

Air Quality, Noise & Vibration Work Plan

St. Marys Future Solid Waste Disposal Needs Environmental Assessment

Town of St. Marys

(Note: Work Plans were provided as draft reports only. Comments provided by agencies, Indigenous communities and the public were directly incorporated into the implementation as described in Volume I, Section 10.0, Consultation Summary)

DRAFT

**R.J. Burnside & Associates Limited
292 Speedvale Avenue West Unit 20
Guelph ON N1H 1C4 CANADA**

**July 2015
300032339.0000**



Distribution List

No. of Hard Copies	PDF	Email	Organization Name

Record of Revisions

Revision	Date	Description
0	July 22, 2015	Draft release for review

R.J. Burnside & Associates Limited**Report Prepared By:**

Harvey Watson
Technical Group Leader, Air, Noise & Vibration
HW:mp

Report Reviewed By:

James R. Hollingsworth, P.Eng.
Technical Leader, Solid Waste
JRH:mp

Table of Contents

1.0	Introduction	1
2.0	Study Parameters	2
2.1	Study Purpose	2
2.2	Alternatives to be Assessed.....	2
2.3	Study Area	3
2.4	Study Timeframe.....	3
2.5	Features of the Environment to be studied	3
3.0	Methodology	5
3.1	Step 1: Background Data Collection	5
3.2	Step 2: Develop Current Air Dispersion and Noise Models	6
3.3	Step 3: Determine <i>Alternative Methods</i>	6
3.4	Step 4: Develop Air Dispersion and Noise Models for Future Cases.....	6
3.5	Step 5: Evaluate Alternatives and Assess Potential Impacts.....	6
3.5.1	Evaluation of Alternative Methods for Landfill Expansion	6
3.5.2	Impacts and Mitigation	7
3.5.3	Permits and Authorizations	7
4.0	Public and First Nation Input.....	7
5.0	Conclusions.....	7
6.0	References	8

Tables

Table 1:	<i>Alternative Methods</i> for Carrying Out the Undertaking.....	2
----------	--	---

Figures

Figure 1: Site Location

Figure 2: Study Area

Disclaimer

Other than by the addressee, copying or distribution of this document and related instruments of service, in whole or in part, is not permitted without the express written consent of R.J. Burnside & Associates Limited (Burnside).

In the preparation of the various instruments of service contained herein, Burnside was required to use and rely upon various sources of information (including but not limited to: reports, data, drawings, observations) produced by third parties. Burnside has proceeded on the belief that third parties produced their documentation using accepted industry standards and best practices and that all information was therefore complete, accurate, unbiased, and free of errors. Similarly, Burnside has applied accepted industry standards and best practices in the preparation of the various instruments of service contained herein. As such, the comments, recommendations and materials presented reflect best judgment in light of the information available at the time of preparation. Burnside and its employees, affiliates and subcontractors accept no liability for inaccuracies or errors in the instruments of service provided to the client arising from deficiencies in the aforementioned third party information or arising from undisclosed, non-visible or undetected conditions.

Burnside makes no warranties, either express or implied, of merchantability and fitness of the documents and other instruments of service for any purpose other than that specified by the contract.

1.0 Introduction

The Town of St. Marys is conducting an Individual Environmental Assessment under the *Environmental Assessment Act* to review alternative means to managing solid waste in the town over a forty year planning period. The existing St. Marys landfill site (the Site), Environmental Compliance Approval (ECA) Number A150203, is located at 1221 Water St. South, St. Marys, Ontario. The 37 ha Site was part of a former clay barrow pit that was used by St. Marys Cement in cement manufacturing and contains an approved fill area of 8 ha. The landfill is nearing its approved fill capacity and a new means to manage post-diversion solid waste is required. The location of the existing landfill is illustrated on Figure 1.

Terms of Reference (TOR) were approved by the Minister of Environment and Climate Change on December 29, 2014. The TOR laid out a strategy for completing the EA. The TOR also included a summary of pre-planning work which had been done to eliminate a number of *Alternatives to the Undertaking*. Those *Alternatives* which were eliminated due to a variety of technical, financial and environmental criteria included:

- Do Nothing;
- Energy From Waste;
- Enhanced waste diversion, and,
- Constructing a new landfill site at a new location in the Town.

A further assessment is currently being conducted to evaluate transporting waste to a landfill in another jurisdiction or expanding the current landfill site. This assessment is not yet complete.

Included in the TOR was a requirement to develop Work Plans should Expansion of the Existing Landfill be identified as the preferable *Alternative to the Undertaking*. Work Plans are to provide a detailed methodology for completing the evaluation of *Alternative Methods for Carrying out the Undertaking*, the next step in the EA process. Work Plans are to be prepared for a variety of disciplines, including:

- Terrestrial and Aquatic Ecology;
- Hydrogeology;
- Socio-Economic Environment;
- Air Quality; and,
- Others.

This Work Plan provides the framework for evaluating the *Alternative Methods for Carrying Out the Undertaking* based on factors associated with the air quality, noise and vibration.

A preferred *Alternative to the Undertaking* has not yet been identified (i.e., whether waste will be transported to another landfill or whether the St. Marys site will be expanded). The work outlined in this work plan will only be required if the landfill expansion option is selected. Nonetheless, the Town has elected to be proactive and prepare for possible fieldwork in 2015.

2.0 Study Parameters

The Study will be completed using the parameters described in the following sections.

2.1 Study Purpose

If it is decided to expand the existing landfill, the Undertaking will be defined as:

The expansion of the St. Marys landfill in order to provide the necessary capacity to fulfill the Town's post-diversion solid waste disposal needs for the next 40 years.

The purpose of this study is, therefore:

To evaluate a variety of Alternative Methods for expanding the St. Marys landfill in order to fulfill the Town's post-diversion solid waste disposal needs for the next 40 years.

2.2 Alternatives to be Assessed

Alternative Methods are technically, economically and environmentally feasible ways of doing, or implementing, the same activity. Assuming that the preferred *Alternative to the Undertaking* is to expand the existing landfill, the *Alternative Methods* will include various design options associated with the expansion. Increased waste diversion will be considered for the preferred *Alternative Method* but will not constitute part of the undertaking.

Therefore, the *Alternative Methods* to be reviewed will include those identified in Table 1.

Table 1: *Alternative Methods* for Carrying Out the Undertaking

Method		Description
1	Vertical Expansion of the Existing Landfill	This <i>Method</i> involves an expansion in the vertical direction within the existing footprint of the landfill.
2	Horizontal Expansion of the Existing Landfill	This involves an expansion outside of the existing landfill footprint. There may be a number of options as to the direction of the horizontal expansion (i.e., expansion could occur to the north, west or east).

Method		Description
3	A Combination of Vertical and Horizontal Expansion	This <i>Method</i> would involve partial vertical expansion along with some horizontal expansion of the landfill footprint, basically a mixture of Methods 1 and 2.
4	Other Options Which May be Identified During the EA Process	Other <i>Methods</i> may be identified during public, Aboriginal and agency consultation.

2.3 Study Area

Two specific Study Areas have been identified which will be used as the basis for defining and characterizing the hydrogeological environment which may be potentially affected by the expansion.

The Study Areas are as follows:

- On-site Study Area - includes all lands associated with the existing St. Marys landfill, the 37 ha site located as 1221 Water St. South, St. Marys; and,
- Study Area Vicinity - all lands within a 1,000 m radius of the On-site Study Area.

Both Study Areas are shown on Figure 2.

2.4 Study Timeframe

The EA will consider the potential effects on various environmental components over two time periods:

- Construction and operation of the expanded landfill:
 - Construction is currently anticipated to commence in 2018¹; and,
 - Operations would then occur over a 40 year period, ending around 2058. This may be revised and updated as the EA process progresses.
- Closure and post-closure of the landfill.

2.5 Features of the Environment to be studied

Section 1(1) of the *EA Act* broadly defines the environment as:

- (a) *air, land or water,*
- (b) *plant and animal life, including human life,*
- (c) *the social, economic and cultural conditions that influence the life of humans or a community,*
- (d) *any building, structure, machine or other device or thing made by*

¹ This timeframe is preliminary and will be updated to consider EA study results and subsequent approval requirements.

humans,

(e) any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from human activities, or

(f) any part or combination of the foregoing and the interrelationships between any two or more of them.

This portion of the Work Plan will focus on the air quality, noise and vibration components of the environment. The study will specifically consider the current air quality, noise and vibration environment and compare it to the predicted air quality noise and vibration levels under the various future scenarios identified above.

Parameters that affect the air quality include the following:

- Number of vehicles arriving at or active at the Site for the worst case 24-hours;
- Distance travelled by the vehicles while on Site/ while performing activities;
- Size of the open face (how much waste is exposed at a time);
- Mass of waste in-place (existing), rate of receipt, and total (future);
- Dust management practises being used; and,
- Number of hours of operation each day.

The parameters above will be used to predict the off-property concentrations of the parameters listed below and compare them to their published criteria (Ambient Air Quality Criteria, Standard, or Guideline as applicable). Some contaminants may not have published criteria so they will be presented without reference to a criterion.

- Particulate matter / Dust;
- Odour;
- Landfill gas; and,
- Other contaminants.

Parameters that affect the noise levels include the following:

- Number of vehicles arriving at or active at the Site;
- Distance travelled by the vehicles while on Site/ while performing activities;
- Number and type of equipment used on Site; and,
- Number of hours of operation each day.

Parameters that affect the vibration levels include the following:

- Size/weight of vehicles arriving at or active at the Site;
- Distance of vehicles from sensitive receptors; and,
- Number of hours of operation each day.

The parameters above will be used to predict the off-property noise and vibration levels and compare them to their published criteria.

3.0 Methodology

The basis for evaluation of the *Alternative Methods* will be provincial standards as described by Ontario Regulation (O.Reg.) 419/05, its associated regulations and guidelines. We will therefore produce reporting equivalent to the Emission Summary and Dispersion Modelling (ESDM) Reports and the Acoustic and Vibration Assessment (AVA) Reports associated with O.Reg. 419. Specific to landfill operations, vehicles, mobile equipment and road dust emissions could be excluded under some circumstances according to provincial standards. Despite these exclusions we will consider all emission sources with respect to the ESDM and AVA reporting. The AVA will assess the impact of all noise and vibration sources on the local sensitive receptors. A qualitative assessment of the air quality, noise and vibration impacts along the haul route will be completed as part of this study as well. This study will prepare an ESDM and AVA for each scenario under consideration. The remainder of the study will compare the complete impact under the existing and future scenarios. The overall project will include the following steps:

- Step 1: Background Data Collection;
- Step 2: Develop Current ESDM and AVA;
- Step 3: Determine Site Expansion Plan;
- Step 4: Develop ESDM and AVA for future cases (i.e., expansion *Methods*); and,
- Step 5: Evaluate *Alternative Methods* and Assess Potential Impacts.

Each step is described in the following sections.

3.1 Step 1: Background Data Collection

If an ESDM and/or AVA exist, these documents will serve as the basis of the air and noise emissions for the current scenario. If not, the site will be toured and all relevant information identified. Sensitive receptors within the Study Area Vicinity and along the haul route will be identified. Terrain Data will be downloaded from the MOECC. Noise measurements will be taken for the equipment where the manufacturer's data or data for similar equipment is not available.

St. Marys Cement may have an acoustic report with potentially valuable information identifying road noise impacts on local sensitive receptors and similar information. St. Marys Cement will be approached for any Acoustic Assessments they may have performed. Further, the Town has indicated that a National Pollutant Release Inventory and Green House Gas summary memorandum is available². This will be reviewed for relevancy.

² This is a single document, assumed to be from 2005.

3.2 Step 2: Develop Current Air Dispersion and Noise Models

All buildings, traffic, processes and emissions will be quantified, assigned to locations at the Site and built into air dispersion and noise models required and acceptable to the MOECC. These models will represent the existing site conditions.

3.3 Step 3: Determine *Alternative Methods*

Each source will be assessed for the future cases to consider location, height, emission rate, frequency, and buildings. Predicted future traffic volumes along the haul route will be included in the assessment.

The future case will also consider whether there are sources that should be removed and whether there are sources that will exist in the future that don't currently exist. All of these considerations will be driven by the plan for expansion under that scenario. Since the area of the expansion may be quite large, emissions will be assigned to locations that will result in the highest off-property impacts. The highest off-property impact will not exist for the entire 40 year life of the landfill. In fact, it will likely occur for less than one year of that lifespan. Additionally, off-property impacts may occur at different times for different emissions (i.e., peak dust impacts verses when peak noise impacts occur). The models developed in Step 4 will identify how the timing of peak emissions/impacts will be determined.

3.4 Step 4: Develop Air Dispersion and Noise Models for Future Cases

New models will be constructed from the existing models that address the future scenarios identified in the step above.

3.5 Step 5: Evaluate Alternatives and Assess Potential Impacts

3.5.1 Evaluation of Alternative Methods for Landfill Expansion

Air quality and acoustic impacts will be used in the evaluation of alternative methods for landfill expansion. The differences between various alternatives will be determined based on their potential impact on sensitive receptors in the Study Area Vicinity and along the haul route.

An overall preferred alternative will be determined based on a review of the advantages and disadvantages of a broader set of criteria, including factors associated with the air quality and acoustic impacts.

3.5.2 Impacts and Mitigation

Once the preferred *Alternative Method* is selected, a comprehensive list of potential impacts and proposed mitigation (if any) specific to that alternative will be described.

The site's landfill gas contribution to greenhouse gases and resulting carbon dioxide equivalent impact will be described and, if appropriate, mitigation methods will be suggested.

3.5.3 Permits and Authorizations

Burnside will discuss the need for permits and approvals with Ministry of the Environment and Climate Change staff. The Work Plan report will then identify any permits and authorizations specified by Ministry staff.

4.0 Public and First Nation Input

It is recognized that local landowners and First Nation communities may have specific knowledge of the site and surrounding area. Local and Aboriginal knowledge can positively contribute to studies such as this by adding observations and historical information which may not be included in public records. Public and First Nation input will be obtained in the following manner:

- This Work Plan will be posted to the Town's website for public comment prior to initiating field work;
- This Work Plan will be sent to First Nations who have expressed an interest in the project for comment prior to initiating data collection;
- Should discrepancies arise, First Nation communities with an interest in the project will be invited to help resolve discrepancies;

5.0 Conclusions

The preferred method for managing post-diversion solid waste within the Town of St. Marys will be determined through an evaluation of a number of social, environmental, technical and financial criteria. Potential impacts on sensitive receptors and to natural features are an important component of the environmental evaluation. The landfill property and surrounding lands are relatively disturbed from landfilling and aggregate resources extraction activities. Nonetheless some significant natural features may be present. Residents on the west side of Water Street South/Perth Road 123 are the most likely to be affected by the landfill expansion. This work plan has outlined how that impact will be quantified.

6.0 References

Code of Practice: Preparing and Reviewing Environmental Assessments in Ontario, Ontario Ministry of the Environment

Environmental Noise Guideline: Stationary and Transportation Sources – Approval and Planning, Publication NPC-300, Ontario Ministry of the Environment, PIBS 8458e1.

Guide to Applying For Approval (Air & Noise), Version 2.0, Ontario Ministry of the Environment, PIBS# 4174e

Guideline on the Regulatory and Approval Requirements for New or Expanded Landfilling Sites, Jan2012, Ontario Ministry of the Environment, PIBS 7792e

Ontario's Ambient Air Quality Criteria, April 2012, Standards Development Branch, Ontario Ministry of the Environment, PIBS# 6570e01

ORNAMENT Ontario Road Noise Analysis Method for Environment and Transportation - Technical Document. October 1989. Ontario Ministry of the Environment. ISBN 0-7729-6376. PIBS 1527e.

Procedure for Preparing An Emission Summary And Dispersion Modelling Report, February 2009, Version 3, Ontario Ministry of the Environment, PIBS#3614e03

Summary of Standards And Guidelines to Support Ontario Regulation 419/05 - Air Pollution – Local Air Quality, April 2012, Ontario Ministry of the Environment, PIBS# 6569e01



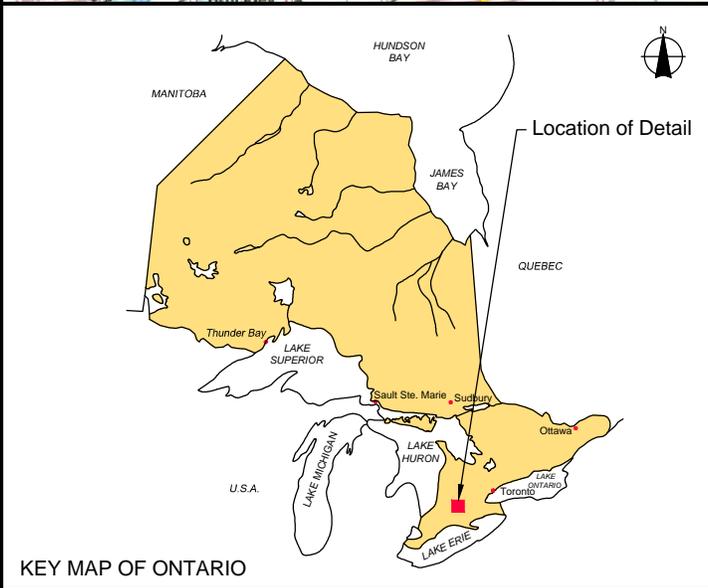
BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]



Figures

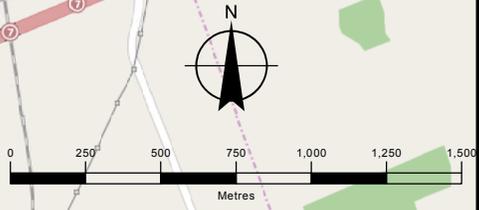
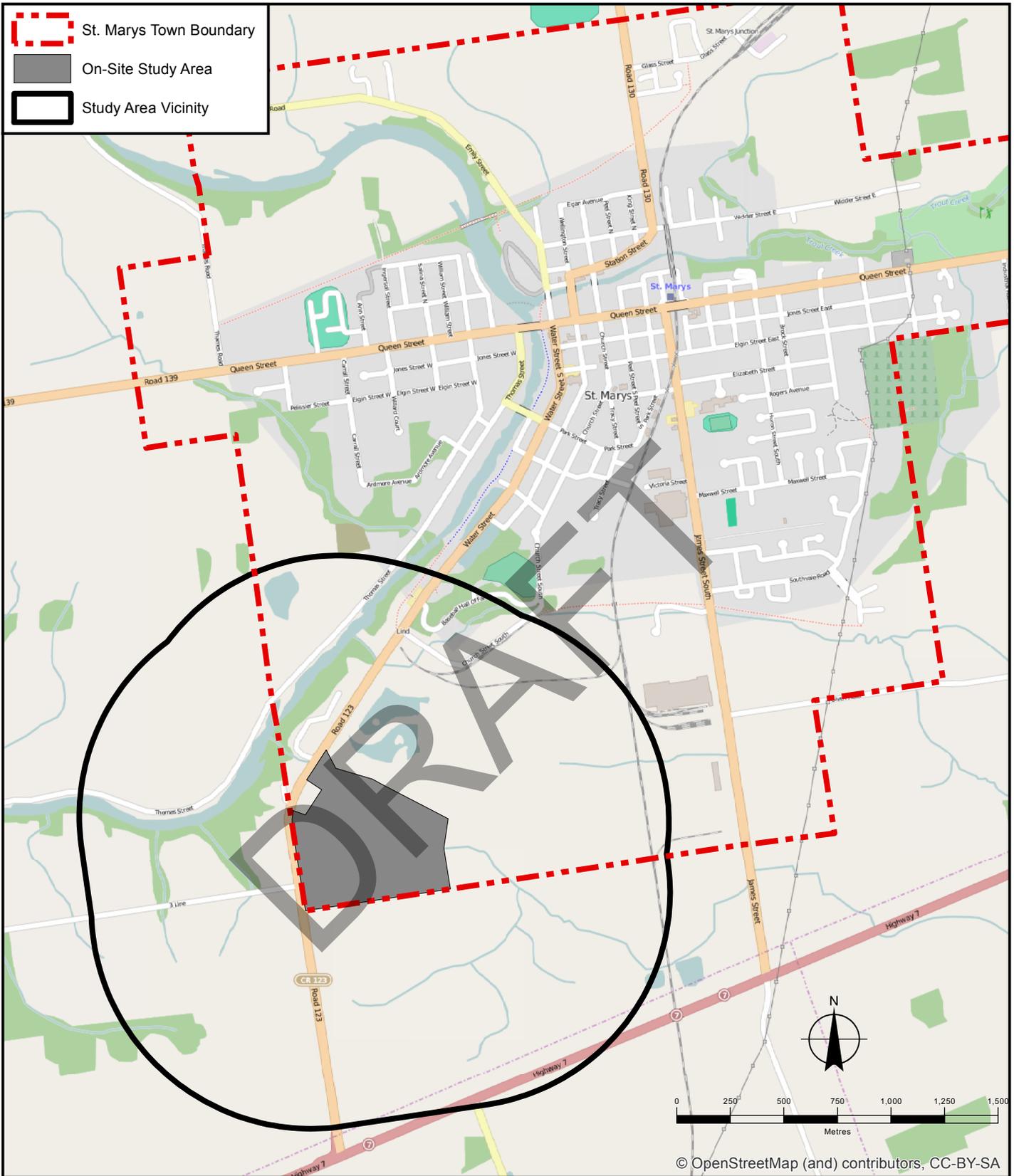
DRAFT





Client	THE CORPORATION OF THE TOWN OF ST. MARYS		
Figure Title	SITE LOCATION DRAFT		
Drawn CD	Checked JR	Date July 2015	Figure No. 1
Scale N.T.S.	Project No. 300032339		

-  St. Marys Town Boundary
-  On-Site Study Area
-  Study Area Vicinity



© OpenStreetMap (and) contributors, CC-BY-SA



Map Title
STUDY AREA
DRAFT

Client
**THE CORPORATION OF
 THE TOWN OF ST. MARYS**

Drawn	Checked	Date
CD	JR	July 2015
Scale	Project No.	
1:25,000	300032339	

Figure No.
2