures such as open barns, buildings, bridges and culverts. | No | Suitable nesting habitat is absent within the study area |
| *Hylocichla mustelina* | Wood Thrush | S4B | | T | T | Schedule 1 | OMNR 2025; BSC et al. 2008 | Carolinian and Great Lakes-St. Lawrence forest zones. Undisturbed moist mature deciduous or mixed forest with deciduous sapling growth. Near pond or swamp. Must have some trees higher than 12 m.[3,4] | Yes | Suitable woodland habitat exists within the study area |
| *Melanerpes erythrocephalus* | Red-headed Woodpecker | S3 | | E | E | Schedule 1 | OMNR 2025 | Open, deciduous forest with little understory; fields, parks or pasture lands with scattered large trees; wooded swamps; orchards, small woodlots or forest edges; groves of dead or dying trees. Requires cavity trees with at least 40 cm dbh. | Yes | Suitable woodland habitat exists within the study area |
| *Riparia riparia* | Bank Swallow | S4B | | T | T | Schedule 1 | BSC et al. 2008 | Nests in burrows in natural and human-made settings with vertical faces in silt and sand deposits. Ususally on banks of river and lakes, but also found in sand and gravel pits. | No | Suitable nesting habitat is absent within the study area |
| *Spatula discors* | Blue-winged Teal | S3B, S4M | | | | | eBird 2025 | Shallow open wetlands, ponds or lakes; margins of rivers; marshes near grasslands or open woodland; hillside thickets | No | Suitable habitat is not present within the study area |

| Scientific Name | Common Name | S-RANK | SCA | COSEWIC | SARA | SARA Schedule | Background Source | Habitat Requirements | Suitable Habitats within Study Area | Rationale |
|---|---|---|---|---|---|---|---|---|---|---|
| *Sturnella magna* | Eastern Meadowlark | S4B, S3N | | T | T | Schedule 1 | BSC et al. 2008 | Open pastures, hayfields, grasslands or grassy meadows with elevated singing perches (small trees, shrubs or fence posts). Also weedy borders of croplands, roadsides, orchards, airports, shrubby overgrown fields or other open areas. Generally prefers larger tracts of habitat >10 ha, but will sometimes use smaller tracts. | Yes | The subject property contains a large meadow area that may provide suitable habitat. The adjacent agricultural lands may provide suitable habitat. |
| **Herpetofauna** | | | | | | | | | | |
| **Turtles** | | | | | | | | | | |
| *Chelydra serpentina* | Snapping Turtle | S4 | | SC | SC | Schedule 1 | Ontario Nature 2019 | Slow-flowing rivers and streams, lakes, and permanent or semi-permanent wetlands with soft substrates and vegetation. Key habitat requirements: open areas with structures for basking, open sand or gravel areas for nesting, shallow areas with soft substrates to bury in, soft banks or substrates for hibernation. | No | Suitable open water habitat is absent within the study area |
| *Emydoidea blandingii* | Blanding's Turtle | S3 | THR | E | T | Schedule 1 | Ontario Nature 2019 | Eutrophic, shallow wetlands such as marshes, ponds, swamps, bogs, fens, or coastal wetlands, with soft, muddy substrates, abundant aquatic vegetation, and basking structures (logs, stumps, hummocks). Large overland movements occur between aquatic habitats and to open sandy or gravelly areas for nesting. Forest habitat is important for upland movements. Overwintering typically occurs in permanent wetlands. | No | Suitable wetland habitat is absent within the study area |
| *Graptemys geographica* | Northern Map Turtle | S3 | | SC | SC | Schedule 1 | Ontario Nature 2019 | Large bodies of water such as rivers and lakes with soft bottoms, aquatic vegetation, abundant mollusc prey, and basking structures such as logs or rocks. Nesting occurrs in open areas with soft substrates such as sand or gravel. Hibernate on the bottom of deep areas of lakes or deep, slow-moving sections of rivers. | No | Suitable open water habitat is absent within the study area |
| **Snakes** | | | | | | | | | | |
| *Heterodon platirhinos* | Eastern Hog-nosed Snake | S3 | THR | T | T | Schedule 1 | Ontario Nature 2019 | Open habitats, such as open woods, brushland or forest edges, with well-drained loose or sandy soils, well-drained substrates. Specializes in hunting and eating toads; occurs in habitats near or adjacent to wetland habitats where toads are present. Rocks, logs, stumps, etc. are used for shelter. Use snout to dig nests as well as to dig burrows for overwintering. | Yes | The study area contains suitable habitats including open woods, forest edges with loose sandy soils |
| *Pantherophis gloydi* pop. 2 | Eastern Foxsnake (Carolinian population) | S2 | END | E | E | Schedule 1 | Ontario Nature 2019 | Open natural and semi-natural upland habitats, such as meadows, fields, restored prairies, and marshes and creeks. Root wads and logs provide cover and shelter. Nests in rotten logs, stumps, dune slopes, decaying piles of vegetation. Hibernates communally underground in animal burrows, or in old wells or foundations. | Yes | The study area contains upland natural habitats including meadows and fields |
| *Thamnophis sauritus septentrionalis* | Northern Ribbonsnake | S4 | | SC | SC | Schedule 1 | Ontario Nature 2019 | Sunny grassy areas with low dense vegetation near bodies of shallow permanent quiet water; wet meadows, marshes, borders of ponds, lakes or streams. | No | Sunny grassy areas near water are not present within the study area |
| **Mammals** | | | | | | | | | | |
| *Lasionycteris noctivagans* | Silver-haired Bat | S4 | END | E | | | COSEWIC 2023 | Woodlands with large-diameter decaying trees | Yes | The study area woodlands and other tree growth may provide roosting habitat for the species |
| *Lasiurus borealis* | Eastern Red Bat | S4 | END | E | | | COSEWIC 2023 | Deciduous and coniferous forests with open understories, containing large-diameter and some tall trees | Yes | The study area woodlands and other tree growth may provide roosting habitat for the species |
| *Lasiurus cinereus* | Hoary Bat | S4 | END | E | | | COSEWIC 2023 | Deciduous and coniferous forests with open understories, containing large-diameter and some tall trees | Yes | The study area woodlands and other tree growth may provide roosting habitat for the species |

| Scientific Name | Common Name | S-RANK | SCA | COSEWIC | SARA | SARA Schedule | Background Source | Habitat Requirements | Suitable Habitats within Study Area | Rationale |
|---|---|---|---|---|---|---|---|---|---|---|
| *Myotis leibii* | Eastern Small-footed Myotis | S2S3 | END | | | | Humphrey 2017 | Roosts in caves, mine shafts, crevices or buildings that are in or near woodland. Hibernates in cold dry caves or mines. Maternity colonies in caves or buildings. Hunts in forests. | Yes | The study area woodlands and other tree growth may provide roosting habitat for the species |
| *Myotis lucifungus* | Little Brown Myotis | S3 | END | E | E | Schedule 1 | ECCC 2018 | Uses caves, quarries, tunnels, hollow trees or buildings for roosting. Winters in humid caves. Maternity sites in dark warm areas such as attics and barns. Feeds primarily in wetlands and forest edges.[3,4] | Yes | The study area woodlands and other tree growth may provide roosting habitat for the species |
| *Myotis septentrionalis* | Northern Myotis | S3 | END | E | E | Schedule 1 | ECCC 2018 | Roosts in houses and man-made structures but prefers hollow trees or under loose bark. Hibernates in mines or caves. Hunts within forest, below the canopy. | Yes | The study area woodlands and other tree growth may provide roosting habitat for the species |
| *Perimyotis subflavus* | Tri-colored Bat | S3? | END | E | E | Schedule 1 | ECCC 2018 | Roosts and maternity colonies in older forests and occassionally in barns or other sturctures. Forage over water and along streams in the forest. Hibernate in caves. | Yes | The study area woodlands and other tree growth may provide roosting habitat for the species |
| *Taxidea taxus jacksoni* | American Badger (Southwestern Ontario population) | S2 | END | E | E | Schedule 1 | MNRF 2014 | Open grasslands, oak savannahs, sand barrens and farmland. | Yes | Open sandy habitats and farmland within the study area may provide suitable habitat |
| **Butterflies** | | | | | | | | | | |
| *Danaus plexippus* | Monarch | S2N, S4B | | END | SC | Schedule 1 | Macnaughton et al. 2025; iNaturlist 2025 | Adults found in a diversity of habitats with a variety of wildflowers. Caterpillars are confined to meadows and open areas where milkweeds grow (larval food plants). | Yes | Open meadow habitat exists that may contain the host plant milkweed |
| *Thorybes bathyllus* | Southern Cloudywing | S3 | | | | | Macnaughton et al. 2025 | Open scrubby places including dry meadows, burned areas, dry prairie hills, powerline right-of-ways | Yes | Suitable dry open meadow habitat is present within the study area |
| **Odonates** | | | | | | | | | | |
| *Arigomphus villosipes* | Unicorn Clubtail | S3 | | | | | OOAD 2023 | Ponds, lakes and slow streams with muddy bottoms and little submerged vegetation | No | Suitable habitat is not present within the study area |
| *Epiaeschna heros* | Swamp Darner | S3S4 | | | | | OOAD 2023 | Shallow shaded woodpland ponds, including those that are sometimes temporary; swamps and slow streams | No | Suitable habitat is not present within the study area |
| *Libellula semifasciata* | Painted Skimmer | S3 | | | | | OOAD 2023 | Marshy forest ponds; bogs or slow streams | No | Suitable habitat is not present within the study area |
| *Somatochlora tenebrosa* | Clamp-tipped Emerald | S3 | | | | | OOAD 2023 | Shady forest waters, from trickles to streams, occasionally boggy and also partly dry | No | Suitable habitat is not present within the study area |
| **Fish** | | | | | | | | | | |
| *Lethenteron appendix* | American Brook Lamprey | S3 | | | | | OMNR 2025 | Gravel/sand riffles and runs of creeks and small to medium-sized rivers with strong flow and clear waters. | No | Suitable aquatic habitat is absent within the study area |
| **Plants** | | | | | | | | | | |
| *Restricted Species | *Restricted Species | S2 | THR | E | E | Schedule 1 | OMNR 2025 | Rich, even swamy, hardwoods (beech, sugar maple, hemlock), especially on slopes or ravines (including forested dunes) | Yes | Suitable woodland conditions may exist within the study area |
| *Carya glabra* | Pignut Hickory | S3 | | | | | OMNR 2025 | Usually in upland, often sandy, forests, associated with oaks | Yes | Suitable woodland conditions may exist within the study area |
| *Corallorhiza odontorhiza* | Autumn Coralroot | S3 | | | | | OMNR 2025 | Dry open oak forests, pine plantations; much less often in beech-maple forests or under tamarack | Yes | Suitable woodland conditions may exist within the study area |
| *Juglans cinerea* | Butternut | S2? | END | E | E | Schedule 1 | OMNR 2025 | Stream banks and swamps, as well as upland beech-maple, oak-hickory, and mixed hardwood stands. | Yes | Suitable woodland conditions exist within the study area |
| *Monarda didyma* | Scarlet Beebalm | S3 | | | | | iNaturalist 2025 | Rich forests on banks and floodplains; roadsides and thickets | Yes | Suitable habitat may exist within the study area |
| *Phegopteris hexagonoptera* | Broadbeech Fern | S3 | | SC | SC | Schedule 3 | OMNR 2025 | Rich, moist deciduous forests, often at bases of slopes, edges of seeps, and along streams. | No | Suitable conditions not present within the study area woodlands |
| *Tephrosia virginiana* | Virginia Goat's-rue | S1 | END | E | E | Schedule 1 | OMNR 2025 | Sandy barrens, fields, prairie-like areas, and oak-pine savannahs. | Yes | Open sandy areas and fields exist within the study area |
| *Vicia caroliniana* | Carolina Vetch | S2? | | | | | OMNR 2025 | Oak and oak-hickory forests, borders of forests, dry open ground and clearings; less often in moist places, banks of streams and lakes. | Yes | Suitable woodland conditions may exist within the study area |
| *Viola palmata* | Palmate-leaved Violet | S2 | | | | | OMNR 2025 | Dry oak, oak-hickory, and beech-maple forests, prairies, and thickets between forests and prairies | Yes | Suitable woodland conditions may exist within the study area |

## Appendix VIII
## Significant Wildlife Habitat Assessment

**Significant Wildlife Habitat Assessment: Ecoregion 7E.**

**Table 1. Characteristics of Seasonal Concentration Areas**

| Rationale | Wildlife Species | Candidate SWH | | Confirmed SWH | Study Area |
|---|---|---|---|---|---|
| | | ELC Ecosite Codes | Habitat Criteria and Information Sources | Defining Criteria | Assessment Details |
| **Waterfowl Stopover and Staging Areas (Terrestrial)** | | | | | |
| Habitat important to migrating waterfowl | American Black Duck<br>Northern Pintail<br>Gadwall<br>Blue-winged Teal<br>Green-winged Teal<br>American Wigeon<br>Northern Shoveler<br>Tundra Swan | CUM1<br>CUT1<br>- Plus evidence of annual spring flooding from melt water or run-off within these Ecosites.<br>- Fields with seasonal flooding and waste grain in the Long Point, Rondeau, Lake. St. Clair, Grand Bend and Pt. Pelee areas may be important to Tundra Swans. | Fields with sheet water during Spring (mid March to May).<br>• Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl.<br>• Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have spring sheet water available[cxlviii]<br><br><u>Information Sources</u><br>• Anecdotal information from the landowner, adjacent landowners or local naturalist clubs may be good information in determining occurrence.<br>• Reports and other information available from Conservation Authorities (CAs)<br>• Sites documented through waterfowl planning processes (eg. EHJV implementation plan)<br>• Field Naturalist Clubs<br>• Ducks Unlimited Canada<br>• Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area | Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi]<br>• Any mixed species aggregations of 100[l] or more individuals required.<br>• The area of the flooded field ecosite habitat plus a 100-300m radius buffer dependant on local site conditions and adjacent land use is the significant wildlife habitat[cxlviii].<br>• Annual use of habitat is documented from information sources or field studies (annual use can be based on studies or determined by past surveys with species numbers and dates).<br>• SWHMIST[cxlix] Index #7 provides development effects and mitigation measures. | Suitable habitat is not present within the study area.<br><br>**Not SWH** |
| **Waterfowl Stopover and Staging Areas (Aquatic)** | | | | | |
| Important for local and migrant waterfowl populations during the spring or fall migration or both periods combined. Sites identified are usually only one of a few in the eco-district | Canada Goose<br>Cackling Goose<br>Snow Goose<br>Green-winged Teal<br>American Black Duck<br>Northern Pintail<br>Northern Shoveler<br>American Wigeon<br>Gadwall<br>Blue-winged Teal<br>Hooded Merganser<br>Common Merganser<br>Red-breasted Merganser<br>Lesser Scaup<br>Greater Scaup | MAS1<br>MAS2<br>MAS3<br>SAS1<br>SAM1<br>SAF1<br>SWD1<br>SWD2<br>SWD3<br>SWD4<br>SWD5<br>SWD6<br>SWD7 | • Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify.<br>• These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water).<br><br><u>Information Sources</u><br>• Environment Canada | Studies carried out and verified presence of:<br>• Aggregations of 100[l] or more of listed species for 7 days[l], results in >700 waterfowl use days.<br>• Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH[cxlix]<br>• The combined area of the ELC ecosites and a 100m radius area is the SWH[cxlviii]<br>• Wetland area and shorelines associated with sites identified within the SWHTG[cxlviii] Appendix K[cxlix] are significant wildlife | Suitable habitat is not present within the study area.<br><br>**Not SWH** |

**Table 1. Characteristics of Seasonal Concentration Areas**

| Rationale | Wildlife Species | Candidate SWH | | Confirmed SWH | Study Area |
|---|---|---|---|---|---|
| | | ELC Ecosite Codes | Habitat Criteria and Information Sources | Defining Criteria | Assessment Details |
| | Common Goldeneye<br>Bufflehead<br>Long-tailed Duck<br>Surf Scoter<br>White-winged Scoter<br>Black Scoter<br>Canvasback<br>Redhead<br>Ruddy Duck<br>Brant<br>White-winged Scoter<br>Black Scoter | | • Naturalist clubs often are aware of staging/stopover areas<br>• OMNRF Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging.<br>• Sites documented through waterfowl planning processes (eg. EHJV implementation plan)<br>• Ducks Unlimited projects<br>• Element occurrence specification by Nature Serve: http://www.natureserve.org<br>• Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area | habitat.<br>• Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi]<br>• Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded).<br>• SWHMIST[cxlix] Index #7 provides development effects and mitigation measures. | |
| **Shorebird Migratory Stopover Area** | | | | | |
| High quality shorebird stopover habitat is extremely rare and typically has a long history of use | Greater Yellowlegs<br>Lesser Yellowlegs<br>Marbled Godwit<br>Hudsonian Godwit<br>Black-bellied Plover<br>American Golden-Plover<br>Semipalmated Plover<br>Solitary Sandpiper<br>Spotted Sandpiper<br>Semipalmated Sandpiper<br>Pectoral Sandpiper<br>White-rumped Sandpiper<br>Baird's Sandpiper<br>Least Sandpiper<br>Purple Sandpiper<br>Stilt Sandpiper<br>Short-billed Dowitcher<br>Red-necked Phalarope<br>Whimbrel<br>Ruddy Turnstone<br>Sanderling<br>Dunlin | BBO1<br>BBO2<br>BBS1<br>BBS2<br>BBT1<br>BBT2<br>SDO1<br>SDS2<br>SDT1<br>MAM1<br>MAM2<br>MAM3<br>MAM4<br>MAM5 | Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats.<br><br>Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. Sewage treatment ponds and storm water ponds do not qualify as a SWH.<br><br><u>Information Sources</u><br>• Western hemisphere shorebird reserve network<br>• Canadian Wildlife Service (CWS) Ontario Shorebird Survey<br>• Bird Studies Canada<br>• Ontario Nature<br>• Local birders and naturalist clubs<br>• Natural Heritage Information Center (NHIC) Shorebird Migratory Concentration Area | Studies confirming:<br>• Presence of 3 or more of listed species and > 1000[l] shorebird use days during spring or fall migration period (shorebird use days are the accumulated number of shorebirds counted per day over the course of the fall or spring migration period).<br>• Whimbrel stop briefly (<24hrs) during spring migration, any site with >100[l] Whimbrel used for 3 years or more is significant.<br>• The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100m radius area[cxlviii]<br>• Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi]<br>• SWHMIST[cxlix] Index #8 provides development effects and mitigation measures. | Suitable habitat is not present within the study area.<br><br>**Not SWH** |
| **Raptor Wintering Area** | | | | | |
| Sites used by multiple species, a high number of | Rough-legged Hawk<br>Red-tailed Hawk<br>Northern Harrier | <u>Hawks/Owls:</u><br>Combination of ELC Community Series; need to | The habitat provides a combination of fields and woodlands that provide roosting, | Studies confirm the use of these habitats by:<br>• One or more Short-eared Owls, | |

**Table 1. Characteristics of Seasonal Concentration Areas**

| Rationale | Wildlife Species | Candidate SWH | | Confirmed SWH | Study Area |
|---|---|---|---|---|---|
| | | ELC Ecosite Codes | Habitat Criteria and Information Sources | Defining Criteria | Assessment Details |
| individuals and used annually are most significant | American Kestrel<br>Snowy Owl<br><br><u>Special Concern</u>:<br>Short-eared Owl<br>Bald Eagle | have present one Community Series from each land class.<br>Forest:<br>FOD, FOM, FOC<br><br>Upland:<br>CUM, CUT, CUS, CUW<br><br><u>Bald Eagle:</u><br><br>Forest Community Series: FOD, FOM, FOC, SWD, SWM, or SWC, on shoreline areas adjacent to large rivers or adjacent to lakes with open water (hunting area). | foraging and resting habitats for wintering raptors.<br><br>Raptor wintering (hawk/owl) sites need to be > 20ha[cxlviii, cxlix] with a combination of forest and upland[xvi, xvii, xviii, xix, xx, xxi].<br><br>Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands[cxlix]<br><br>Field area of the habitat is to be wind swept with limited snow depth or accumulation.<br><br>Eagle sites have open water and large trees and snags aviable for roosting[cxlix]<br><br><u>Information Sources</u><br>• OMNRF Districts<br>• Natural clubs<br>• Natural Heritage Information Centre (NHIC) Raptor Winter Concentration Area<br>• Data from Bird Studies Canada<br>• Reports and other information available from CAs<br>• Results of Christmas Bird Counts | or, One of more Bald Eagles or; at least 10 individuals and two listed hawk/owl species<br>• To be significant a site must be used regularly (3 in 5 years)[cxlix] for a minimum of 20 days by the above number of birds[l].<br>• The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area.<br>• Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi]<br>• SWHMIST[cxlix] Index #10 and #11 provides development effects and mitigation measures. | Suitably sized habitat is not present within the study area<br><br>**Not SWH** |
| **Bat Hibernacula** | | | | | |
| Bat hibernacula, are rare habitats in all Ontario landscapes. | Big Brown Bat<br>Eastern Pipistrelle/Tri-colored Bat | Bat Hibernacula may be found in these ecosites:<br>CCR1<br>CCR2<br>CCA1<br>CCA2<br>(Note: buildings are not considered to be SWH) | Hibernacula may be found in caves, mine shafts, underground foundations and Karsts.<br><br>Active mine sites should not be considered<br><br>The locations of bat hibernacula are relatively poorly known.<br><br><u>Information Sources</u><br>• OMNRF for possible locations and contact for local experts<br>• Natural Heritage Information Centre (NHIC) Bat Hibernaculum | • All sites with confirmed hibernating bats are SWH[l].<br>• The area includes 200m radius around the entrance of the hibernaculum[cxlviii, ccvii, l]. for the development types and 1000m for wind farms [ccv.]<br>• Studies are to be conducted during the peak swarming period (Aug. – Sept.). Surveys should be conducted following methods outlined in the[ccv]."Bats and Bat Habitats: Guidelines for Wind Power Projects" [ccv]<br>• SWHMIST[cxlix] Index #1 | Suitable habitat is not present within the study area.<br><br>**Not SWH** |

**Significant Wildlife Habitat Assessment: Ecoregion 7E.**

**Table 1. Characteristics of Seasonal Concentration Areas**

| Rationale | Wildlife Species | Candidate SWH | | Confirmed SWH | Study Area |
|---|---|---|---|---|---|
| | | ELC Ecosite Codes | Habitat Criteria and Information Sources | Defining Criteria | Assessment Details |
| | | | • Ministry of Northern Development and Mines for location of mine shafts<br>• Clubs that explore caves (eg. Sierra Club)<br>• University Biology Departments with bat experts | provides development effects and mitigation measures. | |
| **Bat Maternity Colonies** | | | | | |
| Known locations of forested bat maternity colonies are extremely rare in all Ontario landscapes. | Big Brown Bat<br>Silver-haired Bat | Maternity colonies considered SWH are found in forested Ecosites.<br><br>All ELC Ecosites in ELC Community Series:<br>FOD<br>FOM<br>SWD<br>SWM | Maternity colonies can be found in tree cavities, vegetation and often in building [sxxii, xxv, xxvi, xxvii, xxxi] (buildings are not considered to be SWH).<br>• Maternity roosts are not found in caves and mines in Ontario[xxii].<br>• Maternity colonies located in Mature deciduous or mixed forest stands[ccix, ccx] with >10/ha large diameter (>25cm dbh) wildlife trees[ccvii].<br>• Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3[ccxiv] or class 1 or 2[ccxii].<br>• Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred[ccx].<br><br><u>Information Sources</u><br><br>• OMNRF for possible locations and contact for local experts<br>• University Biology Departments with bat experts | Maternity Colonies with confirmed use by:<br>• >10 Big Brown Bats[l]<br>• >5 Adult Female Silver-haired Bats[l]<br>• The area of the habitat includes the entire woodland or the forest stand ELC Ecosite containing the maternity colonies[l].<br>• Evaluation methods for maternity colonies should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects"[ccv].<br>• SWHMIST[cxlix] Index #12 provides development effects and mitigation measures. | The study area woodlands may provide suitable maternity colony habitat.<br><br>**Possible SWH** |
| **Turtle Wintering Area** | | | | | |
| Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant. | Midland Painted Turtle<br><br><u>Special Concern</u>:<br>Northern Map Turtle<br>Snapping Turtle | Snapping and Midland Painted Turtles:<br>ELC Community Classes:<br>SW, MA, OA and SA<br>ELC Community Series:<br>FEO and BOO<br><br>Northern Map Turtle: Open Water areas such as deeper rivers or streams and lakes | • For most turtles, wintering areas are in the same general area as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates.<br><br>• Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen[cix, cx, | • Presence of 5 over-wintering Midland Painted Turtles is significant[l].<br>• One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant[l].<br>• The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site | Suitable habitat is not present within the study area.<br><br>**Not SWH** |

**Table 1. Characteristics of Seasonal Concentration Areas**

| Rationale | Wildlife Species | Candidate SWH | | Confirmed SWH | Study Area |
|---|---|---|---|---|---|
| | | ELC Ecosite Codes | Habitat Criteria and Information Sources | Defining Criteria | Assessment Details |
| | | with current can also be used as over-wintering habitat. | [cxi, cxviii].<br><br>• Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH<br><br>Information Sources<br>• EIS studies carried out by Conservation Authorities<br>• Field naturalists clubs<br>• OMNRF Ecologist or Biologist<br>• Natural Heritage Information Centre (NHIC) | is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH.<br>• Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (Sept. – Oct.) or spring (Mar. – Apr)[cvii].<br>Congregation of turtles is more common where wintering areas are limited and therefore significant[cix, cx, cxi, cxii].<br>• SWHMIST[cxlix] Index #28 provides development effects and mitigation measures for turtle wintering habitat. | |
| **Reptile Hibernaculum** | | | | | |
| Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant | Snakes:<br>Eastern Gartersnake<br>Northern Watersnake<br>Northern Red-bellied Snake<br>Northern Brownsnake<br>Smooth Green Snake<br>Northern Ring-necked Snake<br><br>Special Concern:<br>Milksnake<br>Eastern Ribbonsnake | For all snakes, habitat may be found in any ecosite in southern Ontario other than very wet ones. Talus, Rock Barren, Crevice and Cave, and Alvar sites may be directly related to these habitats.<br><br>Observations of congregations of snakes on sunny warm days in the spring or fall is a good indicator. The existence of rock piles or slopes, stone fences, and crumbling foundations assist in identifying candidate SWH. | For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural locations. Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line[xliv, l, li, lii, cxii]. Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover.<br><br>Information Sources<br>• In spring, local residents or landowners may have observed the emergence of snakes on their property (e.g. old dug wells).<br>• Reports and other information available from CAs<br>• Local naturalists and experts, as well as university herpetologists may also know where to find some of these sites. | Studies confirming:<br>• Presence of snake hibernacula used by a minimum of five individuals of a snake sp., or, individuals of two or more snake spp.<br>• Congregations of a minimum of five individuals of a snake sp., or, individuals of two or more snake spp. near potential hibernacula (eg. foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct)[l].<br>• Note: If there are Special Concern Species present, then site is SWH<br>• Note: Sites for hibernation possess specific habitat parameters (e.g. temperature, humidity, etc.) and consequently are used annually, often by many of the same individuals of a local population (i.e. strong hibernation site fidelity). Other critical life processes (e.g. mating) often take place in close proximity to hibernacula. The | Suitable hibernaculum conditions may exist on site (e.g., rock piles, mammal burrows), such as where these may exist within open areas and clearings.<br><br>**Candidate SWH** |

**Table 1. Characteristics of Seasonal Concentration Areas**

| Rationale | Wildlife Species | Candidate SWH | | Confirmed SWH | Study Area |
|---|---|---|---|---|---|
| | | ELC Ecosite Codes | Habitat Criteria and Information Sources | Defining Criteria | Assessment Details |
| | | | • Natural Heritage Information Centre (NHIC) | feature in which the hibernacula is located plus a 30m buffer is the SWH[cxlix].<br>• SWHMIST[cxlix] Index #13 provides development effects and mitigation measures for snake hibernacula. | |
| **Colonially - Nesting Bird Breeding Habitat (Bank and Cliff)** | | | | | |
| Historical use and number of nests in a colony make this habitat significant. An identified colony can be very important to local populations. All swallow population are declining in Ontario. | Cliff Swallow<br>Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies) | Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles<br>Cliff faces, bridge abutments, silos, barns<br><br>Habitat found in the following ecosites:<br>CUM1 CUT1<br>CUS1 BLO1<br>BLS1 BLT1<br>CLO1 CLS1<br>CLT1 | • Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area.<br>• Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles.<br>• Does not include a licensed/permitted Mineral Aggregate Operation.<br><br><u>Information Sources</u><br>• Reports and other information available from CAs<br>• Ontario Breeding Bird Atlas[ccv].<br>• Bird Studies Canada: Nature Counts http://www.birdscanada.org/birdmon/<br>• Field Naturalist clubs | Studies confirming:<br>• Presence of 1 or more nesting sites with 8[cxlvix] or more cliff swallow pairs and/or rough-winged swallow pairs during the breeding season.<br>• A colony identified as SWH will include a 50m radius habitat area from the peripheral nests[ccvii].<br>• Field surveys to observe and count swallow nests are to be completed during the breeding season. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi].<br>• SWHMIST[cxlix] Index #4 provides development effects and mitigation measures. | Suitable nesting habitat is not present within the study area.<br><br>**Not SWH** |
| **Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs)** | | | | | |
| Large colonies are important to local bird population, typically sites are only known colony in area and are used annually. | Great Blue Heron<br>Black-crowned Night-Heron<br>Great Egret<br>Green Heron | SWM2 SWM3<br>SWM5 SWM6<br>SWD1 SWD2<br>SWD3 SWD4<br>SWD5 SWD6<br>SWD7 FET1 | • Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used.<br>• Most nests in trees are 11 to 15 m from ground, near the top of the tree.<br><br><u>Information Sources</u><br>• Ontario Breeding Bird Atlas[ccv], colonial nest records.<br>• Ontario Heronry Inventory 1991 available from Bird Studies Canada or NHIC (OMNRF). | Studies confirming:<br>• Presence of 2 or more active nests of Great Blue Heron or other list species.<br>• The habitat extends from the the edge of the colony and a minimum 300m radius or extent of the Forest Ecosite containing the colony or any island <15.0ha with a colony is the SWH[cc, ccvii].<br>• Confirmation of active colonies must be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the | Suitable habitat is not present within the study area.<br><br>**Not SWH** |

**Significant Wildlife Habitat Assessment: Ecoregion 7E.**

**Table 1. Characteristics of Seasonal Concentration Areas**

| Rationale | Wildlife Species | Candidate SWH | | Confirmed SWH | Study Area |
|---|---|---|---|---|---|
| | | ELC Ecosite Codes | Habitat Criteria and Information Sources | Defining Criteria | Assessment Details |
| | | | • Natural Heritage Information Centre (NHIC) Mixed Wader Nesting Colony<br>• Aerial photographs can help identify large heronries.<br>• Reports and other information available from CAs<br>• MNRF District Offices<br>• Field naturalist clubs | presence of fresh guano, dead young and/or eggshells<br>• SWHMIST[cxlix] Index #5 provides development effects and mitigation measures. | |
| **Colonially - Nesting Bird Breeding Habitat (Ground)** | | | | | |
| Colonies are important to local bird population, typically sites are only known colony in area and are used annually. | Herring Gull<br>Great Black-backed Gull<br>Little Gull<br>Ring-billed Gull<br>Common Tern<br>Caspian Tern<br>Brewer's Blackbird | Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1:50,000 NTS map).<br><br>Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird)<br><br>MAM1 – 6<br>MAS1 – 3<br>CUM<br>CUT<br>CUS | • Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas.<br>• Brewers Blackbird colonies are found loosely on the ground in or in low bushes in close proximity to streams and irrigation ditches within farmlands.<br><br><u>Information Sources</u><br>• Ontario Breeding Bird Atlas[ccv], rare/colonial species records.<br>• Canadian Wildlife Service<br>• Reports and other information available from CAs<br>• Natural Heritage Information Centre (NHIC) Colonial Waterbird Nesting Area<br>• MNRF District Offices<br>• Field naturalist clubs | Studies confirming:<br>• Presence of >25 active nests for Herring Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern[i].<br>• Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant[i].<br>• Presence of 5 or more pairs for Brewer's Blackbird[i].<br>• The edge of the colony and a minimum 150m radius area of the habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH[cc, ccvii].<br>• Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi].<br>• SWHMIST[cxlix] Index #6 provides development effects and mitigation measures. | Suitable habitat is not present within the study area.<br><br>**Not SWH** |
| **Migratory Butterfly Stopover Areas** | | | | | |
| Butterfly stopover areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter | Painted Lady<br>Red Admiral<br><br><u>Special Concern</u>:<br>Monarch | Combination of ELC Community Series; need to have present one Community Series from each landclass:<br><br>Field:<br>CUM<br>CUT<br>CUS | A butterfly stopover area will be a minimum of 10ha in size with a combination of field and forest habitat present, and will be located within 5km of Lake Ontario and Erie[cxlix].<br>• The habitat is typically a combination of field and forest, and provides the butterflies with a location to rest prior to their long | Studies confirm:<br>• The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct)[xliii]. MUD is based on the number of days a site is used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day[xxxvii], significant variation can occur | The study area is not within 5km of Lake Erie.<br><br>**Not SWH** |

**Table 1. Characteristics of Seasonal Concentration Areas**

| Rationale | Wildlife Species | Candidate SWH | | Confirmed SWH | Study Area |
|---|---|---|---|---|---|
| | | ELC Ecosite Codes | Habitat Criteria and Information Sources | Defining Criteria | Assessment Details |
| | | Forest:<br>FOC FOD<br>FOM CUP<br><br>Anecdotally, a candidate sight for butterfly stopover will have a history of butterflies being observed. | migration south [xxxii, xxxiii, xxxiv, xxxv, xxxvi].<br>• The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat [cxlviii, cxlix].<br>• Staging areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes [xxxvii, xxxviii, xxxix, xl, xli].<br><br><u>Information Sources</u><br>• MNRF District Offices<br>• Natural Heritage Information Centre (NHIC)<br>• Agriculture Canada in Ottawa may have list of butterfly experts.<br>• Field Naturalist Clubs<br>• Toronto Entomologists Association<br>• Conservation Authorities | between years and multiple years of sampling should occur[xl, xlii].<br>• Observational studies are to be completed and need to be done frequently during the migration period to estimate MUD<br>• MUD of >5000 or >3000 with the presence of Painted Ladies or White Admiral's is to be considered significant[l].<br>• SWHMIST[cxlix] Index #16 provides development effects and mitigation measures. | |
| **Landbird Migratory Stopover Areas** | | | | | |
| Sites with a high diversity of species as well as high numbers are most significant | All migratory songbirds<br><br>Canadian Wildlife Service Ontario website: http://www.on.ec.gc.ca/wildlife_e.html<br><br>All migrant raptors species<br><br>Ontario Ministry of Natural Resources:<br>Fish and Wildlife Conservation Act, 1997. Schedule 7: Specially Protected Birds (Raptors) | All Ecosites associated with these ELC Community Series:<br>FOC<br>FOM<br>FOD<br>SWC<br>SWM<br>SWD | Woodlots need to be >5 ha[l] in size and within 5km [iv, v, vi, vii, viii, ix, x, xi, xii, xiii, xiv, xv] of Lake Ontario and Erie. If woodlands are rare in an area of shoreline, woodland fragments 2-5ha can be considered for this habitat<br>• If multiple woodlands are located along the shoreline those Woodlands <2km from Lake Erie or Ontario are more significant[cxlix].<br>• Sites have a variety of habitats: forest, grassland and wetland complexes[cxlix].<br>• The largest sites are more significant[cxlix]<br>• Woodlots and forest fragments are important habitats to migrating birds[ccxviii], these features located along the shore and located within 5km of Lake Ontario and Lake Erie are Candidate SWH[cxlviii]. | Studies confirm:<br>• Use of the habitat by >200 birds/day and with >35 spp. with at least 10 bird spp. recorded on at least 5 different survey dates[l]. This abundance and diversity of migrant bird species is considered above average and significant.<br>• Studies should be completed during spring (March/May) and fall (Aug/Oct) migration using standardized assessment techniques. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi].<br>• SWHMIST[cxlix] Index #9 provides development effects and mitigation measures. | The study area is not within 5km of Lake Erie.<br><br>**Not SWH** |

**Significant Wildlife Habitat Assessment: Ecoregion 7E.**

**Table 1. Characteristics of Seasonal Concentration Areas**

| Rationale | Wildlife Species | Candidate SWH | | Confirmed SWH | Study Area |
|---|---|---|---|---|---|
| | | ELC Ecosite Codes | Habitat Criteria and Information Sources | Defining Criteria | Assessment Details |
| | | | Information Sources<br>• Bird Studies Canada<br>• Ontario Nature<br>• Local birders and naturalist clubs<br>• Ontario Important Bird Areas (IBA) Program | | |
| **Deer Winter Congregation Areas** | | | | | |
| Deer movement during winter in the southern areas of Ecoregion 7E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions [cxlviii] | White-tailed Deer | All Forested Ecosites with these ELC Community Series:<br>FOC<br>FOM<br>FOD<br>SWC<br>SWM<br>SWD<br><br>Conifer plantations (CUP) smaller than 50 ha may also be used. | • Woodlots >100 ha in size or if large woodlots are rare in a planning area woodlots>50ha[i].<br>• Deer movement during winter in Ecoregion 7E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands[cxlviii].<br>• Large woodlots > 100ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha[ccxxiv].<br>• Woodlots with high densities of deer due to artificial feeding are not significant[i].<br><br>Information Sources<br>• MNRF District Offices<br>• LIO/NRVIS | Studies confirm:<br>• Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF[cxlviii].<br>• Use of the woodlot by white-tailed deer will be determined by MNRF, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNRF[i].<br>• Studies should be completed during winter (Jan/Feb) when >20cm of snow is on the ground using aerial survey techniques[ccxxiv], ground or road surveys, or a pellet count deer density survey[ccxxv].<br>• SWHMIST[cxlix] Index #2 provides development effects and mitigation measures. | The study area woodlands have not been mapped as deer overwintering habitat by the OMNR.<br><br>**Not SWH** |

**Significant Wildlife Habitat Assessment: Ecoregion 7E.**

**Table 2. Characteristics of Rare Vegetation Communities**

| Rationale | Candidate SWH | | | Confirmed SWH | Study Area |
|---|---|---|---|---|---|
| | ELC Ecosite Codes | Habitat Description | Habitat Criteria and Information Sources | Defining Criteria | Assessment Details |
| **Cliffs and Talus Slopes** | | | | | |
| Cliffs and Talus Slopes are extremely rare habitats in Ontario. | Any ELC Ecosite within Community Series:<br><br>TAO CLO<br>TAS CLS<br>TAT CLT | A Cliff is vertical to near vertical bedrock >3m in height.<br><br>A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris. | Most cliff and talus slopes occur along the Niagara Escarpment.<br><br>Information Sources<br>• The Niagara Escarpment Commission has detailed information on location of these habitats.<br>• OMNRF Districts<br>• Natural Heritage Information Centre (NHIC) has location information available on their website<br>• Field naturalist clubs<br>• Conservation Authorities | • Confirm any ELC Vegetation Type for Cliffs or Talus Slopes[lxxviii]<br><br>• SWHMIST[cxlix] Index #21 provides development effects and mitigation measures. | These vegetation community types are not present within the study area.<br><br>**Not SWH** |
| **Sand Barren** | | | | | |
| Sand barrens are rare in Ontario and support rare species. Most Sand Barrens have been lost due to cottage development and forestry. | ELC Ecosites:<br>SBO1<br>SBS1<br>SBT1<br><br>Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always ≤ 60%. | Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. They have little or no soil and the underlying rock protrudes through the surface. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered but less than 60%. | A sand barren area >0.5ha in size<br><br>Information Sources<br>• OMNRF Districts<br>• Natural Heritage Information Centre (NHIC) has location information available on their website<br>• Field naturalist clubs<br>• Conservation Authorities | • Confirm any ELC Vegetation Type for Sand Barrens[lxxviii]<br>• Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotics sp)[i].<br>• SWHMIST[cxlix] Index #20 provides development effects and mitigation measures. | These vegetation community types are not present within the study area.<br><br>**Not SWH** |
| **Alvar** | | | | | |
| Alvars are extremely rare habitats in Ecoregion 7E | ALO1<br>ALS1<br>ALT1<br>FOC1<br>FOC2<br>CUM2<br>CUS2<br>CUT2-1<br>CUW2<br><br>**Five Alvar Indicator Species:** | An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to | An Alvar site > 0.5ha in size[lxxv]. Alvar is particularly rare in Ecoregion 7E where the only known sites are found in the western islands of Lake Erie[cxcix].<br><br>Information Sources<br>• Alvars of Ontario (2000), Federation of Ontario Naturalists[lxxvi].<br>• Ontario Nature – Conserving Great Lakes Alvars[ccviii]. | Field studies identify four of the five **Alvar indicator species**[lxxv] at a candidate Alvar site is Significant<br>• Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics).<br>• The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses[lxxv].<br>• SWHMIST[cxlix] Index #17 | These vegetation community types are not present within the study area.<br><br>**Not SWH** |

## Table 2. Characteristics of Rare Vegetation Communities

| Rationale | Candidate SWH | | | Confirmed SWH | Study Area |
|---|---|---|---|---|---|
| | **ELC Ecosite Codes** | **Habitat Description** | **Habitat Criteria and Information Sources** | **Defining Criteria** | **Assessment Details** |
| | 1) Carex crawei<br>2) Panicum philadelphicum<br>3) Eleocharis compressa<br>4) Scutellaria parvula<br>5) Trichostema brachiatum<br><br>These indicator species are very specific to Alvars within Ecoregion 7E[cxlix] | grasslands and shrublands and comprising a number of characteristic or indicator plant. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animals species. Vegetation cover varies from patchy to barren with a less than 60% tree cover[lxxviii]. | • Natural Heritage Information Centre (NHIC) has location information available on their website<br>• OMNRF Staff<br>• Field Naturalist clubs<br>• Conservation Authorities | provides development effects and mitigation measures. | |
| **Old Growth Forest** | | | | | |
| Due to historic logging practices and land clearance for agriculture, old growth forest is rare in Ecoregion 7E. | Forest Community Series:<br>FOD<br>FOC<br>FOM<br>SWD<br>SWC<br>SWM | Old growth forests are characterized by heavy mortality or turnover of overstorey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris. | Woodland area is >0.5ha<br><br><u>Information Sources</u><br>• OMNRF Forest Resource Inventory mapping<br>• OMNRF Districts<br>• Field naturalist clubs<br>• Conservation Authorities<br>• Sustainable Forestry Licence (SFL) companies will possibly know locations through field operations.<br>• Municipal forestry departments | Field Studies will determine:<br>• If dominant trees species of the ecosite are >140 years old, then stand is Significant Wildlife Habitat[cxlviii].<br>• The forested area containing the old growth characteristics will have experienced no recognizable forestry activities [cxlviii] (cut stumps will not be present)<br>• Determine ELC Vegetation Type for forest area containing the old growth characteristics[lxxviii].<br>• SWHMIST[cxlix] Index #23 provides development effects and mitigation measures. | These vegetation community types are not present within the study area.<br><br>**Not SWH** |
| **Tallgrass Prairie** | | | | | |
| Tallgrass Prairies are extremely rare habitats in Ontario. | TPO1<br>TPO2 | A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover.<br><br>In Ecoregion 7E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in | No minimum size to site[l]. Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH.<br><br><u>Information Sources</u><br>• Natural Heritage Information Centre (NHIC has location information available on their website<br>• OMNRF Districts<br>• Field naturalists clubs<br>• Conservation Authorities | Field studies confirm one or more of the Prairie indicator species listed in[lxxv] Appendix N should be present[l]. Note: Prairie plant spp. list from Ecoregion 7E should be used.<br><br>• Area of the ELC Vegetation Type is the SWH[lxxviii].<br><br>• Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). | These vegetation community types are not present within the study area.<br><br>**Not SWH** |

**Significant Wildlife Habitat Assessment: Ecoregion 7E.**

**Table 2. Characteristics of Rare Vegetation Communities**

| Rationale | Candidate SWH | | | Confirmed SWH | Study Area |
|---|---|---|---|---|---|
| | ELC Ecosite Codes | Habitat Description | Habitat Criteria and Information Sources | Defining Criteria | Assessment Details |
| | | the Toronto area (north of Lake Ontario)[cc]. | | • SWHMIST[cxlix] Index #19 provides development effects and mitigation measures. | |
| **Savannah** | | | | | |
| Savannahs are extremely rare habitats in Ontario. | TPS1<br>TPS2<br>TPW1<br>TPW2<br>CUS2 | A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%.<br><br>In Ecoregion 7E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario)[cc]. | No minimum size to site[l]<br>Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH.<br><br><u>Information Sources</u><br>• OMNRF Districts<br>• Natural Heritage Information Centre (NHIC) has location data available on their website<br>• Field naturalists clubs<br>• Conservation Authorities | Field studies confirm one or more of the Savannah indicator species listed in[lxxv] Appendix N should be present[j]. Note: Savannah plant spp. list from Ecoregion 7E should be used.<br><br>• Area of the ELC Vegetation type is the SWH[lxxviii].<br><br>• Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics).<br><br>• SWHMIST[cxlix] Index #18 provides development effects and mitigation measures. | These vegetation community types are not present within the study area.<br><br>**Not SWH** |
| **Other Rare Vegetation Communities** | | | | | |
| Plant communities that often contain rare species which depend on the habitat for survival. | Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG[cxlviii]. Any ELC Ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH. | Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps. | ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in appendix M[cxlviii].<br><br>The OMNRF/NHIC will have up to date listing for rare vegetation communities.<br><br><u>Information Sources</u><br>• Natural Heritage Information Centre (NHIC) has location information available on their website<br>• OMNRF Districts<br>• Field naturalists clubs<br>• Conservation Authorities | Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTG[cxlviii].<br><br>• Area of the ELC Vegetation Type polygon is the SWH.<br><br>• SWHMIST[cxlix] Index #37 provides development effects and mitigation measures. | Rare vegetation communities are not present within the study area.<br><br>**Not SWH** |

**Significant Wildlife Habitat Assessment: Ecoregion 7E.**

**Table 3. Characteristics of Specialized Wildlife Habitat**

| Rationale | Wildlife Species | Candidate SWH | | Confirmed SWH | Study Area |
|---|---|---|---|---|---|
| | | ELC Ecosite Codes | Habitat Criteria and Information Sources | Defining Criteria | Assessment Details |
| **Waterfowl Nesting Area** | | | | | |
| Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant | American Black Duck<br>Northern Pintail<br>Northern Shoveler<br>Gadwall<br>Blue-winged Teal<br>Green-winged Teal<br>Wood Duck<br>Hooded Merganser<br>Mallard | All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH:<br>MAS1 MAS2<br>MAS3 SAS1<br>SAM1 SAF1<br>MAM1 MAM2<br>MAM3 MAM4<br>MAM5 MAM6<br>SWT1 SWT2<br>SWD1 SWD2<br>SWD3 SWD4<br><br>**Note: includes adjacency to Provincially Significant Wetlands** | A waterfowl nesting area extends: 120m[cxlix] from a wetland (>0.5ha) or a wetland (>0.5ha) with small wetlands (0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120m of each individual wetland where waterfowl nesting is known to occur[cxlix].<br>• Upland areas should be at least 120m wide so that predators such as racoons, skunks, and foxes have difficulty finding nests.<br>• Wood Ducks and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites.<br><br><u>Information Sources</u><br>• Ducks Unlimited staff may know the locations of particularly productive nesting sites.<br>• OMNRF Wetland Evaluations for indication of significant waterfowl nesting habitat.<br>• Reports and other information available from CAs | Studies confirmed:<br>• Presence of 3 or more nesting pairs for listed species excluding Mallards[l], or,<br>• Presence of 10 or more nesting pairs for listed species including Mallards[l].<br>• Any active nesting site of an American Black Duck is considered significant.<br>• Nesting studies should be completed during the spring breeding season (April - June). Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi]<br>• A field study confirming waterfowl nesting habitat will determine the boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120m[cxlviii] from the wetland and will provide enough habitat for waterfowl to successfully nest.<br>• SWHMIST[cxlix] Index #25 provides development effects and mitigation measures. | Suitable habitat is not present within the study area.<br><br>**Not SWH** |
| **Bald Eagle and Osprey Nesting, Foraging and Perching Habitat** | | | | | |
| Nest sites are fairly uncommon in Ecoregion 7E and are used annually by these species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat. | Osprey<br><br><u>Special Concern</u>:<br>Bald Eagle | ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands. | Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water.<br><br>Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy.<br><br>Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and | Studies confirm the use of these nests by:<br>• One or more active Osprey or Bald Eagle nests in an area[cxlviii].<br>• Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH.<br>• For an Osprey, the active nest and a 300m radius around the nest or the contiguous woodland stand is the SWH[ccvii], | Suitable habitat is not present within the study area.<br><br>**Not SWH** |

**Table 3. Characteristics of Specialized Wildlife Habitat**

| Rationale | Wildlife Species | Candidate SWH | | Confirmed SWH | Study Area |
|---|---|---|---|---|---|
| | | ELC Ecosite Codes | Habitat Criteria and Information Sources | Defining Criteria | Assessment Details |
| | | | constructed nesting platforms).<br><br>Information Sources<br>• Natural Heritage Information Center (NHIC) compiles all known nesting sites for Bald Eagles in Ontario<br>• MNRF values information (LIO/NRVIS) will list known nesting locations, Note: data from NRVIS is provided as a point format and does not include all the habitat.<br>• Nature Counts, Ontario Nest Records Scheme data<br>• OMNRF Districts<br>• Check the Ontario Breeding Bird Atlas[ccv] or Rare Breeding Birds in Ontario for species documented<br>• Reports and other information available from CAs<br>• Field naturalists clubs | maintaining undisturbed shorelines with large trees within this area is important[cxlviii].<br>• For a Bald Eagle the active nest and a 400-800m radius around the nest is the SWH[cvi, ccvii]. Area of the habitat from 400-800m is dependant on site lines from the nest to the development and inclusion of perching and foraging habitat[cvi].<br>• To be significant a site must be used annually. When found inactive, the site must be known to be inactive for ≥3 years or suspected of not being used for >5 years before being considered not significant[ccvii].<br>• Observational studies to determine nest site use, perching sites and foraging areas need to be done from mid March to mid August.<br>• Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi]<br>• SWHMIST[cxlix] Index #26 provides development effects and mitigation measures. | |
| **Woodland Raptor Nesting Habitat** | | | | | |
| Nests sites for these species are rarely identified; these area sensitive habitats are often used annually by these species. | Northern Goshawk<br>Cooper's Hawk<br>Sharp-shinned Hawk<br>Red-shouldered Hawk<br>Barred Owl<br>Broad-winged Hawk | May be found in all forested ELC Ecosites.<br><br>May also be found in SWC, SWM, SWD and CUP3 | All natural or conifer plantation woodland/forest stands combined >30ha or with >4ha of interior habitat[lxxxviii, lxxxix, xc, xci, xciii, xciv, xcv,xcvi, cxxxiii]. Interior habitat determined with a 200m buffer[cxlviii].<br>• Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Coopers hawk nest along forest edges sometimes on peninsulas or small off-shore islands.<br>• In disturbed sites, nests may be used again, or a new nest will be | Studies confirm:<br>• Presence of 1 or more active nests from species list is considered significant[cxlviii].<br>• Red-shouldered Hawk and Northern Goshawk – A 400m radius around the nest or 28 ha of habitat is the SWH[ccvii].(the 28ha habitat area would be applied where optimal habitat is irregularly shaped around the nest)<br>• Barred Owl – A 200m radius around the nest is the SWH[ccvii].<br>• Broad-winged Hawk and Coopers Hawk – A 100m radius | Woodland habitat within the study area is too small to support this habitat function.<br><br>**Not SWH** |

**Table 3. Characteristics of Specialized Wildlife Habitat**

| Rationale | Wildlife Species | Candidate SWH | | Confirmed SWH | Study Area |
|---|---|---|---|---|---|
| | | ELC Ecosite Codes | Habitat Criteria and Information Sources | Defining Criteria | Assessment Details |
| | | | in close proximity to old nest.<br><br>Information Sources<br>• OMNRF Districts<br>• Check the Ontario Breeding Bird Atlas[ccv] or Rare Breeding Birds in Ontario for species documented.<br>• Check data from Bird Studies Canada<br>• Reports and other information available from CAs | around the nest is the SWH[ccvii].<br>• Sharp-Shinned Hawk – A 50m radius around the nest is the SWH[ccvii].<br>• Conduct field investigations from early March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area.<br>• SWHMIST[cxlix] Index #27 provides development effects and mitigation measures. | |
| **Turtle Nesting Areas** | | | | | |
| These habitats are rare and when identified will often be the only breeding site for local populations of turtles. | Midland Painted Turtle<br><br>Special Concern:<br>Northern Map Turtle<br>Snapping Turtle | Exposed mineral soil (sand or gravel) areas adjacent (<100m)[cxlviii] or within the following ELC Ecosites:<br>MAS1<br>MAS2<br>MAS3<br>SAS1<br>SAM1<br>SAF1<br>BOO1<br>FEO1 | • Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals.<br>• For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH.<br>• Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used.<br><br>Information Sources<br>• Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels).<br>• Check the Ontario Herpetofaunal Summary Atlas records or other similar atlases for uncommon turtles; location information may help to find potential nesting habitat for them. | Studies confirm:<br>• Presence of 5 or more nesting Midland Painted Turtles[l]<br>• One or more Northern Map Turtle or Snapping Turtle nesting is a SWH[l]<br>• The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100m around the nesting area dependant on slope, riparian vegetation and adjacent land use is the SWH[cxlviii].<br>• Travel routes from wetland to nesting area are to be considered within the SWH as part of the 30-100m area of habitat[cxlix].<br>• Field investigations should be conducted in prime nesting season typically late spring to early summer. Observation studies observing the turtles nesting is a recommended method.<br>• SWHMIST[cxlix] Index #28 provides development effects and mitigation measures for turtle nesting habitat. | Suitable habitat is not present within the study area.<br><br>**Not SWH** |

**Table 3. Characteristics of Specialized Wildlife Habitat**

| Rationale | Wildlife Species | Candidate SWH | | Confirmed SWH | Study Area |
|---|---|---|---|---|---|
| | | ELC Ecosite Codes | Habitat Criteria and Information Sources | Defining Criteria | Assessment Details |
| | | | • Natural Heritage Information Center (NHIC)<br>Field naturalist clubs | | |
| **Seeps and Springs** | | | | | |
| Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams | Wild Turkey<br>Ruffed Grouse<br>Spruce Grouse<br>White-tailed Deer<br>Salamander spp. | Seeps/Springs are areas where ground water comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs. | Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system[cxvii, cxlix].<br>• Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species[cxix, cxx, cxxi, cxxii, cxiii, cxiv].<br><br><u>Information Sources</u><br>• Topographical Map<br>• Thermography<br>• Hydrological surveys conducted by CAs and MOE<br>• Field naturalists and landowners<br>• Municipalities and Conservation Authorities may have drainage maps and headwater areas mapped | Field Studies confirm:<br>• Presence of a site with 2 or more[l] seeps/springs should be considered SWH.<br>• The area of a ELC forest ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation of the habitat[cxlviii].<br>• SWHMIST[cxlix] Index #30 provides development effects and mitigation measures. | The study area is not within a headwaters area.<br><br>**Not SWH** |
| **Amphibian Breeding Habitat (Woodland)** | | | | | |
| These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations | Eastern Newt<br>Blue-spotted Salamander<br>Spotted Salamander<br>Gray Treefrog<br>Spring Peeper<br>Western Chorus Frog<br>Wood Frog | All Ecosites associated with these ELC Community Series:<br>FOC<br>FOM<br>FOD<br>SWC<br>SWM<br>SWD<br><br>Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians. | • Presence of a wetland, pond or woodland pool (including vernal pools) >500m$^2$ (about 25m diameter) [ccvii] within or adjacent (within 120m) to a woodland (no minimum size)[clxxxii, lxiii, lxv, lxvi, lxvii, lxviii, lxix, lxx]. Some small wetlands may not be mapped and may be important breeding pools for amphibians.<br>• Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat[cxlviii].<br><br><u>Information Sources</u><br>• Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records<br>• Local landowners may also | Studies confirm:<br>• Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog/toad species with Call Level Codes of 3.<br>• A combination of observational study and call count surveys [cviii] will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands.<br>• The habitat is the wetland area plus a 230m radius of woodland area[lxiii, lxv, lxvi, lxvii, lxviii, lxix, | Suitable habitat is not present within the study area.<br><br>**Not SWH** |

**Significant Wildlife Habitat Assessment: Ecoregion 7E.**

**Table 3. Characteristics of Specialized Wildlife Habitat**

| Rationale | Wildlife Species | Candidate SWH | | Confirmed SWH | Study Area |
|---|---|---|---|---|---|
| | | ELC Ecosite Codes | Habitat Criteria and Information Sources | Defining Criteria | Assessment Details |
| | | | provide assistance as they may hear spring-time choruses of amphibians on their property.<br>• OMNRF Districts and wetland evaluations<br>• Field naturalist clubs<br>• Canadian Wildlife Service Amphibian Road Call Survey<br>• Ontario Vernal Pool Association: http://www.ontariovernalpools.org | [lxx, lxxi]. If a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is to be included in the habitat.<br>• SWHMIST[cxlix] Index #14 provides development effects and mitigation measures. | |
| **Amphibian Breeding Habitat (Wetland)** | | | | | |
| Wetlands supporting breeding for these amphibian species are extremely important and fairly rare within Central Ontario Landscapes | Eastern Newt<br>American Toad<br>Spotted Salamander<br>Four-toed Salamander<br>Blue-spotted Salamander<br>Gray Treefrog<br>Western Chorus Frog<br>Northern Leopard Frog<br>Pickerel Frog<br>Green Frog<br>Mink Frog<br>Bullfrog | ELC Community Classes SW, MA, FE, BO, OA and SA.<br><br>Typically these wetland ecosites will be isolated (>120m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (e.g. Bull Frog) may be adjacent to woodlands. | • Wetlands >500m$^2$ (about 25m diameter)[ccvii] supporting high species diversity are significant: some small or ephemeral habitats may not be identified on MNR mapping and could be important amphibian breeding habitats[clxxxiv].<br>• Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators.<br>• Bullfrogs require permanent water bodies with abundant emergent vegetation.<br><br><u>Information Sources</u><br>• Ontario Herpetofaunal Summary Atlas (or other similar atlases)<br>• Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count.<br>• OMNRF Districts and wetland evaluations<br>• Reports and other information available from CAs | Studies confirm:<br>• Presence of breeding population of 1or more of the listed newt/salamander species or 2 or more of the listed frog or toad species and with at least 20 breeding individuals (adults and eggs masses)[lxxi, lxxiii] or 2 or more of the listed frog/toad species with Call Level of 3. or; Wetland with confirmed breeding Bullfrogs are significant[l].<br>• The ELC ecosite wetland area and the shoreline are the SWH.<br>• A combination of observational study and call count surveys cviii to determine breeding/larval stages will be required during the spring (May March-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands.<br>• If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule.<br>• SWHMIST[cxlix] Index #15 provides development effects and mitigation measures. | Suitable habitat is not present within the study area.<br><br>**Not SWH** |

**Significant Wildlife Habitat Assessment: Ecoregion 7E.**

**Table 3. Characteristics of Specialized Wildlife Habitat**

| Rationale | Wildlife Species | Candidate SWH | | Confirmed SWH | Study Area |
|---|---|---|---|---|---|
| | | ELC Ecosite Codes | Habitat Criteria and Information Sources | Defining Criteria | Assessment Details |
| **Woodland Area-Sensitive Bird Breeding Habitat** | | | | | |
| Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest song birds. | Yellow-bellied Sapsucker<br>Red-breasted Nuthatch<br>Veery<br>Blue-headed Vireo<br>Northern Parula<br>Black-throated Green Warbler<br>Blackburnian Warbler<br>Black-throated Blue Warbler<br>Ovenbird<br>Scarlet Tanager<br>Winter Wren<br>Pileated Woodpecker<br><br><u>Special Concern</u>:<br>Cerulean Warbler<br>Canada Warbler | All Ecosites associated with these ELC Community Series:<br>FOC<br>FOM<br>FOD<br>SWC<br>SWM<br>SWD | • Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs. old) forest stands or woodlots >30ha[cv, cxxxi, cxxxii, cxxxiii, cxxxiv, cxxxv, cxxxvi, cxxxvii, cxxxviii, cxxxix, cxl, cxli, cxlii, cxliii, cxliv, cxlv, cxlvi, cl, cli, clii, cliii, cliv, clv, clvi, clvii, clviii, clix].<br>• Interior forest habitat is at least 200m from forest edge habitat[clxiv].<br><br><u>Information Sources</u><br>• Local birder clubs<br>• Canadian Wildlife Service (CWS) for the location of forest bird monitoring<br>• Bird Studies Canada conducted a 3-year study of 287 woodlands to determine the effects of forest fragmentation on forest birds and to determine what forests were of greatest value to interior species.<br>• Reports and other information available from CAs | Studies confirm:<br>• Presence of nesting or breeding pairs of 3 or more of the listed wildlife species[i].<br>• Note: any site with breeding Cerulean Warblers or Canada Warbler is to be considered SWH[i].<br>• Conduct field investigations in early summer when birds are singing and defending their territories.<br>• Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi]<br>• SWHMIST[cxlix] Index #34 provides development effects and mitigation measures. | Woodlands within the study area are too small to support this habitat function.<br><br>**Not SWH** |

**Significant Wildlife Habitat Assessment: Ecoregion 7E.**

**Table 4. Characteristics of Habitat for Species of Conservation Concern**

| Rationale | Wildlife Species | Candidate SWH | | Confirmed SWH | Study Area |
|---|---|---|---|---|---|
| | | ELC Ecosite Codes | Habitat Criteria and Information Sources | Defining Criteria | Assessment Details |
| **Marsh Bird Breeding Habitat** | | | | | |
| Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes. | American Bittern<br>Virginia Rail<br>Sora<br>Common Gallinule<br>American Coot<br>Pied-billed Grebe<br>Marsh Wren<br>Sedge Wren<br>Common Loon<br>Green Heron<br>Trumpeter Swan<br><br><u>Special Concern</u>:<br>Black Tern<br>Yellow Rail | MAM1<br>MAM2<br>MAM3<br>MAM4<br>MAM5<br>MAM6<br>SAS1<br>SAM1<br>SAF1<br>FEO1<br>BOO1<br><br>For Green Heron:<br>All SW, MA and CUM1 sites | • Nesting occurs in wetlands<br>• All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present[cxxiv].<br>• For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water.<br><br><u>Information Sources</u><br>• OMNRF Districts and wetland evaluations<br>• Field naturalist clubs<br>• Natural Heritage Information Centre (NHIC)<br>• Reports and other information available from CAs<br>• Ontario Breeding Bird Atlas[ccv] | Studies confirm:<br>• Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or breeding by any combination of 4 or more of the listed species[l].<br>• Note: any wetland with breeding of 1 or more Trumpeter Swans, Black Terns, Green Heron or Yellow Rail is SWH[l].<br>• Area of the ELC ecosite is the SWH<br>• Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats.<br>• Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi]<br>• SWHMIST[cxlix] Index #35 provides development effects and mitigation measures | Suitable habitat is not present within the study area.<br><br>**Not SWH** |
| **Open Country Bird Breeding Habitat** | | | | | |
| This wildlife habitat is declining throughout Ontario and North America. Species such as the Upland Sandpiper have declined significantly the past 40 years based on CWS (2004) trend records. | Upland Sandpiper<br>Grasshopper Sparrow<br>Vesper Sparrow<br>Northern Harrier<br>Savannah Sparrow<br><br><u>Special Concern</u>:<br>Short-eared Owl | CUM1<br>CUM2 | Large grassland areas (includes natural and cultural fields and meadows) >30ha[clx, clxi, clxii, clxiii, clxiv, clxv, clxvi, clxvii, clxviii, clxix]. Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e. no row cropping or intensive hay or livestock pasturing in the last 5 years)[l].<br><br>Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older.<br><br>The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species. | Field Studies confirm:<br>• Presence of nesting or breeding of 2 or more of the listed species[l].<br>• A field with 1 or more breeding Short-eared Owls is to be considered SWH.<br>• The area of SWH is the contiguous ELC ecosite field areas.<br>• Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories.<br>• Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi]<br>• SWHMIST[cxlix] Index #32 | Meadow habitat in the study area is too small to support this habitat function.<br><br>**Not SWH** |

**Table 4. Characteristics of Habitat for Species of Conservation Concern**

| Rationale | Wildlife Species | Candidate SWH | | Confirmed SWH | Study Area |
|---|---|---|---|---|---|
| | | ELC Ecosite Codes | Habitat Criteria and Information Sources | Defining Criteria | Assessment Details |
| | | | Information Sources<br>• Agricultural land classification maps Ministry of Agriculture<br>• Local birder clubs<br>• Ontario Breeding Bird Atlas[ccv]<br>• EIS Reports and other information available from CAs | provides development effects and mitigation measures | |
| **Shrub/Early Successional Bird Breeding Habitat** | | | | | |
| This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on CWS (2004) trend records. | Indicator Spp:<br>Brown Thrasher<br>Clay-coloured Sparrow<br><br>Common Spp.<br>Field Sparrow<br>Black-billed Cuckoo<br>Eastern Towhee<br>Willow Flycatcher<br><br>Special Concern:<br>Yellow-breasted Chat<br>Golden-winged Warbler | CUT1<br>CUT2<br>CUS1<br>CUS2<br>CUW1<br>CUW2<br><br>Patches of shrub ecosites can be complexed into a larger habitat such as woodland area for some bird species. | Large natural field areas succeeding to shrub and thicket habitats >10ha[clxiv] in size. Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e. no row-cropping, haying or live-stock pasturing in the last 5 years)[i].<br><br>Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species[clxxiii].<br><br>Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands.<br><br>Information Sources<br>• Agricultural land classification maps, Ministry of Agriculture.<br>• Local bird clubs<br>• Ontario Breeding Bird Atlas[ccv]<br>• Reports and other information available from CAs | Field Studies confirm:<br>• Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species[i].<br>• A field with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat[i].<br>• The area of the SWH is the contiguous ELC ecosite field/thicket area.<br>• Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories<br>• Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi]<br>• SWHMIST[cxlix] Index #33 provides development effects and mitigation measures. | Cultural woodlands within the study area are too small to support this habitat function.<br><br>**Not SWH** |
| **Terrestrial Crayfish** | | | | | |
| Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare. [Ccii] | Chimney or Digger Crayfish (*Fallicambarus fodiens*)<br><br>Devil Crawfish or Meadow Crayfish (*Cambarus Diogenes*) | MAM1<br>MAM2<br>MAM3<br>MAM4<br>MAM5<br>MAM6<br>MAS1<br>MAS2<br>MAS3<br>SWD<br>SWT | Wet meadow and edges of shallow marshes (no minimum size) identified should be surveyed for terrestrial crayfish.<br>• Constructs burrows in marshes, mudflats, meadows, the ground can't be too moist. Can often be found far from water.<br>• Both species are a semi-terrestrial burrower which spends most of its life within burrows | Studies Confirm:<br>• Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable marsh meadow or terrestrial sites[cci].<br>• Area of ELC Ecosite or an ecoelement area of meadow marsh or swamp within the large ecosite area is the SWH<br>• Surveys should be done April | Suitable habitat is not present within the study area.<br><br>**Not SWH** |

**Table 4. Characteristics of Habitat for Species of Conservation Concern**

| Rationale | Wildlife Species | Candidate SWH | | Confirmed SWH | Study Area |
|---|---|---|---|---|---|
| | | ELC Ecosite Codes | Habitat Criteria and Information Sources | Defining Criteria | Assessment Details |
| | | SWM<br><br>CUM1 with inclusions of above meadow marsh ecosites can be used by terrestrial crayfish | consisting of a network of tunnels. Usually the soil is not too moist so that the tunnel is well formed.<br><br><u>Information Sources</u><br>• Information sources from "Conservation Status of Freshwater Crayfishes" by Dr. Premek Hamr for the WWF and CNF March 1998. | to August in temporary or permanent water. Note the presence of burrows or chimneys are often the only indicator of presence, observance or collection of individuals is very difficult [cci]<br>• SWHMIST[cxlix] Index #36 provides development effects and mitigation measures. | |
| **Special Concern and Rare Wildlife Species** | | | | | |
| These species are quite rare or have experienced significant population declines in Ontario | All Special Concern and Provincially Rare (S1-S3, SH) plant and animal species. Lists of these species are tracked by the Natural Heritage Information Centre (NHIC). | All plant and animal element occurrences (EO) within a 1 or 10km grid.<br><br>Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy. | When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or provincially Rare species; linking candidate habitat on the site needs to be completed to ELC Ecosites[lxxviii].<br><br><u>Information Sources</u><br>• Natural Heritage Information Centre (NHIC) will have the Special Concern and Provincially Rare (S1-S3, SH) species lists and element occurrences for these species.<br>• NHIC Website: "Get Information" http://nhic.mnr.gov.on.ca<br>• Ontario Breeding Bird Atlas[ccv]<br>• Expert advice should be sought as many of the rare spp. have little information available about their requirements. | Studies Confirm:<br>• Assessment/inventory of the site for the identified special concern or rare species needs to be completed during the time of year when the species is present or easily identifiable.<br>• The area of the habitat to the finest ELC scale that protects the habitat form and function is the SWH, this must be delineated through detailed field studies. The habitat neess to be easily mapped and cover an important life stage component for a species e.g. specific nesting habitat for foraging habitat.<br>• SWHMIST[cxlix] Index #37 provides development effects and mitigation measures. | Potential habitat for the following Special Concern/rare species (i.e., Species of Conservation Concern) is present in the study area:<br>- Grasshopper Sparrow<br>- Eastern Whip-poor-will<br>- Tufted Titmouse<br>- Common Nighthawk<br>- Eastern Wood-Pewee<br>- Wood Thrush<br>- Monarch<br>- Southern Cloudywing<br>- Pignut Hickory<br>- Autumn Coralroot<br>- Scarlet Beebalm<br>- Carolina Vetch<br>- Palmate-leaved Violet<br><br>**Candidate SWH** |

**Significant Wildlife Habitat Assessment: Ecoregion 7E.**

**Table 5. Characteristics of Animal Movement Corridors**

| Rationale | Wildlife Species | Candidate SWH | | Confirmed SWH | Study Area |
|---|---|---|---|---|---|
| | | ELC Ecosite Codes | Habitat Criteria and Information Sources | Defining Criteria | Assessment Details |
| **Amphibian Movement Corridors** | | | | | |
| Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations. | Eastern Newt<br>American Toad<br>Blue-spotted Salamander<br>Spotted Salamander<br>Four-toed Salamander<br>Gray Treefrog<br>Northern Leopard Frog<br>Pickerel Frog<br>Western Chorus Frog | Corridors may be found in all ecosites associated with water.<br>• Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1. | Movement corridors between breeding habitat and summer habitat[clxxiv, clxxv, clxxvi, clxxvii, clxxviii, clxxix, clxxx, clxxxi]<br><br>Movement corridors must be considered when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (Amphibian Breeding Habitat – Wetland) of this Schedule[i].<br><br>Information Sources<br>• MNRF District Office<br>• Natural Heritage Information Centre NHIC<br>• Reports and other information available from CAs<br>• Field naturalist Clubs | • Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites.<br>• Corridors should consist of native vegetation, with several layers of vegetation. Corridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant[cxlix].<br><br>• Corridors should have at least 15m of vegetation on both sides of waterwaycxlix or be up to 200m widecxlix of woodland habitat and with gaps <20m[cxlix]<br>• Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat[cxlix].<br>• SWHMIST[cxlix] Index #40 provides development effects and mitigation measures. | Suitable habitat is not present within the study area.<br><br>**Not SWH** |

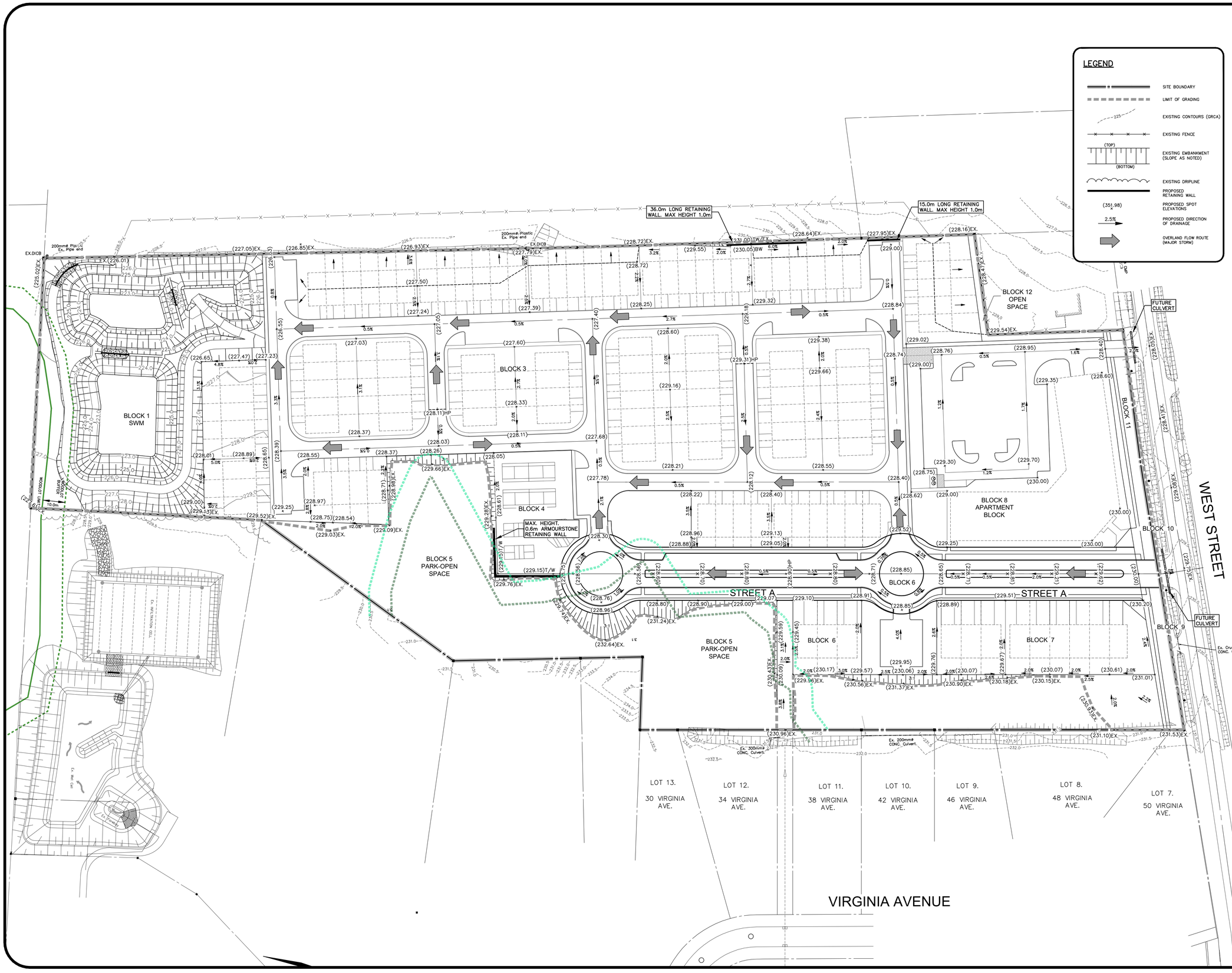
**Significant Wildlife Habitat Assessment: Ecoregion 7E.**

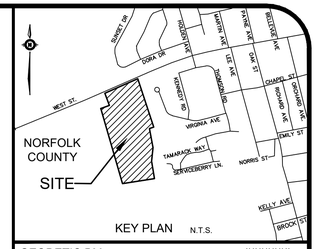
**Table 6. Exceptions for Ecodistricts within Ecoregion 7E.**

| Rationale | Wildlife Species | Candidate SWH | | | Confirmed SWH | Study Area |
|---|---|---|---|---|---|---|
| | | ELC Ecosites | Habitat Description | Habitat Criteria and Information Sources | Defining Criteria | Assessment Details |
| **Bat Migratory Stopover Area** | | | | | | |
| Stopover areas for long distance migrant bats are important during fall migration. | Hoary Bat<br>Eastern Red Bat<br>Silver-haired Bat | No specific ELC types | | • Long distance migratory bats typically migrate during late summer and early fall migrating summer breeding habitats throughout Ontario to southern wintering areas. Their annual fall migration may concentrate these species of bats at stopover areas.<br>• This is the only known bat migratory stopover habitats based on current information.<br><br><u>Information Sources</u><br>• OMNRF for possible locations and contact for local experts<br>• University of Waterloo, Biology Department | • Long Point (42°35'N, 80°30'E, to 42°33'N, 80°03'E) has been identified as a significant stop-over habitat for fall migrating Silver-haired bats, due to significant increases in abundance, activity and feeding that was documented during fall migration[ccxv].<br>• The confirmation criteria and habitat areas for this SWH are still being determined.<br>• SWHMIST[cxlix] Index #38 provides development effects and mitigation measures | |

## Appendix IX
## Proposed Development Plan (MTE 2026d)

MTE File Path: P:\P62275_001\62275_001-AG1




GEODETIC BM ELEV. = ########m
####

SITE BENCHMARK ELEV. = ########m
####

####

NOTE TO CONTRACTOR :

DO NOT SCALE DRAWINGS.

CONTRACTORS MUST CHECK AND VERIFY ALL DIMENSIONS AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.

ALL DRAWINGS REMAIN THE PROPERTY OF THE ENGINEER AND SHALL NOT BE REPRODUCED OR REUSED WITHOUT THE ENGINEER'S WRITTEN PERMISSION.

THE OWNER/ARCHITECT/CONTRACTOR IS ADVISED THAT M.T.E. CONSULTANTS INC. CANNOT CERTIFY ANY COMPONENT OF THE SITE WORKS NOT INSPECTED DURING CONSTRUCTION. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO NOTIFY M.T.E. CONSULTANTS INC. PRIOR TO COMMENCEMENT OF CONSTRUCTION TO ARRANGE FOR INSPECTION.

0 6 12 18 24 30 45 60m

| No. | REVISION | BY | YYYY-MM-DD |
|---|---|---|---|
| 1. | | | |

MTE Engineers, Scientists, Surveyors.

CLIENT
WESTWOOD TRAIL DEVELOPMENTS INC.
2014 VALLEYRUN BOULEVARD, UNIT 23. LONDON, ON N6G 5N8

PROJECT
WESTWOOD TRAILS PHASE III
523-601 WEST ST. NORFOLK, ON.

DRAWING
CONCEPTUAL SITE GRADING PLAN

| | |
|---|---|
| Design By: MPW | Project Manager: A.McMAHON |
| Drawn By: FHG/ACH | Project No.: 62275_001 |
| Checked By: MPW | Drawing No.: AG1.1 |
| Date: 2026-02-25 | |
| Scale: 1:750 | |

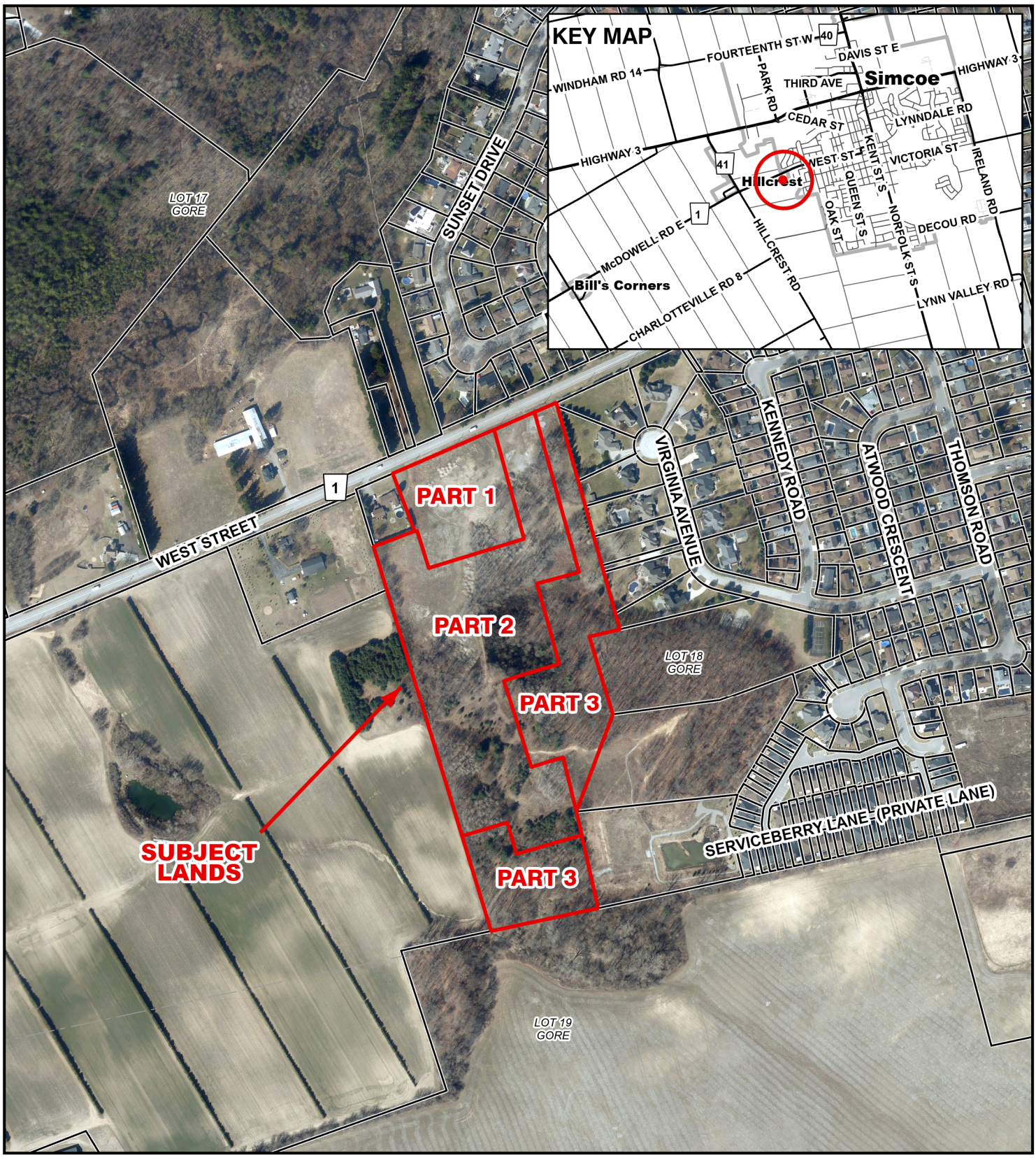
February 25, 2026 - 2:38:06 PM - Plotted By: Matthew Wilcox

**MAP A**

CONTEXT MAP

Geographic Township of WOODHOUSE

28TPL2026154
ZNPL2026153
OPNPL2026127




7/7/2026

## Legend

Subject Lands

N

2025 Air Photo

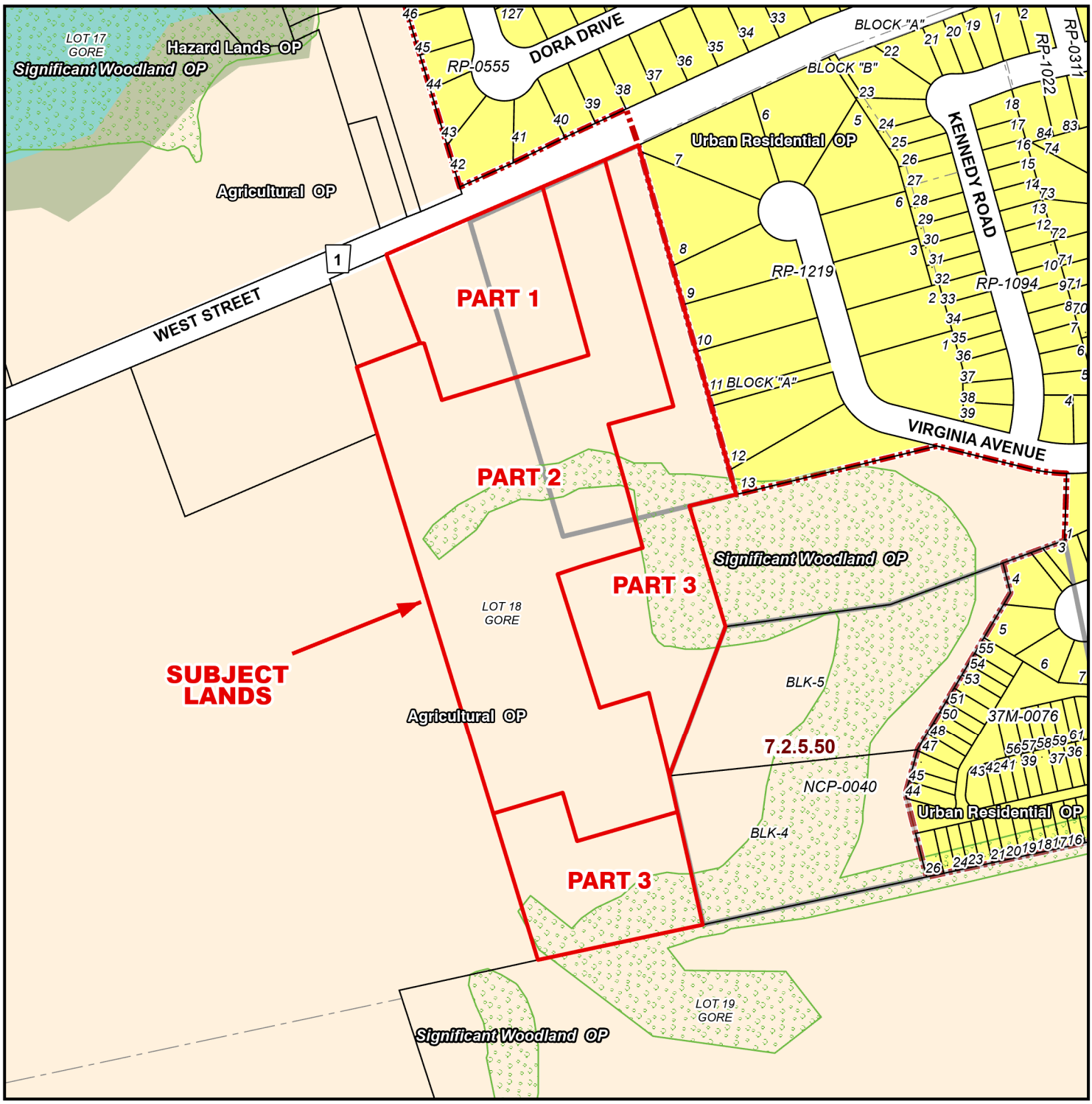
0 50 100 150 200 250 Metres

# MAP B

## PROPOSED OFFICIAL PLAN AMENDMENT MAP

Geographic Township of WOODHOUSE

28TPL2026154
ZNPL2026153
OPNPL2026127




## Legend

Subject Lands

Official Plan Designations

- Agricultural
- Hazard Lands
- Provincially Significant Wetland
- Urban Residential
- Urban Area Boundary
- Significant Woodland

7/7/2026

N

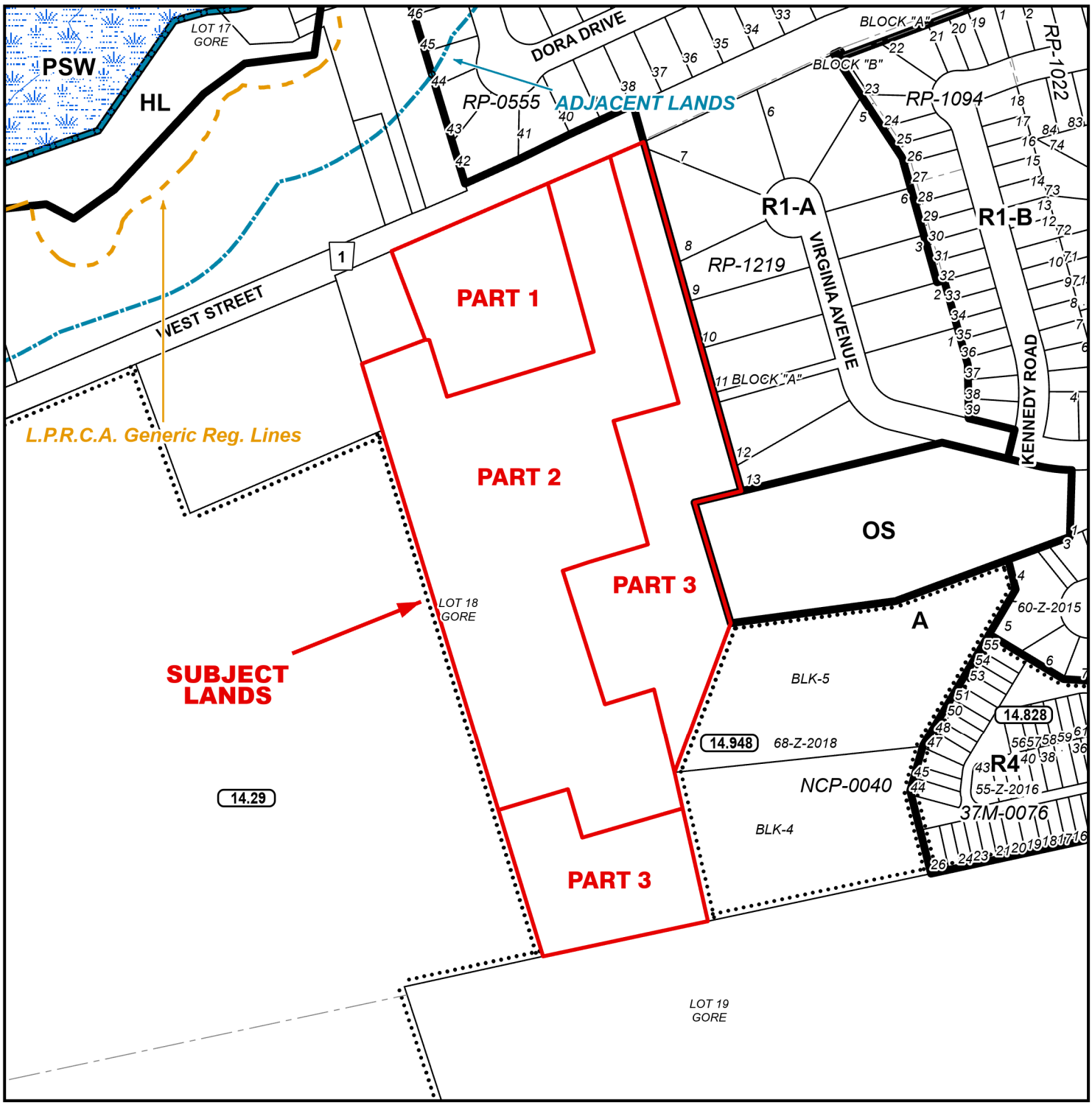
0 30 60 90 120 150 Metres

**MAP C**

# PROPOSED ZONING BY-LAW AMENDMENT MAP

Geographic Township of WOODHOUSE

28TPL2026154
ZNPL2026153
OPNPL2026127




## LEGEND

- Subject Lands
- Adjacent Lands
- Wetland
- LPRCA Generic RegLines

ZONING BY-LAW 1-Z-2014

- (H) - Holding
- A - Agricultural Zone
- HL - Hazard Land Zone
- OS - Open Space Zone
- PSW - Provincially Significant Wetland Zone
- R1-A - Residential R1-A Zone
- R1-B - Residential R1-B Zone
- R4 - Residential R4 Zone

N

0 30 60 90 120 150 Metres

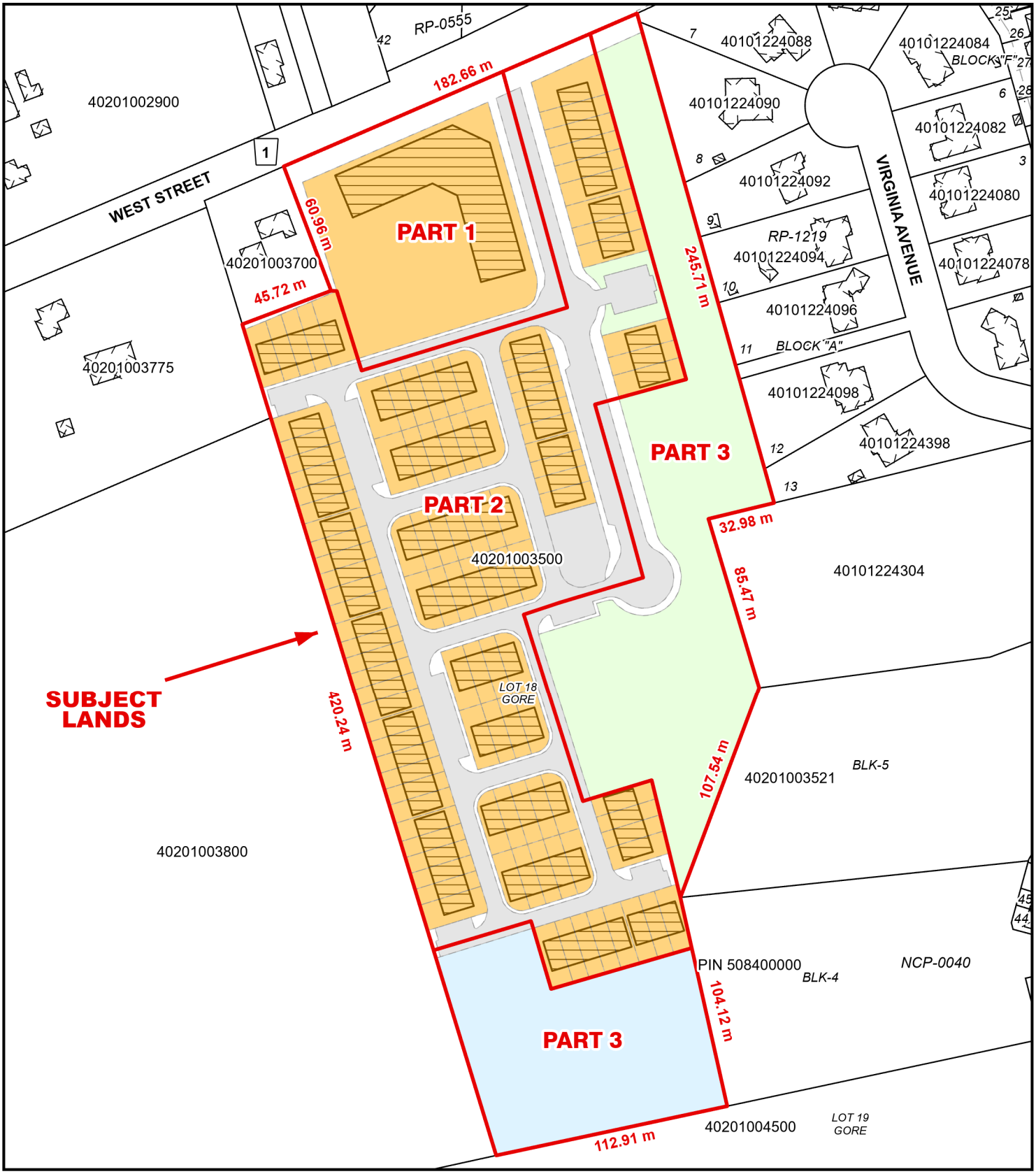
7/7/2026

# MAP D

## CONCEPTUAL PLAN

Geographic Township of WOODHOUSE

28TPL2026154
ZNPL2026153
OPNPL2026127




Legend

- Subject Lands
- Proposed Lots By Type
  - Multi Family Dwellings
  - Single Family Dwelling
  - Park
  - Storm Water Pond
  - Other

7/7/2026

N

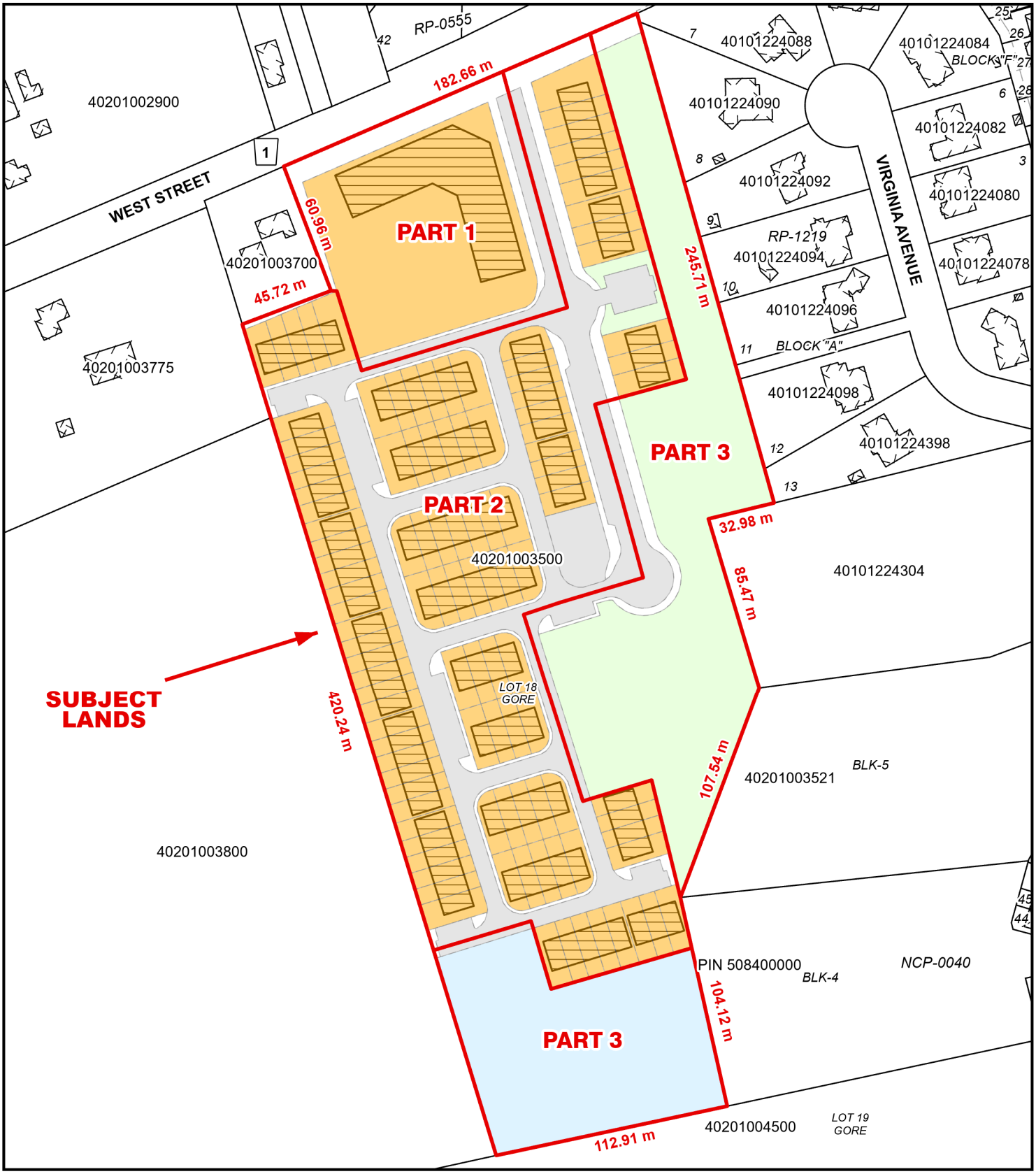
0 20 40 60 80 100 Metres

# LOCATION OF LANDS AFFECTED

CONCEPTUAL PLAN

Geographic Township of WOODHOUSE

28TPL2026154
ZNPL2026153
OPNPL2026127




Legend

- Subject Lands
- Proposed Lots By Type
  - Multi Family Dwellings
  - Single Family Dwelling
  - Park
  - Storm Water Pond
  - Other

7/7/2026

N

0 20 40 60 80 100 Metres