Appendix A:
Figures

Figure 1 – Municipal Class EA Planning and Design Process

Figure 2 – Study Area Map and Alternative Sites for Treatment Facility

City of Guelph Zoning Maps for Study Area

MUNICIPAL CLASS EA PLANNING AND DESIGN PROCESS

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

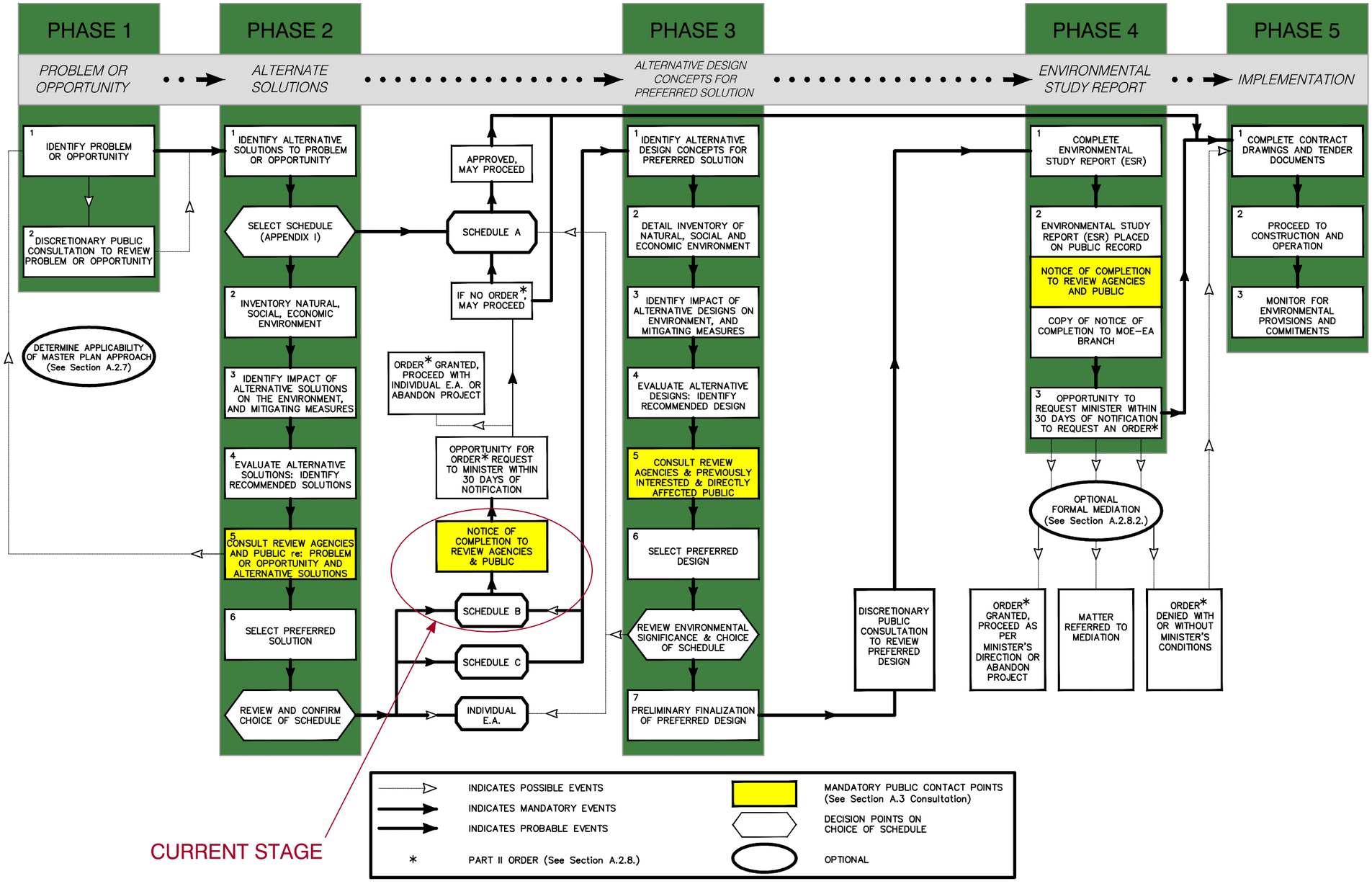


FIGURE 1

CLYTHE WELL TREATMENT UPGRADES CLASS ENVIRONMENTAL ASSESSMENT

MUNICIPAL CLASS EA PLANNING AND DESIGN PROCESS

112041
JANUARY 2018
Scale: 1:10,000 | NAD 1983 UTM Zone 17N

AERIAL IMAGERY PROVIDED BY GOOGLE MAPS

CITY OF Guelph
Making a Difference

N

LEGEND

- POTENTIAL SITES TO LOCATE WATER TREATMENT FACILITY
- SHORTLISTED POTENTIAL SITES TO LOCATE WATER TREATMENT FACILITY

150 0 100 200 400
1:10000 (m)

FIGURE 2

CLYTHE WELL TREATMENT UPGRADES CLASS ENVIRONMENTAL ASSESSMENT

STUDY AREA MAP AND ALTERNATIVE SITES FOR TREATMENT FACILITY

BluePlan ENGINEERING

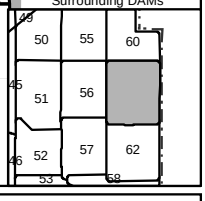
112041
JANUARY 2018
Scale: 1:10,000 | NAD 1983 UTM Zone 17N

FILE:W:\Guelph\112-2012\112041\Drawings\Potential Sites Map.dwg LAYOUT:Layout1
LAST SAVED BY:Fcrew, 1/18/2018 4:31:33 PM PLOTTED BY:Dan Illes - GM BluePlan 2/1/2018 10:15:22 AM

DEFINED AREA
MAP NO.

61

Surrounding DAMs



LANDS ADJACENT TO PROVINCIALLY SIGNIFICANT WETLANDS (See Section 13.3)

LANDS WITHIN ONE OF THE FOLLOWING: LOCALLY SIGNIFICANT WETLANDS, SIGNIFICANT WOODLOTS, NATURAL CORRIDOR, OR LINKAGE (See Section 13.4)

LANDS WITHIN THE SPECIAL POLICY AREA (See Section 12.4)

LANDS WITHIN THE FLOOD FRINGE (See Section 12.3)

CITY OF GUELPH BY-LAW (1995) - 14864

As last amended by By-law (2010) - 19063

SCHEDULE 'A'

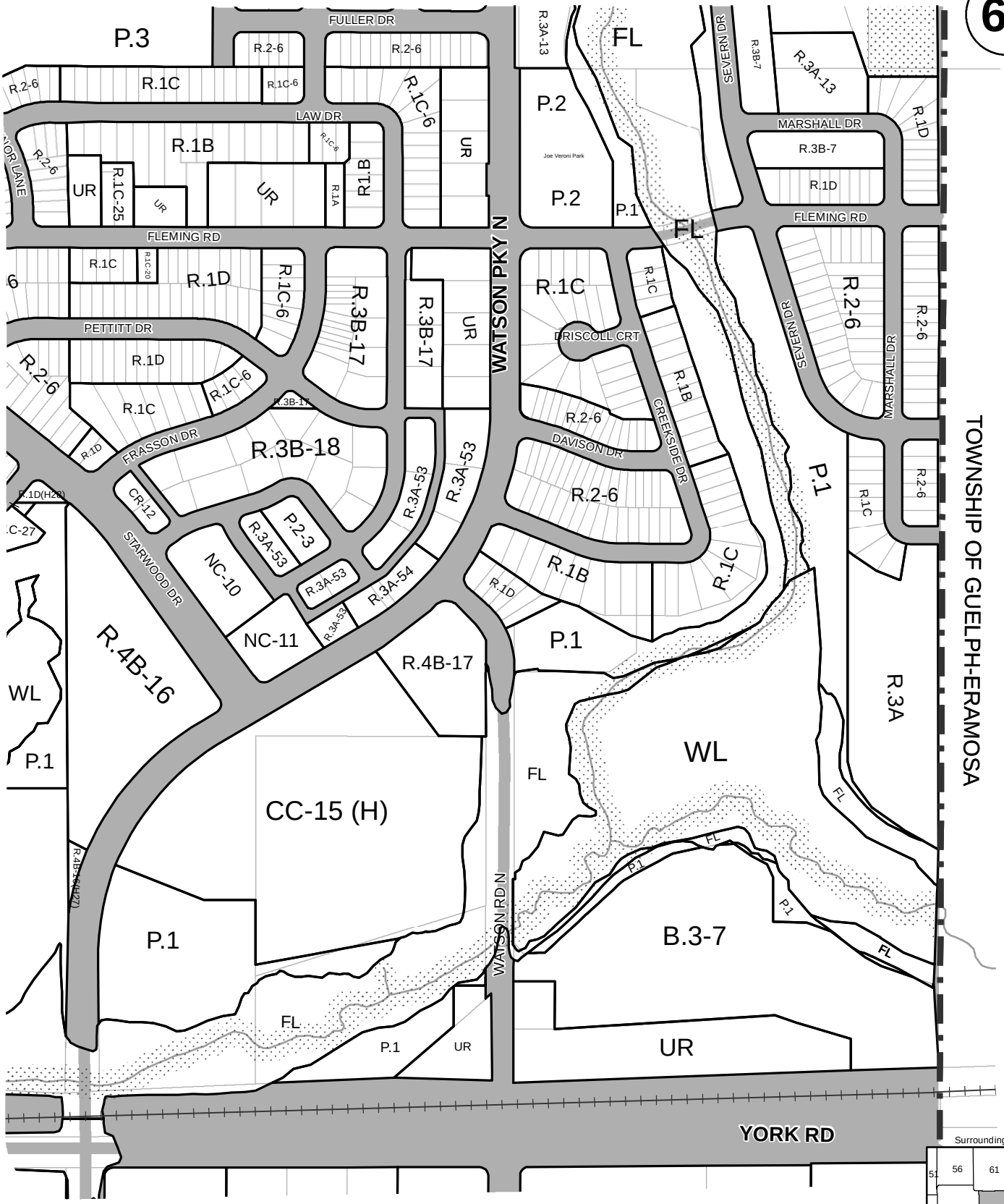
100 50 0 100 M

Produced by the City of Guelph
Community Design and Development Services, Planning Services

CITY OF Guelph
Making a Difference

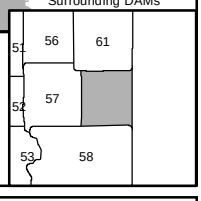
DEFINED AREA
MAP NO.

62



TOWNSHIP OF GUELPH-ERAMOSA

Surrounding DAMs



LANDS ADJACENT TO PROVINCIALLY SIGNIFICANT WETLANDS (See Section 13.3)

LANDS WITHIN THE SPECIAL POLICY AREA (See Section 12.4)

LANDS WITH ONE OF THE FOLLOWING: LOCALLY SIGNIFICANT WETLANDS, SIGNIFICANT WOODLOTS, NATURAL CORRIDOR, OR LINKAGE (See Section 13.4)

LANDS WITHIN THE FLOOD FRINGE (See Section 12.3)

100 50 0 100 M

Produced by the City of Guelph
Planning Services

CITY OF GUELPH BY-LAW (1995) - 14864

As last amended by By-law (2017) - 20134

SCHEDULE 'A'

CITY OF Guelph
Making a Difference

Appendix B:
Notice of Study Commencement

Notice of Study Commencement

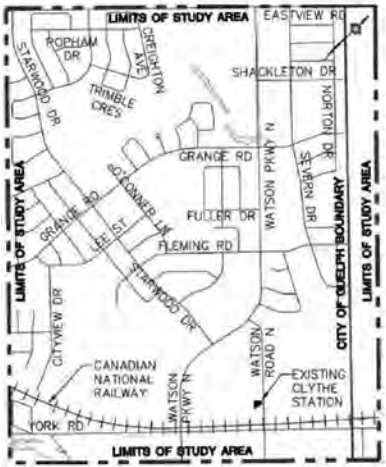
Notification Letter Template

NOTICE OF STUDY COMMENCEMENT

City of Guelph Schedule 'B' Class Environmental Assessment for Clythe well treatment upgrades

Study objectives

The City of Guelph is initiating a Municipal Class Environmental Assessment (EA) for proposed treatment upgrades to bring the Clythe well back into service. The City's Water Supply Master Plan (2014) identifies the need for additional water sources to support future demand. A study conducted in 2011 concluded that water from the Clythe well can be successfully treated with existing technology.



The process

Planning for this project is proceeding as a Schedule "B" undertaking in accordance with the Municipal Class Environmental Assessment process (MEA, June 2000, as amended in 2007 and 2011), prepared by the Municipal Engineers Association. The Class EA is an approved process under the Ontario Environmental Assessment Act and includes public and review agency consultation, an evaluation of alternatives, an assessment of potential environmental effects of the proposed alternatives, and identification of reasonable measures to mitigate any adverse impacts that may result.

Once a preferred alternative is selected and the EA is approved, the project will move into design.

How to participate

The City of Guelph is interested in receiving public input and comments during this project. An open house will be held to review and discuss issues related to this project. Meeting dates and details will be advertised in the City News pages of the Guelph Mercury Tribune (Thursday editions), posted in the meeting and event calendar at **guelph.ca/events** and on the project page at **guelph.ca/clythe,** and promoted on the City's social media accounts (**facebook.com/cityofguelph** and **twitter.com/cityofguelph**).

For more information

To provide your comments, request additional information, or be added to the project mailing list, or if you require this notice to be provided in an alternative format as per the Accessibility for Ontarians with Disabilities Act (2005), please contact:

Robin Puskas, P. Eng., Project Manager, Water Services
City of Guelph
1 Carden Street
Guelph ON N1H 3A1
519-822-1260 x 2195
robin.puskas@guelph.ca

Grant Parkinson, P. Eng., Project Manager
GM BluePlan Engineering Limited
650 Woodlawn Road West, Unit C2
Guelph ON N1K 1B8
519-824-8150
grant.parkinson@gmblueplan.ca

This notice first issued on August 24, 2017.

PEOPLE | ENGINEERING | ENVIRONMENTS

August 30, 2017
Our File: 112041

Organization
Department
Address
City, Province Postal Code

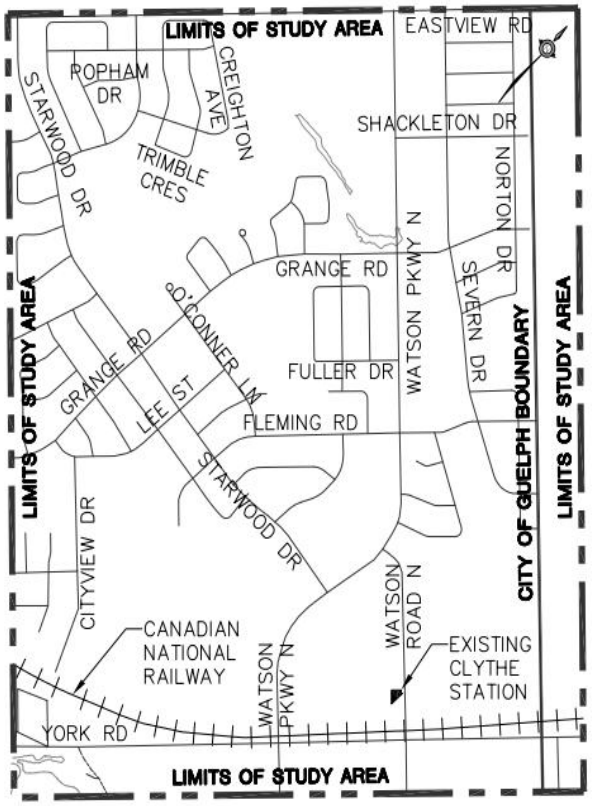
Attention: <salutation> <first name> <last name>
<title.

Re: City of Guelph Schedule 'B' Class Environmental Assessment for Clythe Well Treatment Upgrades – Notice of Study Commencement

Dear <Salutation> <Last Name>,

The City of Guelph is initiating a Municipal Class Environmental Assessment (Class EA) study for proposed treatment upgrades to bring the Clythe Well back into service. The City's Water Supply Master Plan (2014) identifies the need for additional water sources to support future demand. A study conducted in 2011 concluded that water from Clythe Well can be successfully treated with existing technology. The purpose of this letter is to inform you that this study has commenced and to solicit input from your agency regarding the project. A map of the study area is shown below.

Planning for this project is proceeding as a Schedule "B" undertaking in accordance with the Municipal Class Environmental Assessment process (MEA, June 2000, as amended in 2007 and 2011), prepared by the Municipal Engineers Association. The Class EA is an approved process under the Ontario Environmental Assessment Act and includes public and review agency consultation, an evaluation of alternatives, an assessment of potential environmental effects of the proposed alternatives, and identification of reasonable measures to mitigate any adverse impacts that may result.



Once a preferred alternative is selected and the EA is approved, the project will move into design.

An open house will be held to review and discuss issues related to this project. Meeting dates and details will be advertised in the City News pages of the Guelph Mercury Tribune (Thursday editions), posted in the meeting and event calendar at **guelph.ca/events** and on the project page at **guelph.ca/clythe**, and promoted on the City's social media accounts (**facebook.com/cityofguelph** and **twitter.com/cityofguelph**).

Unless your agency indicates otherwise, only those agencies indicating interest in the project will be contacted in the future with project relevant updates. All agencies receiving this notice, will receive notice of study completion.

If your agency wishes to participate further in the Class EA process, or should you require additional information, please contact one of the project team members listed below and provide the following information:

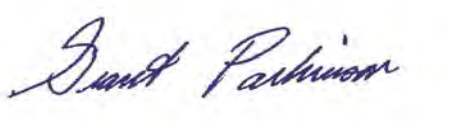
1. the name, address and telephone number of the appropriate contact person (if different from that shown on this letter); and

2. your agency's input and interest which may be affected by the completion of this project.

Robin Puskas, P. Eng.
Project Manager
City of Guelph Water Services
1 Carden Street
Guelph, ON N1H 3A1
Tel: 519-822-1260 X 2195
Email: robin.puskas@guelph.ca

Grant Parkinson, P. Eng.
Project Manager
GM BluePlan Engineering Limited
650 Woodlawn Road West – Unit C2
Guelph, ON N1K 1B8
Tel: 519-824-8150
Email: grant.parkinson@gmblueplan.ca

On behalf of the City of Guelph,



Grant Parkinson, P. Eng.
GM BluePlan Engineering Limited

cc Robin Puskas, P.Eng., Project Manager, City of Guelph - Water Services

Appendix C:
Public Open House

Notice of Public Open House

Display Boards

CITY OF GUELPH

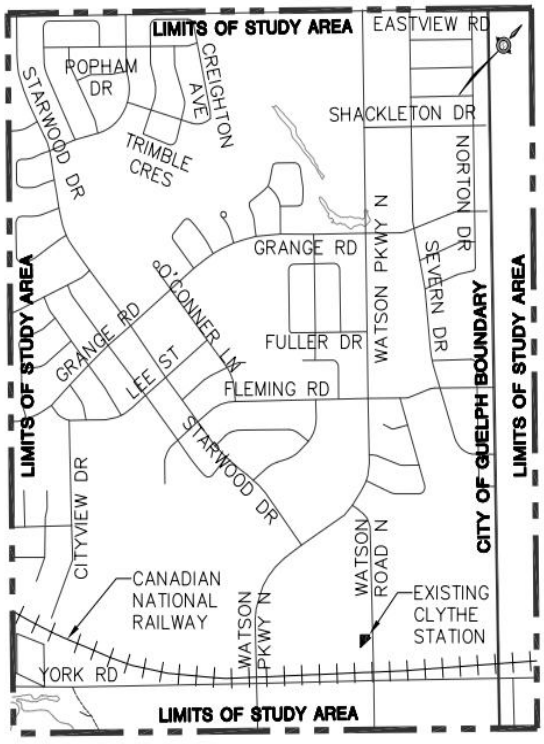
SCHEDULE 'B' CLASS ENVIRONMENTAL ASSESSMENT FOR CLYTHE WELL TREATMENT UPGRADES

NOTICE OF PUBLIC INFORMATION CENTRE

Study Objectives
The City of Guelph is initiating a Municipal Class Environmental Assessment (EA) for proposed treatment upgrades to bring the Clythe well back into service. The City's Water Supply Master Plan (2014) identifies the need for additional water sources to support future demand. A study conducted in 2011 concluded that water from Clythe well can be successfully treated with existing technologies.

The process
Planning for this project is proceeding as a Schedule "B" undertaking in accordance with the Municipal Class Environmental Assessment process (MEA, June 2000, as amended in 2007 and 2011), prepared by the Municipal Engineers Association. The Class EA is an approved process under the Ontario Environmental Assessment Act and includes public and review agency consultation, an evaluation of alternatives, an assessment of potential environmental effects of the proposed alternatives, and identification of reasonable measures to mitigate any adverse impacts that may result.

Once a preferred alternative is selected and the EA is approved, the project will move into design phase.



How to participate
The City of Guelph is interested in receiving public input and comments during this project. A public Open House is scheduled as follows:

Date: Thursday October 19, 2017
Time: 7:00 – 8:30pm
Location: Victoria Road Recreation Center
151 Victoria Road North, Guelph, ON N1E 5H4

Meeting dates and details are also advertised and posted in the meeting and event calendar at **www.guelph.ca/events.**

For more information
To provide your comments, request additional information, or be added to the project mailing list, or if you require this notice to be provided in an alternative format as per the Accessibility for Ontarians with Disabilities Act (2005), please contact:

Robin Puskas, P. Eng.
Project Manager
City of Guelph Water Services
1 Carden Street
Guelph, ON N1H 3A1
Tel: 519-822-1260 X2195
Email: robin.puskas@guelph.ca

Grant Parkinson, P. Eng.
Project Manager
GM BluePlan Engineering Limited
650 Woodlawn Road West – Unit C2
Guelph, ON N1K 1B8
Tel: 519-824-8150
Email: grant.parkinson@gmblueplan.ca

This Notice first issued on October 5, 2017.

Welcome to City of Guelph

CLYTHE WELL TREATMENT CLASS ENVIRONMENTAL ASSESSMENT

Open House
October 19, 2017
7 - 8:30pm

Public input will be taken into consideration throughout this process. You can participate in this study by:

- Signing the attendance register
- Reviewing the display boards
- Asking questions and discussing your ideas/concerns with City staff and the Project Team
- Providing your thoughts and comments on the Comment Sheet
- Indicating on the comment sheet whether you would like to be added to the project mailing list.

OPPORTUNITY STATEMENT AND STUDY OBJECTIVE

Master Planning and Engineering Studies completed by the City of Guelph have identified the need to develop additional local water sources, and to implement upgrades to existing wells to meet future supply requirements in the City of Guelph.

Returning Clythe Well to service with added treatment was identified in the 2014 Water Supply Master Plan[1] as a high priority project. A treatability study[2] completed in 2010 concluded that raw water from the Clythe Well can be successfully treated for aesthetic quality parameters with well-established technologies.

The purpose of this Schedule 'B' Municipal Class EA process is to select a preferred solution through a comprehensive, environmentally sound planning process open to public participation to address the following objective:

Provide treatment for Clythe Well (an approved water source) to return it to service, contributing to the City's ability to meet long-term water demands and integrating with the City's broader Official Plan[3] to ensure 'A safe and reliable local water supply'.

1. City of Guelph, Water Supply Master Plan, AECOM (May 2014)
2. City of Guelph, Treatability Assessment of the Clythe and Helmar Wells, Gamsby and Mannerow Ltd. (Feb 2010)
3. City of Guelph, Official Plan 2001, September 2014 Consolidation

Clythe Well Treatment
Class Environmental Assessment

PROJECT BACKGROUND

Clythe Well and Pumping Station are located in northeast Guelph at 24 Watson Road North. The facility was constructed to provide dual service as a water supply source and a booster pumping station (firm capacity of 10,886 m^3/d) along with an underground reservoir (capacity of 672 m^3).

Facility History

- 1976 Clythe Well was drilled
- 1983 Clythe Booster Station constructed and put into service
- 1990 Clythe Well put into service
- 1999 Clythe Well taken out of service. Booster station remained in service.
- 2010 Treatability Study reviewed treatment methods
- 2017 Clythe facility continues to operate as a critical supply from Zone 1 to Zone 2. Clythe Well remains out of service.

Water Quantity

- Well completed in productive Amabel formation, same as other City wells
- An approved water source with a valid Permit to Take Water (PTTW No. 1008-9J7S6G) allowing withdrawal of up to 60.6 L/s (5,237 m^3/day)
- Sustainable yield of 39 L/s (3,370 m^3/day) or approximately 7 per cent of average City demand (based on 2016 average annual daily City demand)

Water Quality

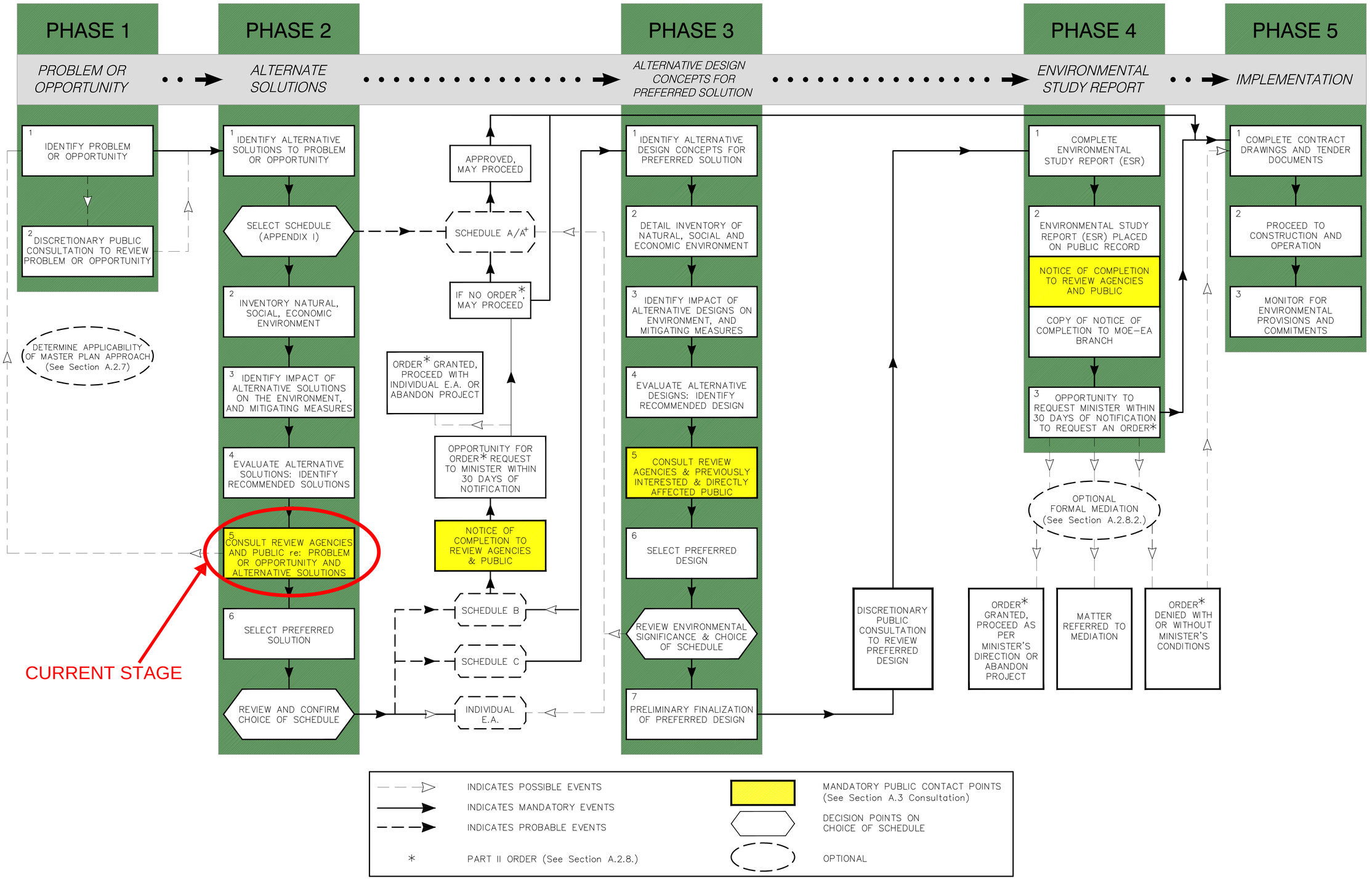
- Secure groundwater source
- Aesthetic concerns due to naturally occurring elements :
  - ✓ Iron – moderately elevated at ~0.20 mg/L (AO *= 0.30 mg/L)
  - ✓ Manganese – moderately elevated at ~0.03 mg/L (AO = 0.050 mg/L)
  - ✓ Hydrogen Sulphide - elevated at ~ 0.45 mg/L (AO = 0.050 mg/L)
- 2010 Treatability Study recommended filtration with catalytic media and polishing with activated carbon contact to bring Clythe Well back into service

This EA process will assess options to implement this treatment strategy either at the existing site or at an alternative location.

*AO = Ontario Drinking Water Quality Standard (ODWQS) Aesthetic Objective

MUNICIPAL CLASS EA PLANNING AND DESIGN PROCESS

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



Clythe Well Treatment
Class Environmental Assessment

EVALUATION PROCESS FRAMEWORK

Approach: Overall strategy to implement treatment

Screening Step: Screening criteria were applied to a long list of alternatives to eliminate alternatives that were impractical or did not meet the threshold of acceptance.

Evaluation Step: The remaining short-listed alternatives were evaluated based on a set of criteria.

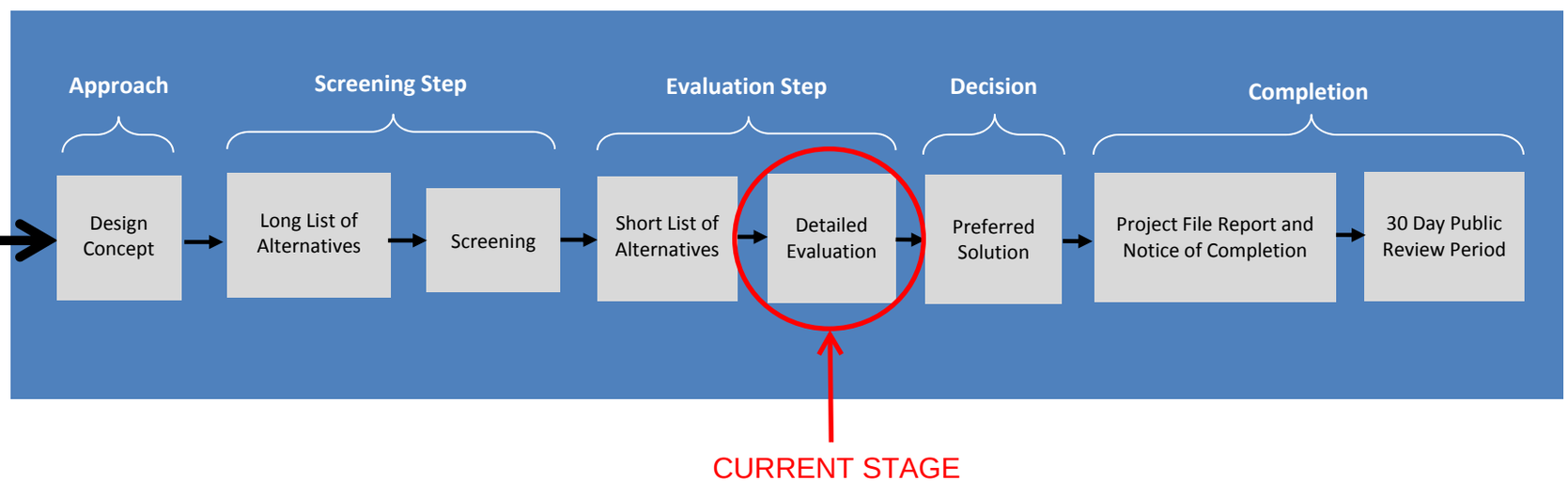
Decision: Preferred solution will be selected based on results of detailed evaluation supplemented with agency and public consultation.

Completion: The Notice of Completion will be issued and the project file report will be submitted to the public record. After a 30 day public review period the file will be approved to proceed or elevated via a Part II Order for further review.

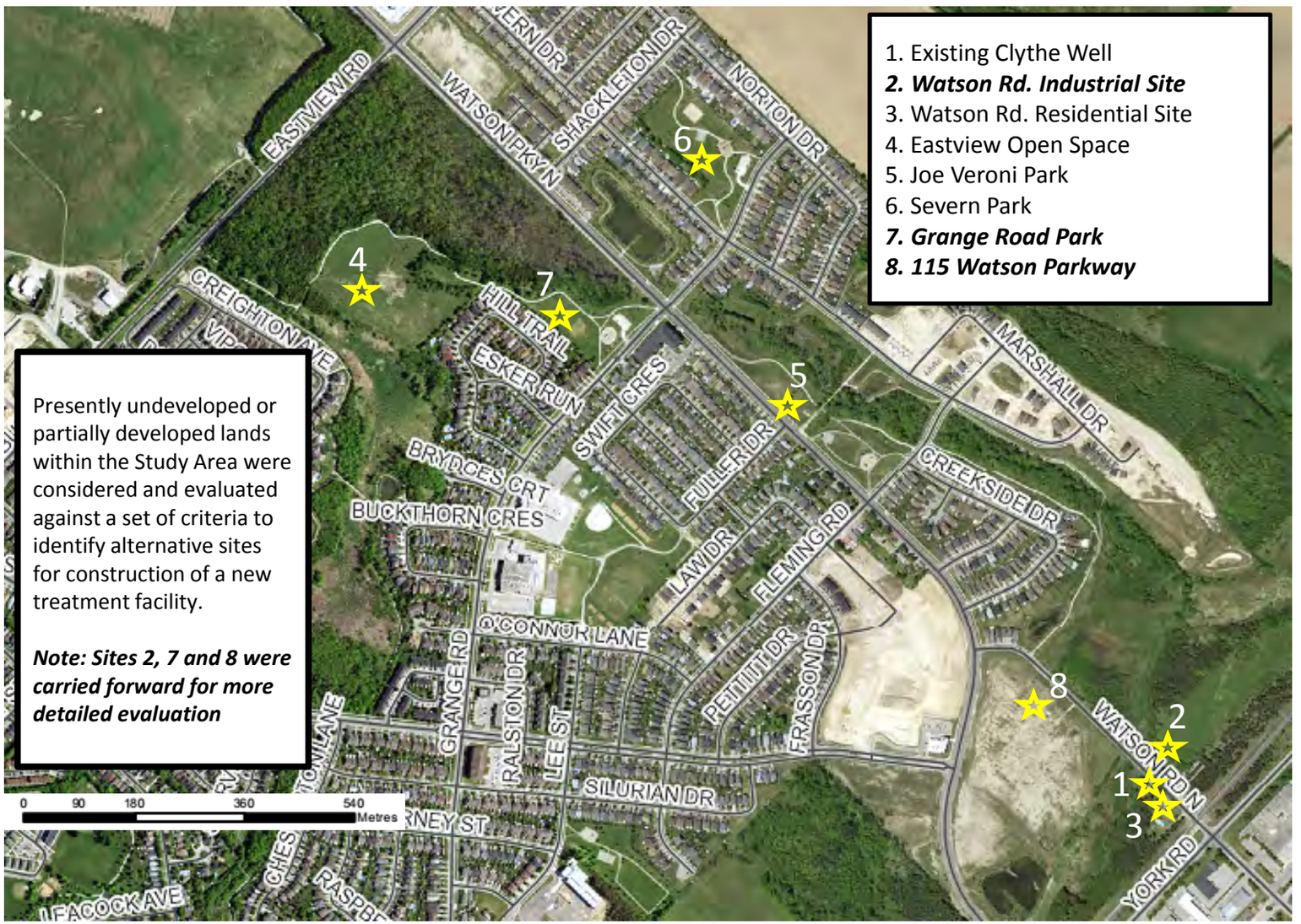
Schedule 'B' Municipal Class EA Process

Phase 1: Problem Statement

Phase 2: Alternative Solutions



LONG LIST OF ALTERNATIVES

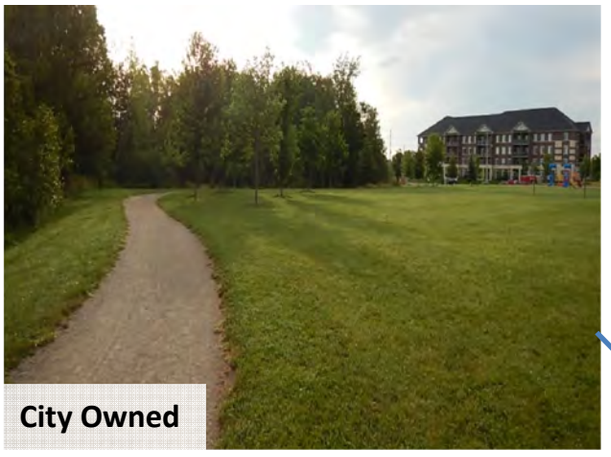


RESULTS OF SCREENING-LEVEL SITE EVALUATION

Site Identification	Screening-Level Evaluation	Result
1. Existing Clythe Booster Station Site	City-owned property, limited available space	
2. Watson Road Industrial	**Privately owned, not developed, adequate size, located across road from existing Clythe Well site**	**Carried Forward as Option A**
3. Watson Road Residential	Privately owned residential property located adjacent to existing Clythe Well site	
4. Eastview Open Space	City property, adequate size, undeveloped, designated for other use	
5. Joe Veroni Park	City-owned property, adequate size, currently developed as a public park, treatment facility would reduce park open space and negatively impact aesthetics	
6. Severn Drive Park	City-owned property, adequate size, currently developed as a public park, treatment facility would reduce park open space and negatively impact aesthetics	
7. Grange Road Park	**City-owned property, adequate size, currently developed as a public park. Area available that would not impact park open space.**	**Carried Forward as Option B**
8. 115 Watson Parkway	**Privately owned, not developed, adequate size, located in close proximity to existing Clythe Well site**	**Carried Forward as Option C**

Clythe Well Treatment
Class Environmental Assessment

TOP 3 RANKED SITES

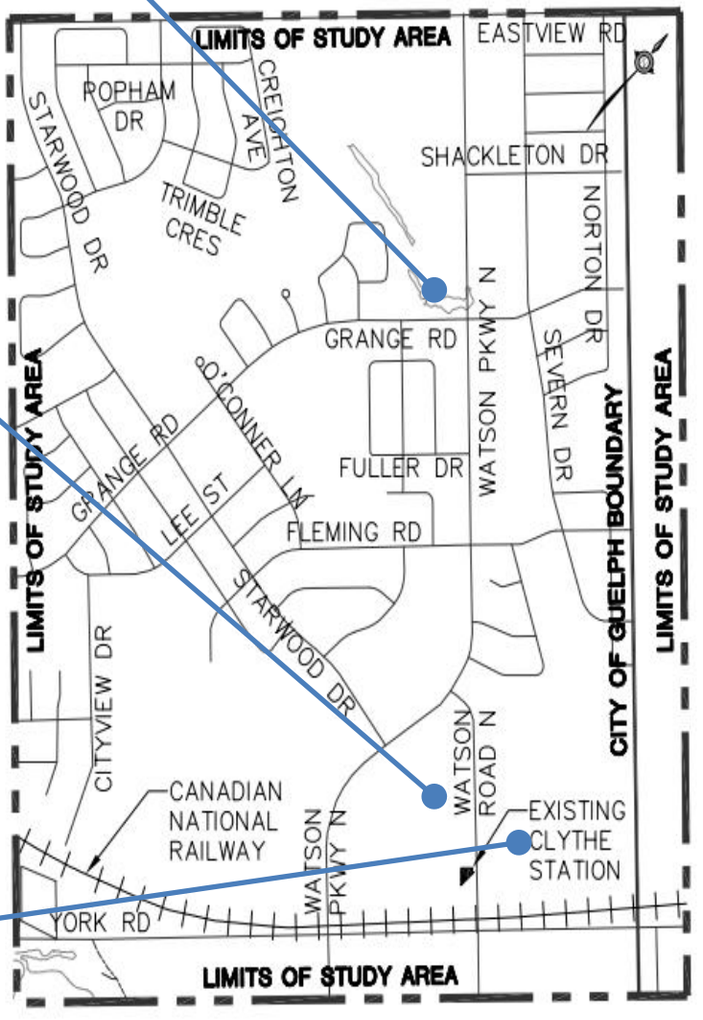


Option B: Grange Road Park

Project implementation at either Option A or Option C is subject to successful property acquisition.

Option C: 115 Watson Pkwy

Option A: Watson Road Industrial



Clythe Well Treatment
Class Environmental Assessment

CONCEPTUAL SITE LAYOUT

OPTION A – WATSON ROAD INDUSTRIAL

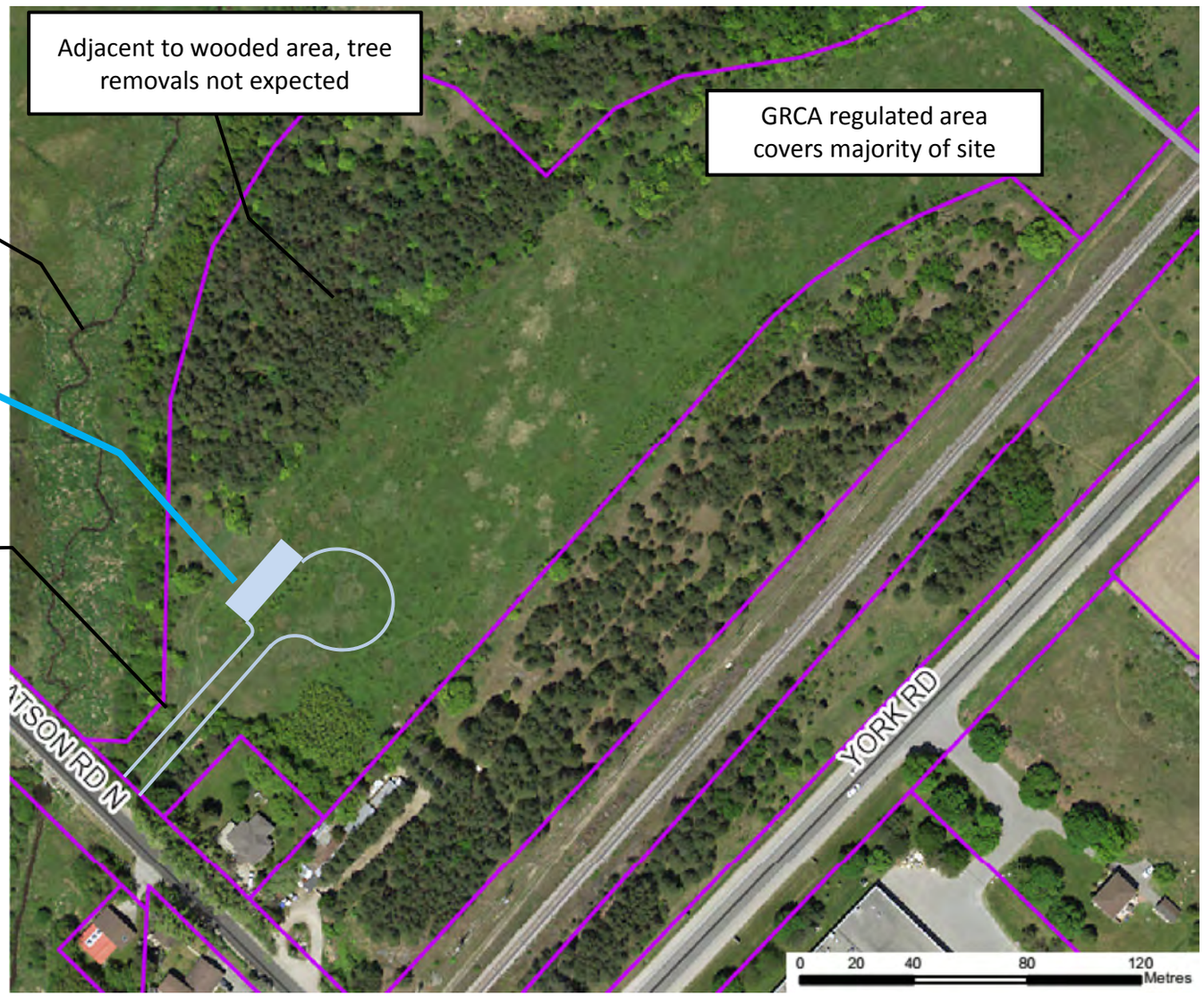
Adjacent to wooded area, tree removals not expected

GRCA regulated area covers majority of site

Clythe Creek Wetland Complex (Provincially Significant Wetland)

Proposed Treatment Facility: ~30m x 10m

Proposed vehicle access potentially through wetland buffer



No Potential for Archeological Resources identified in Stage 1 Assessment

Privately owned by developer, property acquisition required

Large site area for construction staging

Minimal public impact

Some potential for Species at Risk (SAR) to be confirmed through field investigations

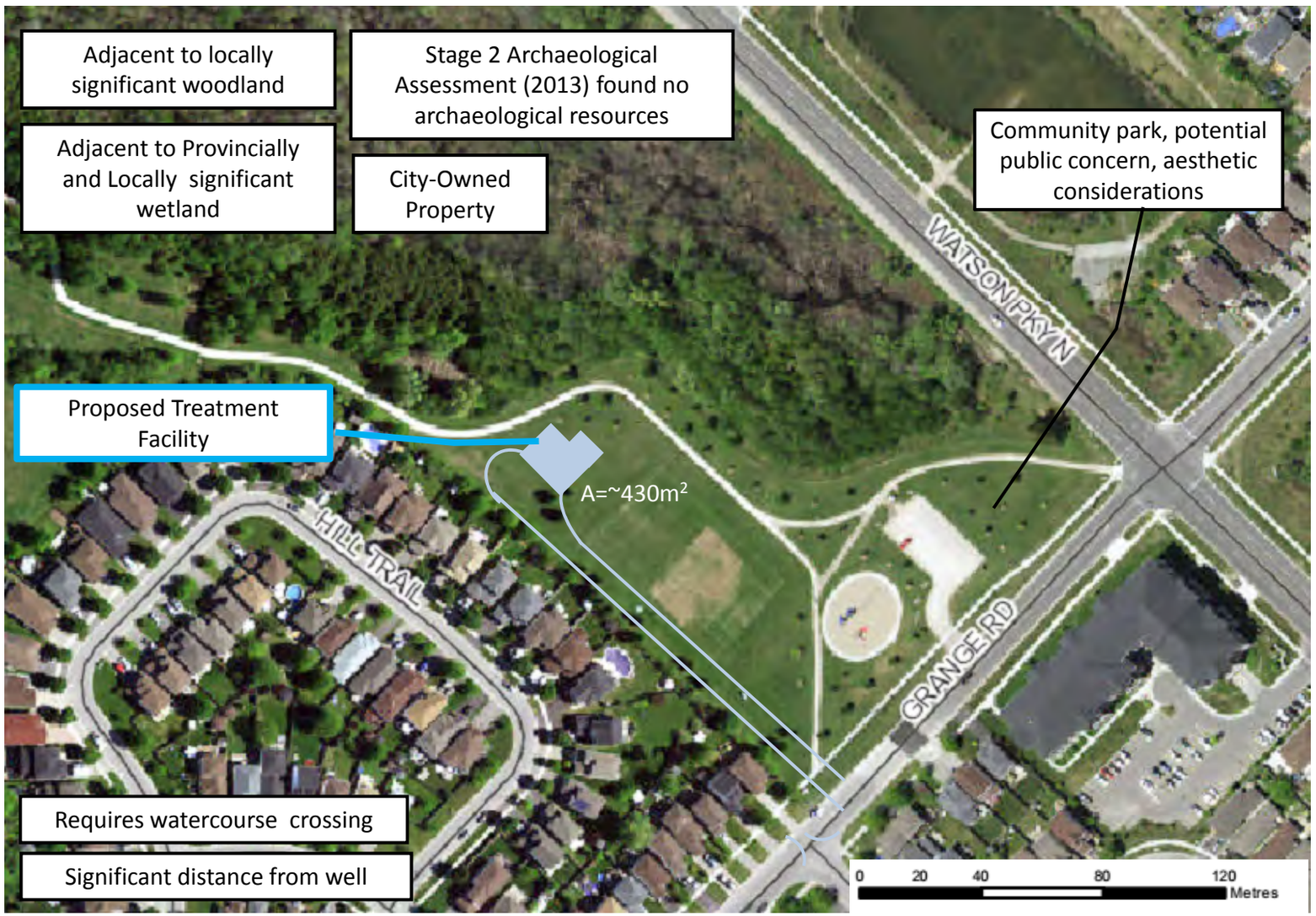
Guelph

BluePlan ENGINEERING

Clythe Well Treatment
Class Environmental Assessment

CONCEPTUAL SITE LAYOUT

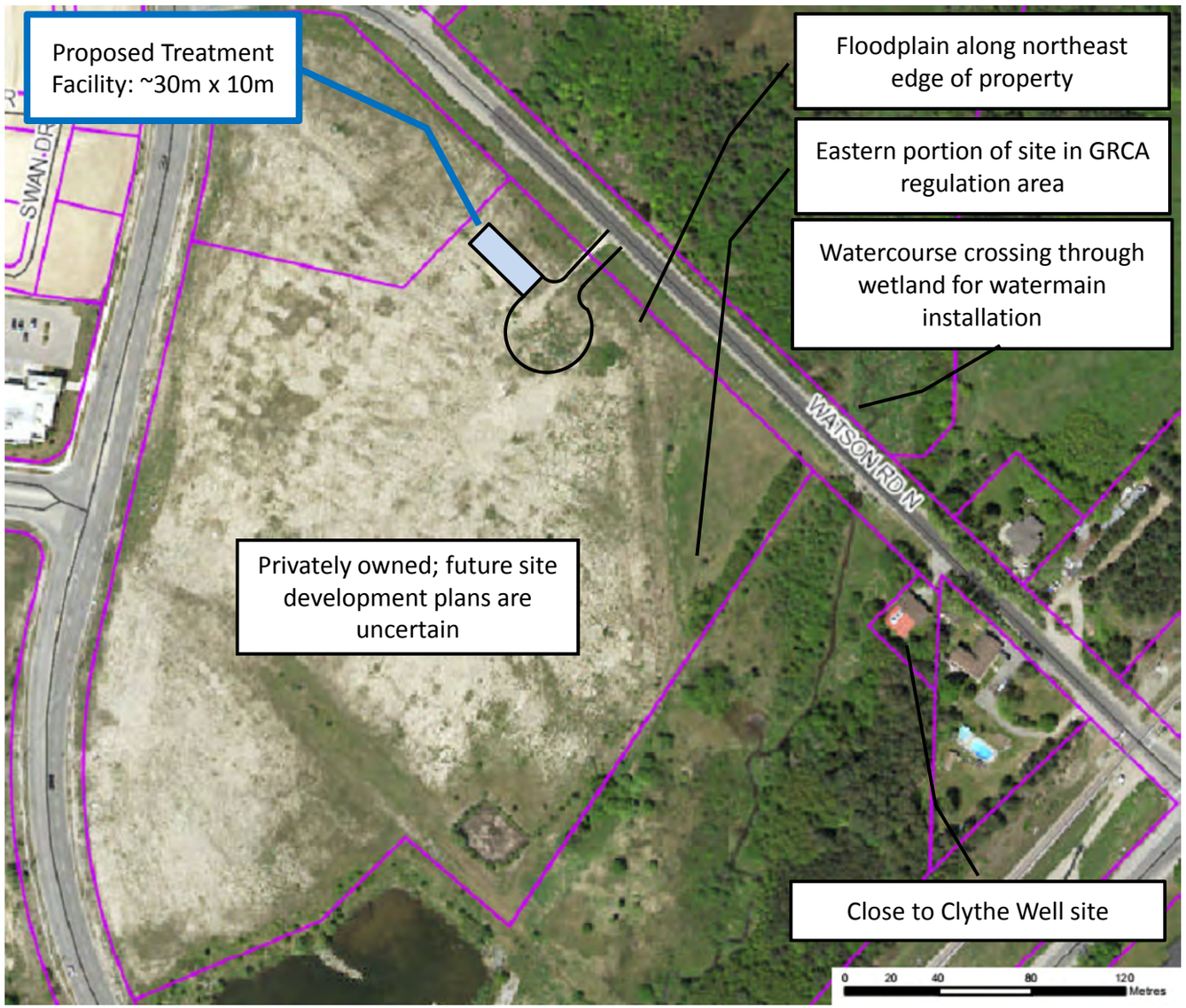
OPTION B – GRANGE ROAD PARK



Clythe Well Treatment
Class Environmental Assessment

CONCEPTUAL SITE LAYOUT

OPTION C – 115 WATSON PARKWAY



Clythe Well Treatment
Class Environmental Assessment

PRELIMINARY EVALUATION OF ALTERNATIVES

ITEM	Option A Watson Road Industrial	Option B Grange Road Park	Option C 115 Watson Parkway
Site Requirements	-large area -one viable site access location	-limited space	-large area -multiple site access locations
Land Use Planning Objectives	-privately owned -currently for sale	-City owned -park	-privately owned -application for development is pending; future of development is uncertain
Natural Environment	-vehicle access driveway could potentially impact wetland, Species at Risk and Significant Wildlife Habitat	-requires watercourse crossing through wetland	-requires watercourse crossing through wetland
Social and Cultural Environment	-Minimal public impact during construction and operation	-Use of park temporarily disrupted, and permanent reduction of parkland -construction impacts (noise/dust)	-Compatible with future site uses -minor construction impacts (noise/dust)
Economic Environment	Lower cost	Higher cost	Moderate cost
Technical Feasibility	-compatible with future development -good constructability	-watercourse crossing may pose challenge from geotechnical perspective -further distance from well	-compatible with future development -watercourse crossing may pose challenge from geotechnical perspective

	Low Impact (most preferred)
	Low to Moderate Impact
	Moderate Impact
	Moderate to High Impact
	High Impact (least preferred)

PROPOSED IMPLEMENTATION PLAN

Proposed timeline for implementation of preferred solution is presented below.

CLASS ENVIRONMENTAL ASSESSMENT

Oct - Dec 2017	Completion of the Clythe Well Class EA and Conceptual Design

DETAILED DESIGN AND CONSTRUCTION

Jan – Jun 2018	Land acquisition, if required
Apr – Jul 2018	Environmental Field Studies
Jul 2018 – May 2019	Completion of detailed design drawings and specifications
Jun 2019	Tendering and contract award for construction
Jul 2019 – Dec 2020	Facility construction and commissioning

Appendix D:
Notice of Study Completion

Notice of Study Completion

First Nations Notification Letter Template

NOTICE OF STUDY COMPLETION

Schedule 'B' Class Environmental Assessment for Clythe Well treatment upgrades

Study objectives

The City of Guelph has completed a Municipal Class Environmental Assessment (EA) for proposed treatment upgrades to bring the Clythe well back into service. The City's Water Supply Master Plan (2014) identifies the need for additional water sources to support future demand. A study conducted in 2011 concluded that water from Clythe well can be successfully treated with existing technologies.

The study area includes the area surrounding the Clythe well, bound by the City's eastern limit, York Road, the area just west of Starwood Drive and Eastview Road (as shown in the map below). The preferred alternative is to construct a water treatment facility at 25 Watson Road, adjacent to the existing Clythe Well and Booster Station site, and associated water main upgrades to connect the treatment facility to the existing water system.

The process

Planning for this project has proceeded as a Schedule "B" undertaking in accordance with the Municipal Class Environmental Assessment process (MEA, June 2000, as amended in 2007 and 2011), prepared by the Municipal Engineers Association. The Class EA is an approved process under the Ontario Environmental Assessment Act and includes public and review agency consultation, an evaluation of alternatives, an assessment of potential environmental effects of the proposed alternatives, and identification of reasonable measures to mitigate any adverse impacts that may result.

A public open house was held on October 19, 2017 as part of the Class EA process and is documented in the Project File Report.

Project File Report

The Class EA Project File Report has been prepared, and documents the planning and evaluation process undertaken during the study. By this notice, the report is being placed on public record for a 30-calendar day review period starting March 29, 2018 and ending April 28, 2018 in accordance with the requirements of the Class EA. The Project File Report is available for public review on the City of Guelph website: **guelph.ca/clythe** or at the following locations:

ServiceGuelph, City Hall
1 Carden Street
Guelph, Ontario N1H 3A1
519-822-1260

Monday to Friday: 8:30 a.m. to 4:30 p.m.
Saturday and Sunday: Closed

Guelph Public Library—East Side Branch
1 Starwood Drive
Guelph, Ontario N1E 0H5
519-829-4405

Monday to Thursday: 9 a.m. to 8 p.m.
Friday to Saturday: 9 a.m. to 5 p.m.
Sunday: 1 p.m. to 5 p.m.

Comments

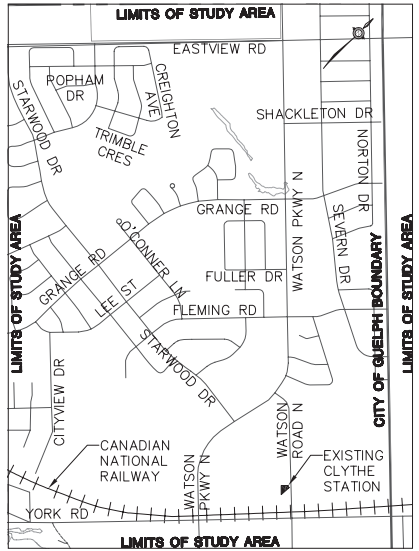
Written comments may be provided to the City of Guelph within 30-calendar days of the Notice of Completion. In the event concerns regarding this project cannot be resolved in discussion with the City, a person may request the Minister of the Environment and Climate Change make an order for the project to comply with Part II of the Environmental Assessment Act (referred to as a Part II Order), which addresses individual environmental assessments. Requests must be received by the Minister at the address below within 30-calendar days of the Notice of Study Completion being issued.

The Honourable Chris Ballard
Minister of the Environment and Climate Change
77 Wellesley Street West
Toronto, Ontario M7A 2T5
Fax 416-314-8452

Copies of the Part II Order requests must also be sent to the Director of the Environmental Approvals Branch at the Ministry of the Environment and Climate Change (MOECC) and the City of Guelph at the addresses below:

Attention: Ms. Kathleen O'Neill, Director
Environmental Approvals Branch
Ministry of the Environment and Climate Change
1st Floor, 135 St. Clair Avenue West
Toronto, Ontario M4V 1P5
EAASIBgen@ontario.ca

Robin Puskas, P. Eng.**,** Project Manager
Water Services
City of Guelph
1 Carden Street
Guelph, Ontario N1H 3A1
robin.puskas@guelph.ca



If you have any questions or concerns, please contact the following:

Robin Puskas, P. Eng.
Project Manager
Water Services
City of Guelph
1 Carden Street
Guelph ON N1H 3A1
519-822-1260 x 2195
robin.puskas@guelph.ca

Grant Parkinson, P. Eng.
Project Manager
GM BluePlan Engineering Limited
650 Woodlawn Road West, Unit C2
Guelph, ON N1K 1B8
519-824-8150
grant.parkinson@gmblueplan.ca

This Notice first issued on March 29, 2018.

Appendix E:
Stakeholder Correspondence

Correspondence Summary Table

City of Guelph Workshop Minutes

Agency Correspondence and Meeting Minutes

Public Comments and Correspondence

112041 - Clythe Treatment Class EA, City of Guelph
Agency Contact List

Mailing List

Salutation	First_Name	Last_Name	Suffix	Title	Organization	Department1	Address1	Address2	City	Province	Postal_Code	Email	Phone No.	Fax No.	Summary of Notices Sent	Via Email	Via Mail	Record of Correspondence
Federal Government Agencies																		
	DFO Contact			FPP Triage and Planning Office	Fisheries and Oceans Canada	Fisheries and Oceans Canada	3027 Harvester Road Suite 304 P.O. Box 85060		Burlington	Ontario	L7R 4K3	FisheriesProtection@dfo-mpo.gc.ca,	(855) 852-8320		Notice of Commencement 2017-08-30 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		Received automatic reply confirming receipt of Notice of Commencement email on Aug 30, 2017
Mr.	Rob	Dobos		Manager	Environment Canada	Environmental Assessment Section, Environmental Protection Operations Division, Ontario Region	867 Lakeshore Rd	P.O. Box 5050	Burlington	Ontario	L7R 4A6	rob.dobos@ec.gc.ca	905-336-4953		Notice of Commencement and Letter 2017-08-30 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		'Read' receipt received Aug 31, 2017 for Notice of Commencement email
Mr.	Tony	Chambers		Senior Counsel, Environment	Indigenous and Northern Affairs Canada	Legal Services	10 Wellington Street		Gatineau	Quebec	K1A 0H4	tony.chambers@aadnc-aandc.gc.ca	(819) 953-9552	(819) 994-4641	Notice of Commencement and Letter 2017-08-30 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		
Ms.	Hanna	Rogers		Director, Environment Directorate	Indigenous and Northern Affairs Canada	Lands and Economic Development	10 Wellington Street		Gatineau	Quebec	K1A 0H4	Hannah.Rogers@aadnc-aandc.gc.ca	(819) 997-9939		Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		
				Environmental Assessment Coordination	Indigenous and Northern Affairs Canada	Environment Unit, Lands Trusts Services	25 St Clair Avenue East	8th Floor	Toronto	Ontario	M4T 1M2	EACoordination_ON@aandc-aadnc.gc.ca			Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		
Mr.	Sunil	Bajaj		Manager	Indigenous and Northern Affairs Canada	Ontario Regional Office	25 St Clair Avenue East	8th Floor	Toronto	Ontario	M4T 1M2	Sunil.Bajaj@aandc-aadnc.gc.ca	(416) 954-4328		Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		
Provincial Government Agencies																		
Mr.	Mark	Smithson		APEP Supervisor, West Central Region	Ministry of the Environment and Climate Change	Air, Pesticides and Environmental Planning, West-Central Region Office	119 King Street West	12th Floor	Hamilton	Ontario	L8P 4Y7	mark.smithson@ontario.ca	(905) 521-7639	(905) 521-7820	Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		'Read' receipt received Aug 31, 2017 for Notice of Commencement email
Ms.	Barb	Slattery		Environmental Resource Planner/EA Coordinator	Ministry of the Environment and Climate Change	Air, Pesticides and Environmental Planning	119 King Street West	12th Floor	Hamilton	Ontario	L8P 4Y7	barbara.slattery@ontario.ca	(905) 521-7640	(905) 521-7820	Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		'Read' receipt received Aug 31, 2017 for Notice of Commencement email
Ms.	Kathleen	O'Neill		Director	Ministry of the Environment and Climate Change	Environmental Approvals Branch	135 St. Clair Avenue West	1st Floor	Toronto	Ontario	M4V 1P5	kathleen.oneill@ontario.ca			Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		'Read' receipt received Aug 31, 2017 for Notice of Commencement email
Ms.	Belinda	Koblik		Water Resources Supervisor (A)	Ministry of the Environment and Climate Change	West-Central Region Office	119 King Street West	12th Floor	Hamilton	Ontario	L8P 4Y7	belinda.koblik@ontario.ca	905-521-7615	905-521-7820	Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		Email response received Aug 31 to confirm receipt and indicate that Technical Staff will contact us soon for further information (copies to Jamie Connelly, Dan Dobrin, Barbara Slattery)
Ms.	Amy	Shaw		District Manager (A)	Ministry of the Environment and Climate Change	Guelph District Office	1 Stone Road West	4th Floor	Guelph	Ontario	N1G 4Y2	amy.shaw@ontario.ca	(519) 826-4258		Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		
Ms.	Corinne	Taylor		Water Inspector	Ministry of the Environment and Climate Change	Guelph District Office	1 Stone Road West		Guelph	Ontario	N1G 4Y2	corinne.taylor@ontario.ca	(519) 826-4787		Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		Email response received Aug 31 indicating she would like to kept informed on project updates
Mr.	Peter	Brown		Aboriginal Consultation Advisor	Ministry of the Environment and Climate Change		135 St. Clair Avenue West	1st Floor	Toronto	Ontario	M4V 1P5	peter.brown@ontario.ca	416-326-9608		Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		
Ms.	Carol	Neumann		Rural Planner	Ministry of Agriculture, Food and Rural Affairs (OMAFRA ELORA RESOURCE CENTRE UNIT)	Food Safety and Environmental Policy Branch	6484 Wellington Road 7 Unit 10		Elora	Ontario	N0B 1S0	carol.neumann@ontario.ca	519-846-0941	519-846-8178	Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		'Read' receipt received Aug 31, 2017 for Notice of Commencement email
Mr.	Joe	Muller		Heritage Planner	Ministry of Tourism, Culture and Sport	Culture Services Unit, Programs and Services Branch	401 Bay Street	Suite 1700	Toronto	Ontario	M7A0A7	general_info@mtc.gov.on.ca, Joseph.muller@ontario.ca	416-326-9326, 416-314-7145	416-314-7854	Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		
Mr.	Scott	Oliver		Manager (A), Community Planning and Development	Ministry of Municipal Affairs	Western Municipal Services Office	659 Exeter Road	2nd Floor	London	Ontario	N6E 1L3	scott.oliver@ontario.ca	(519) 873-4033		Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		
Ms.	Erin	Cotnam		Regional Planning Coordinator	Ministry of Natural Resources and Forestry	Southern Region Office	300 Water Street, Box 7000	4th Floor	Peterborough	Ontario	K9J 8MS	erin.cotnam@ontario.ca	705-755-3215		Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		
Mr.	David	Marriott		District Planner	Ministry of Natural Resources and Forestry	Guelph District Office	1 Stone Road West		Guelph	Ontario	N1G 4Y2	david.marriott@ontario.ca	(519) 826-4926		Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		
Mr.	Michael	Nadeau		Regional Manager	Ministry of Transportation	West Region	659 Exeter Road		London	Ontario	N6E 1L3	Michael.nadeau@ontario.ca	519-873-4373		Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		
Ms.	Rachael	Manson-Smith		Manager (A)	Ministry of Indigenous Relations and Reconciliation	Ministry Partnership Unit	160 Bloor Street East	4th Floor	Toronto	Ontario	M7A 2E6	maa.ea.review@ontario.ca	416-325-7032		Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		
Municipal Government and Local Agencies																		
Mr.	Ian	Roger		CAO	Township of Guelph-Eramosa		8348 Wellington Road 124 P.O. Box 700	P.O. Box 3000	Rockwood	Ontario	N0B 2K0	iroger@get.on.ca	519-856-9951 ext. 105	(519) 856-2240	Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		'Read' receipt received Aug 31, 2017 for Notice of Commencement
Ms.	Gaetanne	Kruse		Planning Administrator	Township of Guelph-Eramosa		8348 Wellington Road 124 P.O. Box 700		Rockwood	Ontario	N0B 2K0	gkruse@get.on.ca	519-856-9951 ext. 112	(519) 856-2240	Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		
Mr.	Corey	Woods		Councillor, Chairperson Guelph-Eramosa Heritage Committee, c/o Amanda Knight, Acting Clerk	Township of Guelph-Eramosa		8348 Wellington Rd, P.O. Box 3000		Rockwood	Ontario	N0B 2K0	aknight@get.on.ca	519-856-9596x125	519-856-2240	Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		
Mr.	Stan	Denhoed	P.Geo.	Hydrogeologist	Township of Puslinch	4622 Nassagaweya-Puslinch Townline Road	RR #1		Moffatt	Ontario	L0P 1J0	sdenhoed@hardenv.com	519-826-0099	519-826-9099	Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		
Ms.	Karen	Landry		CAO/Clerk	Township of Puslinch		7404 Wellington Road 34	RR #3	Puslinch	Ontario	N0B 2J0	klandry@puslinch.ca	(519) 763-15226		Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		Received response Sept 7, 2017 that Karen would like to be kept on mailing list, as the Township is interested in source protection polices within wellhead protection areas for Clythe Well within Township.
Mr.	Aldo	Salis		Director of Planning	County of Wellington		74 Woolwich Street		Guelph	Ontario	N1H 3T9		(519) 837-2600		Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29		x	
Mr.	Gord	Ough	P.Eng.	County Engineer	County of Wellington		74 Woolwich Street		Guelph	Ontario	N1H 3T9		(519) 837-2600		Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29		x	
Mr.	Kyle	Davis		Risk Management Official	Township of Centre Wellington	Wellington Source Water Protection	7444 Wellington Road 21		Elora	Ontario	N0B 1S0	Kdavis@centrewellington.ca	519-846-9691 x362		Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		Received email on Sept 1 indicating that they were interested in receiving project updates as they are responsible for implementing source water protection policies within wellhead protection areas for Clythe (not on original mailing list).
Ms.	Jennifer	Passy	BES, MCIP,	Manager of Planning	Upper Grand District School Board		500 Victoria Road North		Guelph	Ontario	N1E 6K2	Jennifer.Passy@ugdsb.on.ca	519-822-4420 ext. 820 Cell : 519-766-3418	519 822-2134	Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		Received response via email on Oct 12, 2017 to confirm that UGDSB wants to be included on mailing list
Ms.	Tracy	McLennan		Superintendent of Corporate Services and Treasurer	Wellington Catholic School Board		75 Woolwich Street	P.O. Box 1298	Guelph	Ontario	N1R 5W6	tracy.mclennan@wellingtoncdsb.ca	519-821-4640x229		Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		'Read' Receipt received Aug 31, 2017 for Notice of Commencement
Mr.	Shawn	Zentner		Manager, Health Protection	Wellington Dufferin Guelph Public Health	Health Protection Division	600 Southgate Drive		Guelph	Ontario	N1G 4P6	shawn.zentner@wdgpublichealth.ca	519-846-2715		Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		
Ms.	Stacy	Cooper		Executive Officer	Guelph and District Home Builders Association		7 Clair Road W	PO Box 27075	Guelph	Ontario	N1L 0A6	guelph.homebuilders@gmail.com	519-836-8560		Notice of Commencement and Letter 2017-09-5 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		'Read' receipt received Sept 5, 2017 for Notice of Commencement
Ms.	Kim	Hannah		President	Guelph and District Real Estate Board		400 Woolwich Street		Guelph	Ontario	N1H 3X1	info@gdar.ca			Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		
Mr.	Kithio	Mwanzia		President and CEO	Guelph Chamber of Commerce		111 Farqhar Street	2nd Floor	Guelph	Ontario	N1H 3N4	Kithio@guelphchamber.com	519-822-8081	519-822-8451	Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		
GRCA																		
Ms.	Liz	Yerex		Resource Planner	Grand River Conservation Authority		400 Clyde Road Box 729		Cambridge	Ontario	N1R 5W6	lyerex@grandriver.ca	519-621-2763 x2236	Fax: 519-621-4945	Notice of Commencement and Letter 2017-08-31	x		After follow-up calls, determine Liz Yerex is not current contact. Jason Wagler is correct contact.
Mr.	Jamie	Ferguson		Resource Planner	Grand River Conservation Authority		400 Clyde Road Box 729		Cambridge	Ontario	N1R 5W6	jferguson@grandriver.ca	519-621-2763 x2238	Fax: 519-621-4945	Notice of Commencement and Letter 2017-08-31	x		After follow-up calls, determine Jamie Ferguson is not current contact. Jason Wagler is correct contact.
Mr.	Jason	Wagler	MCIP, RPP	Resource Planner	Grand River Conservation Authority		400 Clyde Road		Cambridge	Ontario	N1R 5W6	jwagler@grandriver.ca	519-621-2763 x2320		Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		Contact Jason Sept 15, 2017 to set up meeting to review preliminary site alternatives and considerations from the GRCA's perspective. Meeting is held on Sept 27, 2017. Minutes included in Project File Report appendices
Utility Companies																		

Salutation	First_Name	Last_Name	Suffix	Title	Organization	Department1	Address1	Address2	City	Province	Postal_Code	Email	Phone No.	Fax No.	Summary of Notices Sent	Via Email	Via Mail	Record of Correspondence
Mr.	Shawn	Art		Utility Services Manager	Union Gas		10 Surrey Street East		Guelph	Ontario	N1H 3P5				Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29		x	
Mr.	Brian	Hancocks			Rogers Cable		85 Grand Crest Place PO Box 488	85 Grand Crest Place	Kitchener	Ontario	N2G 4A8				Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29		x	
Mr.	Hassan	Hamzeh		Supervising Network Management Engineer	Hydro One Networks	Asset Management	483 Bay Street	TCT15-A11, North Tower	Toronto	Ontario	M5G 2P5	hassan.hamzeh@hydroone.com	18773456799		Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		
Mr.	Dean	Kingswell		Engineering Technician	Guelph Hydro		395 Southgate Drive		Guelph	Ontario	N1G 4Y1	dkingswell@guelphhydro.com	519-822-7150 ext. 2235	519-822-4963	Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		Received 'read' reply Sept 5 for Notice of Commencement email
Community Groups																		
Ms.	Kiran	Bhattarai		Speed River Project Coordinator	Ontario Public Interest Research Group (OPIRG)		One Trent Lane	University of Guelph	Guelph	Ontario	N1G 2W1	opirg@uoguelph.ca	519-824-2091		Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		
Dr.	Robert	Corry		Director	Centre for Land and Water Stewardship	SEDRD, Ontario Agricultural College	50 Stone Road East	University of Guelph	Guelph	Ontario	N1G 2W1	claws@uoguelph.ca, rcorry@uoguelph.ca	519-824-4120 x58034		Notice of Commencement and Letter 2017-08-30 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		'Read' receipt received Aug 30, 2017 for Notice of Commencement email
Mr.	Chris	Willard		Executive Director	Guelph Community Foundation		46 Cork Street East		Guelph	Ontario	N1H 2W8	info@guelphcf.ca	519-821-9216		Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		Email 'read' received from Ishita Ghose for Notice of Commencement email
Ms.	Dominica	McPherson		Neighbourhood Support Work	Grange Hill Community Group		525 Grange Road		Guelph	Ontario		info@gheng.ca	519-836-9427		Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		
Ms.	Marnie	Benson		Conservation Coordinator	Nature Guelph (Formerly Guelph Field Naturalists)		36B London Road, W.		Guelph	Ontario	N1H 2B5	conservation@natureguelph.ca	519-830-4412		Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		Reply received to update contact info (formerly Jenn Bock). Marnie would like to receive further project updates and plans to comment once Project File Report is released.
					Guelph Historical Society		100 Crimea Street	Unit A102	Guelph	Ontario	N1H 2Y6		519-821-6191		Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29		x	
Adjacent Landowners																		
Mr.	Wesley	Logan		Acting General Manager	Goderich Exeter Railway		101 Shakespeare St	Unit 2	Stratford	Ontario	N5A 3W5	Wesley.logan@railamerica.com Randy.taylor@railamerica.com	519-272-4705 x2		Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		
Mr.	Jason	Ryan		Manager, Environmental Programs and Assessment	Metrolinx		20 Bay Street		Toronto	Ontario	M5J 2W3	Jason.Ryan@gotransit.com	416-202-4895		Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		
Mr.	Narciso	Cancian			De Lido Construction Ltd (C/O Fabio Holdings)	Owner of 0 Watson Rd	1963 Avenue Road	Suite 200	Toronto	Ontario	M5M 4A3	n/a	n/a		Notice of Open House and Letter 2017-10-13, Follow-up Letter on 2017-11-21 Notice of Completion 2018-03-29		x	First letter and notice couriered on October 13, 2017 was sent back UNDELIVERABLE to Yonge St address. Updated letter to revised address on Avenue Rd couriered on November 21, 2017 and confirmation of receipt received.
Mr.	Robert	Nespolo			LabWare	Owner of 0 Watson Rd						nespolo@labware.com	302-830-9159		Notice of Completion 2018-03-29	x		Received email from Robert indicating he had read letter addressed to Narciso Cancian, and was a partial owner of the property. The City of Guelph has contacted him directly via phone to discuss the project.
Mr.	Barry	Sklar		President	High Point Realty	Real Estate Agent for 0 Watson Rd (son of Ruth Sklar, owner of property)	1963 Avenue Road	Suite 200	Toronto	Ontario	M5M 4A3	n/a	416-480-1606 (land), 416-786-0002 (cell)	416-480-1102	Notice of Completion 2018-03-29		x	Barry received letter that was addressed to Narciso Cancian (same address), and City of guelph has contacted him directly to discuss project.
Mr.	Mark	Vandoodewaard		Loblaw Properties Limited	re. 115 Watson Parkway North (formerly 72 Watson Road North)		1 President's Choice Circle		Brampton	Ontario	L6Y 5S5	mark.vandoodewaard@loblaw.ca	905-861-2160 (Mark), 905-459-2500 ext. 613784 (assistant)		Notice of Open House and letter 2017-10-13 Notice of Completion 2018-03-29		x	Notice couriered on Oct 13, 2017 (to old address), no mail to new address as of Jan 10, 2018
Member of Parliament																		
Mr.	Lloyd	Longfield			M.P.	City of Guelph		40 Cork Street East	Guelph	Ontario	N1H 2W8	LLOYD.LONGFIELD@PARL.GC.CA			Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		
Ms.	Liz	Sandals			M.P.P.	City of Guelph	173 Woolwich St	Suite 102	Guelph	Ontario	N1H 3V4	lsandals.mpp.co@liberal.ola.org			Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29	x		Responded by email on Sept 11; requested to be kept up-to-date on study notices/updates.

112041 - Clythe Treatment Class EA, City of Guelph
Public Contact List
Mailing List

Salutation	First_Name	Last_Name	Title	Organization	Address	City	Province	Postal_Code	Email	Phone No.	NOTES/RESPONSES
Public Contacts											
Ms.	Victoria	MacPhail	PhD Candidate								Sent email questions on Oct 11, City/GMBP responded Oct 12. Victoria asked to be on contact list on Oct 13, and was added. Sent Notice of Completion 2018-03-29
Mr.	Peter	Hannam	Resident / farmer / business owner in Woolwich Township								Left voicemail with City on Oct 18, and requested he be added to mailing list for Class EA and receive updates on project. Sent Notice of Completion 2018-03-29
Dr.	Hugh	Whiteley	Professor								Sent email to City on Oct 19, 2017 with questions related to impact of Eastview landfill leachate on Clythe well, and wetland impacts of returning well to service. Email response sent from GMBP/City on Nov 21, 2017 to address concerns. Reply from Hugh received Dec 7, 2017 requesting further clarification. Sent Notice of Completion 2018-03-29
Mr.	Ron	Sinclair	Resident / farmer in Woolwich Township								Expressed concern regarding impact of returning well to service on 1) his Nutrient Management Plan requirements and 2) his private well flows. Responded to his concerns via email on November 21, 2017, and requested information on Ron's existing well. Sent Notice of Completion 2018-03-29
Mr.	Paul	Blake	City resident								Attended public open house and asked to be on mailing list. Sent Notice of Completion 2018-03-29
Ms.	Lynda	Walters	City resident								Attended public open house and asked to be on mailing list. Sent Notice of Completion 2018-03-29
Ms.	Jane	Cabral	City resident								Attended public open house and expressed a preference for water treatment facility to be located outside of a public park. Sent Notice of Completion 2018-03-29

112041 - Clythe Treatment Class EA, City of Guelph
First Nations Contact List
Mailing List

Salutation	First_Name	Last_Name	Suffix	Title	Organization	Department1	Address1	Address2	City	Province	Postal_Code	Email	Phone No.	Summary of Notices Sent	Via Email	Via Mail	Record of Corresopndence
Aboriginal Contacts																	
Mr.	Lonny	Bomberry		Lands and Resources Director	Six Nations of the Grand River	Land & Resources Department	2498 Chiefswood Road	P.O. Box 5000	Ohsweken	Ontario	N0A 1M0	lonnybomberry@sixnations.ca	519-753-0665	Notice of Commencement and Letter 2017-09-15 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29 and Letter and E-copy of Project File Report	x		Phone call to notify of study and confirm correct contact on Aug 28, 2018. 'Read' receipt received Sept 15, 2017 for Notice of Commencement
Chief	Ava	Hill			Six Nations of the Grand River		2500 Chiefswood Road	P.O. Box 5002	Ohsweken	Ontario	N0A 1M0	avahill@sixnations.ca	(519) 445-2201	Notice of Commencement and Letter 2017-09-15 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29 and Letter and E-copy of Project File Report	x		Phone call to notify of study and confirm correct contact on Aug 28, 2018.
					Haudenosaunee Development Institute		16 Sunrise Court, Suite 417	P.O. Box 714	Ohsweken	Ontario	N0A 1M0	hdi2@bellnet.ca	519-445-422	Notice of Commencement and Letter 2017-09-15 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29 and Letter and E-copy of Project File Report	x		Phone call to notify of study and confirm correct contact on Aug 28, 2018.
Ms.	Fawn	Sault		Consultation Manager	Mississaugas of the New Credit First Nation	Department of Consultation and Accomodation	6 First Line Road, Unit 1	RR #6	Hagersville	Ontario	N0A 1HO	fawn.sault@newcreditfirstnation.com	(905) 768-4260	Notice of Commencement and Letter 2017-08-31 Notice of Open House 2017-10-11 Notice of Completion 2018-03-29 and Letter and E-copy of Project File Report	x		Phone call to notify of study and confirm correct contact on Aug 28, 2018. Specifically requested to be informed of all City of Guelph jobs. 'Read' receipt received Aug 31, 2017 for Notice of Commencement
Chief	Stacey	LaForme			Mississaugas of the New Credit First Nation		2789 Mississauga Road	RR #6	Hagersville	Ontario	N0A 1H0	Stacey.Laforme@mncfn.ca	519-768-1133	Notice of Open House 2017-10-11 Notice of Completion 2018-03-29 and Letter and E-copy of Project File Report	x		'Phone call to notify of study and confirm correct contact on Aug 28, 2018.

March 29, 2018
Our File: 112041

<Group Name>
<Department>
<Address>

Attention: <Name>,
<Position>

Re: City of Guelph Schedule 'B' Class Environmental Assessment for Clythe Well Treatment Upgrades – Notice of Study Completion

Dear <Name>,

The City of Guelph has completed a Schedule 'B' Municipal Class Environmental Assessment (Class EA) study for proposed treatment upgrades to bring the Clythe Well back into service.

This letter is to inform you that the Project File Report is now available for your review, which documents the planning and evaluation process undertaken during the study and the preliminary recommendation to construct a water treatment facility at 25 Watson Road North in the City of Guelph. The publically issued Notice of Completion and Project File Report are attached to this letter for your reference and convenience.

The Class EA is an approved process under the Ontario Environmental Assessment Act and includes stakeholder consultation, an evaluation of alternatives, an assessment of potential environmental effects of the proposed alternatives, and identification of reasonable measures to mitigate any adverse impacts that may result. A public Open House was held on October 19, 2017 as part of the Class EA process and is documented in the Project File Report.

We would like to give you a further opportunity to comment on this study, and provide valuable input. This may be in the form of written comments, an in-person meeting or an alternative format per your preference. To provide comments or arrange a meeting, please contact Robin Puskas at the City of Guelph or Grant Parkinson at GM BluePlan whose contact information is below. If you have no comments on the study, we kindly request that you indicate this in writing to one of the contacts below.

Robin Puskas, P. Eng.
Project Manager
City of Guelph Water Services
1 Carden Street
Guelph, ON N1H 3A1
Tel: 519-822-1260 X 2195
Email: robin.puskas@guelph.ca

Grant Parkinson, P. Eng.
Project Manager
GM BluePlan Engineering Limited
650 Woodlawn Road West – Unit C2
Guelph, ON N1K 1B8
Tel: 519-824-8150
Email: grant.parkinson@gmblueplan.ca

On behalf of the City of Guelph,

<insert signature here>

Grant Parkinson, P. Eng.
GM BluePlan Engineering Limited

cc Robin Puskas, P.Eng., Project Manager, City of Guelph - Water Services
Patty Quackenbush, P.Eng., City of Guelph – Water Services
Laura Verhaeghe, P.Eng, GM BluePlan Engineering

CITY OF GUELPH PROJECT No. 12-066
CLYTHE WELL TREATMENT CLASS EA
EVALUATION OF ALTERNATIVES WORKSHOP
Our File: 112041

DATE: July 10, 2017

LOCATION: City of Guelph Waterworks
29 Waterworks Place, Guelph, ON
Waterworks Boardroom

ATTENDEES: Dave Belanger (DB), City of Guelph (City), Water Services
Chris Garcia (CG), City, Water Services
John-Paul Palmer (JPP), City, Water Services
Matt Phillips (MP), City, Water Services
Robin Puskas (RP), City, Water Services
Patty Quackenbush (PQ), City, Water Services
Emily Stahl (ES), City, Water Services
Arun Hindupur (AH), City, Engineering Services
Mary Angelo (MA), City, Engineering Services
Tiffany Hanna (TH), City, Park Planning
April Nix (AN), City, Planning, Building and Urban Design
Grant Parkinson (GP), GM BluePlan Engineering (GMBP)
Laura Verhaeghe (LV), GMBP

REGRETS: Kier Taylor, City, Water Services
Bryce McDonald, City, Water Services
Tim Donegani, City, Planning, Building and Urban Design
Laura Catalano-Bragues, City

COPIES TO: All Attendees

ACTION BY:

Introduction and Project History

1) Attendees introduced themselves. GP provided a summary of the project history, justification and objectives. It was noted that this project to bring Clythe well back into service was identified in the most recent Water Supply Master Plan for early implementation. DB noted that although the Water and Wastewater Servicing Plan (2014) estimated date for completion of treatment upgrades for the Clythe Well as 2020, the City's preference is to proceed with this work as soon as possible. — INFO

ACTION BY:

Long List of Alternatives and Screening

2) It was decided to carry forward Watson Road Loblaws site (Alternative 8) that had been previously screened out. MA indicated the development plans were still at a preliminary stage, and Loblaws may not develop this site. Land use is not confirmed. There may be an opportunity to use a portion of this site for a treatment facility. AN will determine if development of this site for water treatment in is line with planning policy and objectives. — AN

Preliminary Evaluation of Alternatives

3) **Alternative 1: Existing Clythe Well Site** — INFO

- Regarding constructability, JPP noted that it may be possible to supply Zone 2 from the west if Clythe booster pumps are shut down temporarily for construction. However, there is limited redundancy in E-W conveyance within the distribution system, introducing risk to this approach.
- JPP suggested converting existing reservoir at Clythe station to a dry well with in-line pumping to avoid double-pumping of Zone 1 supply. GP noted that due to very restricted space available at the Clythe facility, this approach would have limited constructability.
- AN noted that Clythe Station Site is no longer designated an 'Aggregate Resource Area' in the Official Plan. This designation should also be removed for Alternatives 2 and 3.
- There are no current plans to close Watson Road; it will be upgraded and urbanized. Shutdown during construction may still be possible.

4) **Alternative 2: Watson Road Industrial**

- Civic address 0 Watson Road N
- Property is currently for sale and listed at ~$1.5 million.
- Although this property is currently designated industrial in the official plan and has a draft plan of subdivision (industrial type) approved by the City, owner has requested designation be changed to residential. City Planning is currently working to implement new provincial planning policies which include changes to requirements for designation of commercial and employment lands. Changes will likely take 3 – 5 years to implement. Such changes may impact City's ability to change designation of 0 Watson Road from Industrial to Residential. Owner may request change in designation to residential as a condition of property severance/sale, or may hold off sale until designation can be changed. — AN
- Industrial lands are also referred to as "Employment Lands" and the City is making effort to increase the proportion of employment lands in the overall City footprint. Removal of a portion of industrial land for public utilities may require some form of compensation elsewhere in the City.
- If land is appropriated by the City, the City would be responsible for developing and servicing the site. Appropriation process can be lengthy, and is not preferred.
- There is likely interest from other City departments to utilize site for multiple purposes (ex. Sports field, public works yard etc.) if entire site is purchased.

ACTION BY:

5) Alternative 3: Watson Road Residential

- Civic address 18 Watson Road N
- Informal discussions with landowner have been completed by City's Property department, and owner is asking for $3million or more.
- Further formal negotiations are preferred to better establish financial cost of this option and feasibility. — City (RP)

6) Alternative 4: Eastview Open Space

- Developer of another site in Guelph is in discussions with City Parks and Planning departments to use Eastview Open Space for tree compensation (i.e. reforestation). This is likely compatible with treatment facility use, as total available meadowland area is large.

7) Alternatives 5, 6 and 7: Joe Veroni, Severn and Grange Road Parks

- Parks were selected as potential treatment plant sites, as the City already owns this land.
- TH expressed concern over use of parkland, particularly in new residential subdivisions. Significant public opposition is anticipated.
- Open space in parks is used for recreation, and is not necessarily available for development.
- Official plan includes land use designations for parks; removing a portion of park land for Public Utilities may lead to overall deficit of parkland.
- AN will inquire about coordination of shared land use in parks with Planning Department. — AN
- Scores for park options should be reduced, as impact would likely be greater than originally projected, despite proposed added beneficial use (ex. Washrooms, splash pad, water tap, skating rink etc.). — GMBP
- Grange Road Park would likely have lower impact to park use, compared to Joe Veroni and Severn, as proposed facility location does not use large open space, and is more isolated from other park areas.

8) Evaluation Criteria and Method

- Criteria category 'Land Use Planning' is primarily related to availability of property, and title should be changed to be more specific. 'Land Availability' was suggested for clarity — GMBP
- AN commented that conformance with Official Plan is related to other categories including 'Natural Environment' and 'Social and Cultural Environment', and score for adherence to planning policies should consider these other factors.
- Project File Report must clearly describe how preferred alternative is in conformance with the City's Official Plan
- City's preference is to use Qualitative ranking, rather than weighting and quantitative scores. GMBP will adjust scoring system accordingly for the upcoming PIC. — GMBP

<u>Implementation Plan and Related Projects</u>

9) Any alternatives that require water crossings would require Department of Fisheries and Oceans approval during detailed design, and should be noted as such in the Project File Report. Crossings include Clythe Creek for Alternatives 4, 5, 7 and 8, and Clythe Creek and Watson Creeks for Alternative 6. — GMBP

10) Some Species-At-Risk are found in Guelph; consultation with MNR may be required pending — GMBP

		ACTION BY:
	outcome of Natural Heritage Evaluation.	
11)	Site plan approval and building permit will be required for detailed design. All natural environment studies, tree preservation plans etc. will be submitted for City's review under Site Plan Approval process. Approval requirements will be noted in the Project File Report.	GMBP
12)	The culvert under Watson Road at the Clythe Creek crossing needs to be replaced, and an amphibian crossing structure is planned. Need to consider coordination of construction if raw watermain will run under this culvert (alternatives 4, 5, 6, 7 and 8).	GMBP
13)	Planned upgrades to east-west transmission main along Speedvale Avenue will reduce criticality of Clythe. Completion of that project is expected in 2019.	INFO
	Next Steps	
14)	Proceed with Archeological Assessment Stage 1 of entire study area, and desktop Natural Heritage Evaluation for all alternative sites.	GMBP
15)	Update evaluation matrix based on feedback from today's workshop.	GMBP
16)	Plan to confirm preliminary preferred site for Public Information Centre by late August once more information is available from Planning Department and studies are complete.	

These minutes have been prepared by the undersigned. If there are any errors or omissions in these minutes, please contact the author as soon as possible.

GM BLUEPLAN ENGINEERING LIMITED
Per:

Laura Verhaeghe, P.Eng.
Project Engineer

CITY OF GUELPH - PROJECT No. 12-066
CLASS EA AND CONCEPTUAL DESIGN FOR CLYTHE WELL
WORKSHOP ATTENDEES

Time: Monday July 10, 2017 at 1:00 pm.
Place: Woods Station, Main Board Room

Name	Organization/Department	E-mail
1. Patty Quackenbush	Water Services	patricia.quackenbush@guelph.ca
2. Dave Belanger	Water Services	Dave.Belanger@guelph.ca
3. Matt Phillips	Water Services	matthew.phillips@guelph.ca
4. Arun Hindupur	Engineering Services	arun.hindupur@guelph.ca
5. Tiffany Hanna	Park Planning	tiffany.hanna@guelph.ca
6. Mary Angelo	Engineering	mary.angelo@guelph.ca
7. APRIL NIX	Planning, Building + Urban Design	april.nix@guelph.ca.
8. John-Paul Palmer	Water Services	john-paul.palmer@guelph.ca
9. Robin Puskas	Water Services	robin.puskas@guelph.ca.
10. CHRIS GARCIA	CITY OF GUELPH, WATER SUS.	chris.garcia@guelph.ca

Name	Organization/Department	E-mail
11. Emily Stahl	Cofs - Wat Servs.	emily.stahl@guelph.ca
12.		
13.		
14.		
15.		
16.		

CITY OF GUELPH PROJECT No. 12-066
CLYTHE WELL TREATMENT CLASS EA
MEETING with GRCA
Our File: 112041

DATE: September 27, 2017

TIME: 2:00 to 3:00 pm

LOCATION: GRCA Office
400 Clyde Road, Cambridge

ATTENDEES: Robin Puskas (RP), City, Water Services
Patty Quackenbush (PQ), City, Water Services
Jason Wagler (JW), GRCA
Grant Parkinson (GP), GM BluePlan Engineering (GMBP)
Laura Verhaeghe (LV), GMBP

COPIES TO: All Attendees

ACTION BY:

1) Meeting Objective — INFO

The objective of this meeting was to obtain initial feedback and recommendations from Grand River Conservation Authority (GRCA) regarding our preliminary short list of preferred sites.

2) Project Background — INFO

GP provided a summary of the project history, justification and objectives. Clythe Station serves 2 functions; a booster station from Zone 1 and Zone 2, and as a water supply source. The well was taken out of service several years ago due to aesthetic water quality issues related to taste and odour from naturally-occurring sulphides. However, the station continues to operate as a booster station. It was noted that this project to bring Clythe Well back into service was identified in the most recent Water Supply Master Plan for early implementation. Bringing the well back into service requires construction of a treatment facility. Since the existing site is not large enough to accommodate a treatment facility, and taking the booster station off-line for an extended period during construction would be problematic, a process of site identification and evaluation has become a core component of this EA.

The EA is currently at the stage where local sites in the Study Area have been identified for evaluation and a preliminary short list of sites has been established based a comprehensive evaluation matrix. Sub-consultant studies have been completed for archaeological (ASI) and natural heritage (NRSI) features in the Study Area. We are preparing to conduct a Public Information Centre (PIC) within the next month and would like some initial feedback on comments from GRCA prior to the PIC to ensure GRCA comments are taken into consideration before going to the public.

ACTION BY:

GMBP sent a copy of the NRSI report to JW for his review. Currently, preliminary preferred sites include Site 2 : O Watson Road N., a vacant industrial-zoned property, and Site 8 : 115 Watson Road N..

3) GRCA General Requirements

INFO

It is a general requirement of GRCA when reviewing land development plans that development should not impact the ecological or hydrological function of natural features such as existing water courses and wetlands. Development could occur within a wetland buffer subject to conditions and mitigation measures that would be defined on a site-specific basis. Two (2) of the preferred sites are located in proximity to Clythe Creek and associated wetlands.

JW indicated that Clythe Creek is managed as a "cold" watercourse since it is predominately fed by groundwater, although it is technically designated a "cool" watercourse. Construction timing windows to protect fisheries would be based on classification as a "cool" watercourse.

JW noted that GRCA does not require a Permit to install boreholes within a wetland but does for test pits.

4) City of Guelph General Requirements

CITY

City of Guelph has policies that only allow linear infrastructure within a wetland buffer. The City will confirm that a roadway plus services is acceptable.

5) Species at Risk and Significant Wildlife Habitats

INFO

Species at Risk (SAR) and Significant Wildlife Habitats (SWH) are typically under the jurisdiction of the Ministry of Natural Resources and Forestry (MNRF). City of Guelph also has policies to deal with these issues. It was also noted that it is typically MNRF that defines construction timing windows to protect fisheries.

6) Site 2 – 0 Watson Road N.

GMBP

Most of the site is located within the GRCA regulation limit. The NRSI report identified a wetland along the north side of the site and the developable area beyond. The proposed treatment facility would be located entirely outside the floodplain and the wetland buffer. However, a portion of the access road to the site would pass through the wetland buffer, although not within the wetland itself. The wetland buffer was delineated based on existing high-level mapping. It was noted that a grassed access road is existing. This is the only access from Watson Road into the site and any development of the site would require an access road. Consequently, GRCA recommends a targeted investigation to identify the wetland boundary more precisely in the field to verify the extent of encroachment into the wetland buffer. It was noted that the timing window for flagging a wetland generally closes in mid to late October.

ACTION BY:

7) Site 8 – 115 Watson Road N.

Approximately half of this site is located within the GRCA regulation limit, but only a tiny portion is within the wetland buffer. A key consideration for this site is that a pipeline crossing of Clythe Creek would be required. The pipeline would be installed using trenchless methods, however the access pits at each end would be located with the wetland buffer. Potential impacts would only be during construction and proper restoration would bring the area back to existing conditions within a short period following construction. There would be temporary impacts during construction for this site as well as risk of frack-out (loss of drilling fluids) during construction of the pipeline crossing. JW indicated less concern with respect to the wetland for a potential creek crossing if the watermain alignment is maintained within an existing road allowance (ROW) or utility corridor.

INFO

8) Next Steps

The City intends to proceed with a PIC in mid to late October and complete the EA by the end of 2017. If there are further site-specific studies required by regulatory agencies such as GRCA, these would be completed during the detailed design stage after completion of the EA. Wetland boundary flagging will be completed by the City in the short term to confirm impacts of each site alternative prior to completing the EA.

GMBP/CITY

9) Summary

Based on our discussions and his initial review of available information, JW did not see any "show stoppers" that would have Site 2 or Site 8 being rejected outright by GRCA as a potential site for development of a public water supply facility, subject to site-specific considerations and potential mitigation measures.

ALL

The Project team will need to compare short-term impacts of a water crossing (e.g. dewatering; potential for frac-out; wetland impacts) to long-term impacts resulting from permanent infrastructure (access road plus services) within a wetland boundary.

GMBP

These minutes have been prepared by the undersigned. If there are any errors or omissions in these minutes, please contact the author as soon as possible.

GM BLUEPLAN ENGINEERING LIMITED
Per:

Grant Parkinson

Grant Parkinson, P.Eng.
Project Manager

Laura Verhaeghe - GM BluePlan

From: Ackerman, R. Neil <neil.ackerman1@bell.ca>
Sent: Tuesday, September 05, 2017 3:48 PM
To: Laura Verhaeghe - GM BluePlan
Cc: Grant Parkinson - GM BluePlan
Subject: RE: Clythe Well Treatment Class EA, City of Guelph - Notice of Commencement

Remove me please.

Bell

Neil Ackerman
Guelph-Rockwood,Acton & Breslau
Specialist - Network Provisioning

F1-575 Riverbend Drive
Kitchener, Ontario
N2K 3S3
P 519.568.5797
C 226.750.5389
neil.ackerman1@bell.ca

From: Laura Verhaeghe - GM BluePlan [mailto:Laura.Verhaeghe@gmblueplan.ca]
Sent: Tuesday, September 05, 2017 2:53 PM
To: Ackerman, R. Neil
Cc: Grant Parkinson - GM BluePlan
Subject: RE: Clythe Well Treatment Class EA, City of Guelph - Notice of Commencement

Neil,

Thank you for your reply. Would you like to continue receiving updates in relation to this study, or would you prefer to be removed from our mailing list?

Best Regards,

Laura Verhaeghe, P.Eng.
Project Manager

GM BluePlan Engineering Limited
650 Woodlawn Road West, Block C, Unit 2 | Guelph ON N1K 1B8
t: 519.824.8150 | c: 226.500.4771
laura.verhaeghe@gmblueplan.ca | www.gmblueplan.ca

From: Ackerman, R. Neil [mailto:neil.ackerman1@bell.ca]
Sent: Tuesday, September 05, 2017 11:34 AM
To: Laura Verhaeghe - GM BluePlan
Subject: FW: Clythe Well Treatment Class EA, City of Guelph - Notice of Commencement

Hi Laura

We have no comments to add.

Neil Ackerman
Guelph-Rockwood,Acton & Breslau
Specialist - Network Provisioning

F1-575 Riverbend Drive
Kitchener, Ontario
N2K 3S3
P 519.568.5797
C 226.750.5389
neil.ackerman1@bell.ca

From: Boulton, Bradley
Sent: Tuesday, September 05, 2017 10:18 AM
To: Ackerman, R. Neil
Subject: FW: Clythe Well Treatment Class EA, City of Guelph - Notice of Commencement

FYI

Brad Boulton
Network Planning Consultant
Bell Canada
575 Riverbend Dr, Floor 1
Kitchener, ON, N2K 3S3
Office: (519) 568-5757
Toll Free: 1-844-459-3636
Mobile: (519) 503-7999
Fax: (519) 744-3082

From: Laura Verhaeghe - GM BluePlan [mailto:Laura.Verhaeghe@gmblueplan.ca]
Sent: Wednesday, August 30, 2017 4:57 PM
To: Boulton, Bradley <bradley.boulton@bell.ca>
Subject: Clythe Well Treatment Class EA, City of Guelph - Notice of Commencement

Mr. Boulton,

Please find attached the Notice of Commencement letter for the Clythe Well Treatment Class EA study in City of Guelph, including contact information if you would like to comment or receive further study details.

Best Regards,

Laura Verhaeghe, P.Eng.
Project Manager

GM BluePlan Engineering Limited
650 Woodlawn Road West, Block C, Unit 2 | Guelph ON N1K 1B8
t: 519.824.8150 | c: 226.500.4771
laura.verhaeghe@gmblueplan.ca | www.gmblueplan.ca

Laura Verhaeghe - GM BluePlan

From: FPP.CA / PPP.CA (DFO/MPO) <fisheriesprotection@dfo-mpo.gc.ca>
Sent: Wednesday, August 30, 2017 5:26 PM
To: Laura Verhaeghe - GM BluePlan
Subject: Automatic reply: Clythe Well Treatment Class EA, City of Guelph - Notice of Commencement

This e-mail is a confirmation of receipt for your submission. Thank you for contacting Fisheries and Oceans Canada, Fisheries Protection Program.

Le présent courriel est un accusé de réception de votre soumission. Merci d'avoir communiqué avec le Programme de protection des pêches de Pêches et Océans Canada.

Laura Verhaeghe - GM BluePlan

From: Jason Wagler <jwagler@grandriver.ca>
Sent: Friday, September 15, 2017 10:50 AM
To: Laura Verhaeghe - GM BluePlan
Cc: Grant Parkinson - GM BluePlan; Patricia.Quackenbush@guelph.ca; Robin Puskas (robin.puskas@guelph.ca)
Subject: RE: Clythe Well Treatment Class EA, City of Guelph - Notice of Commencement

Hi Laura,

2pm works – see you then!

Jason

Jason Wagler, MCIP, RPP
Resource Planner
Grand River Conservation Authority
400 Clyde Rd, Cambridge ON N1R 5W6
(519) 621-2763 x2320
www.grandriver.ca

From: Laura Verhaeghe - GM BluePlan [mailto:Laura.Verhaeghe@gmblueplan.ca]
Sent: Friday, September 15, 2017 10:46 AM
To: Jason Wagler
Cc: Grant Parkinson - GM BluePlan; Patricia.Quackenbush@guelph.ca; Robin Puskas (robin.puskas@guelph.ca)
Subject: RE: Clythe Well Treatment Class EA, City of Guelph - Notice of Commencement

Hi Jason,

Our team is available to meet at your office on Wednesday, September 27 in the afternoon. Is there a time that would work best for you? We plan to send you further details on the project sites under consideration for your review prior to the meeting.

Thank you,

Laura Verhaeghe, P.Eng.
Project Manager

GM BluePlan Engineering Limited
650 Woodlawn Road West, Block C, Unit 2 | Guelph ON N1K 1B8
t: 519.824.8150 | c: 226.500.4771
laura.verhaeghe@gmblueplan.ca | www.gmblueplan.ca

From: Jason Wagler [mailto:jwagler@grandriver.ca]
Sent: Thursday, September 14, 2017 3:16 PM
To: Laura Verhaeghe - GM BluePlan
Subject: RE: Clythe Well Treatment Class EA, City of Guelph - Notice of Commencement

Hi Laura,

I'll be the GRCA contact.

Are you available to meet on the 26th or 27th?

Jason

Jason Wagler, MCIP, RPP
Resource Planner
Grand River Conservation Authority
400 Clyde Rd, Cambridge ON N1R 5W6
(519) 621-2763 x2320
www.grandriver.ca

From: Nathan Garland
Sent: Tuesday, September 12, 2017 1:25 PM
To: Jason Wagler
Subject: FW: Clythe Well Treatment Class EA, City of Guelph - Notice of Commencement

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From: Laura Verhaeghe - GM BluePlan [mailto:Laura.Verhaeghe@gmblueplan.ca]
Sent: September 12, 2017 11:03 AM
To: Nathan Garland
Cc: Grant Parkinson - GM BluePlan
Subject: FW: Clythe Well Treatment Class EA, City of Guelph - Notice of Commencement

Mr. Garland,

To follow-up on my voice mail this morning, GM BluePlan is currently working with the City of Guelph on a Schedule 'B' Class EA for Clythe Well Treatment. Details of the Study are described in the attached Notice of Commencement for your reference. Note that this notice was distributed on August 31 to our GRCA contacts on record who are no longer with your organization. Our study team would like to opportunity to meet with a representative from the GRCA to receive preliminary feedback on our alternative site selections, and note any concerns from the GRCA's perspective. Some of the alternative sites fall within GRCA regulation area, and one site would require a paved driveway through a wetland buffer area.

Please give me a call to discuss at your convenience. We are hoping to set up a meeting in the next 1-2 weeks.

Thank you,

Laura Verhaeghe, P.Eng.
Project Manager

GM BluePlan Engineering Limited
650 Woodlawn Road West, Block C, Unit 2 | Guelph ON N1K 1B8
t: 519.824.8150 | c: 226.500.4771
laura.verhaeghe@gmblueplan.ca | www.gmblueplan.ca

A PROPONENT'S INTRODUCTION TO THE DELEGATION OF PROCEDURAL ASPECTS OF CONSULTATION WITH ABORIGINAL COMMUNITIES

DEFINITIONS

The following definitions are specific to this document and may not apply in other contexts:

Aboriginal communities – the First Nation or Métis communities identified by the Crown for the purpose of consultation.

Consultation – the Crown's legal obligation to consult when the Crown has knowledge of an established or asserted Aboriginal or treaty right and contemplates conduct that might adversely impact that right. This is the type of consultation required pursuant to s. 35 of the *Constitution Act, 1982*. Note that this definition does not include consultation with Aboriginal communities for other reasons, such as regulatory requirements.

Crown – the Ontario Crown, acting through a particular ministry or ministries.

Procedural aspects of consultation – those portions of consultation related to the process of consultation, such as notifying an Aboriginal community about a project, providing information about the potential impacts of a project, responding to concerns raised by an Aboriginal community and proposing changes to the project to avoid negative impacts.

Proponent – the person or entity that wants to undertake a project and requires an Ontario Crown decision or approval for the project.

I. PURPOSE

The Crown has a legal duty to consult Aboriginal communities when it has knowledge of an existing or asserted Aboriginal or treaty right and contemplates conduct that may adversely impact that right. In outlining a framework for the duty to consult, the Supreme Court of Canada has stated that the Crown may delegate procedural aspects of consultation to third parties. This document provides general information about the Ontario Crown's approach to delegation of the procedural aspects of consultation to proponents.

This document is not intended to instruct a proponent about an individual project, and it does not constitute legal advice.

II. WHY IS IT NECESSARY TO CONSULT WITH ABORIGINAL COMMUNITIES?

The objective of the modern law of Aboriginal and treaty rights is the *reconciliation* of Aboriginal peoples and non-Aboriginal peoples and their respective rights, claims and interests. Consultation is an important component of the reconciliation process.

The Crown has a legal duty to consult Aboriginal communities when it has knowledge of an existing or asserted Aboriginal or treaty right and contemplates conduct that might adversely impact that right. For example, the Crown's duty to consult is triggered when it considers issuing a permit, authorization or approval for a project which has the potential to adversely impact an Aboriginal right, such as the right to hunt, fish, or trap in a particular area.

The scope of consultation required in particular circumstances ranges across a spectrum depending on both the nature of the asserted or established right and the seriousness of the potential adverse impacts on that right.

Depending on the particular circumstances, the Crown may also need to take steps to accommodate the potentially impacted Aboriginal or treaty right. For example, the Crown may be required to avoid or minimize the potential adverse impacts of the project.

III. THE CROWN'S ROLE AND RESPONSIBILITIES IN THE DELEGATED CONSULTATION PROCESS

The Crown has the responsibility for ensuring that the duty to consult, and accommodate where appropriate, is met. However, the Crown may delegate the procedural aspects of consultation to a proponent.

There are different ways in which the Crown may delegate the procedural aspects of consultation to a proponent, including through a letter, a memorandum of understanding, legislation, regulation, policy and codes of practice.

If the Crown decides to delegate procedural aspects of consultation, the Crown will generally:

- Ensure that the delegation of procedural aspects of consultation and the responsibilities of the proponent are clearly communicated to the proponent;
- Identify which Aboriginal communities must be consulted;
- Provide contact information for the Aboriginal communities;
- Revise, as necessary, the list of Aboriginal communities to be consulted as new information becomes available and is assessed by the Crown;
- Assess the scope of consultation owed to the Aboriginal communities;

- Maintain appropriate oversight of the actions taken by the proponent in fulfilling the procedural aspects of consultation;
- Assess the adequacy of consultation that is undertaken and any accommodation that may be required;
- Provide a contact within any responsible ministry in case issues arise that require direction from the Crown; and
- Participate in the consultation process as necessary and as determined by the Crown.

IV. THE PROPONENT'S ROLE AND RESPONSIBILITIES IN THE DELEGATED CONSULTATION PROCESS

Where aspects of the consultation process have been delegated to a proponent, the Crown, in meeting its duty to consult, will rely on the proponent's consultation activities and documentation of those activities. The consultation process informs the Crown's decision of whether or not to approve a proposed project or activity.

A proponent's role and responsibilities will vary depending on a variety of factors including the extent of consultation required in the circumstance and the procedural aspects of consultation the Crown has delegated to it. Proponents are often in a better position than the Crown to discuss a project and its potential impacts with Aboriginal communities and to determine ways to avoid or minimize the adverse impacts of a project.

A proponent can raise issues or questions with the Crown at any time during the consultation process. If issues or concerns arise during the consultation that cannot be addressed by the proponent, the proponent should contact the Crown.

a) What might a proponent be required to do in carrying out the procedural aspects of consultation?

Where the Crown delegates procedural aspects of consultation, it is often the proponent's responsibility to provide notice of the proposed project to the identified Aboriginal communities. The notice should indicate that the Crown has delegated the procedural aspects of consultation to the proponent and should include the following information:

- a description of the proposed project or activity;
- mapping;
- proposed timelines;
- details regarding anticipated environmental and other impacts;
- details regarding opportunities to comment; and
- any changes to the proposed project that have been made for seasonal conditions or other factors, where relevant.

Proponents should provide enough information and time to allow Aboriginal communities to provide meaningful feedback regarding the potential impacts of the project. Depending on the nature of consultation required for a project, a proponent also may be required to:

- provide the Crown with copies of any consultation plans prepared and an opportunity to review and comment;
- ensure that any necessary follow-up discussions with Aboriginal communities take place in a timely manner, including to confirm receipt of information, share and update information and to address questions or concerns that may arise;
- as appropriate, discuss with Aboriginal communities potential mitigation measures and/or changes to the project in response to concerns raised by Aboriginal communities;
- use language that is accessible and not overly technical, and translate material into Aboriginal languages where requested or appropriate;
- bear the reasonable costs associated with the consultation process such as, but not limited to, meeting hall rental, meal costs, document translation(s), or to address technical & capacity issues;
- provide the Crown with all the details about potential impacts on established or asserted Aboriginal or treaty rights, how these concerns have been considered and addressed by the proponent and the Aboriginal communities and any steps taken to mitigate the potential impacts;
- provide the Crown with complete and accurate documentation from these meetings and communications; and
- notify the Crown immediately if an Aboriginal community not identified by the Crown approaches the proponent seeking consultation opportunities.

b) What documentation and reporting does the Crown need from the proponent?

Proponents should keep records of all communications with the Aboriginal communities involved in the consultation process and any information provided to these Aboriginal communities.

As the Crown is required to assess the adequacy of consultation, it needs documentation to satisfy itself that the proponent has fulfilled the procedural aspects of consultation delegated to it. The documentation required would typically include:

- the date of meetings, the agendas, any materials distributed, those in attendance and copies of any minutes prepared;
- the description of the proposed project that was shared at the meeting;
- any and all concerns or other feedback provided by the communities;
- any information that was shared by a community in relation to its asserted or established Aboriginal or treaty rights and any potential adverse impacts of the proposed activity, approval or disposition on such rights;

- any proposed project changes or mitigation measures that were discussed, and feedback from Aboriginal communities about the proposed changes and measures;
- any commitments made by the proponent in response to any concerns raised, and feedback from Aboriginal communities on those commitments;
- copies of correspondence to or from Aboriginal communities, and any materials distributed electronically or by mail;
- information regarding any financial assistance provided by the proponent to enable participation by Aboriginal communities in the consultation;
- periodic consultation progress reports or copies of meeting notes if requested by the Crown;
- a summary of how the delegated aspects of consultation were carried out and the results; and
- a summary of issues raised by the Aboriginal communities, how the issues were addressed and any outstanding issues.

In certain circumstances, the Crown may share and discuss the proponent's consultation record with an Aboriginal community to ensure that it is an accurate reflection of the consultation process.

c) Will the Crown require a proponent to provide information about its commercial arrangements with Aboriginal communities?

The Crown may require a proponent to share information about aspects of commercial arrangements between the proponent and Aboriginal communities where the arrangements:

- include elements that are directed at mitigating or otherwise addressing impacts of the project;
- include securing an Aboriginal community's support for the project; or
- may potentially affect the obligations of the Crown to the Aboriginal communities.

The proponent should make every reasonable effort to exempt the Crown from confidentiality provisions in commercial arrangements with Aboriginal communities to the extent necessary to allow this information to be shared with the Crown.

The Crown cannot guarantee that information shared with the Crown will remain confidential. Confidential commercial information should not be provided to the Crown as part of the consultation record if it is not relevant to the duty to consult or otherwise required to be submitted to the Crown as part of the regulatory process.

V. WHAT ARE THE ROLES AND RESPONSIBILITIES OF ABORIGINAL COMMUNITIES' IN THE CONSULTATION PROCESS?

Like the Crown, Aboriginal communities are expected to engage in consultation in good faith. This includes:

- responding to the consultation notice;
- engaging in the proposed consultation process;
- providing relevant information;
- clearly articulating the potential impacts of the proposed project on Aboriginal or treaty rights; and
- discussing ways to mitigate any adverse impacts.

Some Aboriginal communities have developed tools, such as consultation protocols, policies or processes that provide guidance on how they would prefer to be consulted. Although not legally binding, proponents are encouraged to respect these community processes where it is reasonable to do so. Please note that there is no obligation for a proponent to pay a fee to an Aboriginal community in order to enter into a consultation process.

To ensure that the Crown is aware of existing community consultation protocols, proponents should contact the relevant Crown ministry when presented with a consultation protocol by an Aboriginal community or anyone purporting to be a representative of an Aboriginal community.

VI. WHAT IF MORE THAN ONE PROVINCIAL CROWN MINISTRY IS INVOLVED IN APPROVING A PROPONENT'S PROJECT?

Depending on the project and the required permits or approvals, one or more ministries may delegate procedural aspects of the Crown's duty to consult to the proponent. The proponent may contact individual ministries for guidance related to the delegation of procedural aspects of consultation for ministry-specific permits/approvals required for the project in question. Proponents are encouraged to seek input from all involved Crown ministries sooner rather than later.

Ministry of the Environment and Climate Change
West Central Region

119 King Street West
12th Floor
Hamilton, Ontario L8P 4Y7
Tel.: 905 521-7640
Fax: 905 521-7820

Ministère de l'Environnement et de l'Action en matière de changement climatique
Direction regionale du Centre-Ouest

119 rue King Quest
12e étage
Hamilton (Ontario) L8P 4Y7
Tél. : 905 521-7640
Téléc. : 905 521-7820

Ontario

September 8, 2017

Mr. Robin Puskas
City of Guelph

Mr. Grant Parkinson
GM BluePlan Engineering Ltd.

- *Via Email Only* –

Dear Messrs. Puskas and Parkinson:

Re: **Clythe Well Treatment Upgrades**
City of Guelph
MEA Class EA, Schedule "B"
Response to Notice of Commencement

This letter is in response to the Notice of Commencement for the above noted project. The Ministry of the Environment and Climate Change (MOECC) acknowledges that the City of Guelph has indicated that its study is following the process for Schedule "B" projects as provided for by the MEA Class EA.

The Crown has a legal duty to consult Aboriginal communities when it has knowledge, real or constructive, of the existence or potential existence of an Aboriginal or treaty right and contemplates conduct that may adversely impact that right. Before authorizing this project, the Crown must ensure that its duty to consult has been fulfilled, where such a duty is triggered. Although the duty to consult with Aboriginal peoples is a duty of the Crown, the Crown may delegate procedural aspects of this duty to project proponents while retaining oversight of the consultation process.

Your proposed project may have the potential to affect Aboriginal or treaty rights protected under Section 35 of Canada's *Constitution Act* 1982. Where the Crown's duty to consult is triggered in relation to your proposed project**, the MOECC is delegating the procedural aspects of rights-based consultation to you through this letter.** The Crown intends to rely on the delegated consultation process in discharging its duty to consult and maintains the right to participate in the consultation process as it sees fit.

Based on information you have provided to date and the Crown`s preliminary assessment you are required to consult with the following communities who have been identified as potentially affected by your proposed project.

Nation	Contact Information
Six Nations of the Grand River	Six Nations of the Grand River P.O. BOX 5000, Ohsweken, ON., N0A 1M0 (519) 445-2201 Chief Ava Hill avahill@sixnations.ca Other Contact: Lands and Resources Director, Lonny Bomberry lonnybomberry@sixnations.ca 519-753-0665 2498 Chiefswood Road, P.O. Box 5000 Ohsweken, ON N0A 1M0
Haudenosaunee Development Institute	16 Sunrise Court, Suite 417 P.O. Box 714 Ohsweken, ON N0A 1M0 519-445-422 hdi2@bellnet.ca
Mississaugas of the New Credit First Nation	Mississaugas of the New Credit First Nation 2789 Mississauga Road R.R. #6, Hagersville, ON N0A 1H0 519-768-1133 Chief Stacey LaForme Stacey.Laforme@mncfn.ca Other Contact: Fawn Sault Consultation Coordinator Department of Consultation & Accommodation 6 First Line Rd., Unit 1 R.R.#6, Hagersville, ON N0A 1H0 905-768-4260

Steps that you may need to take in relation to Aboriginal consultation for your proposed project are outlined in the "Code of Practice for Consultation in Ontario's Environmental Assessment Process" which can be found at the following link: https://www.ontario.ca/document/consultation-ontarios-environmental-assessment-process
Additional information related to Ontario's Environmental Assessment Act is available online at: www.ontario.ca/environmentalassessments

You must contact the Director of Environmental Approvals Branch under the following circumstances subsequent to initial discussions with the communities identified by MOECC:

- Aboriginal or treaty rights impacts are identified to you by the communities
- You have reason to believe that your proposed project may adversely affect an Aboriginal or treaty right
- Consultation has reached an impasse
- A Part II Order request or elevation request is expected

The Director of the Environmental Approvals Branch can be notified either by email with the subject line "Potential Duty to Consult" to EAASIBgen@ontario.ca or by mail or fax at the address provided below:

Email:	EAASIBGen@ontario.ca Subject: Potential Duty to Consult

Fax:	416-314-8452
Address:	Environmental Approvals Branch 135 St. Clair Avenue West, 1st Floor Toronto, ON, M4V 1P5

The MOECC will then assess the extent of any Crown duty to consult for the circumstances and will consider whether additional steps should be taken, including what role you will be asked to play in them.

We would like the opportunity to be involved in this EA as it progresses so that we can provide technical advice on matters such as any approvals that may be required upon completion of the EA process. You may wish to provide me with a draft copy of the Environmental Study Report allowing a minimum of 30 days for the ministry's technical reviewers to provide comments. Please also forward the Notice of Completion and final document when completed.

Should you or any members of your project team have any questions regarding the material above, please contact me at 905 521-7864 or at Barbara.slattery@ontario.ca

Yours truly,

Barbara Slattery
Environmental Assessment/Planning Coordinator

c. Amy Shaw, MOECC – GDO (Via Email only)

Laura Verhaeghe - GM BluePlan

From: Koblik, Belinda (MOECC) <Belinda.Koblik@ontario.ca>
Sent: Thursday, August 31, 2017 9:53 AM
To: Laura Verhaeghe - GM BluePlan
Cc: Connelly, Jamie (MOECC); Dobrin, Dan (MOECC); Slattery, Barbara (MOECC)
Subject: RE: Clythe Well Treatment Class EA, City of Guelph - Notice of Commencement

Good Morning Laura,

Thank you for providing the Ministry with the Notification regarding the Clythe Well Treatment Class EA Study. Technical staff will contact you shortly to obtain further information on the proposal for our review.

Belinda Koblik

Belinda Koblik, P.Eng.
Supervisor
Water Resources Unit
Technical Support Section
West Central Region
(905) 521-7615

From: Laura Verhaeghe - GM BluePlan [mailto:Laura.Verhaeghe@gmblueplan.ca]
Sent: August 31, 2017 8:32 AM
To: Koblik, Belinda (MOECC)
Subject: Clythe Well Treatment Class EA, City of Guelph - Notice of Commencement

Ms. Koblik,

Please find attached the Notice of Commencement letter for the Clythe Well Treatment Class EA study in City of Guelph, including contact information if you would like to comment or receive further study details.

Best Regards,

Laura Verhaeghe, P.Eng.
Project Manager

GM BluePlan Engineering Limited
650 Woodlawn Road West, Block C, Unit 2 | Guelph ON N1K 1B8
t: 519.824.8150 | c: 226.500.4771
laura.verhaeghe@gmblueplan.ca | www.gmblueplan.ca

Laura Verhaeghe - GM BluePlan

From: Taylor, Corinne (MOECC) <Corinne.Taylor@ontario.ca>
Sent: Thursday, August 31, 2017 9:15 AM
To: Laura Verhaeghe - GM BluePlan
Subject: RE: Clythe Well Treatment Class EA, City of Guelph - Notice of Commencement

Hi Laura,

If you could keep me on your cc list of updates I would appreciate it.

Thank you.
Corinne

Corinne Taylor
Water Inspector
Safe Drinking Water Branch
Ministry of the Environment and Climate Change
1 Stone Road West, 4th Floor
Guelph, Ontario, N1G 4Y2
Phone: 519-826-4787
Fax: 519-826-4286
Email: corinne.taylor@ontario.ca

Please consider the environment before printing this email

From: Laura Verhaeghe - GM BluePlan [mailto:Laura.Verhaeghe@gmblueplan.ca]
Sent: August-31-17 8:35 AM
To: Taylor, Corinne (MOECC)
Subject: Clythe Well Treatment Class EA, City of Guelph - Notice of Commencement

Ms. Taylor,

Please find attached the Notice of Commencement letter for the Clythe Well Treatment Class EA study in City of Guelph, including contact information if you would like to comment or receive further study details.

Best Regards,

Laura Verhaeghe, P.Eng.
Project Manager

GM BluePlan Engineering Limited
650 Woodlawn Road West, Block C, Unit 2 | Guelph ON N1K 1B8
t: 519.824.8150 | c: 226.500.4771
laura.verhaeghe@gmblueplan.ca | www.gmblueplan.ca

Laura Verhaeghe - GM BluePlan

From: Slattery, Barbara (MOECC) <barbara.slattery@ontario.ca>
Sent: Friday, September 08, 2017 2:02 PM
To: Stewart, Rosa (MOECC)
Subject: FW: Clythe Well - Notice of Commencement of an EA
Attachments: ClytheWellacklet.doc.docx; A Proponent's Introduction to the Delegated Aspects of Consultation with....pdf

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From: Slattery, Barbara (MOECC)
Sent: September 07, 2017 4:17 PM
To: 'robin.puskas@guelph.ca'; 'grant.parkinson@gmblueplan.ca'
Cc: Shaw, Amy (MOECC)
Subject: Clythe Well - Notice of Commencement of an EA

With regards,

Barb Slattery, EA/Planning Coordinator
Ministry of the Environment and Climate Change
West Central Region
(905) 521-7864

Laura Verhaeghe - GM BluePlan

From: Stewart, Rosa (MOECC) <Rosa.Stewart@ontario.ca>
Sent: Friday, September 08, 2017 2:13 PM
To: Laura Verhaeghe - GM BluePlan
Cc: Koblik, Belinda (MOECC); Slattery, Barbara (MOECC)
Subject: RE: Clythe Well Treatment Class EA, City of Guelph - Notice of Commencement
Attachments: FW: Clythe Well - Notice of Commencement of an EA

Hi Laura,

I spoke with Barb Slattery and she has already sent a ministry response to the Notice of Commencement to Robin Puskas of the City of Guelph and Grant Parkinson of your office (attached).

I will follow up shortly with a copy of the existing expired or current Permit To Take Water for the Clythe Well as I promised.

Regards

Rosa

Rosa C. Stewart, P. Geo. | Hydrogeologist | West Central Region | Ontario Ministry of the Environment and Climate Change | 119 King Street West, 12th Floor, Hamilton, Ontario, L8P 4Y7 | Ph: 905-521-7592

From: Laura Verhaeghe - GM BluePlan [mailto:Laura.Verhaeghe@gmblueplan.ca]
Sent: August 31, 2017 8:32 AM
To: Koblik, Belinda (MOECC)
Subject: Clythe Well Treatment Class EA, City of Guelph - Notice of Commencement

Ms. Koblik,

Please find attached the Notice of Commencement letter for the Clythe Well Treatment Class EA study in City of Guelph, including contact information if you would like to comment or receive further study details.

Best Regards,

Laura Verhaeghe, P.Eng.
Project Manager

GM BluePlan Engineering Limited
650 Woodlawn Road West, Block C, Unit 2 | Guelph ON N1K 1B8
t: 519.824.8150 | c: 226.500.4771
laura.verhaeghe@gmblueplan.ca | www.gmblueplan.ca

Laura Verhaeghe - GM BluePlan

From: Stewart, Rosa (MOECC) <Rosa.Stewart@ontario.ca>
Sent: Friday, September 08, 2017 2:28 PM
To: Laura Verhaeghe - GM BluePlan
Subject: Clythe Well Permit
Attachments: NUMBER 1008-9J7S6G.pdf

Hi Laura,

Attached please find the current permit for the Clythe Well.

Regards,

Rosa

Rosa C. Stewart, P. Geo. | Hydrogeologist | West Central Region | Ontario Ministry of the Environment and Climate Change | 119 King Street West, 12th Floor, Hamilton, Ontario, L8P 4Y7 | Ph: 905-521-7592

Laura Verhaeghe - GM BluePlan

From: Liz Sandals, MPP (Constituency Office) <lsandals.mpp.co@liberal.ola.org>
Sent: Monday, September 11, 2017 2:49 PM
To: Laura Verhaeghe - GM BluePlan
Subject: RE: Clythe Well Treatment Class EA, City of Guelph - Notice of Commencement

Dear Laura :

Thank you for this information. I would definitely appreciate receiving further study details and notices and updates.

Sincerely,

Liz

Office of Hon. Liz Sandals, MPP - Guelph
173 Woolwich St., Suite 102
Guelph, ON N1H 3V4
T: 519-836-4190
F: 519-836-4191

From: Laura Verhaeghe - GM BluePlan [mailto:Laura.Verhaeghe@gmblueplan.ca]
Sent: Thursday, August 31, 2017 9:47 AM
To: Sandals, Liz MPP CO
Subject: Clythe Well Treatment Class EA, City of Guelph - Notice of Commencement

Ms. Sandals,

Please find attached the Notice of Commencement letter for the Clythe Well Treatment Class EA study in City of Guelph, including contact information if you would like to comment or receive further study details.

Best Regards,

Laura Verhaeghe, P.Eng.
Project Manager

GM BluePlan Engineering Limited
650 Woodlawn Road West, Block C, Unit 2 | Guelph ON N1K 1B8
t: 519.824.8150 | c: 226.500.4771
laura.verhaeghe@gmblueplan.ca | www.gmblueplan.ca

Laura Verhaeghe - GM BluePlan

From: Robin.Puskas@guelph.ca
Sent: Thursday, September 07, 2017 10:14 AM
To: Grant Parkinson - GM BluePlan; Laura Verhaeghe - GM BluePlan
Cc: Patricia.Quackenbush@aecom.com
Subject: FW: Environmental Assessment for Clythe Well Treatment Upgrades – Notice of Study Commencement

Please add to contacts

Robin Puskas, P.Eng, Project Manager
Water Services
City of Guelph
519-822-1260 extension 2195
Cell 519-820-7448
robin.puskas@guelph.ca

From: Marnie Benson [mailto:benson.zack@gmail.com]
Sent: September 7, 2017 9:44 AM
To: Robin Puskas
Subject: Environmental Assessment for Clythe Well Treatment Upgrades – Notice of Study Commencement

Hello Robin

Could you please add me as contact person for further notices regarding the Clythe Well EA and other issues related to development and or EA's in the city?

Marnie Benson
Conservation Coordinator
Nature Guelph
36B London Rd. W.
Guelph, ON N1H 2B5

conservation@natureguelph.ca
(519) 830-4412

We would be happy to provide input once further details become available. Thank you
Marnie

Laura Verhaeghe - GM BluePlan

From: Muller, Joseph (MTCS) [mailto:Joseph.Muller@ontario.ca]
Sent: Wednesday, October 25, 2017 12:35 PM
To: robin.puskas@guelph.ca
Cc: Grant Parkinson - GM BluePlan
Subject: Clythe Well Treatment Upgrades

Hello Robin Puskas:

Please find attached my (tardy) comments from the Heritage Program Unit at the Ministry of Tourism, Culture and Sport on the above project, and contact me if you have any questions or would like to discuss the file. Thank-you for your assistance,

Joe

Joseph Muller, RPP, MCIP

Heritage Planner
Ministry of Tourism, Culture and Sport
Culture Division | Programs and Services Branch | Heritage Program Unit

401 Bay Street, Suite 1700
Toronto, Ontario M7A 0A7

Tel. 416.314.7145 | Fax. 416.212.1802

Ministry of Tourism, Culture and Sport

Heritage Program Unit
Programs and Services Branch
401 Bay Street, Suite 1700
Toronto ON M7A 0A7
Tel: 416 314 7145
Fax: 416 212 1802

Ministère du Tourisme, de la Culture et du Sport

Unité des programmes patrimoine
Direction des programmes et des services
401, rue Bay, Bureau 1700
Toronto ON M7A 0A7
Tél: 416 314 7145
Téléc: 416 212 1802

Ontario

October 25, 2017 (EMAIL ONLY)

Robin Puskas, P.Eng.
City of Guelph
1 Carden Street
Guelph, ON N1H 3A1
E: robin.puskas@guelph.ca

RE: MTCS file #: 0007281
Proponent: City of Guelph
Subject: Notice of Commencement, Municipal Class Environmental Assessment Clythe Well Treatment Upgrades
Location: Guelph, Ontario

Dear Robin Puskas:

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

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

Under the EA process, the proponent is required to determine a project's potential impact on cultural heritage resources. While some cultural heritage resources may have already been formally identified, others may be identified through screening and evaluation. Indigenous communities may have knowledge that can contribute to the identification of cultural heritage resources, and we suggest that any engagement with Indigenous communities includes a discussion about known or potential cultural heritage resources that are of value to these communities. Municipal Heritage Committees, historical societies and other local heritage organizations may also have knowledge that contributes to the identification of cultural heritage resources.

Archaeological Resources
Your EA project may impact archaeological resources and I understand that an Archaeological Assessment (AA) under Project Information Form (PIF) P094-0241-2017 has been undertaken by an archaeologist licenced under the *OHA*, who is responsible for submitting the report directly to MTCS for review.

Built Heritage and Cultural Heritage Landscapes
The MTCS *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes* should be completed to help determine whether your EA project may impact cultural heritage resources. The Clerk for City of Guelph can provide information on property registered or designated under the *Ontario Heritage Act*. Municipal Heritage Planners can also provide information that will assist you in completing the checklist.

If potential or known heritage resources exist, MTCS recommends that a Heritage Impact Assessment (HIA), prepared by a qualified consultant, should be completed to assess potential project impacts. Our Ministry's *Info Sheet #5: Heritage Impact Assessments and Conservation Plans* outlines the scope of HIAs. Please send the HIA to MTCS for review, and make it available to local organizations or individuals who have expressed interest in review.

Environmental Assessment Reporting
All technical heritage studies and their recommendations are to be addressed and incorporated into EA projects. Please advise MTCS whether any technical heritage studies will be completed for your EA project, and provide them to MTCS before issuing a Notice of Completion. If your screening has identified no known or potential cultural heritage resources, or no impacts to these resources, please include the completed checklists and supporting documentation in the EA report or file.

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

Sincerely,

Joseph Muller, RPP/MCIP
Heritage Planner
Joseph.Muller@Ontario.ca

Copied to: Grant Parkinson, Project Manager, GM BluePlan Engineering Limited

Screening for Impacts to Built Heritage and Cultural Heritage Landscapes

This checklist is intended to help proponents determine whether their project could affect known or potential cultural heritage resources. The completed checklist should be returned to the appropriate Heritage Planner or Heritage Advisor at the Ministry of Tourism and Culture.

Step 1 – Screening for Recognized Cultural Heritage Value

YES	NO	Unknown	
❑	☒	❑	1. Is the subject property designated or adjacent* to a property designated under the *Ontario Heritage Act*?
❑	☒	❑	2. Is the subject property listed on the municipal heritage register or a provincial register/list? (e.g. Ontario Heritage Bridge List)
❑	☒	❑	3. Is the subject property within or adjacent to a Heritage Conservation District?
❑	☒	❑	4. Does the subject property have an Ontario Heritage Trust easement or is it adjacent to such a property?
❑	☒	❑	5. Is there a provincial or federal plaque on or near the subject property?
❑	☒	❑	6. Is the subject property a National Historic Site?
❑	❑	☒	7. Is the subject property recognized or valued by an Aboriginal community?

Step 2 – Screening Potential Resources

YES	NO	Unknown	
			Built heritage resources
			1. Does the subject property or an adjacent property contain any buildings or structures **over forty years old**† that are:
☒	❑	❑	▪ Residential structures (e.g. house, apartment building, shanty or trap line shelter)
❑	☒	❑	▪ Farm buildings (e.g. barns, outbuildings, silos, windmills)
❑	☒	❑	▪ Industrial, commercial or institutional buildings (e.g. a factory, school, etc.)
☒	❑	❑	▪ Engineering works (e.g. bridges, water or communications towers, roads, water/sewer systems, dams, earthworks, etc.)
❑	☒	❑	▪ Monuments or Landmark Features (e.g. cairns, statues, obelisks, fountains, reflecting pools, retaining walls, boundary or claim markers, etc.)
❑	☒	❑	2. Is the subject property or an adjacent property associated with a known architect or builder?
❑	☒	❑	3. Is the subject property or an adjacent property associated with a person or event of historic interest?
❑	☒	❑	4. When the municipal heritage planner was contacted regarding potential cultural heritage value of the subject property, did they express interest or concern?
			Cultural heritage landscapes
YES	NO	Unknown	5. Does the subject property contain landscape features such as:
❑	☒	❑	▪ Burial sites and/or cemeteries
☒	❑	❑	▪ Parks or gardens
❑	☒	❑	▪ Quarries, mining, industrial or farming operations
❑	☒	❑	▪ Canals
❑	☒	❑	▪ Prominent natural features that could have special value to people (such as waterfalls, rocky outcrops, large specimen trees, caves, etc.)
☒	❑	❑	▪ Evidence of other human-made alterations to the natural landscape (such as trails, boundary or way-finding markers, mounds, earthworks, cultivation, non-native species, etc.)
❑	☒	❑	6. Is the subject property within a Canadian Heritage River watershed?
❑	☒	❑	7. Is the subject property near the Rideau Canal Corridor UNESCO World Heritage Site?
❑	☒	❑	8. Is there any evidence from documentary sources (e.g., local histories, a local recognition program, research studies, previous heritage impact assessment reports, etc.) or local knowledge or Aboriginal oral history, associating the subject property/ area with historic events, activities or persons?

Note:

If the answer is "yes" to any question in Step 1, proceed to Step 3.

The following resources can assist in answering questions in Step 1:

Municipal Clerk or Planning Department – Information on properties designated under the Ontario Heritage Act (individual properties or Heritage Conservation Districts) and properties listed on a Municipal Heritage register.

Ontario Heritage Trust – Contact the OHT directly regarding easement properties. A list of OHT plaques can be found on the website: Ontario Heritage Trust

Parks Canada – A list of National Historic Sites can be found on the website: Parks Canada

Ministry of Tourism and Culture – The Ontario Heritage Properties Database includes close to 8000 identified heritage properties. Note while this database is a valuable resource, it has not been updated since 2005, and therefore is not comprehensive or exhaustive. Ontario Heritage Properties Database

Local or Provincial archives

Local heritage organizations*, such as the municipal heritage committee, historical society, local branch of the Architectural Conservancy of Ontario, etc.*

Consideration should also be given to obtaining oral evidence of CHRs. For example, in many Aboriginal communities, an important means of maintaining knowledge of cultural heritage resources is through oral tradition.

If the answer is "yes" to any question in Step 2, an evaluation of cultural heritage value is required. If cultural heritage resources are identified, proceed to Step 3.

If the answer to any question in Step 1 or to questions 2-4, 6-8 in Step 2, is “unknown”, further research is required.

If the answer is "yes" to any of the questions in Step 3, a heritage impact assessment is required.

If uncertainty exists at any point, the services of a qualified person should be retained to assist in completing this checklist. All cultural heritage evaluation reports and heritage impact assessment reports must be prepared by a qualified person. Qualified persons means individuals (professional engineers, architects, archaeologists, etc.) having relevant, recent experience in the identification and conservation of cultural heritage resources. Appropriate evaluation involves gathering and recording information about the property sufficient to understand and substantiate its heritage value; determining cultural heritage value or interest based on the advice of qualified persons and with appropriate community input. If the property meets the criteria in Ontario Regulation 9/06 under the Ontario Heritage Act, it is a cultural heritage resource.

† The 40 year old threshold is an indicator of potential when conducting a preliminary survey for identification of cultural heritage resources. While the presence of a built feature that is 40 or more years old does not automatically signify cultural heritage value, it does make it more likely that the property could have cultural heritage value or interest. Similarly, if all the built features on a property are less than 40 years old, this does not automatically mean the property has no cultural heritage value. Note that age is not a criterion for designation under the *Ontario Heritage Act*.

Step 3 – Screening for Potential Impacts		
YES	**NO**	**Will the proposed undertaking/project involve or result in any of the following potential impacts to the subject property or an adjacent* property?**
❑	❑	**Destruction, removal or relocation** of any, or part of any, heritage attribute or feature.
❑	❑	**Alteration** (which means a change in any manner and includes restoration, renovation, repair or disturbance).
❑	❑	**Shadows** created that alter the appearance of a heritage attribute or change the exposure or visibility of a natural feature or plantings, such as a garden.
❑	❑	**Isolation** of a heritage attribute from its surrounding environment, context or a significant relationship.
❑	❑	**Direct or indirect obstruction** of significant views or vistas from, within, or to a built or natural heritage feature.
❑	❑	**A change in land use** such as rezoning a battlefield from open space to residential use, allowing new development or site alteration to fill in the formerly open spaces.
❑	❑	**Soil disturbance** such as a change in grade, or an alteration of the drainage pattern, or excavation, etc.

* For the purposes of evaluating potential impacts of development and site alteration “adjacent” means: contiguous properties as well as properties that are separated from a heritage property by narrow strip of land used as a public or private road, highway, street, lane, trail, right-of way, walkway, green space, park, and/or easement or as otherwise defined in the municipal official plan.

Laura Verhaeghe - GM BluePlan

From: Stephen.Robinson@guelph.ca
Sent: Wednesday, September 13, 2017 4:13 PM
To: Laura Verhaeghe - GM BluePlan
Cc: Grant Parkinson - GM BluePlan
Subject: RE: 12-066 Clythe Well Treatment Class EA - Potential for Heritage Impacts

Laura,

As discussed on the phone this afternoon, I have reviewed the eight potential sites for the Clythe Well Treatment Class EA and can confirm that none of these sites contain known built heritage resources or cultural heritage landscapes.

Stephen

Stephen Robinson, MA, CAHP | Senior Heritage Planner
Planning Services
Infrastructure, Development and Enterprise
City of Guelph
T (519) 837-5616 x 2496 |
E stephen.robinson@guelph.ca
guelph.ca

* Please consider the environment before printing this email.

"Heritage conservation is a team sport."

From: Laura Verhaeghe - GM BluePlan [mailto:Laura.Verhaeghe@gmblueplan.ca]
Sent: September 13, 2017 3:12 PM
To: Stephen Robinson
Cc: Grant Parkinson - GM BluePlan
Subject: RE: 12-066 Clythe Well Treatment Class EA - Potential for Heritage Impacts

Hi Stephen,

Thanks for your response. I will plan to give you a call between 3:30 – 4:30 this afternoon.

Best Regards,

Laura Verhaeghe, P.Eng.
Project Manager

GM BluePlan Engineering Limited
650 Woodlawn Road West, Block C, Unit 2 | Guelph ON N1K 1B8
t: 519.824.8150 | c: 226.500.4771
laura.verhaeghe@gmblueplan.ca | www.gmblueplan.ca

From: Stephen.Robinson@guelph.ca [mailto:Stephen.Robinson@guelph.ca]
Sent: Wednesday, September 13, 2017 2:41 PM
To: Laura Verhaeghe - GM BluePlan
Cc: Grant Parkinson - GM BluePlan
Subject: RE: 12-066 Clythe Well Treatment Class EA - Potential for Heritage Impacts

Hello Laura,

Sorry for my delayed response on this. Give me a call and we can discuss. I am here between 3:30-4:30 today. Then tomorrow (Thurs) am by 9:00.

Stephen

Stephen Robinson, MA, CAHP | Senior Heritage Planner
Planning Services
Infrastructure, Development and Enterprise
City of Guelph
T (519) 837-5616 x 2496 |
E stephen.robinson@guelph.ca
guelph.ca

* Please consider the environment before printing this email.

"Heritage conservation is a team sport."

From: Laura Verhaeghe - GM BluePlan [mailto:Laura.Verhaeghe@gmblueplan.ca]
Sent: September 7, 2017 8:27 AM
To: Stephen Robinson
Cc: Grant Parkinson - GM BluePlan
Subject: RE: 12-066 Clythe Well Treatment Class EA - Potential for Heritage Impacts

Good Morning Stephen,

To follow-up on the email chain below, Grant Parkinson and I at GM BluePlan would like to set up a meeting with you to discuss potential cultural heritage impacts for the Clythe Well Treatment Class EA that is currently underway. You will have received a Notice of Commencement for the study last week, which I have attached again for your easy reference. What is your availability over the next week or so to meet? We could come to your office, if that is easiest for you.

Thank you,

Laura Verhaeghe, P.Eng.
Project Manager

GM BluePlan Engineering Limited
650 Woodlawn Road West, Block C, Unit 2 | Guelph ON N1K 1B8
t: 519.824.8150 | c: 226.500.4771
laura.verhaeghe@gmblueplan.ca | www.gmblueplan.ca

-----Original Message-----
From: Laura Verhaeghe - GM BluePlan
Sent: Tuesday, August 22, 2017 4:25 PM
To: 'Stephen.Robinson@guelph.ca'
Subject: RE: 12-066 Clythe Well Treatment Class EA - Potential for Heritage Impacts

Thanks for the reply while on vacation, Stephen. Let's touch based once you're back in the office.

Laura Verhaeghe, P.Eng.
Project Manager

GM BluePlan Engineering Limited
650 Woodlawn Road West, Block C, Unit 2 | Guelph ON N1K 1B8
t: 519.824.8150 | c: 226.500.4771
laura.verhaeghe@gmblueplan.ca | www.gmblueplan.ca

-----Original Message-----
From: Stephen.Robinson@guelph.ca [mailto:Stephen.Robinson@guelph.ca]
Sent: Tuesday, August 22, 2017 4:24 PM
To: Laura Verhaeghe - GM BluePlan
Subject: RE: 12-066 Clythe Well Treatment Class EA - Potential for Heritage Impacts

Laura,
I am away on vacation until Sept 5.

Stephen

_____
From: Laura Verhaeghe - GM BluePlan [Laura.Verhaeghe@gmblueplan.ca]
Sent: Tuesday, August 22, 2017 1:17 PM
To: Stephen Robinson
Cc: Grant Parkinson - GM BluePlan
Subject: RE: 12-066 Clythe Well Treatment Class EA - Potential for Heritage Impacts

Stephen,

I wanted to follow-up on my email and voicemail I left you last week regarding the Clythe Well Treatment Class EA currently on-going with the City of Guelph. Are you available to meet over the next week or so to discuss?

Thank you,

Laura Verhaeghe, P.Eng.
Project Manager

GM BluePlan Engineering Limited
650 Woodlawn Road West, Block C, Unit 2 | Guelph ON N1K 1B8
t: 519.824.8150 | c: 226.500.4771
laura.verhaeghe@gmblueplan.ca<mailto:laura.verhaeghe@gmblueplan.ca> | www.gmblueplan.ca

[GMBP_email_logo]

From: Laura Verhaeghe - GM BluePlan
Sent: Tuesday, August 15, 2017 5:07 PM
To: 'stephen.robinson@guelph.ca'
Cc: Grant Parkinson - GM BluePlan; Patricia.Quackenbush@guelph.ca; Robin Puskas (robin.puskas@guelph.ca)
Subject: 12-066 Clythe Well Treatment Class EA - Potential for Heritage Impacts

Stephen,

To follow-up on my voicemail, GMBP has been retained by the City's Water Services department to complete a Schedule B Class EA for Clythe Well Treatment. Master planning and engineering studies have identified the need to develop additional local water sources to meet long term demand, and returning the Clythe Well to service would help achieve this goal. The Class EA study will evaluate alternative sites to construct a water treatment facility for the Clythe well. The study area map is attached for your reference. I have also attached a map of 8 alternative sites under consideration for the treatment equipment.

We have completed the Ministry of Tourism, Culture and Sport's screening checklist for Built and Cultural Heritage Landscapes, which has identified potential for resources ('Yes' to several items in Step 2, see attached). Some of the sites are adjacent to homes that are older than 40 years (estimated to be built in the 1950-70s, but this is not confirmed), or within parks. Although, we don't suspect impacts to any of the potential resources, we need to better understand if these items would actually be considered heritage resources. I spoke with Joseph Muller at MTCS, and he recommended we speak with you directly to assess the need for a more in depth Cultural Heritage Resource Assessment at this stage.

Are you available to meet with us at some point (ideally on or before Aug 24) to discuss? We intend to hold a Public Information Centre in September, and would like to incorporate any comments you provide into the alternative evaluation that will be presented at the PIC.

Thank you,

Laura Verhaeghe, P.Eng.
Project Manager

GM BluePlan Engineering Limited
650 Woodlawn Road West, Block C, Unit 2 | Guelph ON N1K 1B8
t: 519.824.8150 | c: 226.500.4771
laura.verhaeghe@gmblueplan.ca<mailto:laura.verhaeghe@gmblueplan.ca> | **Error! Hyperlink reference not valid.**>

[GMBP_email_logo]

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Ministry of Tourism, Culture and Sport

Archaeology Programs Unit
Programs and Services Branch
Culture Division
401 Bay Street, Suite 1700
Toronto ON M7A 0A7
Tel.: (416) 314-7152
Email: Sarah.Roe@ontario.ca

Ministère du Tourisme, de la Culture et du Sport

Unité des programmes d'archéologie
Direction des programmes et des services
Division de culture
401, rue Bay, bureau 1700
Toronto ON M7A 0A7
Tél. : (416) 314-7152
Email: Sarah.Roe@ontario.ca

Ontario

Mar 19, 2018

Lisa Merritt (P094)
ASI Archaeological and Cultural Heritage Services
528 Bathurst Street Toronto ON M5S 2P9

RE: Review and Entry into the Ontario Public Register of Archaeological Reports: Archaeological Assessment Report Entitled, "STAGE 1 ARCHAEOLOGICAL ASSESSMENT CLYTHE STATION TREATMENT AND PUMPING STATION PART OF LOTS 5-6, CONCESSION 3 DIVISION C AND PART OF LOTS 4-6 CONCESSION 4 DIVISION C (FORMER TOWNSHIP OF GUELPH) CITY OF GUELPH COUNTY OF WELLINGTON, ONTARIO", Dated Sep 1, 2017, Filed with MTCS Toronto Office on Jan 24, 2018, MTCS Project Information Form Number P094-0241-2017, MTCS File Number 0007281

Dear Ms. Merritt:

This office has reviewed the above-mentioned report, which has been submitted to this ministry as a condition of licensing in accordance with Part VI of the Ontario Heritage Act, R.S.O. 1990, c 0.18.[1] This review has been carried out in order to determine whether the licensed professional consultant archaeologist has met the terms and conditions of their licence, that the licensee assessed the property and documented archaeological resources using a process that accords with the 2011 Standards and Guidelines for Consultant Archaeologists set by the ministry, and that the archaeological fieldwork and report recommendations are consistent with the conservation, protection and preservation of the cultural heritage of Ontario.

The report documents the assessment of the study area as depicted in Figure 11: Clythe Station Treatment and Pumping Station Study Area - Results of the Property Inspection (Sites 4 and 7) and Figure 12: Clythe Station Treatment and Pumping Station Study Area - Results of the Property Inspection (Sites 1, 2, 3, &8) and Figure 13: Clythe Station Treatment and Pumping Station Study Area - Results of the Property Inspection (Site 6) and Figure 14: Clythe Station Treatment and Pumping Station Study Area - Results of the Property Inspection (Site 5) of the above titled report and recommends the following:

In light of these results, the following recommendations are made:
1. Parts of Sites 1 and 3 exhibit archaeological potential. These lands require Stage 2 archaeological assessment by test pit survey at five metre intervals prior to any proposed impacts to the property;
2. Sites 2, 4, 5, 6, and 7 have been previously assessed and do not require further archaeological assessment;
3. The remainder of the Study Area does not retain archaeological potential on account of deep and extensive land disturbance and does not require further archaeological assessment; and,
4. Should the proposed work extend beyond the current Study Area, further Stage 1 archaeological

assessment should be conducted to determine the archaeological potential of the surrounding lands.

Based on the information contained in the report, the ministry is satisfied that the fieldwork and reporting for the archaeological assessment are consistent with the ministry's 2011 Standards and Guidelines for Consultant Archaeologists and the terms and conditions for archaeological licences. This report has been entered into the Ontario Public Register of Archaeological Reports. Please note that the ministry makes no representation or warranty as to the completeness, accuracy or quality of reports in the register.

Should you require any further information regarding this matter, please feel free to contact me.

Sincerely,

Sarah Roe
Archaeology Review Officer

cc. Archaeology Licensing Officer
Laura Verhaeghe,GM BluePlan Engineering
Robin Puskas,City of Guelph

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

Laura Verhaeghe - GM BluePlan

From: Grant Parkinson - GM BluePlan
Sent: Thursday, September 07, 2017 8:59 AM
To: Karen Landry
Cc: Laura Verhaeghe - GM BluePlan
Subject: City of Guelph Schedule B Class Environmental Assessment for Clythe Well Treatment Upgrades - Notice of Study Commencement

Hi Karen

Thanks for your response. We have you on the mailing list and will keep you informed.

Grant Parkinson, P.Eng.
Senior Project Manager, Partner

GM BluePlan Engineering Limited
650 Woodlawn Road West, Block C, Unit 2 | Guelph ON N1K 1B8
tel: (519) 824-8150 Ext. 1231| cell: (519) 831-1520
grant.parkinson@gmblueplan.ca | www.gmblueplan.ca

From: Karen Landry [mailto:KLandry@puslinch.ca]
Sent: Wednesday, September 06, 2017 9:21 AM
To: Grant Parkinson - GM BluePlan
Subject: City of Guelph Schedule B Class Environmental Assessment for Clythe Well Treatment Upgrades - Notice of Study Commencement

Hi Grant,

The Township requests to be notified and participate in the Class EA process. Please note the address is: 7404 Wellington Road 34, Puslinch, ON N0B 2J0. The Township's interest relates to source protection policies within the wellhead protection areas for Clythe well within the Township.

Thanks,

Karen

Karen M. Landry
CAO/Clerk
Township of Puslinch
7404 Wellington Rd 34, Puslinch, ON N0B 2J0
P: (519) 763-1226 ext. 214 F: (519) 763-5846
www.puslinch.ca

and delete this message without making a copy. (Information related to this email is automatically monitored and recorded and the content may be required to be disclosed by the Township to a third party in certain circumstances). Thank you.

Township of Puslinch
7404 Wellington Rd 34, Puslinch, ON N0B 2J0
P 519 763-1226 F 519-763-5846
www.puslinch.ca

REPORT ADM-2017-048

TO:	Mayor and Members of Council
FROM:	Kyle Davis, Risk Management Official
MEETING DATE:	December 6, 2017
SUBJECT:	Adjacent Municipal Environmental Assessments and Clean Water Act

RECOMMENDATIONS

That Report ADM-2017-048 regarding the Clythe Creek Environmental Assessment and the Cambridge East Environmental Assessment and the Clean Water Act be received.

DISCUSSION

Background

The *Clean Water Act* (2006) provides the framework for the development and implementation of watershed-based Source Protection Plans. The Source Protection Plans identify the risks to municipal drinking water sources and establishes actions and policies to protect current and future sources of drinking water. The policies apply within Wellhead Protection Areas (WHPA) and Intake Protection Zones (IPZ) established around municipal wells or intakes.

There are 14 municipal drinking water systems within Wellington County in the following communities:

- Erin, Bel-Erin and Hillsburgh (Erin);
- Clifford, Palmerston, Minto Pines, and Harriston (Minto);
- Arthur and Mount Forest (Wellington North);
- Rockwood, Hamilton Drive (Guelph-Eramosa);
- Drayton and Moorefield (Mapleton); and
- Elora/Fergus (Centre Wellington).

The Wellhead Protection Areas (WHPA) from adjoining municipalities also enter into Wellington County and require protection by the Townships and Towns:

- City of Guelph

- Cambridge (Regional Municipality of Waterloo); and
- Acton and Georgetown (Halton Region)
- Freelton (City of Hamilton)

The Region of Waterloo and the City of Guelph are separately pursuing Class Environmental Assessments related to the City of Cambridge and City of Guelph municipal water supplies. The Cambridge East Environmental Assessment (EA) and the Clythe Creek EA both recently held public open houses in Fall 2017. Summaries of these open houses are attached to this report. These wells and / or wellhead protection areas currently extend into the Township of Puslinch. The Grand River Source Protection Plan is the applicable source protection plan for the areas of the Township affected by these Class EAs and the Township would be responsible for any increased source protection implementation responsibilities due to any potential increases in wellhead protection areas.

Purpose

This report provides brief summaries of the recent public open house materials for both the Cambridge East and Clythe Creek EAs.

Clythe Creek EA – City of Guelph

The Clythe Creek well is currently off line and was identified in the City of Guelph's most recent Water Supply Master Plan as an option to increase municipal water capacity for the City. Clythe Creek requires treatment for iron, manganese and hydrogen sulphide that is naturally occurring. The EA evaluates options for locating a treatment facility.

Eight site options were presented initially. Through screening-level site evaluation, three options were carried forward.

Option A: Watson Road Industrial – privately owned, not developed, adequate size, located across from existing Clythe Well site

Option B: Grange Road Park – City-owned property, adequate size, currently developed as a public park. Area available that would not impact park open space.

Option C: 115 Watson Parkway – privately owned, not developed, adequate size, located in close proximity to existing Clythe Well site

In reviewing the attached public open house materials, it is apparent that this is an EA regarding treatment options and siting. There are no discussions regarding increasing or changing the permitted pumping rate at this time. Clythe Creek was already included in the wellhead protection area (WHPA) delineation pursuant to the Grand River Source Protection Plan and the Clean Water. At this time, there are no anticipated changes to WHPAs in the Township of Puslinch from this study.

Cambridge East EA

The Cambridge East EA has been the subject of previous reports to Council from the Township hydrogeologist, Harden Environmental. The purpose of this summary is to comment specifically on the Clean Water Act implications and not on the hydrogeological, surface water or monitoring aspects of the Cambridge East EA as these have been previously addressed by the Township hydrogeologist.

The following alternatives were presented:

1) Do nothing

2) Upgrades at existing sites

   2A) increase supply from existing wells only: deepened Well G16
   2B) Increase supply from Pinebush new wells at existing site: P10A, P10B, PBTW1-10

3) New wells at new sites

   3A) increased supply from Clemens Mill new well: Cedarbrook well
   3B) increased supply from Clemens Mill new well: Portuguese Club well

4) Combination of 2A, 2B, 3A - preferred alternative

The preferred alternative was chosen due to the following rationale:

- Provides good quality ground water with low interaction with surface water features
- Meets the water supply (38L/s by 2031)
- Operational flexibility
- Flexibility of moving pumping from one well to another in case monitoring shows impacts

The preferred alternative includes the creation of new well sites at Clemens Mill and Pinebush and increasing supply at an existing well. A main consideration for source protection implementation is the WHPA delineations and vulnerability scoring as this will, in part, determine what drinking water threats are considered significant. A draft of this was shared during the Township of Puslinch public meeting in June 2017. Based on the information publicly available, there will be expanded WHPA B (2 year time of travel), C (5 year) and D (25 year) that extend into the Township for at least some of the preferred well locations. The Clemens Mill well site is located with a few hundred metres of the County / Regional boundary (Townline Road). The highest vulnerability

score shown to extend into the Township is a score 8. If the vulnerability scores are 8 or less within the WHPAs that extend into the Township, than new significant drinking water threats will be limited to chemical handling. Based on the rural nature of that portion of the Township, it is anticipated that there would be limited properties that could potentially result in significant drinking water threats. This would need to be confirmed through field verification by Township Risk Management staff. If properties are identified, based on the vulnerability scoring currently available, risk management plans would be the policy requirement for significant drinking water threats. Risk management staff are in contact with Region of Waterloo staff to discuss the vulnerability scoring and WHPA delineation.

FINANCIAL IMPLICATIONS

None at this time

APPLICABLE LEGISLATION AND REQUIREMENTS

Clean Water Act
Environmental Assessment Act

ATTACHMENTS

Schedule A - Cambridge East EA – Public Consultation # 3 – November 2017
Schedule B - Cambridge East EA – Township of Puslinch Public Meeting – June 2017
Schedule C - Clythe Creek Class Environmental Assessment – October 19, 2017

Laura Verhaeghe - GM BluePlan

From: Robin.Puskas@guelph.ca
Sent: Tuesday, November 21, 2017 8:18 AM
To: Grant Parkinson - GM BluePlan; Laura Verhaeghe - GM BluePlan
Subject: FW: Oct. 19 Clythe well Environmental Assessment Open House

Robin Puskas, P.Eng, Project Manager
Water Services
City of Guelph
519-822-1260 extension 2195
Cell 519-820-7448
robin.puskas@guelph.ca

From: Alexey Shcherbin [mailto:AShcherbin@centrewellington.ca]
Sent: November 21, 2017 8:17 AM
To: Robin Puskas
Subject: RE: Oct. 19 Clythe well Environmental Assessment Open House

Thank you very much Robin.

Regards,

Alex

From: Robin.Puskas@guelph.ca [mailto:Robin.Puskas@guelph.ca]
Sent: Monday, November 20, 2017 3:58 PM
To: Alexey Shcherbin <AShcherbin@centrewellington.ca>
Cc: Grant.Parkinson@gmblueplan.ca
Subject: RE: Oct. 19 Clythe well Environmental Assessment Open House

Alex

The Open House boards have been uploaded to the link below:
In the **Engagement** tab: https://guelph.ca/city-hall/planning-and-development/community-plans-studies/environment-planning/environmental-assessments/clythe-well-ea/ in the **Resources** section.

If you have any questions please contact either Grant or myself

Regards
Robin

Robin Puskas, P.Eng, Project Manager
Water Services
City of Guelph
519-822-1260 extension 2195
Cell 519-820-7448
robin.puskas@guelph.ca

From: Alexey Shcherbin [mailto:AShcherbin@centrewellington.ca]
Sent: November 8, 2017 9:01 AM
To: Robin Puskas
Subject: Oct. 19 Clythe well Environmental Assessment Open House

Good morning Robin,

I'm emailing in regards to the Clythe well Environmental Assessment open house that took place on Oct. 19. http://guelph.ca/city-hall/planning-and-development/community-plans-studies/environment-planning/environmental-assessments/clythe-well-ea/

I've spoken with the other PM on the phone, Grant Parkinson about the information slides that will be uploaded for the public from that open house. He said that the city will be doing it shortly.

Project pages has last been updated on Oct. 5, and I am wondering where I can find out more detail and if I was looking in a wrong place.

Particularly, any sort of presentation slides, boards, or any meeting notes would be of great use to understand what took place at the open house.

Regards,
Alex **SHCHERBIN** |519.846.9691 **x384**| Source Protection Assistant (Co-op)

Wellington Source Water Protection
7444 Wellington Road 21, Elora, ON, N0B 1S0
www.wellingtonwater.ca

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CITY OF Guelph
Making a Difference

MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT
CLYTHE WELL TREATMENT

OPEN HOUSE COMMENT SHEET

Thursday, October 19, 2017

We welcome your input...
Your comments and opinions are important to us.
Please take some time to give us your feedback by answering the questions below and sharing your viewpoint.
Please print legibly.
All personal information provided will be kept confidential.

Personal information collected on this form is being collected as part of stakeholder engagement and public input into possible treatment upgrades to Clythe Well. All individual responses will be kept confidential, but may be summarized in reports to reflect overall feedback received from the public.

Personal information, as defined by Section 2 of the Municipal Freedom of Information and Protection of Privacy Act (MFIPPA), is collected under the authority of the Municipal Act, 2001, and in accordance with the provisions of MFIPPA.

For questions regarding the collection, use and disclosure of this information please contact the Information and Access Coordinator at 519-822-1260 extension 2349 or privacy@guelph.ca

Name: SINCLAIR (Last name) RON (First name) _____ (Initial)

Address: _____ (Street) _____ (Apt. No.)

_____ (City) _____ (Province) _____ (Postal code)

_____ (Home telephone) _____ (Business telephone) _____ (Email)

Would you like to be placed on a contact list to receive future notifications regarding this project?

Please indicate Yes or No. ☑ Yes ☐ No

Please answer 'Yes' or 'No' to the following questions:

Did the Open House help you understand more about the project? ☑ Yes ☐ No

Were your questions answered to your satisfaction? ☐ Yes ☒ No

Continued on Reverse

Please provide any comments

The study limits seem too narrow. The well hasn't been in use for 18 years according to the slides. A lot has changed. The issue for me is turning the well back on rather than the treatment. Just because a permit was originally taken in 1976, should not be acceptable to return the well to service. The Ground Water Protection Act should be considered and a full study undertaken before returning the well to service. The study should extend into the rural area of Guelph Eramosa Township where our farm is located. We have spent thousands of dollars to comply with the Ground Water Protection Act to allow our beef farm to continue in operation. We need to know the impact on our nutrient management practices if this well is returned to service. We also need to know the impact on our own well if the City now starts drawing so much water only about 1km away from our farm. Thank you for hosting the open house. Ron Sinclair

Please leave your comments on your departure or mail or email them to:

Robin Puskas, P.Eng.
Project Manager, Water Service
City of Guelph
1 Carden Street
Guelph ON N1H 3A1
Phone: 519-822-1260 x 2195
E-mail: robin.puskas@guelph.ca

Grant Parkinson, P.Eng.
Project Manager
GM BluePlan Engineering
650 Woodlawn Road West, Block C, Unit 2
Guelph, ON N1K 1B8
Phone: 519-824-8150
E-mail: grant.parkinson@gmblueplan.ca

CITY OF Guelph
Making a Difference

MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT
CLYTHE WELL TREATMENT

OPEN HOUSE COMMENT SHEET

Thursday, October 19, 2017

We welcome your input…
Your comments and opinions are important to us.
Please take some time to give us your feedback by answering the questions below and sharing your viewpoint.
Please print legibly.
All personal information provided will be kept confidential.

Personal information collected on this form is being collected as part of stakeholder engagement and public input into possible treatment upgrades to Clythe Well. All individual responses will be kept confidential, but may be summarized in reports to reflect overall feedback received from the public.

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For questions regarding the collection, use and disclosure of this information please contact the Information and Access Coordinator at 519-822-1260 extension 2349 or privacy@guelph.ca

Name: Cabral (Last name) Jane (First name) _____ (Initial)

Address: _____ (Street) _____ (Apt. No.)

_____ (City) _____ (Province) _____ (Postal code)

_____ (Home telephone) _____ (Business telephone) _____ (Email)

Would you like to be placed on a contact list to receive future notifications regarding this project?

Please indicate Yes or No. ☑ Yes ☐ No

Please answer 'Yes' or 'No' to the following questions:

Did the Open House help you understand more about the project? ☑ Yes ☐ No

Were your questions answered to your satisfaction? ☑ Yes ☐ No

Continued on Reverse

Please provide any comments

Option A is my #1 choice.

Please leave your comments on your departure or mail or email them to:

Robin Puskas, P.Eng.
Project Manager, Water Service
City of Guelph
1 Carden Street
Guelph ON N1H 3A1
Phone: 519-822-1260 x 2195
E-mail: robin.puskas@guelph.ca

Grant Parkinson, P.Eng.
Project Manager
GM BluePlan Engineering
650 Woodlawn Road West, Block C, Unit 2
Guelph, ON N1K 1B8
Phone: 519-824-8150
E-mail: grant.parkinson@gmblueplan.ca

Laura Verhaeghe - GM BluePlan

From: Grant Parkinson - GM BluePlan
Sent: Tuesday, November 21, 2017 8:31 AM
To:
Cc: Laura Verhaeghe - GM BluePlan; Robin.Puskas@guelph.ca; Dave.Belanger@guelph.ca; Scott.Cousins@guelph.ca
Subject: 112041 : City of Guelph - Clythe Well EA
Attachments: Open House Comment Sheet_Sinclair.pdf

Mr. Sinclair

Thank you for your interest in the Clythe Well Treatment Class Environmental Assessment. We offer the following response to your comments submitted at the Open House on October 19, 2017 (attached).

This project is for proposed treatment upgrades to bring Clythe Well back into service. Clythe Well is an existing well with an existing Permit to Take Water that permits the City to withdraw up to 5,237 m3/day. No changes are proposed to the well or the water taking. The wellhead protection area as defined in the City of Guelph Source Water Protection Project (2010) includes consideration for withdrawal from Clythe Well; as such, no required changes to your nutrient management practices are anticipated. The study limits are based on potential sites for a future treatment facility, which is the focus of this study.

Regarding impacts of Clythe Well operation on your private well, we understand your concerns and present the following measures to mitigate those concerns:

1. A clause found in the Permit To Take Water (PTTW) for Clythe Well issued by the Ministry of Environment and Climate Change (MOECC) is as follows:

   "If the taking of water is observed to cause any negative impact to other water supplies obtained from any adequate sources that were in use prior to initial issuance of a Permit for this water taking, the Permit Holder shall take such action necessary to make available to those affected, a supply of water equivalent in quantity and quality to their normal takings, or shall compensate such persons for their reasonable costs of so doing, or shall reduce the rate and amount of taking to prevent or alleviate the observed negative impact. Pending permanent restoration of the affected supplies, the Permit Holder shall provide, to those affected, temporary water supplies adequate to meet their normal requirements, or shall compensate such persons for their reasonable costs of doing so. If permanent interference is caused by the water taking, the Permit Holder shall restore the water supplies of those permanently affected."

We reviewed the Ministry of Environment and Climate Change (MOECC) water well data base to identify your well. However, it was not clear from the information available if your well is listed. There is one well noted in Concession 2 Lot 8 of Guelph-Eramosa Township that was drilled in 1961 to a depth of 60 feet. If you have any details or a copy of the original well record, that would be useful.

We thank you for your interest in this study.

Grant Parkinson, P.Eng.
Senior Project Manager, Partner

GM BluePlan Engineering Limited
650 Woodlawn Road West, Block C, Unit 2 | Guelph ON N1K 1B8
tel: (519) 824-8150 Ext. 1231| cell: (519) 831-1520
grant.parkinson@gmblueplan.ca | www.gmblueplan.ca

Laura Verhaeghe - GM BluePlan

From: Grant Parkinson - GM BluePlan
Sent: Thursday, December 21, 2017 3:13 PM
To: Hugh R Whiteley
Cc: Robin.Puskas@guelph.ca; Dave.Belanger@guelph.ca; Laura Verhaeghe - GM BluePlan; Scott.Cousins@guelph.ca
Subject: 112041 : Clythe Well EA

Dr. Whiteley

In response to your email of December 7, 2017, we offer the following additional information. For tracking purposes, we note that your original email from October 19, 2017 identified 3 areas of concern and we address each concern as follows.

1. Potential impact from the closed Eastview Landfill

With regards to the closed Eastview Landfill, the groundwater capture zone for the Clythe Well does not extend to the Eastview Landfill. Therefore, the well does not draw water from the area of the landfill and the water quality of Clythe Well will not be impacted by the landfill. The capture zone for Clythe well is identified from previous hydrogeological studies and is shown on Figure 6 in the City of Guelph Source Protection Project Report (Aqua Resource Inc., 2010) (http://guelph.ca/wp-content/uploads/2010GroundwaterSurfaceWaterVulnerabilityReport.pdf). We would also direct you to the 2016 Annual Report for the Eastview Landfill (http://guelph.ca/wp-content/uploads/Eastview2016AnnualReport.pdf) wherein you will find details of the leachate management plans that are used to address risks presented by the landfill. The 2016 Annual Landfill Report indicates that the sheet pile wall is effectively preventing leachate from entering the shallow groundwater table. Page 14 also discusses the relationship between pumping wells in the NE quadrant and leachate monitoring well level. No correlation was found from 2005 to 2016, and variations in monitoring well levels are attributed to normal seasonal variation and not changes in pumping. Since it is not a factor in our Class EA, if you have further questions regarding the closed Eastview Landfill, they can be directed to Solid Waste Services.

2. GUDI status of Clythe Well

Concerns have been satisfied.

3. Potential impacts on Clythe Creek

The Clythe Well is an “Existing municipal well site” as defined in the Municipal Class Environmental Assessment document (Municipal Engineers Association, 2015). This means it is the site of an existing, operating municipal well which has received all the necessary approvals including a Permit to Take Water (1008-9J7S6G, issued/renewed in 2014), Municipal Drinking Water License and Drinking Water Works Permit. With an existing municipal well site and an approved PTTW, this Class EA is considering only the environmental effects of this project which is the addition of a treatment facility. In granting and renewing the PTTW, the potential impacts of the well were reviewed and have been permitted. Baseline conditions for the Class EA project are with the well in operation and the site conditions as they exist today (i.e. 34 years after the well was first permitted). The Class EA project considers only the additional environmental impacts that may occur as a result of proposed treatment upgrades. In contrast, if this were a new water supply source, the Class EA would consider potential impacts of the new taking including effects to surface water, groundwater, existing wells, source water protection etc. with the hydrogeological investigation studying these issues.

The most recent update to the MEA Municipal Class EA document (2015) incorporated Source Water Protection, in that projects located within a vulnerable area under the Clean Water Act need to consider policies in the area source protection plan to ensure they do not pose a risk to drinking water. Also for any **proposed projects that alter or result in new vulnerable areas**, landowners within new or amended vulnerable areas (WHPAs) could be impacted by the source protection plan policies. Clythe Well has been included in the City’s Source Protection Program and wellhead protection areas for the well have been included in the relevant Source Protection documents. Since the Clythe well will be operating under an existing PTTW that is not proposed to change, the WHPA was developed on this basis, and therefore, this would not apply. For an existing water supply with an approved PTTW, this Class EA is considering only the environmental effects of the addition of a treatment facility.

We note that a deep liner was installed in the Clythe Well since the well was first permitted in 1983. The liner, installed in 1999 to a depth of 26.8 m below surface, was intended to address the water quality issues from naturally-occurring hydrogen sulphide in the deep aquifer. While the liner did not mitigate water quality issues in the well and the treatment upgrade is now proposed, the deep liner has the advantage of reducing the effects of water taking on shallow groundwater. The City has reduced the potential environmental impacts of the well on shallow groundwater since the well was first permitted.

In addition, the City has completed the Guelph – Guelph Eramosa Tier 3 Water Budget and Local Area Risk Assessment. The Clythe Well was included in the Tier 3 study as a component of the City's existing and future water supply system. The Tier 3 Assessment scenarios predicted impacts of increased pumping on groundwater discharge to cold-water streams. It is recognized that the City water taking has an impact on surface water in the model area; however, this impact was predicted to be Moderate, not Significant, for a number of streams in the model area. The City is now in the process of conducting a Risk Management Measures Evaluation Process (RMMEP) to address Significant Drinking Water Threats (SDWT) to water quantity; however, since the impacts to surface water are considered to be Moderate, and the RMMEP addresses only SDWT. The RMMEP will be completed in 2018 and will be used to develop water quantity policies. The City does not currently have water quantity policies in its Source Protection Plan, however, policies developed through the RMMEP would address only SDWT.

Thank you for your suggestions for monitoring. We will take these suggestions under advisement. As noted, the impacts of the operation of Clythe Well are not part of the Class EA project. No monitoring is currently required under our PTTW. The City has a monitoring well nest (OW11-06, overburden, shallow bedrock, deep bedrock) located off of Watson Parkway adjacent to Clythe Creek as well as other well nests in its City-wide monitoring network that will be monitored during the start-up of the Clythe Well. Upon our next renewal of the PTTW, the City, in discussions with the MOECC, will consider whether we need to modify our existing Environmental Monitoring Program and whether additional monitoring is necessary for Clythe Creek.

Thank you for your interest in this study and we trust the above has addressed your concerns.

Grant Parkinson, P.Eng.
Senior Project Manager, Partner

GM BluePlan Engineering Limited
650 Woodlawn Road West, Block C, Unit 2 | Guelph ON N1K 1B8
tel: (519) 824-8150 Ext. 1231| cell: (519) 831-1520
grant.parkinson@gmblueplan.ca | www.gmblueplan.ca

From: Hugh R Whiteley
Sent: Thursday, December 07, 2017 5:55 PM
To: Grant Parkinson - GM BluePlan
Cc: Robin.Puskas@guelph.ca; Dave.Belanger@guelph.ca; Laura Verhaeghe - GM BluePlan; Scott.Cousins@guelph.ca
Subject: Re: 112041 : Clythe Well EA

Greetings Grant

Thank you for your comprehensive response to the questions I raised regarding the Clythe Well Treatment Class Environmental Assessment.

Your response answers my question (2) about the possible GUDI status of the Clythe Well in the future and I have no residual concerns on this issue.

I do have continuing concerns about the other two areas of concern that related to possible effects of re-establishing sustained pumping from the Clythe well on leachate movement to the bedrock aquifers under the

Eastview landfill site (Question 1) and possible detrimental effects of sustained pumping of the Clythe well on baseflow in Clythe Creek, a already-stressed potentially coldwater stream (Question 3).

As you state the Class EA for the Clythe well is undertaken for the proposed water treatment upgrades but all EA's must consider all the environmental effects that may result from the proposed works being implemented. In this case one of the results of installation of the treatment upgrades is that it makes possible continuous pumping from the Clythe well. The potential environmental impacts from this pumping include possible increase in downward vertical gradient under the former Eastview landfill and possible increase in loss of baseflow in Clythe Creek in the vicinity of the well.

Both these potential environmental effects are of concern from a Sourcewater Protection perspective and must be evaluated in the EA even though the well has a valid permit to take water.

An example of the analysis that is required is shown in the Orangeville Tier 3 Risk Management Measures Report. In this case pumping from a number of Orangeville wells was of concern for baseflow in Manora Creek. By modelling a temporal pattern of pumping in the surrounding wells was established which prevented unacceptable declines in baseflow.

The Risk Assessment Official has responsibility for assessing risks for both water quality (i.e. Eastview leachate movement) and water quantity risks posed by reduction in baseflow in Clythe Creek.

If the Risk Assessment Official has already assessed these risks and prescribed what monitoring well data and modelling results are required to assess the risks from these two potential results from pumping of the Clythe well I would be interested in seeing this report.

I am particularly interested in knowing about the extent of monitoring that will be undertaken to access the impact of pumping at the Clythe well if continuous pumping of the well is approved by acceptance of the EA. My suggestion is continuous monitoring of two multilevel monitoring wells, one as close to the south side of the former Eastview landfill as is allowable and the other immediately beside Clythe Creek in the vicinity of (old) Watson Road with records starting several months before pumping of Eastview begins and continuing for at least five years. In addition a low-flow-sensitive gauging structure (fish-friendly control section) in Cythe Creek between Watson Road and Watson Boulevard with continuous recording is needed to assess effects on baseflow over time.

If further explanation of my concerns is needed I will try to clarify.

Hugh Whiteley

From: Grant Parkinson - GM BluePlan <Grant.Parkinson@gmblueplan.ca>
Sent: Tuesday, November 21, 2017 8:17:25 AM
To: Hugh R Whiteley
Cc: Robin.Puskas@guelph.ca; Dave.Belanger@guelph.ca; Laura Verhaeghe - GM BluePlan; Scott.Cousins@guelph.ca
Subject: 112041 : Clythe Well EA

Dr. Whiteley

Thank you for your interest in the Clythe Well Treatment Class Environmental Assessment. We offer the following responses to your comments submitted by email to the City on October 19, 2017.

I have three questions that arise from the possibility of resuming regularly scheduled pumping from the Clythe Creek well. They are not directly related to the treatment options which are the specific thrust of the Schedule B EA but in my view require answers that confirms that there is evidence to support the finding that there will be no negative environmental impacts created by pumping from the Clythe Creek Well.

The questions are:

(1) In approving the closure of the Eastview land fill MOECC set the following condition

17.10 The City in the annual monitoring report shall address the impact of water taking from the municipal water supply on the movement of landfill leachate into the bedrock aquifer. The City shall at all times ensure that the pumping rates from the municipal wells are maintained at a hydraulic steady state and pumping equilibrium so that the cone of influence of pumping from the wells does not expand and induce landfill leachate transport and flow downwards to the bedrock aquifer and towards the municipal water wells.
For the renewed use of the Clythe Creek well to be approved it will be necessary for the City to demonstrate, possibly by use of the integrated source water model that is now available, that pumping of the Clythe Creek well does not create any induced landfill leachate transport and flow downward to the bedrock aquifer. Has this analysis been done and are the results available for scrutiny ?

Answer: Condition 17.10 was removed from the Eastview Landfill Environmental Compliance Approval in 2011 and the condition no longer applies.

(2) The position of the Clythe Creek well in close proximity to Clythe Creek gives rise to concern that this may be a GUDI well. This would not preclude its use but would require specific features be present in the treatment system. Has the water quality been tested after an extensive period of pumping (long enough to establish equilibrium water chemistry) and did the results from this test confirm the well to be non-GUDI ?

Answer: When the Clythe Well was in operation, it was licensed as a groundwater well and was confirmed as such in the City's Engineers' Report for Waterworks, Guelph Water Supply System (Acres and Associated, 2001). In 2008, as part of its re-evaluation of the Clythe Well, the water quality was assessed with respect to the treatment requirements for the well (Stantec, 2008). In the Source Water Determination and on the basis of water quality analyses including Laser Particle Counting and Microscopic Particulate Analysis, Stantec stated: "Based on these findings, together with the water level monitoring data, it was concluded that the water quality of the Clythe Well is not influenced by surface water and this assessment should be considered in any proposed changes to the treatment for this well". In the Treatment Requirements, Stantec stated: "Water quality analysis indicates that this source water can be characterized as true groundwater".

It is the City's expectation that this designation (true groundwater) will remain in effect when the well is returned to service. Regardless of the designation, water from the Clythe Well must meet the requirements of the Safe Drinking Water Act with respect to water quality.

(3) A thesis study of the flowrate variations in Clythe Creek in the vicinity of the Clythe Creek well by Ashworth (2012, attached) showed that in low flow periods streamflow was insufficient to support coldwater fish and that Clythe Creek was a losing stream in portions of its length near the Clythe Creek well. These findings make Clythe Creek susceptible to environmental damage if the pumping of the Clythe Creek well increases the losses of water from the stream to the groundwater system.
Confirmation is required that pumping of the Clythe Creek well does not increase seepage from the stream to groundwater. Source water studies, in particular the Orangeville study, demonstrated that changes to streamflow from pumping from an underlying bedrock aquifer can take over a year to begin to occur. A very long-term pumping test with extensive monitoring of the vertical gradient n the streambed is required to establish the effect of pumping on the adjacent stream. Has this test been performed and if so are the results available for examination ?

Answer: The Class EA project is for proposed treatment upgrades to bring the Clythe well back into service. The Clythe Well is an existing well with an existing Permit to Take Water that permits the City to withdraw up to 5,237 m3/day. No changes are proposed to the well or the water taking.

We thank you for your interest in this study.

Grant Parkinson, P.Eng.
Senior Project Manager, Partner

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grant.parkinson@gmblueplan.ca | www.gmblueplan.ca

Appendix F:
Detailed Evaluation Matrix

Evaluation Criteria/ Considerations	Screening Criteria Weighting Factor	OPTION A 25 Watson Road Industrial (elev. 330m)		OPTION B Grange Road Park (elev. 347m)		OPTION C 115 Watson Parkway (elev. 328m)	
Site Requirements		Score	Weighted Score	Score	Weighted Score	Score	Weighted Score
Adequate Developable Size	0.33	1	0.33	0.5	0.17	1	0.33
Proximity to large distribution mains	0.33	0.75	0.25	0.75	0.25	1	0.33
Elevation appropriate for intended use	0.33	1	0.33	0.75	0.25	1	0.33
Adequate site access	0.33	0.5	0.17	0.5	0.17	1	0.33
Availability of site services (road, sanitary, Hydro, communications, gas)	0.33	0.5	0.17	0.75	0.25	1	0.33
Total: Site Requirements	*1.67*	*3.75*	*1.25*	*3.25*	*1.08*	*5*	*1.67*
Score			*75%*		*65%*		*100%*
Land-Use Planning Objectives							
Availability of property for purchase by City	0.84	0.75	0.63	1	0.84	0.25	0.21
Compatibility with zoning, maintains intent of Official Plan, community plan, and other planning policies and good urban planning principles.	0.84	1	0.84	0.5	0.42	0.75	0.63
Total: Land Use Planning Objectives	*1.67*	*1.75*	*1.46*	*1.5*	*1.25*	*1*	*0.84*
Percentage score			*88%*		*75%*		*50%*
Natural Environment							
Impact on natural environment such as woodlands, wildlife, terrestrial vegetation, groundwater, aquatic, air, etc.	0.56	0.5	0.28	0.75	0.42	0.75	0.42
Impact on Provincially Significant Wetlands (PSW), Significant Wildlife Habitats (SWH), Species at Risk (SAR)	0.56	0.5	0.28	1	0.56	0.75	0.42
Energy Consumption/Carbon Footprint	0.56	1	0.56	0.5	0.28	1	0.56
Total: Natural Environment	*1.67*	*2*	*1.11*	*2.25*	*1.25*	*2.5*	*1.39*
Percentage score			*67%*		*75%*		*83%*
Social and Cultural Environment							
Public Acceptance	0.21	1	0.21	0.25	0.05	0.75	0.16
Aesthetic Appearance/Landscaping	0.21	1	0.21	0.5	0.10	0.5	0.10
Noise	0.21	1	0.21	0.5	0.10	0.75	0.16
Archaeological/Heritage Sites	0.21	1	0.21	1	0.21	1	0.21
Compatibility with adjacent land uses	0.21	1	0.21	0.75	0.16	1	0.21
Property Impacts	0.21	1	0.21	0.75	0.16	0.5	0.10
First Nations/Aboriginal Peoples	0.21	0.75	0.16	0.75	0.16	0.75	0.16
Compatibility with Parks and Recreation Plans	0.21	1	0.21	0.5	0.10	1	0.21
Total: Social and Cultural Environment	*1.67*	*7.75*	*1.61*	*5.00*	*1.04*	*6.25*	*1.30*
Percentage score			*97%*		*63%*		*78%*
Economic Environment							
Lifecycle Cost (Including design, construction, land acquisition, provision of utilities/services, operating cost, maintenance cost, replacement cost. Suggest use Net Present Value of these costs over 75 year life of facility)	0.83	0.75	0.62	0.5	0.42	0.75	0.62
Rate Impact/ Budget Compatibility (Capital Cost)	0.83	1	0.83	0.75	0.62	0.75	0.62
Total: Economic Environment	*1.67*	*1.75*	*1.46*	*1.25*	*1.04*	*1.5*	*1.25*
Percentage score			*88%*		*63%*		*75%*
Technical Feasibility							
Operation and Maintenance Complexity	0.42	1	0.42	0.75	0.31	0.75	0.31
Proximity to proposed Pressure Zone Boundary at Fleming Road and proximity to well	0.42	0.5	0.21	0.75	0.31	0.75	0.31
Ease of Implementation (constructability, approvals, geotechnical, groundwater conditions)	0.42	0.75	0.31	0.5	0.21	0.5	0.21
Watercourse crossings	0.42	1	0.42	0.75	0.31	0.5	0.21
Total: Technical Considerations	*1.67*	*3.25*	*1.35*	*2.75*	*1.15*	*2.50*	*1.04*
Percentage score			*81%*		*69%*		*63%*
OVERALL SCORE	***10.00***	***8.25***		***6.81***		***7.48***	

Appendix G:
Conceptual Design Drawings

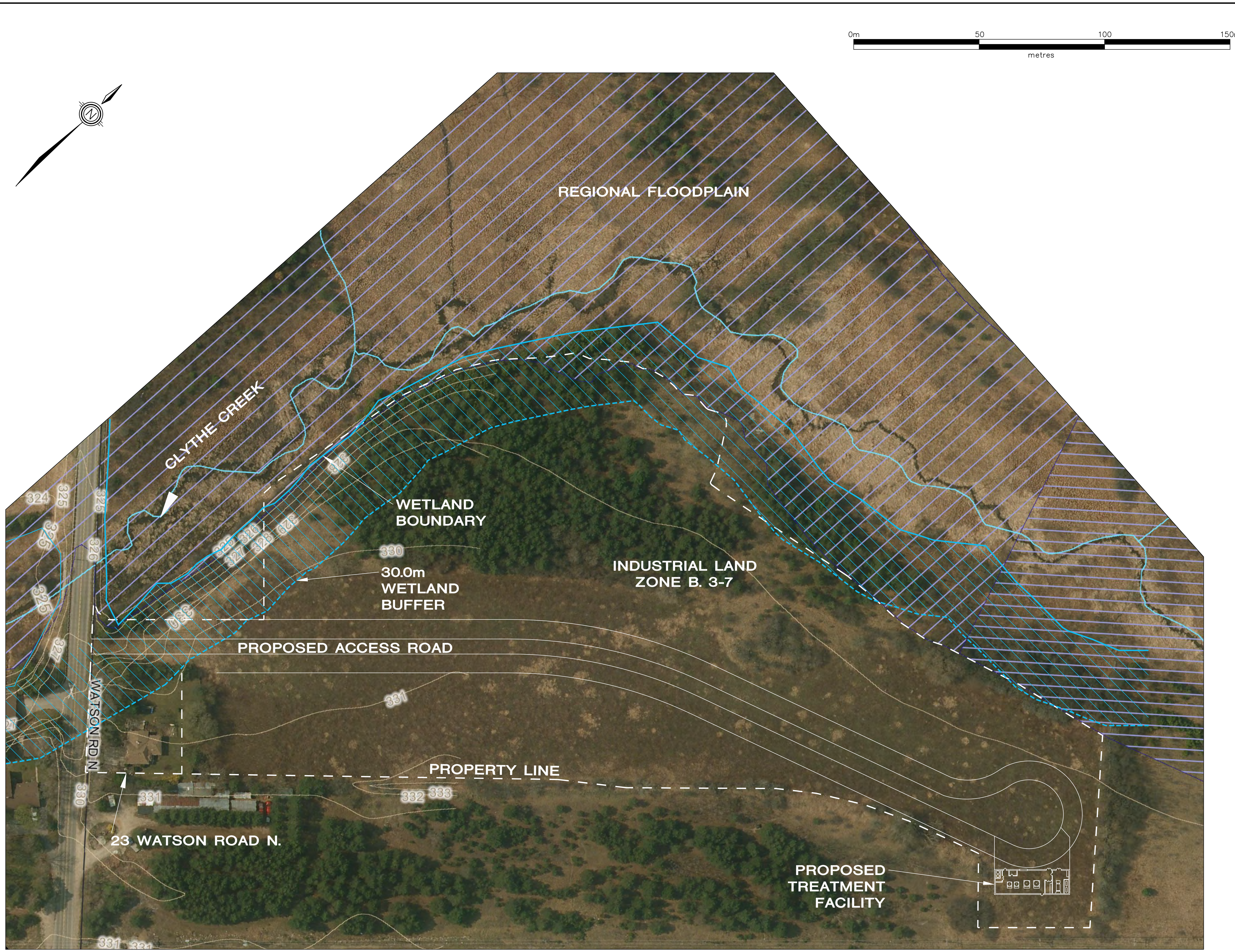
Drawing 1: Conceptual Site Plan Layout

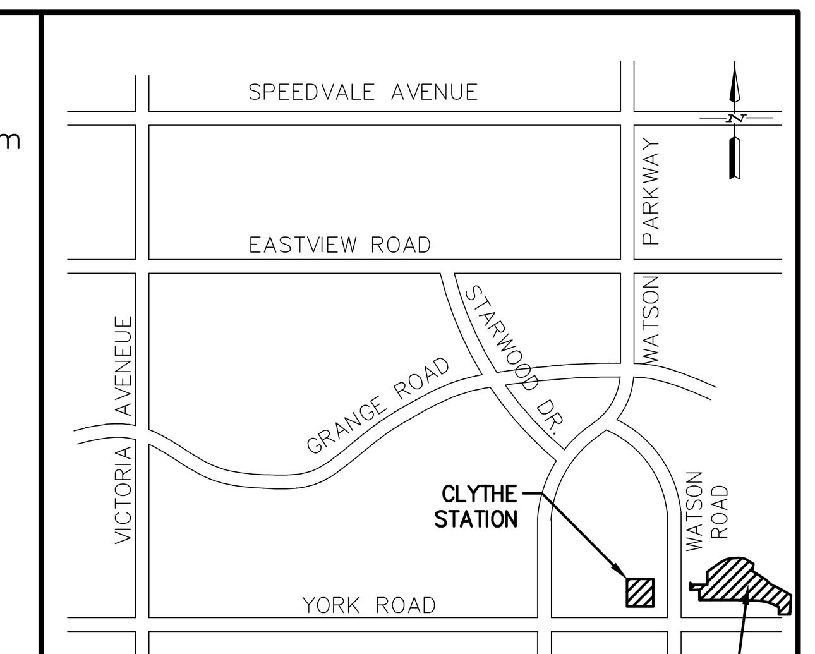
Drawing 2: Conceptual Site Plan Layout – Detailed

Drawing 3: Conceptual Building Layout Plan Options

Drawing 4: Conceptual Treatment Strategy

Drawing 5: Conceptual Process Flow Diagram





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KEY PLAN
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NOTES :

1. DIMENSIONS ARE SHOWN IN MILLIMETERS UNLESS OTHERWISE NOTED
2. THIS SITE PLAN IS CONCEPTUAL ONLY AND BASED ON GRCA AERIAL PHOTOGRAPHY. NO SITE TOPOGRAPHIC INFORMATION WAS AVAILABLE.

BENCH MARKS :

THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND, WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED.

BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR ANY DAMAGE TO THEM.

NO.	DATE	REVISION DESCRIPTION	CH'KD
1.	01/19/18	ISSUED FOR CITY REVIEW	G.A.P.

GM BluePlan ENGINEERING
GUELPH | OWEN SOUND | LISTOWEL | KITCHENER | LONDON | HAMILTON | GTA
650 WOODLAWN ROAD WEST, BLOCK C, UNIT 2, GUELPH, ON N1K 1B8
TEL. 519-824-8150 www.gmblueplan.ca

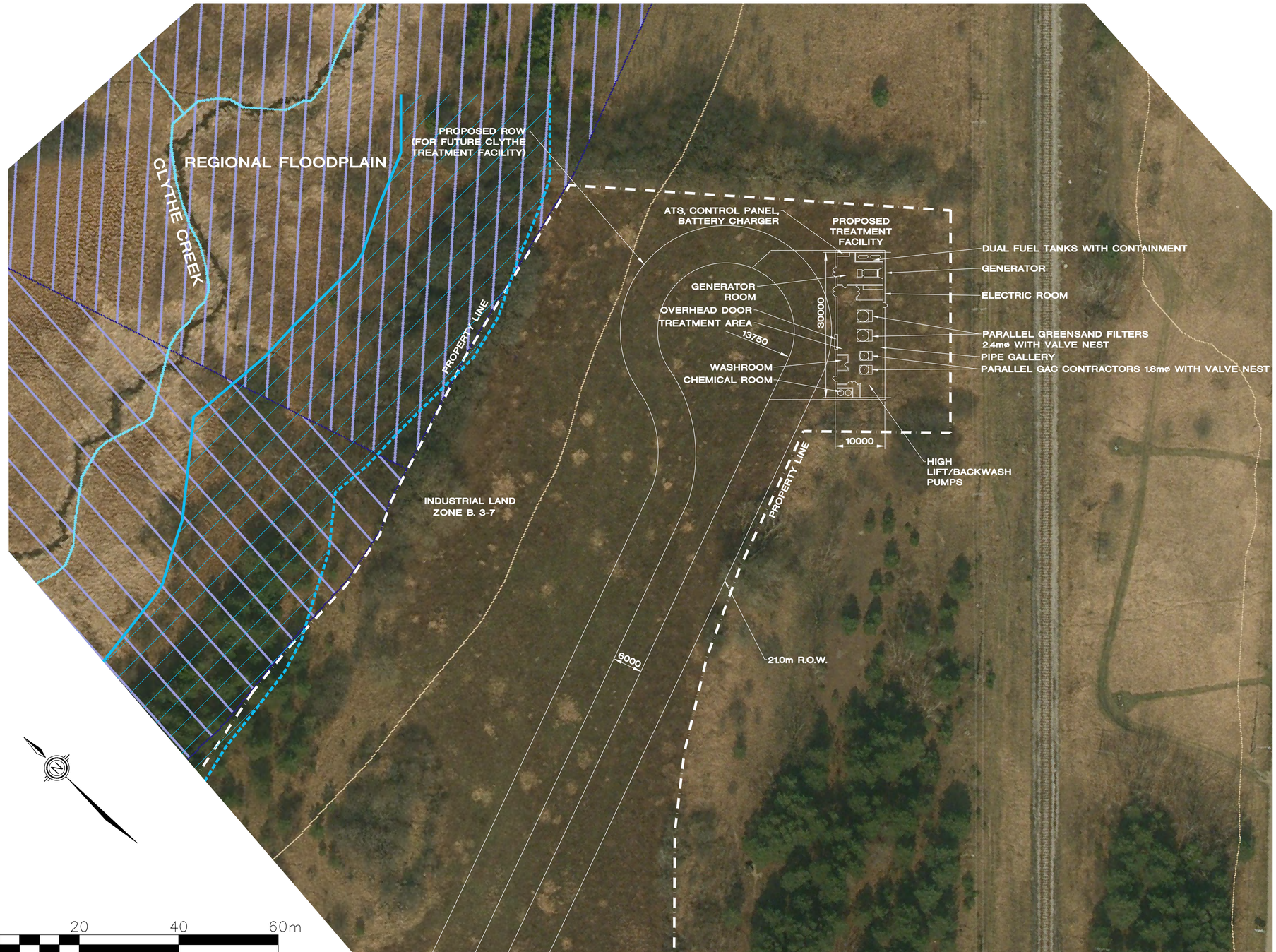
CITY OF GUELPH
PROJECT No. 12-066

CLYTHE WELL TREATMENT UPGRADES CLASS EA

NEW TREATMENT FACILITY
25 WATSON ROAD N.

CONCEPTUAL SITE PLAN LAYOUT

DRAWN BY :	APPROVED BY :	PROJECT NO. :	DRAWING NO. :
D.J.I.	G.A.P.	112-041	1
DESIGNED BY :	DATE :	SCALE :	
D.J.I.	JAN 2018	1:750	



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650 WOODLAWN ROAD WEST, BLOCK C, UNIT 2, GUELPH, ON N1K 1B8
TEL. 519-824-8150 www.gmblueplan.ca

CITY OF GUELPH
PROJECT No. 12-066
CLYTHE WELL TREATMENT
UPGRADES CLASS EA
NEW TREATMENT FACILITY
25 WATSON ROAD N.
CONCEPTUAL SITE PLAN LAYOUT - DETAILED

DRAWN BY :	APPROVED BY :	PROJECT NO. :	DRAWING NO. :
D.J.I.	G.A.P.	112-041	2
DESIGNED BY :	DATE :	SCALE :	
D.J.I.	JAN 2018	1:750	

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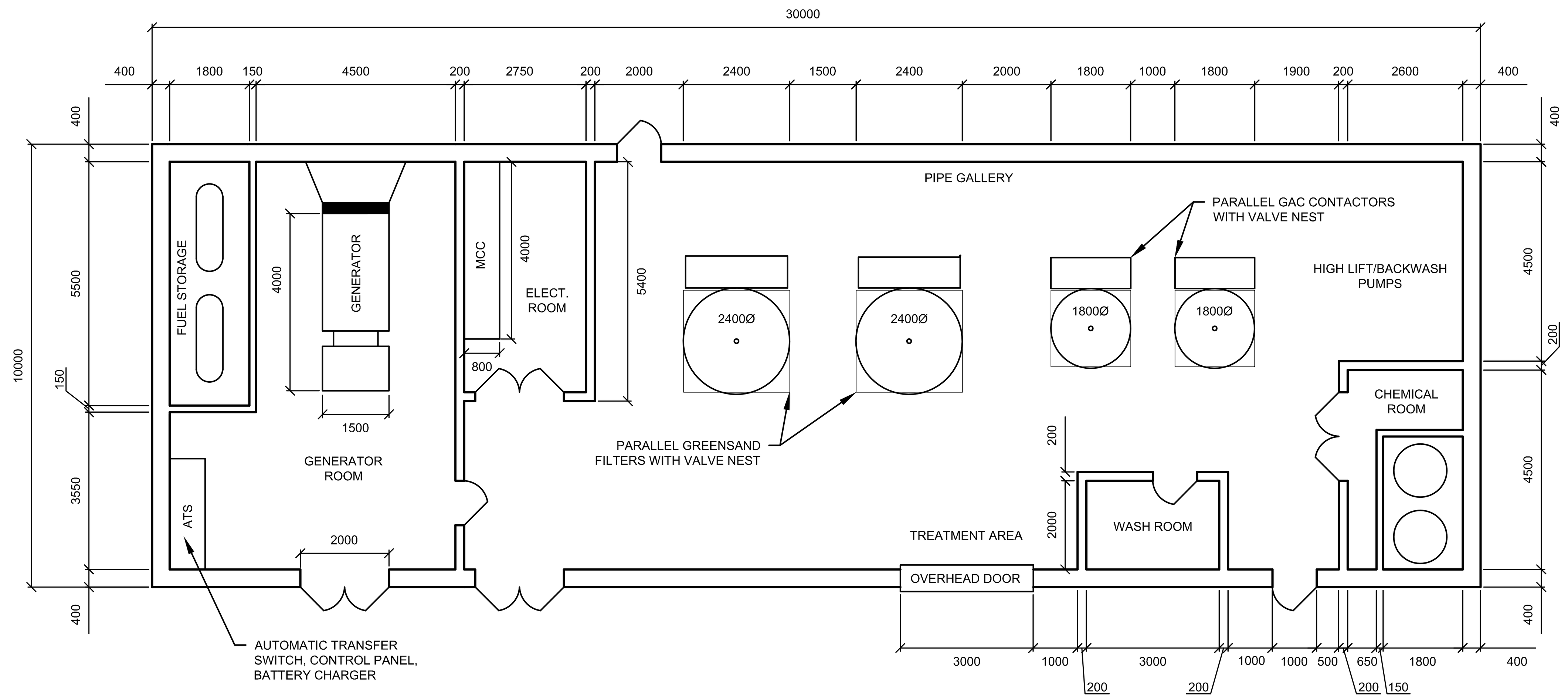
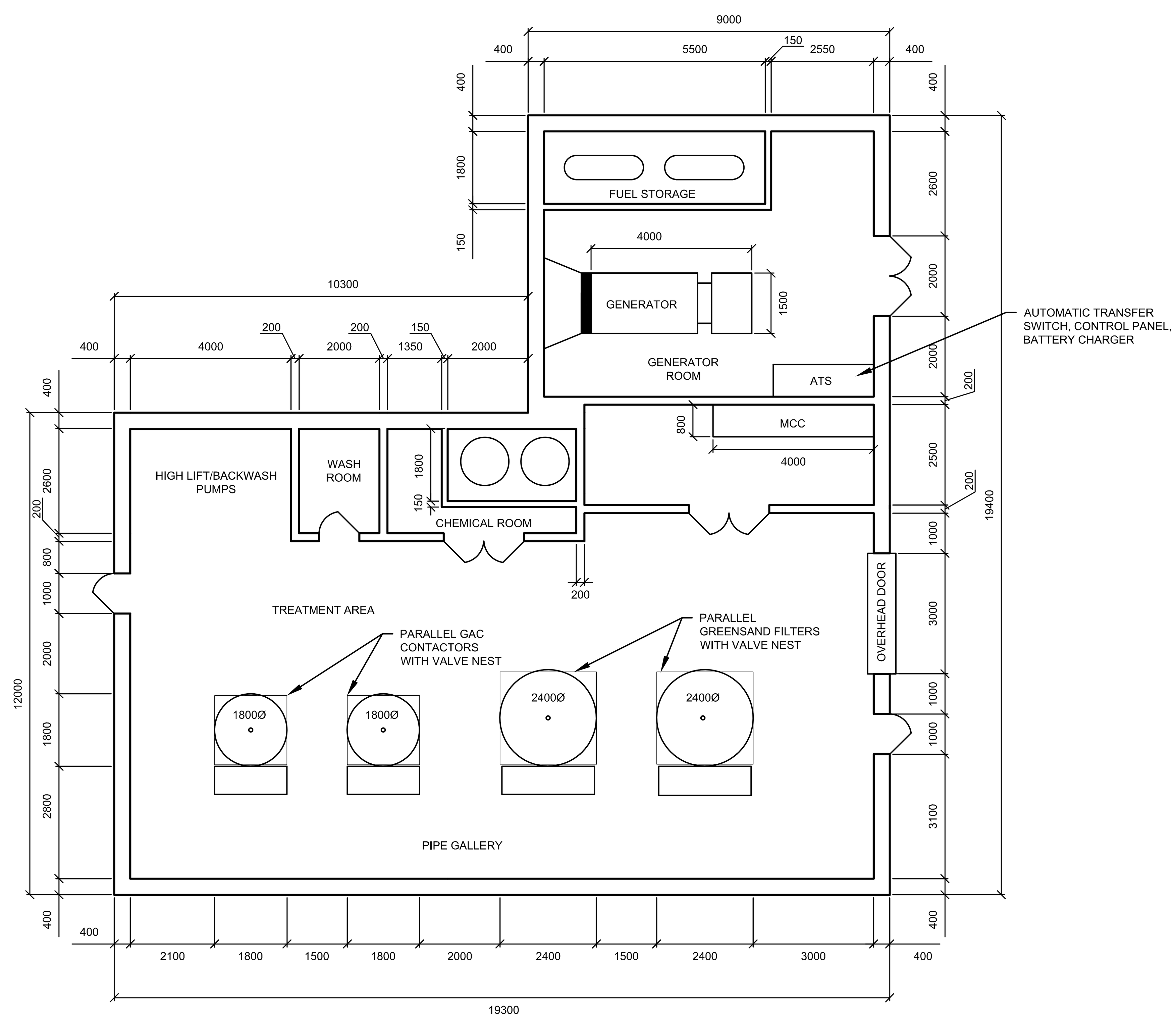
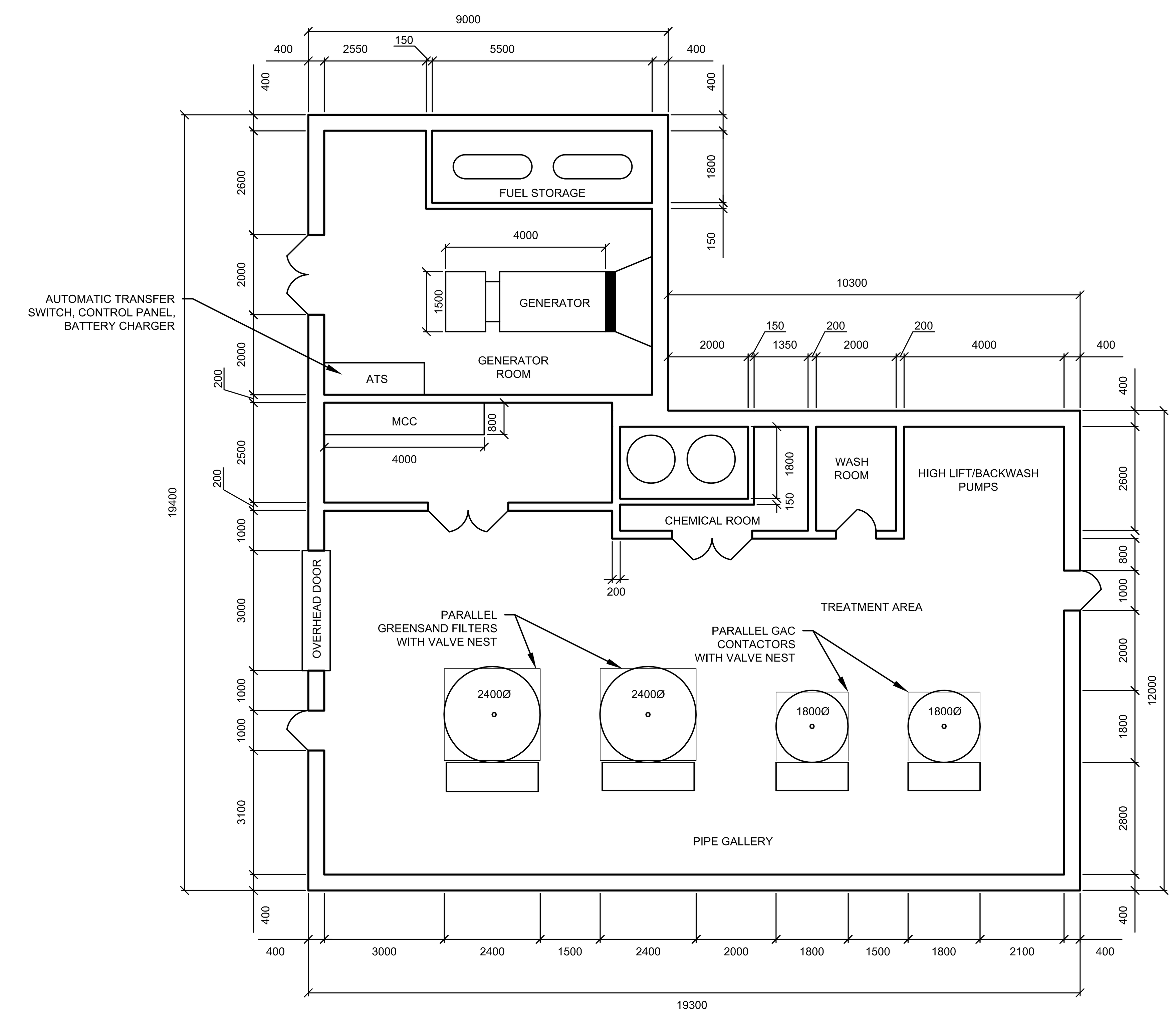


CONCEPTUAL BUILDING LAYOUT - OPTION #1
(APPROX. 300m²)



CONCEPTUAL BUILDING LAYOUT - OPTION #2
(APPROX. 300m²)



CONCEPTUAL BUILDING LAYOUT - OPTION #3
(APPROX. 300m²)

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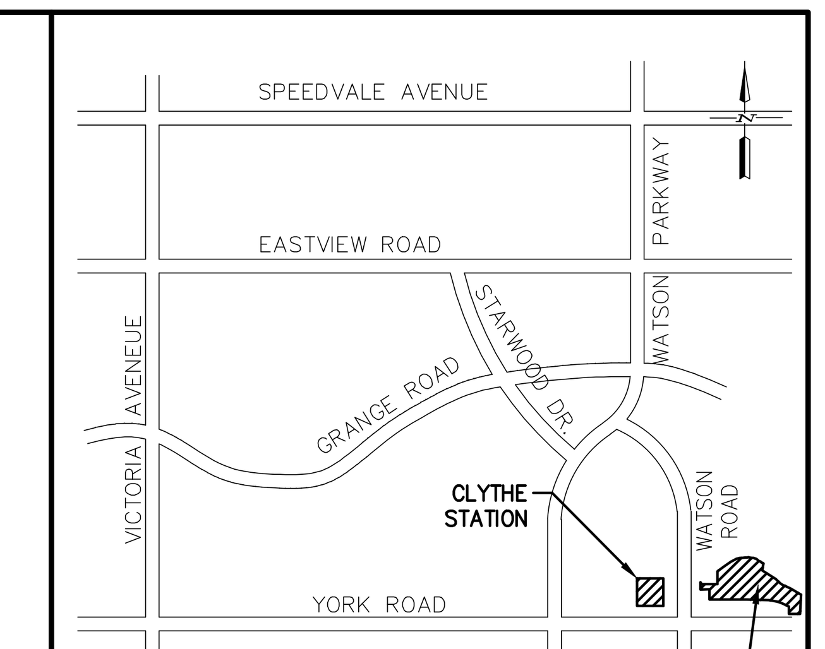

MUNICIPALITY
KEY PLAN
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25 WATSON RD

NOTES :

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2. CONCEPTUAL BUILDING LAYOUT PLAN OPTION #1 SHOWN ON THIS DRAWING WAS USED FOR CONCEPTUAL SITE LAYOUT ONLY

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NO.	DATE	REVISION DESCRIPTION	CHK'D
1.	01/19/18	ISSUED FOR CITY REVIEW	GP

GM BluePlan ENGINEERING

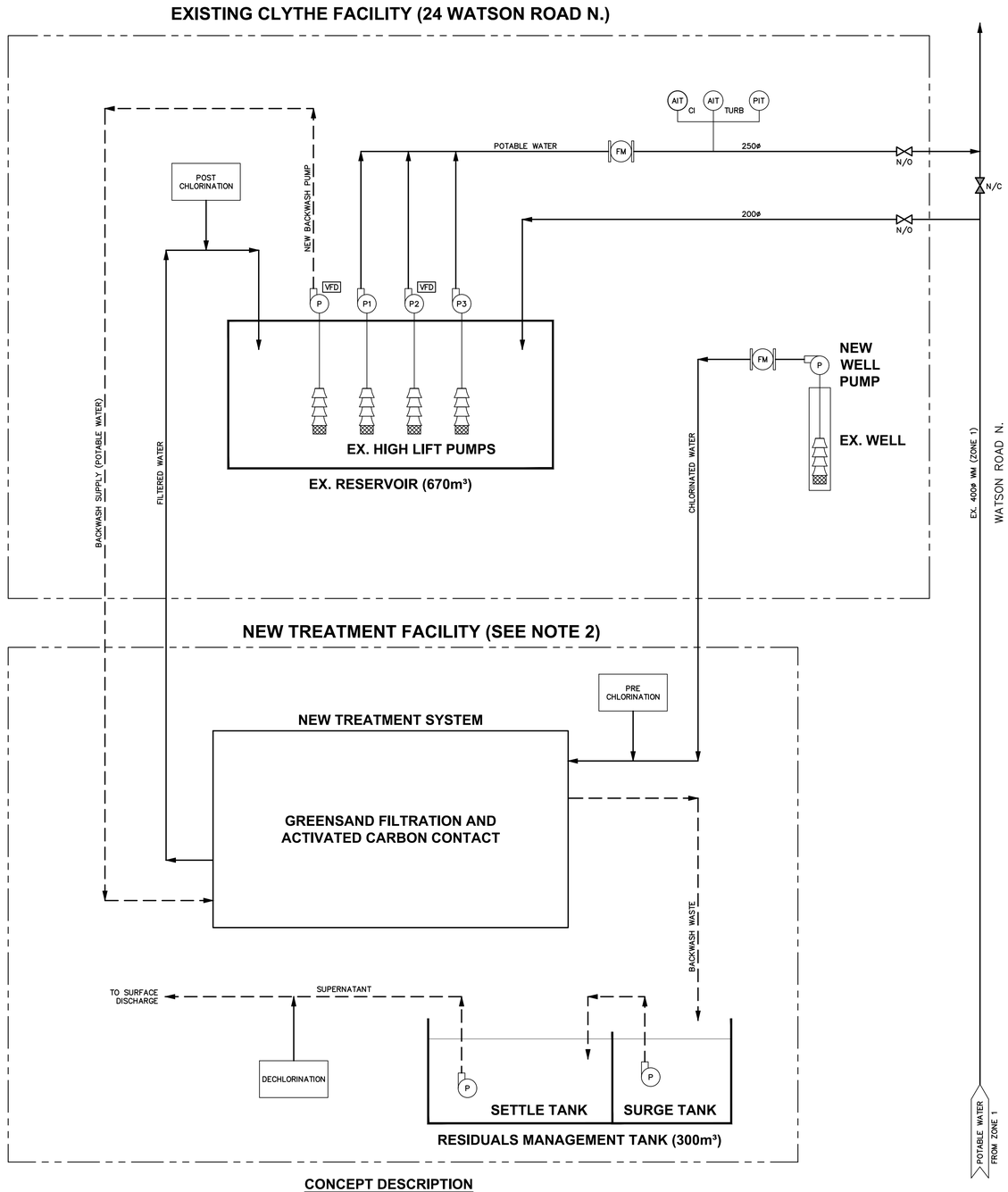
GUELPH | OWEN SOUND | LISTOWEL | KITCHENER | LONDON | HAMILTON | GTA
650 WOODLAWN ROAD WEST, BLOCK C, UNIT 2, GUELPH, ON N1K 1B8
TEL. 519-824-8150 www.gmblueplan.ca

CITY OF GUELPH
PROJECT No. 12-066
CLYTHE WELL TREATMENT UPGRADES CLASS EA
NEW TREATMENT FACILITY
25 WATSON ROAD N.
CONCEPTUAL BUILDING LAYOUT PLAN OPTIONS

DRAWN BY :	APPROVED BY :	PROJECT NO. :	DRAWING NO. :
A.H. / B.L.	G.P.	112041	3
DESIGNED BY :	DATE :	SCALE :	
G.P.	JUNE 2017	1:100	

LEGEND

⋈	MANUAL ISOLATION VALVE
FM	FLOW METER
AIT	ANALYZER INDICATOR/TRANSMITTER
PIT	PRESSURE INDICATOR/TRANSMITTER
CI	CHLORINE
TURB	TURBIDITY
N/O	NORMALLY OPEN
N/C	NORMALLY CLOSED



CONCEPT DESCRIPTION

WELL	WELL PUMP	PRE-CHLORINATION	Fe/Mn/H_2S REDUCTION	T&O POLISHING	PRIMARY DISINFECTION	HIGH LIFT PUMPING	POST CHLORINATION	BACKWASH SUPPLY	BACKWASH WASTE
EQUIPPED	NEW 40L/s @ 40m TDH	EX. WELL SITE	GREENSAND OXIDATION & FILTRATION	GAC CONTACT	CONTACT TIME IN EX. RESERVOIR	EX. HIGH LIFT PUMPS	EX. WELL SITE	EX. RESERVOIR	NEW 2 COMPARTMENT TANK
ADDRESS	(24 WATSON RD. N)	(25 WATSON RD. N)	(25 WATSON RD. N)	(25 WATSON RD. N)	(24 WATSON RD. N)	(24 WATSON RD. N)	(24 WATSON RD. N)	(24 WATSON RD. N)	(25 WATSON RD. N)

NOTES :

1. DIMENSIONS ARE SHOWN IN MILLIMETERS UNLESS OTHERWISE NOTED
2. THIS SITE PLAN IS CONCEPTUAL ONLY AND BASED ON GRCA AERIAL PHOTOGRAPHY. NO SITE TOPOGRAPHIC INFORMATION WAS AVAILABLE.

BENCH MARKS :

THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND, WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED.

BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR ANY DAMAGE TO THEM.

NO.	DATE	REVISION DESCRIPTION	CHKD
1.	01/19/18	ISSUED FOR CITY REVIEW	G.A.P.

BluePlan ENGINEERING
GUELPH | OWEN SOUND | LISTOWEL | KITCHENER | LONDON | HAMILTON | GTA
650 WOODLAWN ROAD WEST, BLOCK C, UNIT 2, GUELPH, ON N1K 1B8
TEL. 519-824-8150 www.gmblueplan.ca

CITY OF GUELPH
PROJECT No. 12-066
CLYTHE WELL TREATMENT UPGRADES CLASS EA
NEW TREATMENT FACILITY
25 WATSON ROAD N.
CONCEPTUAL TREATMENT STRATEGY

DRAWN BY :	APPROVED BY :	PROJECT NO. :	DRAWING NO. :
P.R.M.	G.A.P.	112-041	4
DESIGNED BY :	DATE :	SCALE :	
G.A.P.	MARCH 2013	N.T.S.	

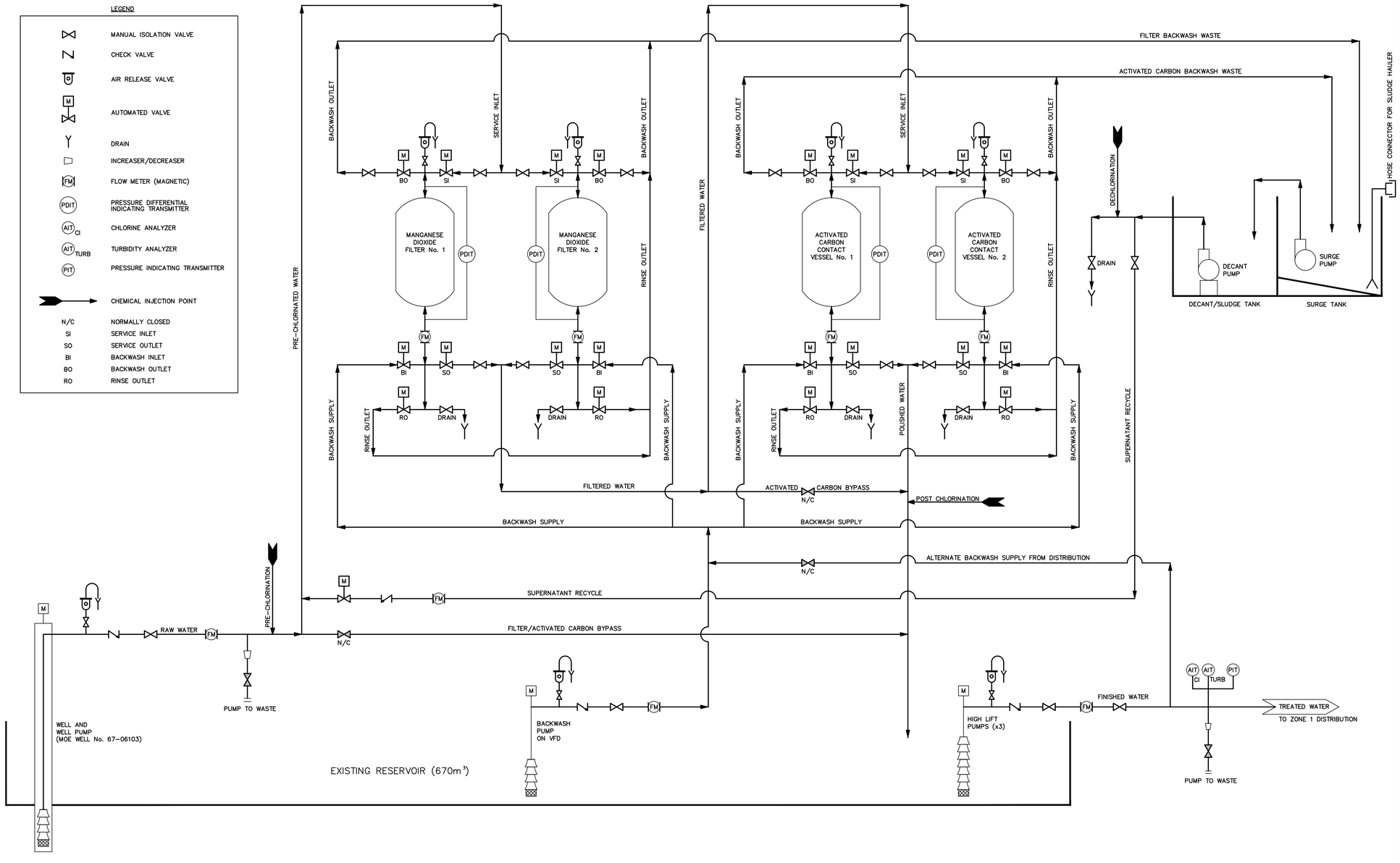
OXIDATION-FILTRATION FOR IRON, MANGANESE AND SULPHIDE REDUCTION

POLISHING FOR TASTE AND ODOUR CONTROL

RESIDUALS MANAGEMENT

LEGEND

	MANUAL ISOLATION VALVE
	CHECK VALVE
	AIR RELEASE VALVE
M	AUTOMATED VALVE
	DRAIN
	INCREASER/DECREASER
FM	FLOW METER (MAGNETIC)
PDIT	PRESSURE DIFFERENTIAL INDICATING TRANSMITTER
AIT Cl	CHLORINE ANALYZER
AIT TURB	TURBIDITY ANALYZER
PIT	PRESSURE INDICATING TRANSMITTER
	CHEMICAL INJECTION POINT
N/C	NORMALLY CLOSED
SI	SERVICE INLET
SO	SERVICE OUTLET
BI	BACKWASH INLET
BO	BACKWASH OUTLET
RO	RINSE OUTLET



NOTES :

1. DIMENSIONS ARE SHOWN IN MILLIMETERS UNLESS OTHERWISE NOTED
2. THIS SITE PLAN IS CONCEPTUAL ONLY AND BASED ON GRCA AERIAL PHOTOGRAPHY. NO SITE TOPOGRAPHIC INFORMATION WAS AVAILABLE.

BENCH MARKS :

NO.	DATE	REVISION DESCRIPTION	CHKD
1.	01/19/18	ISSUED FOR CITY REVIEW	G.A.P.

BluePlan ENGINEERING

GUELPH | OWEN SOUND | LISTOWEL | KITCHENER | LONDON | HAMILTON | GTA

650 WOODLAWN ROAD WEST, BLOCK C, UNIT 2, GUELPH, ON N1K 1B8
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CITY OF GUELPH
PROJECT No. 12-066
CLYTHE WELL TREATMENT UPGRADES CLASS EA
NEW TREATMENT FACILITY
25 WATSON ROAD N.
CONCEPTUAL PROCESS FLOW DIAGRAM

DRAWN BY :	APPROVED BY :	PROJECT NO. :	DRAWING NO. :
P.R.M.	G.A.P.	112-041	5
DESIGNED BY :	DATE :	SCALE :	
G.A.P.	DEC 2012	N.T.S.	

Appendix H:
Capital Budget Estimate

CITY OF GUELPH WATER SERVICES
PROJECT No. 12-066: CLYTHE EA
CAPITAL COST ESTIMATE FOR TREATMENT ONLY

New Treatment Facility at 25 Watson Road N. (Industrial site)

Item No.	Description	Service Life (years)	Qty.	Unit	Unit Cost ($2018)	Total Cost ($2018)
GENERAL						
1	Mobilization, demobilization, bonding, insurance, temporary facilities, meetings, submittals, contractor coordination, commissioning (5% of construction sub-total)	N/A	100%	L.S.	207,000.00	207,000.00
2	Property acquisition near existing well site	N/A	100%	L.S.	1,200,000.00	1,200,000.00
3	Ontario Land Surveyor (OLS) costs associated with property acquisition	N/A	0%	L.S.	0.00	0.00
4	Legal costs associated with property acquisition	N/A	0%	L.S.	0.00	0.00
5	Allowance for maintaining operation of existing facility during construction	N/A	0%	L.S.	0.00	0.00
6	Allowance for storage of equipment and materials during construction, incl. closure of Watson Road	N/A	0%	L.S.	0.00	0.00
					General Sub-Total	**$ 1,407,000.00**
SITE WORKS						
7	Site preparation, area grading, erosion and sediment control		100%	L.S.	10,000.00	10,000.00
8	Earthworks - Excavation, hauling, backfill, engineered fill, compaction	N/A	100%	L.S.	20,000.00	20,000.00
9	Final grading, topsoil and hydro seeding		100%	L.S.	5,000.00	5,000.00
10	Access Road and Parking Area		100%	L.S.	300,000.00	300,000.00
11	Stormwater Management, swales, drainage works		100%	L.S.	25,000.00	25,000.00
12	Site Perimeter Fencing and Gates		100%	L.S.	50,000.00	50,000.00
13	Shallow groundwater - dewatering		100%	L.S.	0.00	0.00
					Site Works Sub-Total	**$ 410,000.00**
PIPELINES						
14	Raw Water Pipeline 200mm dia. pipeline from Well to Treatment Plant - PVC DR25 C900 pipeline, tracer wire, pressure testing, disinfection		400	l.m.	300.00	120,000.00
15	Zone 1 Pipeline 200mm dia. pipeline from Treatment Plant to Ex. Clythe Station - PVC DR25 C900 pipeline, tracer wire, pressure testing, disinfection		400	l.m.	300.00	120,000.00
16	Direct buried isolation valves		4	each	20,000.00	80,000.00
					Pipelines Sub-Total	**$ 320,000.00**
STRUCTURAL AND BUILDINGS						
17	New treatment building (approx. 30m x 10m) incl. foundation, exterior walls, floor, roof, doors, windows, thermal and moisture protection		300	m^2	2,000.00	600,000.00
18	Reservoir construction for CT compliance, baffled (concrete, waterproofing, insulation, etc.)		0	cu.m.	1,500.00	0.00
19	Underground reinforced CIP 2-compartment concrete tank for filter backwash residuals management		200	cu.m.	1,500.00	300,000.00
20	Structural modifications to existing reservoir roof to support filtration system equipment		0%	L.S.	0.00	0.00
21	Structural modifications to existing pump room including removal of roof and south wall, protection of existing equipment during construction		0%	L.S.	0.00	0.00
22	Overhead door, 2.7m wide x 3.0m high, roll-up, insulated, motorized		100%	L.S.	20,000.00	20,000.00
23	Miscellaneous metals (handrails, stairs, pipe supports, access hatches, etc.)		100%	L.S.	40,000.00	40,000.00
					Structural and Buildings Sub-Total	**$ 960,000.00**
MECHANICAL AND PROCESS EQUIPMENT						
24	Well Pump - Submersible SS, 40 L/s at 40 m TDH		100%	L.S.	40,000.00	40,000.00
25	Transfer Pumps from New Treatment Facility to Existing Clythe Station		0%	L.S.	0.00	0.00
26	Manganese Greensand Filtration System (2 parallel pressure vessels with media, motorized valve nest)		100%	L.S.	450,000.00	450,000.00
27	Granular Activated Carbon Contact System (2 parallel pressure vessels with media, motorized valve nest)		100%	L.S.	300,000.00	300,000.00
28	Filter backwash pumps		2	each	50,000.00	100,000.00
29	Backwash Management System (instrumentation, pump controls, supernatant pump, transfer pump, drain pump)		100%	L.S.	50,000.00	50,000.00
30	Treatment System - main process piping and valves		100%	L.S.	150,000.00	150,000.00
31	Chemical feed equipment for chlorination (1000L solution tank, containment, pumps, duplex control panel, tubing, flow monitor)		100%	L.S.	50,000.00	50,000.00
32	Chemical feed equipment for dechlorination (200L solution tank, containment, pump, tubing)		100%	L.S.	20,000.00	20,000.00
33	Building HVAC system incl. fans, dampers, actuators, heaters, etc.		100%	L.S.	50,000.00	50,000.00
34	Miscellaneous plumbing, backflow prevention, drains, vents, and fixtures		100%	L.S.	20,000.00	20,000.00
35	Safety equipment (eye/face wash, personal protective equipment, etc.)		100%	L.S.	5,000.00	5,000.00
36	Well head upgrades		100%	L.S.	25,000.00	25,000.00
					Mechanical and Process Equipment Sub-Total	**$ 1,260,000.00**
ELECTRICAL AND INSTRUMENTATION						
37	Site power supply, meter, and transformer		100%	L.S.	270,000.00	270,000.00
38	Site communication system (fibre optic for data, voice, etc.)		100%	L.S.	100,000.00	100,000.00
39	Backup power supply (200 kW outdoor stand-alone diesel generator, ATS, fuel system, noise attenuation enclosure)		100%	L.S.	300,000.00	300,000.00
40	Motor control centre (MCC)	25	100%	L.S.	200,000.00	200,000.00
41	General electrical work (cables, conduits, boxies, cable trays)		100%	L.S.	50,000.00	50,000.00
42	Well Pump Flow Control (BFV with electric actuator to adjust filter loading rate)		1	each	10,000.00	10,000.00
43	Filter Backwash Pump Flow Control (BFV with electric actuator to adjust flow rate)		2	each	10,000.00	20,000.00
44	Lighting panel, lighting transformer, conduits, and cables		100%	L.S.	40,000.00	40,000.00
45	Lighting fixtures including emergency lighting		100%	L.S.	20,000.00	20,000.00
46	Miscellaneous electrical equipment, smoke detectors, security system, intrusion alarms, limit switches on doors and hatches, etc.		100%	L.S.	10,000.00	10,000.00
47	Raw Water Supply Instrumentation (flow, pressure, water level in well)		100%	L.S.	30,000.00	30,000.00
48	Treatment System Instrumentation (flow, pressure, chlorine residual, turbidity, level in reservoir)		100%	L.S.	40,000.00	40,000.00
49	SCADA system upgrade (control panel, PLC, UPS, etc.)		100%	L.S.	100,000.00	100,000.00
					Electrical and Instrumentation Sub-Total	**$ 1,190,000.00**
					CONSTRUCTION SUB-TOTAL	**$ 5,547,000.00**
ENGINEERING SERVICES						
50	Detailed design, approvals, tendering, contract administration, site inspection, materials testing, testing and commissioning (15% of construction sub-total)	N/A	15%	L.S.	652,000.00	652,000.00
51	SCADA system programming	N/A	100%	L.S.	100,000.00	100,000.00
					ENGINEERING SERVICES SUB-TOTAL	**$ 752,000.00**
					SUB-TOTAL	**$ 6,299,000.00**
					CONTINGENCY ALLOWANCE (25%)	**$ 1,575,000.00**
					TOTAL ESTIMATED COST ($2013)	**$ 7,874,000.00**

Appendix I:
Clythe Station Facility Assessment Report

CITY OF GUELPH PROJECT 12-066
CLYTHE STATION MUNICIPAL CLASS EA
FACILITY ASSESSMENT REPORT

Prepared for

City of Guelph
Water Services

GAMSBY AND MANNEROW LIMITED
CONSULTING PROFESSIONAL ENGINEERS
GUELPH - OWEN SOUND – LISTOWEL – KITCHENER - EXETER

February 2013
Our File: 112-041

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TABLES

APPENDICES

Gamsby and Mannerow
ENGINEERS

CITY OF GUELPH PROJECT 12-066
CLYTHE STATION MUNICIPAL CLASS EA
FACILITY ASSESSMENT REPORT

February 2013
Our File: 112-041

1.0 INTRODUCTION

The City of Guelph Water Services retained Gamsby and Mannerow Limited (G&M) to complete a Municipal Class Environmental Assessment (EA) to improve water supply in north-east Guelph through upgrades to the Clythe Well and Booster Pumping Station. Part of that assignment included completion of a facility assessment of the existing Clythe Well and Booster Station. The objective of the assessment was to determine the overall condition of the facility in order to make informed decisions during the EA process about its future status.

The facility assessment was based primarily on site inspections and discussions with the City's lead water system operators along with review of background documents. No destructive testing or physical field tests were conducted as part of the assessment. The assessment dealt with accessible parts of the facility, including the existing well house, pumping station, site, process piping and equipment, valves and instrumentation, HVAC equipment, electrical panels, control panels, and SCADA system hardware. This report identifies the current condition of the facility along with observed deficiencies and recommended upgrades. Recommendations take into consideration current codes and standards as well as overall objectives of the Clythe Class EA. Information in the report was supplemented with available background information including structural inspection of the reservoir conducted in 2010.

Watson Road is considered to run north-south for the purposes of orientation when reading this report.

2.0 BACKGROUND

The Clythe Well and Booster Station is located at 22 Watson Road North, approximately 150 metres north of York Road. The Clythe well was drilled in 1976 and the original facility was constructed in 1983, upgraded in 1998 with a new pump room, and upgraded again in 2004 with the addition of a third booster pump. A chronology of the development and testing of the Clythe Well and Booster Station facility is summarized in the following table.

Table 1. Chronology of Clythe Station Development and Testing

Date	Work Performed
1976	Clythe Well drilled
1983	Original facility construction, including a well house, in-ground reservoir, and booster pumping station. Booster pumping with a single horizontal centrifugal pump installed in the lower level valve room.
1990	Clythe well was equipped with a well pump and put into service. Raw water quality exhibits taste and odour problems due to elevated hydrogen sulphide (H_2S). Trevi used to aerate and off-gas dissolved gases.
1998	Construction of facility upgrades, including new booster pump room adjacent to the well house and over top of the reservoir, conversion of booster pumping from a single centrifugal pump in the lower valve room to 2 vertical turbine pumps in the new pump room.
1999	Well upgrades by International Water Supply with insertion of a 200mm diameter steel liner to a depth of 26.8 metres in an effort to block inflow from shallower formations with the objective of improving raw water quality. However, these efforts proved unsuccessful and the well was taken out of service.
2000	Treatability testing for H_2S removal using catalytic activated carbon (CAC) was completed by G&M with XCG Consultants. Results were promising, however, full-scale treatment was not implemented and the well remained out of service.
2004	Construction of facility upgrades including addition of a third high lift vertical turbine pump operating on a variable frequency drive (VFD) for pressure control along with replacement of main process piping and valves.
2008	Well rehabilitation and assessment by Lotowater Technical Services with Stantec Consulting. Results of the work confirmed that the well classification is groundwater (i.e. not GUDI) and the sustainable pumping rate for the rehabilitated well is 39 L/s. Continued presence of odour-causing substances (H_2S) was also confirmed.
2009	Treatability study conducted by G&M involving pilot testing and a taste and odour survey. Results demonstrated the effectiveness of manganese dioxide filtration in combination with activated carbon polishing to remove iron, manganese and H_2S.
2010	Booster pump 2 was rehabilitated with a new bowl and impeller assembly. This pump has been operating as the duty pump since 2004.
2010	Internal structural inspection of reservoir by G&M. Reservoir was drained and taken off line for the inspection. Results indicated no major structural deficiencies with the reinforced concrete structure, overall condition was considered to be satisfactory.
2012	Variable frequency drive (VFD) for booster pump 2 was replaced. (Allen Bradley unit replaced with Teco)
2012/3	Municipal Class EA for Clythe Station : Treatment, Pumping and Storage. Objectives are to return Clythe well to service with appropriate treatment, and to establish a larger booster pumping and storage facility at a new site.

The original well was drilled to a depth of 64 metres at a diameter of 300mm. That well has Permit To Take Water (PTTW) No. 3240-62HPVV which is valid until March 31, 2014 and is listed in the City's Municipal Drinking Water License (MDWL). The Clythe Well is permitted to pump up to 5,237 m^3/d at a maximum allowable pumping rate of 3,637 L/min (61 L/s). Based on well rehabilitation and pumping tests conducted in 2008 however, a more sustainable pumping rate would be on the order of 2,340 L/min (39 L/s), which would add 3,370 m^3/d to the City of Guelph water supply or contribute approximately 7% of average daily demand system based on data in the 2012 Annual and Summary Guelph Water Services Report. The well was assessed by Stantec in 2008 and verified to be a secure groundwater source. The booster pumping station has a firm capacity of 10,886 m^3/d and the reservoir has capacity of 670 m^3.

Since the well was taken out of service, the facility has been operating as a booster station only, transferring water from the low pressure zone (Zone 1) to the high pressure zone (Zone 2).

3.0 FACILITY DESCRIPTION

An internal inspection of the reservoir was conducted with City operators on December 15, 2010. A detailed facility inspection was conducted on July 4, 2012 with lead operators from City of Guelph Water Services. Main components of Clythe Station are summarized in the following table.

Table 2. Main Components of Clythe Station

Item	General Description	Capacity / Dimensions
Property	Trapezoidal shape, zoned Urban reserve (UR)	Approx. 765 sq.m. or 0.08 ha
Well (MOE Well No. 67-06103)	Drilled in 1976, 64 metres deep, 300mm diameter, non-GUDI	Sustainable yield of approx. 39 L/s (2008)
Well Pump	Not equipped (2013)	N/A
Reservoir	In-ground reinforced concrete, trapezoidal shaped	670 m^3 capacity
Well House	Constructed 1983, concrete block walls and wood rafters creating sloped ceiling	Approx. dimensions 5.7m x 11.9m
Pump Room	Constructed 1997, wood stud walls and wooden roof trusses with attic	Approx. dimensions 8.6m x 10.2m
Station Inlet Piping	150mm Schedule 10 316L stainless steel	
Station Inlet Flow Meter	ABB Kent Taylor Mag Master	150mm magmeter
Station Inlet Process Valves	Butterfly isolation, motorized butterfly, pressure reducing/pressure sustaining	150mm diameter
Station Discharge Piping	200mm Schedule 10 316L stainless steel	
Station Discharge Flow Meter	ABB Kent Taylor Mag Master	200mm magmeter

Item	General Description	Capacity / Dimensions
Station Discharge Process Valves	Swing check, butterfly isolation	200mm diameter
High Lift Pump 1	Goulds VTT-CT, 5-stage Fixed speed vertical turbine Benshaw soft starter	63 L/s at 76 m TDH 56 kW motor, 3Ø/600V/60Hz
High Lift Pump 2	Goulds VIT-CT, 5-stage Variable speed vertical turbine (new bowl and impeller assembly installed 2010) TECO VFD (installed Apr. 2012)	Size 11 CHC 63 L/s at 77 m TDH 75 kW motor, 3Ø/600V/60Hz
High Lift Pump 3	Goulds VTT-CT, 5-stage Fixed speed vertical turbine Benshaw soft starter	63 L/s at 76 m TDH 56 kW motor, 3Ø/600V/60Hz
Site Transformer	pad mounted transformer owned by Guelph Hydro	300kVA, 13.8kV/600/347V
Harmonics Filter	Mirus International Model 100-600-60 Lineator	Advanced Universal Harmonics Filter
Station Inlet Pressure Transducer	Rosemount	
Station Discharge Pressure Transducer	Johnson Yokogawa	
Pressure Sustaining /Relief Valve (station inlet)	Singer Valve Model 106-RPS-AC	150mm diameter
Inlet Butterfly Actuated Valve	Rotork Actuator Model AQM-360-F-A10	150mm diameter valve 0.26 kW electric motor 1Ø/110V/60Hz
Pressure Relief / Surge Anticipator Valve (station discharge)	Singer Valve Model 106-RPS-RR	150mm diameter
Chlorine Analyzer / Indicator	Prominent Dulcometer D1C	
Chlorine Feed System	Prominent Gamma L pump 400 L day tank	1.4 L/h
Reservoir Level Indicator / Transmitter	Siemens Milltronics Mini-Ranger Plus, XRS-5 Transducer	
Standby Diesel Generator	Detroit Diesel	300 kW, 3Ø/600V/60Hz
Fuel System	DTE Industries	935 litre, single wall
Heating and Ventilation Systems	Electric forced air blower heaters (Chromalox)	Three – 5 kW
Control Panel and PLC	Allen-Bradley SLC 5/05 Programmable Logic Controller (PLC), GE QuickPanel View Operator Interface Terminal (OIT) and Data Logger	

4.0 RESULTS OF FACILITY ASSESSMENT

See Appendix A for photographs from site inspections conducted for this Facility Assessment Report.

4.1 GENERAL SITE

The site is trapezoidal shaped, bounded by Watson Road North to the east, Clythe Creek and its floodplain to the north and west, and a residential property to the south (18 Watson Road N.). There is very limited space for parking on site and poor visibility for access to and from the site from Watson Road. Almost the entire footprint of the property is occupied by the building, reservoir, and driveway/parking area. There is a gabion wall constructed along the north side of the facility facing the floodplain of Clythe Creek. The gabion wall in non-structural and serves mainly to hold soil along the north side of the building as well as to protect the building in the vent of high flood waters in the creek channel.

4.2 STRUCTURAL ASSESSMENT - BUILDING

4.2.1 Building Description

The structural portion of the overall facility assessment describes the visible condition of the structure along with recommendations for repair where the structure was found to be deficient or where problems exist which may lead to future deficiencies. The building structure is defined as the portion of the building with ability to resist loads prescribed within Part 4 of the Ontario Building Code (OBC). The building structure was visually evaluated for signs of damage or distress as well as with regards to the potential risk of failure of a structural element or system.

The building is a one storey structure with a dry well room and reservoir below grade. The original structure (well house) was built in 1983 and is constructed of timber rafters resting on a steel beams and masonry walls. The masonry walls are clad with a brick veneer and rest on a cast-in-place concrete foundation and concrete floor slabs. The roof structure is covered by asphalt shingles. An addition to the structure (pump room) was constructed in 1998 to the west of the existing building. The addition is constructed of a pre-engineered roof trusses, resting on stud walls and a concrete curb which is supported by the existing concrete slab and walls of the reservoir. The addition is clad in vinyl siding with a metal roof.

4.2.2 Assessment Methodology

G&M conducted an on-site structural inspection and review the condition of structure. All rooms were entered and the exterior was viewed from the ground.

The following documents were reviewed for the purposes of completing this updated study:

- Clythe Well & Reservoir Drawings dated October 27, 1983 prepared by Gamsby and Mannerow Limited.
- Clythe Well Booster Station drawings dated June 2, 1998, prepared by Gamsby and Mannerow Limited.

As the Ontario Building Code is revised and updated every few years, so are the loadings for which a building is to resist. The National Building Code Commentary stipulates that so long as a building has demonstrated satisfactory performance for 30 years or more, and careful examination by a Professional Engineer does not expose any evidence of significant damage, distress or deterioration, the building may be considered to have demonstrated satisfactory capacity to resist loads other than an earthquake. Therefore, as this existing structure is almost 30 years old, this assessment consisted of reviewing the structural elements for evidence of damage, distress or deterioration.

4.2.3 Observations

Foundation
The structure is mainly founded on the reservoir below. The reservoir was inspected in December of 2010 and the condition detailed within G&M's report dated June 10, 2011. Overall the condition of the reservoir was stated to be satisfactory with only minor deficiencies. The walls of the dry well in the original structure were observed to be in good condition with several sealed small diameter holes from removed previously existing pipes.

Concrete Floors
The concrete floors through the existing structure were observed to be in good condition with only hair line cracks observed.

Roof
The roof framing for the original building consists of wood roof rafters supported by the masonry walls and steel I-beams. The I-beams show signs of minor rust however were observed to be in fair to good condition. The rafters appear to be in fair to good condition however were covered with fiber-glass insulation at the time. At the time of inspection the drywall on the underside of the roof was removed due to moisture problems. There are indications of moisture on the roof joists, insulation and the vapour barrier. The insulation currently contains black debris which could be dirt due to air flow or mold. The exterior roof is covered with asphalt shingles which were observed to be in good condition; however eaves troughs and downspouts are not currently installed.

The pre-engineered roof trusses of the addition (1998) were observed from the attic access and did not show any signs of distress and were observed to be in good condition. The exterior roof is covered with metal roofing. During the inspection, outside light was observed to be penetrating through the flashing around the skylights. In addition, indications of water damage to the ceiling was observed around the sky lights.

The roof line of both the original and addition structures was observed from the exterior of the building and did not exhibit any areas of distress. Overall, the wood roof framing appears to be in good condition and structurally adequate with no signs of overstressing or deflection.

Walls
The interior block walls within the original structure were exposed and observed from the interior. The exterior brick veneer was observed from the exterior of the structure. Efflorescence was observed along the bottom of the interior south wall and southeast portion of the north wall. The cast in place concrete below the existing louvers in the south wall, which based on the 1983 drawings was a vestibule door in

the past, was observed to be deteriorated and in poor condition. Both observations are indications of water penetration through the walls in the past. Additionally, a crack was observed in the mortar line of the masonry blocks in the south east corner of this structure. A similar crack was observed in the exterior brick veneer. Overall, the walls of the original structure were found to be in fair to good condition.

Except for a short concrete wall/curb at the base of the wall, the walls of the addition where covered with drywall on the interior and vinyl siding on the exterior and were not visually inspected. The exposed concrete was observed to be in good condition. Indications of water pooling were observed on the floor adjacent to the south wall. Discussions with City Staff have indicated water penetration is an on-going issue. Additionally, the vinyl siding was noted to have numerous perforations which are currently covered with tuck tape and one location where the siding was bulging away from the structure.

In addition, the site grading adjacent to the south of both the original and addition structures is poor and currently directs water towards the structure.

Gabion Basket Retaining Wall
The gabion basket retaining wall to the north of the structure was inspected and observed to be in stable condition.

4.3 STRUCTURAL ASSESSMENT - RESERVOIR

Gamsby and Mannerow (G&M) was retained by the City of Guelph Waterworks department to perform a structural investigation on the Clythe Reservoir while it was drained for cleaning. The initial site inspection was performed on December 15th, 2010. The following notes a list of minor structural deficiencies and general observations that were observed during the inspection. A plan of the reservoir is attached which details the locations of the various deficiencies by number.

Reservoir:

- Five hairline cracks (#3-4m long, #17-3m, #20-6m, #21-3m, #36-1m) on the ceiling were noted. Crack #3 had discolouration at the northeast edge of the crack which could be possible corroding rebar. Crack #20 had efflorescence present.
- Nine small to medium sized cracks (#12-5m, #13-4m, #14-5m, #18-3m, #19-2m, #32-4m, #33-3m, #34-7m, #35-1m) on the ceiling were noted. Efflorescence was observed in cracks #12, #33, #35.
- Three hairline cracks (#9-1m, #10-2m, #11-2m) were noted along the south-westerly exterior wall.
- Two surface stains were observed near the top of the column which is located within the interior wall. Potential reinforcement corrosion (#5).
- The existing concrete patch on easterly interior wall is delaminated and cracking (#6).
- The existing grout/concrete patch work at the wall/base slab connection is degraded and pulling away from the wall. This starts on the NW wall starting 2.6m from the NE interior wall, extending to the south-westerly exterior wall and along the south westerly wall approximately 15m (#7).

- The westerly hatch, installed through the existing reservoir roof slab, has localized corroding rebar. The ceiling around the perimeter of the hatch is also spalling. The hydraulic arm for the hatch is malfunctioning and does not hold the hatch open. (#8, #26)
- The ceiling around the pipes in the western section of the reservoir is spalling (#15, #16).
- A 6m x 0.5m surface spall on the southerly interior wall (#1) and minor spalling on the end of the wall (#2).
- A 0.2m x 0.2m surface spall on the base of two columns (#22, #23).
- A 0.1m x 0.1m minor spall on the south-easterly beam (#27).
- Various areas of minor surface spalling on reservoir walls were noted - 1m x 1m area (#29), 0.4m x 0.4m area (#30), 0.2m x 0.2m area on column within the interior wall (#31).
- 0.2m x 0.2m spall on the floor by southeast interior wall (#37).
- Random concrete bugholes were observed on the reservoir walls.
- Plugs for the ceiling formwork snap-tie holes were corroded in many locations throughout.
- Grout in formwork snap-tie holes on the walls was beginning to disintegrate in various locations.
- The steel pipes within the reservoir had light surface corrosion with little or no pitting. The well casing in the easterly portion of the reservoir had moderate corrosion with small amounts of minor pitting.

These deficiencies and general observations are shown through the attached pages containing pictures that were taken during the site visit on December 15th.

4.4 HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)

Comfort heating for the inside of the building is provided by three (3) electric forced air blower heaters. These are ceiling mounted industrial grade space heaters that are controlled automatically by a temperature thermostat. One heater is installed in the well house and 2 heaters are installed in the pump room. The functioning and condition of the heating system is considered satisfactory with no upgrades recommended. The existing heaters are expected to have several more years of remaining service life.

There is no automatic ventilation system for the building. However, there are wall-mounted exhaust fans than can be activated manually from wall switches. There is automated air intake and exhaust system that is activated whenever the diesel generator starts-up to provide combustion air and discharge of exhaust air. The system generally consists of a motorized louver for intake of combustion air on the south wall of the well house and a motorized exhaust louver on the north wall.

The building is not equipped with air conditioning. System operators indicated that ceiling fans installed at select locations could improve air circulation and reduce condensation and moisture build-up inside the building.

4.5 MECHANICAL EQUIPMENT AND PIPING

All main process piping is schedule 10 316L stainless steel and installed in 2004 during the most recent facility upgrade. This piping is in good condition with only minor localized spots of rust. The existing process piping is expected to have many more years of remaining service life.

It is noted that although the facility has re-chlorination capability, that function has not been required for many years and consequently there is no liquid sodium hypochlorite currently stored on site, which can contribute to deterioration of stainless steel through oxidization. It is noted that if Clythe well is returned to serve, active chlorination will resume at the facility, and this may cause some increase in the rate of deterioration of exposed stainless steel piping, hardware, and fittings in the facility. Chlorine gas naturally off-gasses from sodium hypochlorite

4.6 CHEMICAL FEED SYSTEMS

The facility has re-chlorination capability consisting of a polyethylene day tank, secondary containment, and a chemical metering pump with associated suction and discharge tubing. It has not been used in several years since operating experience has demonstrated that chlorine residuals leaving the station are adequate without boosting. The chemical feed pump will likely be replaced in any event when Clythe well is returned to service with a newer generation chemical feed system similar to that used at other City water treatment facilities. The City has been using a duplex arrangement with Blue-White peristaltic metering pumps, and it is expected that type of system will be installed at the Clythe facility.

4.7 INSTRUMENTATION

Instrumentation currently includes an on-line chlorine analyzer, 2 magnetic flow meters, an ultra-sonic level sensor, and on-line pressure transducers. One magnetic flow meter monitors total flow rates and volumes into the station, and the other monitors total flow rates and volumes discharged from the station. This instrumentation was installed in 2000 and is calibrated regularly. The flow tubes are expected to last for several decades as they have no moving parts and the materials in contact with the water are relatively inert. The electrical components (indicators/transmitters) have several years of service life remaining. The ultra-sonic level transducer that continuously monitors reservoir level was installed in 2004 and is expected to have several years of service life remaining. The station inlet and discharge pressure sensors/transmitters were installed in 2000 and are similarly expected to have several years of remaining service life. All the above instrumentation is reported to be operated well and is maintained and calibrated in accordance with manufacturer's recommendations.

4.8 ELECTRICAL

4.8.1 Existing Electrical Equipment

The current Clythe Booster Pumping Station receives utility power through a 300kVA, 13.8kV/600/347V pad mounted transformer owned by Guelph Hydro. The power is fed from the secondary side of the transformer to the main circuit breaker located in the well house electrical room through an underground duct bank. From the main circuit breaker the power feed is routed through a Guelph Hydro metering cabinet, then through an Automatic Transfer Switch (ATS) to the main 600V splitter. The main splitter provides power for unit heaters 1, 3 and 4 (5 kW each), power monitoring equipment, lighting transformer (10kVA), Booster Pump Soft Starter No.1 (56 kW), Booster Pump Variable Frequency Drive (VFD) No.2 (75 kW), and Booster Pump Soft Starter No.3 (56 kW).

4.8.2 Existing Auxiliary Power

The existing station currently has an indoor installed standby power diesel generator providing the station with emergency power in case of utility failure. The standby generator is rated at 375kVA, 600V, 3 phase and is currently capable of running two (2) booster pumps at one time. The existing Automatic Transfer Switch (ATS) is an ASCO Power Technologies series switch and is rated for 600Y/347V, 400A, 60Hz.

4.9 CONTROL SYSTEM AND NETWORK

4.9.1 Control Panel

The existing control panel is equipped with an Allen-Bradley SLC 5/05 Programmable Logic Controller (PLC) (Model 1747-L553), GE QuickPanel View 6" Operator Interface Terminal (OIT) and Data Logger (IC754VSI06STD-FF), and APC Smart-UPS 1000VA. The PLC resides in a 10 slot rack which is approximately 80% utilized with only 2 spare slots and little spare I/O on those cards in use. Although the existing control panel has unused space to permit additional terminal blocks for the 2 spare slots, it does not contain sufficient space to use a larger rack. The OIT is damaged and can no longer be used for onsite monitoring and trending although the unit continues to function as a data logger.

As the proposed process and electrical upgrades at the Clythe facility are expected to add to the existing I/O count, a new PLC control panel is recommended to replace the existing panel. The new panel would be equipped with an Allen-Bradley CompactLogix PAC[1] complete with Ethernet communications. A new GE QuickPanel View is to be installed on the panel door to replace the existing OIT. A new UPS is to be installed to support the control panel equipment and process instrumentation during periods of utility failure. The new control panel will be sized to suit the new I/O and may require a floor mounted panel depending on whether or not the proposed filters are equipped with their own control system or if they are integrated with the main station control panel.

4.9.2 Process Instrumentation

The existing process instrumentation, including the station inlet flow meter, station discharge flow meter, reservoir fill line pressure transmitter, booster station pressure transmitter, reservoir level transmitter, and chlorine residual analyzer all appear to be in good condition however many of the instruments are powered from the existing lighting panel. It is recommended that all instrumentation including the existing as well as the new instruments for the well pump and filters be fed from the new control panel thus ensuring data continues to be recorded to periods of utility failure and transfer to auxiliary power.

[1] The City's current standard is the 1769-L35E however this model has been replaced with a newer series of processor. The 1769-L3x series has not been discontinued and as such the exact model selected for the upgrade will be confirmed during the detailed design phase of the project.

4.9.3 Network

This facility is equipped with a fibre optic communications link (Atria Networks FOC8553) provided and maintained by Rogers Communications (previously Atria Networks) which connects the onsite PLC to the SCADA system located at F.M. Woods Station (29 Waterworks Place) for continuous monitoring, control, and data collection. As the fibre optic link has been in place for several years, the old Bell Canada 19,200 Baud, Point-to-Point data circuit (#CCDYDA880403) should be disconnected and removed.

5.0 CONCLUSIONS and RECOMMENDATIONS

5.1 GENERAL SITE

Grading, gabions

5.2 STRUCTURAL ASSESSMENT - BUILDING

It is recommended that the insulation be removed and checked for mold. In addition, when the insulation is put back in place, ensure a proper air gap between the top of the insulation and the underside of the roof sheathing is present to allow air flow from the soffits to the ridge vent. Also, eaves troughs and down spouts should be installed to direct rainfall away from the structure.

The roofing and flashing should be checked to ensure proper installation and that all joints are properly caulked to prevent water penetration.

It is recommended that the concrete around the louvers be repaired and the cracks in the bricks surrounding the crack be repointed to prevent water penetration.

It is recommended that the vinyl siding be repaired.

It is recommended that site grading through the use of slopes or ditching be implemented, in addition to the installation of eaves troughs and downspouts on the original structure, be utilized to direct water away from the structure to help alleviate the water penetration issues.

The on–site structural assessment of the Clythe Well and Reservoir Building noted concerns pertaining to water penetration, however the structure appears to be in fair to good condition. Roof and grading improvements to ensure water flows away from the structure should be considered. The recommendations made herein are relatively minor in cost and not currently of structural concern.

5.3 STRUCTURAL ASSESSMENT - RESERVOIR

Based on further review of our findings during the December 15th site inspection, we feel that the structural deficiencies identified above are minor in nature and do not pose a significant structural concern. Therefore the structural condition of the Clythe Reservoir is considered satisfactory.

5.4 HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)

It is recommended that ceiling fans be installed at select locations to improve air circulation and reduce condensation and moisture build-up inside the building.
General statement – all mechanical and process equipment, instrumentation has same service life and LCC regardless of whether it is installed in the existing facility or a new facility.

5.5 MECHANICAL EQUIPMENT AND PIPING

It is noted that if Clythe well is returned to service, active chlorination will resume at the facility, and this may cause some increase in the rate of deterioration of exposed stainless steel piping, hardware, and fittings in the facility.

5.6 CHEMICAL FEED SYSTEMS

It is noted that the condition and expected remaining service life of the chemical feed systems is independent of the overall condition of the facility.

5.7 INSTRUMENTATION

City operations staff indicated that plant instrumentation is operating well and is well maintained. It is noted that the condition and expected remaining service life of instrumentation is independent of the overall condition of the facility.

5.8 ELECTRICAL

Part of proposed facility upgrades includes installation of a 45kW well pump, various electric actuators for filtration systems, additional building lighting and heating, and additional instrumentation. The existing booster pumps (2 – 56kW, 1 – 75kW) and associated building lighting and heating is to remain.

The new well pump control is recommended to be accomplished through a soft starter. T his will allow for constant ramp up and down of speed and will reduce inrush current stresses on the pumps, and the station equipment as a whole. Soft starters typically provide overload, underload, overvoltage, undervoltage, and phase imbalance protection, and can be programmed to shut down a pump in the event of a fault. The existing VFD and soft starters will be re-used for all existing booster pumps.

Preliminary calculations indicate the existing 300 KVA transformer has capacity to handle the increased station requirements. The station will be limited to operating only one (1) booster pump simultaneously with the proposed well pump. Hardwired interlocks will be incorporated to ensure only one booster pump is capable of running simultaneously during normal operation. The existing drive cabinets will be modified during construction to include this wiring. The location of the transformer is proposed to remain in the same location. The existing incoming Hydro feed and conduits are proposed to be replaced for the incoming service due to poor condition of electrical components. The Hydro service is

expected to remain an underground feed. During detailed design it will be confirmed with Guelph Hydro the life-span of the existing transformer, and whether it should be replaced.

The existing pumping station should undergo a partial electrical upgrade. The associated power which powers the booster pumps will be replaced. For better use of space in the station, it is proposed to replace the existing splitter box and breaker arrangement. This is to be removed, and replaced with a Motor Control Centre (MCC) which will house the new well pump soft starter. The new MCC will provide all 600V and below power to the facility and will include the main station circuit breaker, hydro metering auxiliary equipment as per Guelph Hydro requirements, power monitoring equipment, surge protection, heater feeds, and all Pumping Station feeder breakers. The station will be equipped with its own digital meter. The power monitoring equipment will be provided with communication capabilities such that it can be connected to the SCADA network for trending of the power related parameters at the station. In addition, the power monitoring equipment will have a local display to allow the operators to view these values while on site. Values that will be available from the power monitor include kW usage, kWh usage, kVAR, incoming voltage, current usage, and power factor. Operations will be able to use this data for future load shedding purposes.

Surge protection will be provided in the MCC in order to protect the equipment from potential surges, and minimize damage from infrequent spikes from the incoming Hydro power feed. The new MCC will also include feeder breakers to the existing variable frequency drive (VFD) and soft starter enclosures for controlling the booster pumps. A short circuit, coordination and arc flash study is to be completed for the 600V rated equipment. A new 600V/120/240V lighting transformer and a 42 circuit lighting panel will be added in the MCC in order provide power to all lighting, receptacle, and other 120/240V equipment. The current light fixtures on the main floor of the facility provide adequate lighting for the pump room. New outdoor lighting fixtures will be added for the building expansion, and the existing outdoor lighting will be re-used. It is anticipated that a Hydro metering equipment upgrade will be required. During detailed design, Guelph Hydro will be contacted for confirmation.

After preliminary modeling the generator loads in order to confirm if the existing generator has adequate size for running the existing and proposed building loads, one (1) existing booster pump, and one (1) well pump, it appears that the existing 375kVA diesel generator can run these loads simultaneously. In this case the existing ATS is rated sufficiently. Although the existing generator and ATS are sized adequately, it is proposed to install a new generator and ATS due to the condition and age of the current equipment. New power and control wiring and conduits will be run to integrate the new ATS and generator. During emergency standby power operation, the new generator will be able to run any one of the booster pumps simultaneously with the well pump, heaters, and all lighting panel loads. A software interlock will be incorporated to ensure only one booster pump is capable of running simultaneously during standby power operation. Step loading of the generator should be implemented through the PLC program.

5.9 CONTROL SYSTEM AND NETWORK

No major recommendations for existing instrumentation, all functioning well with several years of remaining service life.

6.0 EA CONSIDERATIONS

Results of the Clythe Station facility assessment indicated that while there are several minor deficiencies identified with various aspects of the facility, the overall condition is good and the physical structure is expected to provide many more years of service. Mechanical and electrical equipment is operating properly, well maintained, and are expected to have several more years of service life remaining.

Consequently, there is value in retaining as much of the existing facility and incorporating as much of the facility into the recommended design solution for the Clythe Station EA. It is further noted that the well and well house (part of the original part of the facility constructed in 1983) must remain regardless of the recommended design solution as part of the EA objective of returning the Clythe Well to service.

7.0 ASSESSMENT LIMITATIONS

- This report is intended exclusively for the Client(s) named in the report. The material in it reflects our best judgment in light of the information reviewed by Gamsby and Mannerow Limited at the time of preparation. Unless otherwise agreed in writing by Gamsby and Mannerow Limited, this report shall not be used to imply warranty as to the fitness of the property for a particular purpose. This report is not a certification of compliance with past or present regulations. No portion of this report may be used as a separate entity, it is written to be read in its entirety.

- Only the specific information identified has been reviewed. The consultant is not obligated to identify mistakes or insufficiencies in the information obtained from the various sources or to verify the accuracy of the information. The Consultant may use such specific information obtained in performing its services and is entitled to rely upon the accuracy and completeness thereof.

- This assessment does not wholly eliminate uncertainty regarding the potential for existing or future costs, hazards or losses in connection with a property. No site inspections, physical or destructive testing and no design calculations have been performed unless specifically recorded. Conditions existing but not recorded were not apparent given the level of study undertaken. We can perform further investigation on items of concern if so required.

- This building assessment does not include a review of Parts 3 “Fire Protection, Occupant Safety, and Accessibility”, 5 “Wind, Water and Vapour Protection”, or 6 “Heating, Ventilation and Air-Conditioning” of the Ontario Building Code nor does it include the electrical and mechanical systems.

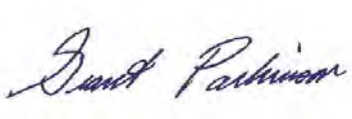
We trust this Report is sufficient for your information at this time. If you have any questions, please call me at your earliest convenience.

GAMSBY AND MANNEROW LIMITED

Per:

Paul McLennan, P.Eng.

Per:



Grant Parkinson, P.Eng.
GP/gp

CITY OF GUELPH PROJECT 12-066
CLYTHE STATION MUNICIPAL CLASS EA
FACILITY ASSESSMENT REPORT

APPENDIX A

SITE PHOTOS

GENERAL SITE

Photo 1. Site grading along south side of building directed towards building. Note lack of eave troughs and down spouts

Photos 2 and 3. Gabion wall along north side of facility adjacent to Clythe Creek floodplain. Localized minor settlement but overall in good condition.

STRUCTURAL – BUILDING

Photo 4. View of ceiling in well house

Photo 5. Interior of well house, ceiling and I-beam

Photo 6. Pump Room showing water damage at skylight above Booster Pump 2

Photo 7. Pump Room showing close up view of water damage at skylight above Booster Pump 2

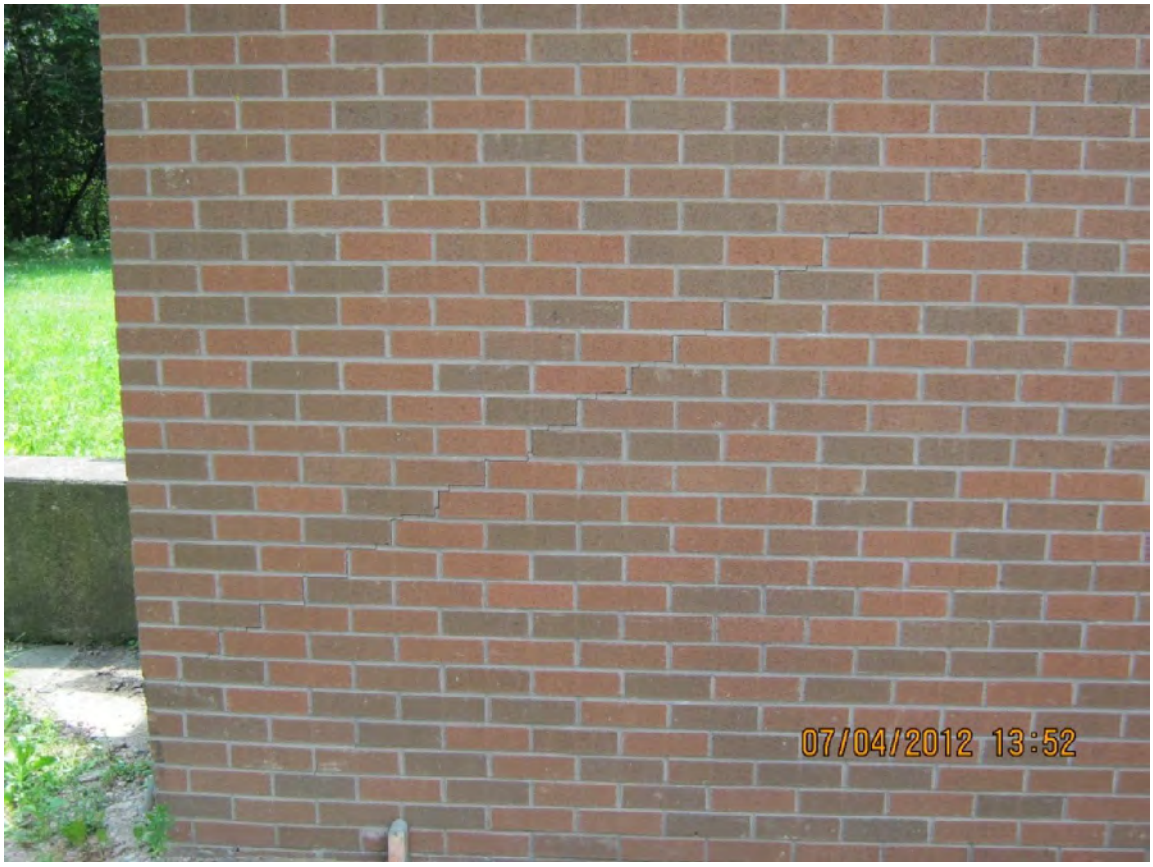


Photo 8. Exterior of east wall at south end – mortar crack in brick work

Photo 9. Close up vie of exterior of east wall at south end – mortar crack in brick work

Photo 10. Interior : Concrete deterioration beneath intake louver on south wall of well house.

Photo 11. Exterior : Concrete deterioration beneath intake louver on south wall of well house.

STRUCTURAL – RESERVOIR

Photo 12. Inside of reservoir showing well casing, Zone 1 inlet piping, and overflow pipe.

Photo 13. Inside of reservoir at western corner.

Photo 14. Inside of reservoir showing columns and Booster Pumps 1 and 2.

Photo 15. Inside of reservoir showing all 3 Booster Pumps and sump at Booster Pump 3.

MECHANICAL EQUIPMENT AND PIPING

Photo 17. Existing ductile iron piping and wellhead pedestal in the well house

Photo 18. Stainless steel process piping entering and leaving the station at the east wall of the lower level valve room

Photo 19. Stainless steel process piping, instrumentation (mag meters) and actuated butterfly valve in lower level valve room

Photo 20. Booster pumps, discharge piping, and vale arrangement

Photo 21. Pump room constructed in 1998 showing 3 vertical turbine booster pumps

Photo 22. Existing standby generator with secondary containment.

Photo 23. Diesel fuel tank for generator with secondary containment

INSTRUMENTATION

Photo 24. Indicators/transmitters for the inlet and discharge magnetic flow meters

Photo 25. Station inlet and discharge pressure transmitters

Photo 26. Chlorine residual analyzer with probe holders

ELECTRICAL

Photo 27. Existing electrical distribution to be replaced with MCC which is to include new power meter, feeder breakers, main breaker, well pump soft starter, and new ATS.

CONTROLS SYSTEM AND NETWORK

Photo 28. Existing PLC panel is recommended for replacement based on I/O capacity.

APPENDIX J:
NATURAL FEATURE CHARACTERIZATION REPORT

Clythe Well Treatment Upgrades Class Environmental Assessment Study

Natural Feature Characterization of Alternative Sites

FINAL

Prepared for:
GM BluePlan Engineering Limited
650 Woodlawn Road West, Block C, Unit 2
Guelph ON N1K 1B8

Project No. 1972 | December 2017

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Clythe Well Treatment Upgrades
Class Environmental Assessment Study

Natural Feature Characterization of Alternative Sites

Project Team:

Katharina Richter	Senior Biologist, Project Manager
Jennifer McCarter	Terrestrial & Wetland Biologist
Laura Hockley	GIS Specialist
Jason Sousa	GIS Technician

Report submitted on December 19, 2017

Katharina Richter
Project Manager
Senior Biologist

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1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained by GM BluePlan Engineering Limited in July 2017, to complete a natural feature characterization for 8 possible locations for the proposed Clythe Well Treatment Upgrades, in northeast of Guelph.

A Class Environmental Assessment (EA) for Clythe Well Treatment Upgrades was initiated by the City of Guelph to improve water supply to northeast Guelph. This project would provide treatment to bring the Clythe Well back online. A total of 8 potential sites for the new treatment facility have been identified for assessment and comparison, as shown on Map 1. In 2012, NRSI completed a natural heritage evaluation on the preferred site at the time, which corresponds to potential Sites 4 and 7 and overlaps with potential Sites 1, 3, and 8 in the current evaluation.

This report summarizes the existing natural environment conditions at the alternative sites for the Clythe Treatment Facility, based on a desktop review of natural heritage features and functions, and ranks the sites in order of suitability (including their potential for Species at Risk (SAR) and Significant Wildlife Habitat (SWH).

The study area is located between York Road/Highway 7 to the south, Eastview Road to the north, the City of Guelph boundary to the east and approximately as far west as the intersection of Grange Road and Starwood Drive (Map 1).

The study area contains residential developments, as well as the Clythe Creek Provincially Significant Wetland (PSW) complex, Clythe and Hadati Creeks, forests, and meadows. The study area falls within the Grand River Conservation Authority (GRCA) regulated area, under Ontario Regulation 150/06. The City of Guelph Natural Heritage System, identified in the City of Guelph Official Plan – September 2014 Consolidation (2014), indicates that the study area has been mapped as containing Significant Natural Areas (Schedule 10), including the Clythe Creek PSW Complex and associated locally significant wetlands (Schedule 10A). No Areas of Natural and Scientific Interest (ANSI) or Environmentally Sensitive Areas (ESA) occur within or immediately adjacent to the study area.

2.0 Relevant Policies, Legislation, and Planning Studies

For the purposes of this report, information on the natural heritage features within the alternative sites and adjacent areas was collected and assessed for significance. To help inform suitability, these features are evaluated against the following relevant policies, legislation, and planning studies outlined in Table 1 below.

Table 1. Relevant Policies, Legislation and Planning Studies

Policy/Legislation	Description	Project Relevance

Provincial Policy Statement (OMMAH 2014).	• Issued under the authority of Section 3 of the Planning Act and came into effect on April 30, 2014, replacing the 2005 PPS (OMMAH 2005).
	• Section 2.1 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'.
	• The Natural Heritage Reference Manual (OMNR 2010) and the Significant Wildlife Habitat Technical Guide (OMNR 2000, MNRF 2015b) were prepared by the MNRF to provide guidance on identifying natural features and in interpreting the Natural Heritage sections of the PPS.
		• Based on a preliminary analysis, natural features were identified within the study area which have implications under the PPS:
		  • Significant wetlands;
		  • Significant woodlands;
		  • Potential habitat for Endangered and Threatened species;
		  • Significant Wildlife Habitat.
		• Section 2.1.5 of the PPS states that development or site alteration shall not be permitted in Significant Wildlife Habitat in Ecoregion 6E unless it has been demonstrated that there will be no negative impacts on the features or their ecological functions.
		• Section 2.1.7 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.
		• Section 2.1.2 of the PPS states that the connectivity of natural features in an area should be maintained, restored, or where possible, improved.

Endangered Species Act (2007)	• The original ESA, written in 1971, underwent a year-long review which resulted in a number of changes which came into force in 2007. • The ESA prohibits killing, harming, harassing or capturing SAR and protects their habitats from damage and destruction.	• Based on a preliminary analysis, multiple SAR were identified as having the potential to occur within the study area based on presence of potential suitable habitat.

Policy/Legislation	Description	Project Relevance
Species at Risk Act (2002)	• The federal Species at Risk Act (SARA) applies to all species listed on Schedule 1 that are on federal lands, are an aquatic species, or are a species of migratory bird protected by the *Migratory Birds Convention Act, 1994.* Schedule 1 is the official list of Species at Risk in Canada.	• Significant fish species are protected. • See the Migratory Birds Convention Act, below.
Migratory Birds Convention Act (1994)	• Prohibits the disturbance, destruction, or taking of a nest or eggs of migratory birds.	• Any vegetation removal required for development of the property must have regard for this legislation in the form of timing window restrictions or other suitable mitigation measures.
The Canadian Fisheries Act (1985)	• The federal Fisheries Act, 1985 (amended in 2013) requires that serious harm to fish be avoided unless authorized by the Minister of the Department of Fisheries and Oceans Canada (DFO). This applies to work being conducted in or near waterbodies that support fish that are part of, or support, a commercial, recreational, or Aboriginal fishery.	• In order to avoid causing serious harm to fish, a self-assessment screening will be required on sites adjacent to watercourses, in order to determine whether a review by the DFO is required.
Fish and Wildlife Conservation Act (1997)	• The provincial Fish and Wildlife Conservation Act contains provisions for the protection of certain bird species not protected by the Migratory Birds Convention Act, such as raptors. It also protects furbearing mammals and their dens or habitual dwellings, other than for Red Fox and Skunk.	• Several furbearers are known from the study area and their dens cannot be destroyed without a permit from the MNRF. • Raptors and other birds, not protected by the Migratory Birds Convention Act, may be protected, meaning several mitigation measures should be implemented.

Policy/Legislation	Description	Project Relevance
Ontario Regulation 150/06 (Conservation Authorities Act 1990)	• Ontario Regulation 150/06 is the Regulation of Development, Interface with Wetlands and Alterations to Shorelines and Watercourses. Through this regulation, the GRCA has the responsibility to regulate activities in natural and hazardous areas (i.e. areas in and near rivers, streams, floodplains, wetlands, and slopes).	• As portions of the study area are within GRCA regulated lands (Clythe Creek and its tributary Watson Creek, as well as their associated valleylands), a permit will be required from the GRCA under Regulation 150/06 to proceed with development within these areas. In addition, if the development is proposed within 120m of these features, an EIS or EA is required to evaluate and demonstrate that there will be no negative impacts on the natural features or on their ecological functions as described under Reg. 150/06 (GRCA 2009).
City of Guelph Official Plan (City of Guelph 2014)	• The September 2014 Consolidation of the Official Plan includes the Natural Heritage System and associated policies that were earlier described in Official Plan Amendment 42. • The City's Natural Heritage System, as presented in the Official Plan, includes Significant Natural Areas and Natural Areas, which have been defined based on their level of significance and mapped in the Official Plan schedules. • The Natural Heritage System provides permanent protection to the Significant Natural Areas (including Ecological Linkages) and established buffers.	• The City of Guelph Official Plan identifies the study area as containing as containing significant wetlands (Schedule 10A), significant woodlands (Schedule 10C) and 3 Amphibian Crossings across Watson Road North, Watson Parkway North and at the north end of the study area across Eastview Road (Schedule 10). • As per 6A.2.1 development or site alteration may be permitted within the adjacent lands to Significant Natural Areas provided that it has been demonstrated through an EIS or EA that there will be no negative impacts to the protected natural heritage features and areas or their associated ecological functions. • Development and site alteration shall not be permitted within Significant Wetlands, or established buffers except for uses permitted by the General Permitted Uses of Section 6A.

3.0 Methods

A desktop review was undertaken to review the natural heritage features and constraints on each of the alternative sites. Field work was not completed at this point in the project, but may be undertaken in 2018 on a subset of sites.

3.1 Collection and Review of Background Information

Information on the biological features in the surrounding area were collected and reviewed. Legacy data collected from agencies encompassed an area of approximately 1km around the study area to ensure that all surrounding natural features were considered. Background information on the natural environmental features within the study area was gathered from the following sources:

- Natural Heritage Information Center (NHIC; MNRF 2014);
- Ontario Breeding Bird Atlas (BSC et al. 2008);
- Ontario Mammal Atlas (Dobbyn 1994);
- Ontario Butterfly Atlas (Macnaughton 2017);
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2017);
- Clythe Creek Subwatershed Study (Ecologistics Ltd. 1998);
- Clythe Booster Station Class Environmental Assessment (EA) Study - Natural Heritage Report (NRSI 2012);
- Guelph Natural Heritage Strategy - Phase 2 Terrestrial Inventory and Natural Heritage System (Dougan and Associates 2009).

Species information from the atlases is based on 10x10km survey squares. Due to the proximity of the alternative sites to each other, the review could be completed comprehensively and were all located within 1 square (17NJ62).

All wildlife species identified as nationally significant (Government of Canada 2017) or provincially significant (MNRF 2017) were cross-referenced with species reported to occur within the vicinity of the study area based on the various atlases. Habitat within the study area was reviewed to assess the likelihood of significant species being found on site.

Air photos from 2016 were interpreted, as well as Google Earth imagery, to assess currently site conditions, including vegetation communities. These were compared to vegetation community descriptions provided in the Clythe Booster Station Class Environmental Assessment Study - Natural Heritage Report (NRSI 2012), where sites overlapped with the past study.

3.2 Species at Risk Screening

SAR are those listed on the Species at Risk in Ontario List (MNRF 2015). These include species identified by the Committee on the Status of Species at Risk in Ontario (COSSARO) as provincially Endangered, Threatened, or Special Concern. Species listed as Endangered or Threatened are protected by the Endangered Species Act, 2007, which includes protection of their habitat. These species are referred to in this report as “regulated SAR”.

Species considered Special Concern are included in the definition of Species of Conservation Concern, which includes species that are:

- Designated provincially as Special Concern (MNRF 2017),
- Assigned a conservation status (S-Rank) of S1 to S3 or SH (i.e. critically imperiled, imperiled, vulnerable, or historical) (NatureServe 2016), Designated federally as Threatened or Endangered by the Committee for the Status of Endangered Wildlife in Canada (COSEWIC) (Government of Canada 2017), but not provincially by the COSSARO. These species are protected by the federal Species at Risk Act but not provincially by the Endangered Species Act.

Species of Conservation Concern are discussed further within the context of Significant Wildlife Habitat (SWH) (see below).

A screening exercise was conducted on these species to identify which species have suitable habitat within the study area. This involved cross-referencing the preferred habitat for reported SAR against habitats known to occur within the alternative sites or adjacent lands.

3.3 Significant Wildlife Habitat Screening

There are a number of woodland and wetland habitats in the area that may provide SWH under the Provincial Policy Statement (PPS; OMMAH 2005). These features were compared against the criteria identified in the Significant Wildlife Habitat Technical Guide (SWHTG; OMNR 2000). The SWHTG divides habitat types into five broad categories:

- Seasonal Concentration Areas of Animals;
- Rare Vegetation Communities;
- Specialized Habitat for Wildlife;
- Habitat for Species of Conservation Concern; and
- Animal Movement Corridors.

NRSI conducted a screening exercise to identify the potential presence of candidate or confirmed SWH within or adjacent to the study area. This exercise involved reviewing existing available information for existing vegetation communities, species, and habitat characteristics in relation to general evaluation criteria set out in the SWHTG (OMNR 2000), as well as the Significant Wildlife Habitat Criterion Schedule for Ecoregion 6E (MNRF 2015). Habitat for Species of Conservation Concern in Ontario were considered in this screening exercise.

4.0 Existing Conditions

4.1 Soils, Terrain and Drainage

The study area is located within the Guelph drumlin field situated among glacial spillway channels and till plain (Chapman and Putnam 1984). The drumlins, which typically occur in a west-northwest direction, and the plains of this area consist of sandy to silty till (Ecologistics Ltd. 1998). Several discontinuous eskers are found in the area. One such esker extends in a northwest to southeast direction across the northern portion of the study area (NRSI 2012). This esker feature creates a drainage divide between Hadati Creek to the west and Clythe Creek to the east and is comprised of notable amounts of gravel and cobble material that likely influence site hydrology. Small pockets of wetland habitat exist on the east-facing side of the esker. NRSI biologists conducting Ecological Land Classification (ELC) soil sampling in 2012 found surficial soils were generally comprised of silty clays and loams with gravel and cobbles present just below the surface (NRSI 2012).

4.2 Designated Natural Areas

The City of Guelph Natural Heritage System, identified in the City of Guelph Official Plan (2014), indicates that the study area contains significant wetlands (Schedule 10A), including the Clythe Creek PSW Complex and associated locally significant wetlands. The PSW is predominantly associated with the Hadati, Watson, and Clythe watercourses and includes a large area of swamp habitat at the headwaters of Clythe Creek. Schedule 2 of the Official Plan identifies regulatory floodplain development constraints within the wetland and riparian area associated with Hadati Creek and Clythe Creek. Schedule 10D identifies significant valleylands along Clythe Creek. Schedule 10B identifies coldwater fish habitat within Clythe Creek and Watson Creek, and coolwater in Hadati Creek. Significant woodlands have been mapped in Schedule 10C and comprise all woodlands within the northern portion of the study area and portions of the Clythe Creek corridor. There are no lands within the study area identified as being significant wildlife habitat (City of Guelph 2014).

Three ‘Amphibian Crossings’ across Watson Road North, Watson Parkway North, and at the north end of the study area across Eastview Road are indicated on Schedule 10 (City of Guelph 2014).

Within the vicinity of the study area are the Guelph Northeast Wetland Complex (~0.6 km to the northeast) and the Guelph Interstadial Site Regional Earth Science ANSI (~1.3 km to the southwest) and the Guelph Correctional Centre Quarry Provincial Earth Science ANSI (~1.6 km to the south; Wedgewood pers. comm. 2017).

4.3 Overall Site Characteristics and Vegetation

A total of 3 regulated SAR plants were identified as occurring in the vicinity of the study area from background resources: American Chestnut (*Castanea dentata*), Butternut (*Juglans cinerea*), and False Hop Sedge (*Carex lupuliformis*). Based on the available habitats, only Butternut may occur within five of the alternative sites (Table 2).

Table 2. Sites Where Regulated SAR Plants May Occur Within the Study Area

Common Name	Suitable Habitat Within Alternative Sites (blanks = no)							
	1	2	3	4	5	6	7	8
American Chestnut								
Butternut	Yes	Yes	Yes	Yes				Yes
False Hop Sedge								
Total	**1**	**1**	**1**	**1**	**0**	**0**	**0**	**1**

Overall site characteristics were assessed through air photo interpretation and using background studies, notably the Clythe Natural Heritage Report (NRSI 2012). ELC vegetation community codes provided from the Clythe Natural Heritage Report (NRSI 2012) have been changed back here to the 1998 ELC codes (Lee et al. 1998). Unless otherwise indicated, descriptions from the 2012 field studies (NRSI) still appear accurate. Alternative sites are shown on Map 1 and described below.

Site 1

Site 1 is the location of an existing pump house located on the west side of Watson Road North just north of the intersection with York Road. In 2012, Site 1 was described as having a small stand of Eastern White Cedar (*Thuja occidentalis*) located immediately north and south of the building, beyond which was a Scot's Pine (*Pinus sylvestris*) plantation (CUP3-3; NRSI 2012).

Site 2

Site 2 is immediately south of the Clythe Creek Wetland Complex on the east side of Watson Road North. Based on aerial imagery, Site 2 is characterized by a cultural meadow, with a small portion of deciduous woodland. The deciduous woodland bordering the northern Site 2 boundary is identified as Significant Cultural Woodland by the City of Guelph (2014). On the south, Site 2 is bordered by a coniferous forest.

Along Watson Road North, the area along the creek, north of Site 2, was characterized in 2012 (NRSI) by a Reed-canary Grass Graminoid Organic Meadow Marsh (MAM3-2), with abundant Broad-leaved Cattail (*Typha latifolia*) and a wide variety of forb associates such as Purple-stemmed Aster (*Symphyotrichum puniceum*), Tall Goldenrod (*Solidago altissima var. altissima*), and Spotted Joe-pye Weed (*Eupatorium maculatum ssp. Maculatum*).

A thicket, dominated by European (*Rhamnus cathartica*) and Glossy Buckthorn (*Frangula alnus*), was located on the northwest side of Site 2, bordering the creek and marsh just outside the site (NRSI 2012). Ground cover in this thicket community was sparse in 2012. Areas closer to the road were more open and contain an understory dominated by meadow species such as goldenrods and asters.

Site 3

Site 3 is a single residential property on the west side of Watson Road North just north of the intersection with York Road. In 2012, this site was surrounded by coniferous plantation (CUP3). The Clythe Creek PSW lies to the north of this site.

Site 4

Site 4 is within Grange Road Park, located at the southwest corner of Eastview Road and Watson Road North. This site is surrounded by the Clythe Creek Wetland Complex to the north and east, Hadati Creek to the west and a residential neighbourhood to the south. In 2012, the central portion of this site was comprised of a large area of Cultural Meadow (CUM) habitat dominated by Goldenrods (*Solidago* spp.) and Asters (*Symphyotrichum* spp.; NRSI 2012). Topography is characterized by a notable divide running in a northwest to southeast direction across the meadow. The community exhibits gentle to moderate slopes and both formal and informal trails exist throughout

the meadow. An area of restoration plantings was established in the northern extent of the meadow adjacent to the Reed-canary Grass Graminoid Organic Meadow Marsh (MAM3-2) and Hadati Creek. In the southern extent of the meadow, depressions caused by the esker led to poor drainage and allowed for the establishment of some wetland vegetation (NRSI 2012).

In 2012, there were 2 wetland inclusions within the mixed meadow community in the center of the study area (NRSI 2012). These wetland depressions were attributed to the esker formation as each was in close proximity to steep, raised ridges of well-drained soil and cobble materials. The dominant species in 2012 included Trembling Aspen (*Populus tremuloides*), Tamarack (*Larix laricina*), European Buckthorn, and Red-osier Dogwood (*Cornus sericea*).

Treed portions of the esker, within the Cultural Meadow, exist as poplar forest inclusions in close proximity to the Tamarack-hardwood swamp inclusions. Vegetation cover includes mature Trembling Aspen and Eastern White Cedar with an understory of European Buckthorn and a groundcover of largely non-native forbs and grasses.

Site 5

Site 5 is located at the northeast corner of Watson Road North and Fleming Road. This site, also known as Joe Veroni Park, is adjacent to the Clythe Creek Wetland Complex and consists of a mowed area with several recreational trails, a playground and small picnic shelter or gazebo.

Site 6

Site 6, or Severn Drive Park, is located on the northeast corner of Severn Drive and Grange Road. This site is primarily used for recreational purposes, with a large mowed clearing, a small network of trails running throughout, and a parking lot, playground, gazebo as well as volleyball and basketball courts.

Site 7

Site 7 is located at the northwest corner of Watson Parkway North and Grange Road. Like site 4, this site is also within the Grange Road Park and is used primarily for recreational purposes. The site consists of a mowed lawn, parking lot, and playground,

with a network of trails running throughout. The Clythe Creek Wetland Complex is located immediately to the north of this site.

Site 8

Site 8 is located on the southeast side of Watson Parkway North. This site is largely characterized by Cultural Meadow (CUM) dominated by a variety of Goldenrods and Asters, predominantly Tall Goldenrod and Panicled Aster (*Symphyotrichum lanceolatum*). A short hedgerow of Eastern White Cedar and European Buckthorn is near the southern edge of the meadow (NRSI 2012). In 2012, it was noted that the meadow became established on land that was graded (NRSI 2012). Recent air photo imagery still shows this Site as open with likely meadow habitat. The Clythe Creek Wetland Complex is located south of Site 8.

4.4 Wildlife

4.4.1 Birds

A total of 112 species were reported from the vicinity of the study area based on the OBBA (BSC et al. 2008; Appendix I – Birds), of which 6 are considered regulated SAR. Another 3 regulated SAR birds were listed as occurring in the area on the Species at Risk in Ontario (SARO) List for Wellington County (MNRF 2016a). The MNRF Guelph District Office also listed 6 of these same species as occurring in Guelph, while the NHIC did not have records of any regulated SAR birds within square 17NJ62 (MNRF 2014).

Of the 9 regulated SAR reported from the study area, 4 may be present within the study area based on what is known about current habitats present and species distributions. The Loggerhead Shrike (*Lanius ludovicianus*) was noted by the MNRF as occurring in Wellington County (MNRF 2016a), however, there are no observations of this species in the County after 1998 (MNRF 2016b), making the presence of this species in the study area highly unlikely. The 4 species that may be present include Barn Swallow (*Hirundo rustica*), Bobolink (*Dolichonyx oryzivorus*), Chimney Swift (*Chaetura pelagica*), and Eastern Meadowlark (*Sturnella magna*). Table 3 lists the alternative sites where these species may be found, based on available habitat.

Table 3. Sites Where Regulated SAR Birds May Occur Within the Alternative Sites

Common Name	Suitable Habitat Within Alternative Sites (blanks = no)							
	1	2	3	4	5	6	7	8
Bank Swallow								
Barn Swallow		Yes		Yes	Yes	Yes		Yes
Bobolink		Yes		Yes				Yes
Chimney Swift		Yes		Yes				Yes
Eastern Meadowlark		Yes		Yes				Yes
Henslow's Sparrow								
Least Bittern								
Loggerhead Shrike								
Yellow-breasted Chat								
Total	**0**	**4**	**0**	**4**	**1**	**1**	**0**	**4**

4.4.2 Herpetofauna

According to the Ontario Reptile and Amphibian Atlas (Ontario Nature 2017), 27 species are reported from the study area and vicinity. Another 2 species are listed as occurring in Wellington County and the City of Guelph by the MNRF (MNRF 2016a, MNRF 2017b; Appendix I – Herpetofauna). Of those listed as occurring in the vicinity of the study area, 3 species, Blanding's Turtle (*Emydoidea blandingii*), Butler's Gartersnake (*Thamnophis butleri*), and Jefferson salamander (*Ambystoma jeffersonianum*), are regulated SAR in Ontario (MNRF 2017a). There were no records of regulated SAR in the NHIC database for the study area (MNRF 2014).

The ponds and wetlands, including the Clythe Creek Wetland Complex, adjacent to the alternative sites in the study area could provide suitable habitat for Blanding's Turtles; however, despite the Ontario Reptile and Amphibian Atlas having records of Blanding's Turtle in square 17NJ62, and the MNRF listing the Blanding's Turtle as occurring in the City of Guelph (MNRF 2017b), the MNRF did not report the Blanding's Turtle as a possible SAR for the study area (Wedgewood pers. comm. 2017; Table 4).

There are records of Butler's Gartersnake in Wellington County (MNRF 2016a); however there are no records in the City of Guelph or in the vicinity of the study area (MNRF 2014, 2017b, Ontario Nature 2017; Table 4).

The Jefferson/Blue-spotted Salamander Complex is listed as occurring in Wellington County and the City of Guelph by the MNRF (MNRF 2016a, 2017b). There could be suitable habitat present for this species in the upland forest habitats in Site 2 (Table 4); however according to the Ontario Reptile and Amphibian Atlas (Ontario Nature 2017), the last record of an individual belonging to this complex in square 17NJ62 was from 1985. In addition, the dataset maintained by species expert Dr. Bogart at the University of Guelph has no records of Jefferson Salamanders from this area (Bogart pers. comm. 2017) and the MNRF did not report this species as occurring in the study area (Wedgewood pers. comm. 2017).

Table 4. Sites Where Regulated SAR Herpetofauna May Occur Within the Alternative Sites

Common Name	Suitable Habitat Within Alternative Sites (blanks = no)							
	1	2	3	4	5	6	7	8
Blanding's Turtle								
Butler's Gartersnake								
Jefferson Salamander Complex								
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

4.4.3 Mammals

A total of 41 mammal species are reported from the vicinity of the study area based on the Mammal Atlas of Ontario (Dobbyn 1994; Appendix I – Mammals). Eastern Small-footed Myotis (*Myotis leibii*), Little Brown Myotis (*Myotis lucifuga*), Northern Myotis (*Myotis septentrionalis*), and Tricoloured Bat (*Perimyotis subflavus*) are the only regulated SAR mammals that may have suitable habitat (trees with suitable roosting cavities) within the study area. Table 5 lists the alternative sites where these species may be found.

Table 5. Site Where Regulated SAR Mammals May Occur Within the Alternative Sites

Common Name	Suitable Habitat Within Alternative Sites (blanks = no)							
	1	2	3	4	5	6	7	8
Eastern Small-footed Myotis	Yes	Yes	Yes	Yes				Yes
Little Brown Myotis	Yes	Yes	Yes	Yes				Yes

Common Name	Suitable Habitat Within Alternative Sites (blanks = no)							
	1	2	3	4	5	6	7	8
Northern Myotis	Yes	Yes	Yes	Yes				Yes
Tri-coloured Bat	Yes	Yes	Yes	Yes				Yes
Total	**4**	**4**	**4**	**4**	**0**	**0**	**0**	**4**

4.4.4 Fish and Mussels

The SARO List for Wellington County (MNRF 2016a) listed 4 regulated SAR fish and mussels as occurring in Wellington County: Black Redhorse (*Moxostoma duquesnei*), Redside Dace (*Clinostomus elongates*), Silver Shiner (*Notropis photogenis*), and Wavy-rayed Lampmussel (*Lampsilis fasciola;* Appendix I – Fishes, Mussels). Based on the habitat within the alternative sites, none of these species are thought to occur within the study area (Table 6).

Table 6. Site Where Regulated SAR Fish and Mussels May Occur Within the Alternative Sites

Common Name	Suitable Habitat Within Alternative Sites (blanks = no)							
	1	2	3	4	5	6	7	8
Black Redhorse								
Redside Dace								
Silver Shiner								
Wavy-rayed Lampmussel								
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

4.4.5 Insects

A total of 60 butterfly species are reported from the study area and vicinity based on the Ontario Butterfly Atlas (Macnaughton 2017; Appendix I - Lepidoptera). None of these species are regulated SAR in Ontario.

The Rusty-patched Bumble Bee (*Bombus affinis*) is noted by the MNRF (MNRF 2016a, MNRF 2017b) as potentially occurring within the study area, and some potentially suitable habitat exists in the study area (open, urban areas), however the only recent observations in Ontario were in the Pinery Provincial Park in 2002, making its presence very unlikely.

A total of 94 species of Odonates (dragonflies and damselflies) have been documented in Wellington County (Dougan & Associates 2009; Appendix I – Odonata). None of these species are currently listed as regulated SAR in Ontario.

Table 7 lists the alternative sites where regulated SAR insects may be found, based on available habitat.

Table 7. Site Where Regulated SAR Insects May Occur Within the Alternative Sites

Common Name	Suitable Habitat Within Alternative Sites (blanks = no)							
	1	2	3	4	5	6	7	8
Rusty-patched Bumble Bee								
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

4.4.6 Regulated SAR Summary

Table 8 provides a summary of the number of regulated SAR by species group that may occur in the 8 alternative sites within the study area. Based on the available habitat, Site 7 does not have the potential to have regulated SAR while Sites 5 and 6 only have potential for 1 regulated SAR (Barn Swallow). Site 2, 4 and 8 have the highest potential for regulated SAR, with 9 species potentially occurring on site, followed by Sites 3 and 1 (5 species). Appendix II has the full summary of the SAR screening exercise.

Table 8. Summary of the Regulated SAR that May Occur Within the Alternative Sites

Species Group	Number of Regulated SAR That May Occur Within Alternative Sites							
	1	2	3	4	5	6	7	8
Plants	**1**	**1**	**1**	**1**				**1**
Birds		**4**		**4**	**1**	**1**		**4**
Herpetofauna								
Mammals	**4**	**4**	**4**	**4**				**4**
Fish and Mussels								
Insects								
Total	**5**	**9**	**5**	**9**	**1**	**1**	**0**	**9**

4.5 Significant Wildlife Habitat

Table 9 summarizes the findings of the SWH screening exercise across all 8 alternative sites. Detailed findings from the SWH screening exercise are provided in Appendix III in Tables A-E, for Seasonal Concentration Areas of Animals, Rare Vegetation Communities, Specialized Habitat for Wildlife, Habitat for Species of Conservation Concern, and Animal Movement Corridors, respectively.

4.5.1 Seasonal Concentration Areas

Sites 1, 2, 3, 4 and 8, may have suitable Snake Hibernaculum habitat and Bat Maternity Colonies. No other significant seasonal concentration areas were identified as potentially occurring in the study area.

4.5.2 Rare Vegetation Communities

No Cliff and Talus Slope, Sand Barren, Alvar, Old Growth Forest, Savannah, or Tallgrass Prairie communities are recorded as occurring in the study area.
Other undocumented Rare Vegetation Communities could possibly exist within the study area; however, at the scale of this SWH screening desktop review, none were identified.

4.5.3 Specialized Wildlife Habitat

The following specialized wildlife habitat may be found within the study area:

- Waterfowl Nesting Areas could occur around the Clythe Creek Wetland Complex including at Sites 2, 4 and 8.
- Open meadows and clearings with 5 or more nesting Midland Painted Turtles (*Chrysemys picta marginata*) or 1 or more nesting Snapping Turtle (*Chelydra serpentina*), could be present within the study area at Sites 2, 4, 5, 7, and 8.

4.5.4 Special Concern and Rare Wildlife Species

Several Species of Conservation Concern (Special Concern or S Ranks S1-S3) are recorded from the vicinity of the study area based on the background review and may be present. These include:

Birds:

- Common Nighthawk (*Chordeiles minor*; S4B; SC)
- Eastern Wood-pewee (*Contopus virens*; S4B; Special Concern)

- Golden-winged Warbler (*Vermivora chrysoptera*; S4B; Special Concern)
- Grasshopper Sparrow (*Ammodramus savannarum*; S4B; Special Concern)

Herpetofauna:

- Snapping Turtle (*Chelydra serpentina*; S3; Special Concern)

Plants:

- Amethyst Aster (*Symphyotrichum X amethystinum*; S3?; no provincial status)
- Cary's Sedge (*Carex careyana*; S2; no provincial status)

Insects:

- Monarch (*Danaus plexippus*; S2N, S4B; Endangered)

4.5.5 Animal Movement Corridors

The presence of Animal Movement Corridors SWH is conditional on the presence of Amphibian Breeding Habitat – Wetland, and Deer Wintering Habitat. As these habitat types are not present, neither are Animal Movement Corridors as SWH.

4.4.6 Regulated SAR Summary

Table 9 lists all SWH possible within Ecoregion 6E and whether or not each habitat type has the potential to occur within any of the alternative sites. Based on the available habitat, Site 6 has the least potential for SWH with only 2 SWH types potentially present. Sites 1, 3, 5 and 7 all have the potential to have 4 SWH types, while Sites 2, 4 and 8 all have the potential to have 7 SWH types. The full SWH screening is attached in Appendix III.

4.6 Adjacent Lands

As all sites, other than Site 6, are within 120m of the Clythe Creek PSW complex, which includes swamp and marshes, additional SWH and SAR may be found in the area. False Hop Sedge (*Carex lupuliformis*) is the only regulated SAR with the potential to be found in the adjacent lands. The following SWH have the potential to be found in the adjacent lands:

- Amphibian Breeding Habitat (Woodland)
- Amphibian Breeding Habitat (Wetland)
- Raptor Wintering Area
- Special Concern and Rare Wildlife Species
    - Canada Warbler (*Cardellina canadensis*)
    - Red-headed Wood Pecker (*Melanerpes erythrocephalus*)
    - Wood Thrush (*Hylocichla mustelina*)
    - Eastern Ribbonsnake (*Thamnophis sauritus*)
    - Hart's-tongue Fern (*Asplenium scolopendrium*)
    - Hill's Pondweed (*Potamogeton hillii*)
    - West Virginia White (*Pieris virginiensis*)

The adjacent lands are addressed further in terms of the recommended fieldwork in Section 6.3.

Table 9. Summary of the Significant Wildlife Habitat for Ecoregion 6E That May Occur Within the Alternative Sites

Type of SWH	Details	Candidate SWH That May Occur Within Potential Sites (blanks = no)							
		1	2	3	4	5	6	7	8
Seasonal Concentration	Waterfowl Stopover and Staging Areas (Terrestrial)								
	Waterfowl Stopover and Staging Areas (Aquatic)								
	Shorebird Migratory Stopover Area								
	Raptor Wintering Area								
	Bat Hibernacula								
	Bat Maternity Colonies	Yes	Yes	Yes	Yes				Yes
	Turtle Wintering Area								
	Snake Hibernaculum	Yes	Yes	Yes	Yes				Yes
	Nesting Bird Breeding Habitat (Bank and Cliff)								
	Nesting Bird Breeding Habitat (Tree/Shrubs)								
	Nesting Bird Breeding Habitat (Ground)								
	Migratory Butterfly Stopover Areas								
	Landbird Migratory Stopover Areas								
	Deer Yarding Areas								
	Deer Winter Congregation Areas								
Rare Vegetation	Cliff and Talus Slopes								
	Sand Barrens								
	Alvar								
	Old Growth Forest								
	Savannah								
	Tallgrass Prairie								
	Other Rare Vegetation Communities	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Type of SWH	Details	Candidate SWH That May Occur Within Potential Sites (blanks = no)							
		1	2	3	4	5	6	7	8
Specialized Wildlife	Waterfowl Nesting Area		Yes		Yes				Yes
	Bald Eagle and Osprey Nesting, Foraging and Perching Habitat								
	Woodland Raptor Nesting Habitat								
	Turtle Nesting Area		Yes		Yes	Yes		Yes	Yes
	Seeps and Springs								
	Amphibian Breeding Habitat (Woodland)								
	Amphibian Breeding Habitat (Wetland)								
	Woodland Area-Sensitive Bird Breeding Habitat								
Habitat for Species of Conservation Concern	Marsh and Bird Breeding Habitat								
	Open Country Bird Breeding Habitat								
	Shrub/Early Successional Bird Breeding Habitat								
	Terrestrial Crayfish		Yes		Yes	Yes		Yes	Yes
	Special Concern and Rare Wildlife Species	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Animal Movement	Amphibian Movement Corridors								
	Deer Movement Corridors								
Total		**4**	**7**	**4**	**7**	**4**	**2**	**4**	**7**

5.0 Alternative Site Analysis

The 8 alternative sites within the study area were ranked in order of their suitability for the development for the new Clythe Treatment Facility from a natural heritage perspective, considering only natural heritage features within the sites themselves as all sites have the same adjacent land constraints. The rankings included their potential for SAR and SWH (see Table 10 and 11). This ranking was conducted on the sites, regardless of their size. Section 6, Site Selection, discusses other ranking considerations, as well as the actual size of the development area required for the treatment facility.

Based on this desktop analysis, Site 6 and Site 7 are the most suitable locations for the new station. Site 6 is an ideal location due to its current recreational use, being surrounded by residential development, and its location away from natural heritage features. This site has the potential for only 1 regulated SAR (Barn Swallow) and 2 types of SWH (possible Other Rare Vegetation Communities and Habitat for Species of Conservation Concern – Common Nighthawk). In addition, Site 6 does not fall within a GRCA regulated area.

Site 7 is tied with Site 6 for most suitable locations from a natural heritage perspective. Although this site is adjacent to the Clythe Creek Wetland Complex, it is currently used for recreational purposes and is surrounded by residential development on the west and southeast sides. Site 7 does not have the potential to provide habitat regulated SAR, although it potentially has 4 types of SWH (Other Rare Vegetation Communities; Turtle Nesting Habitat; Habitat for Species of Conservation Concern – Terrestrial Crayfish; and Habitat for Species of Conservation Concern – Common Nighthawk). Site 7 falls within the GRCA regulated area.

The third most suitable site from a natural heritage perspective, Site 5, is very similar to Site 7 in its current conditions and the number of potential SWH types, however, it also has the potential for Barn Swallow, which is a regulated SAR. Unlike Site 7, Site 5 does not fall within the GRCA regulated area.

The least preferred alternative sites for the new Clythe Well Treatment Facility from a natural heritage perspective are Sites 2, 4 and 8. These sites contain the most natural features, including the highest potential for SAR and SWH (9 SAR and 7 SWH).

Table 10. Ranking of the 8 Alternative Sites Based on the Number of Regulated SAR and SWH that May Occur Within the Alternative Sites

Alternative Site	Regulated SAR		SWH		Overall Site Ranking (average of 2 rankings)
	Number	Ranking	Number	Ranking	
1	5	3	4	2	2.5
2	9	4	7	3	3.5
3	5	3	4	2	2.5
4	9	4	7	3	3.5
5	1	2	4	2	2
6	1	2	2	1	1.5
7	0	1	4	2	1.5
8	9	4	7	3	3.5

Table 11. Alternative Sites in Order of Suitability Based on the Overall Site Ranking

Alternative Site	Overall Site Ranking (average of 2 rankings)	Site Suitability
6	1.5	Most Suitable
7	1.5	
5	2	
1	2.5	
3	2.5	
2	3.5	
4	3.5	Least Suitable
8	3.5	

6.0 Site Selection

Following GM BluePlan's consultation with various stakeholders in both the City of Guelph's Planning and Park Departments, Site 4 is no longer available for development; Site 1 is too small; and Sites 5, 6 and 7 located in City parks may not be preferred from a social and economic perspective. As such, Sites 2, 3 and 8 are the most likely candidates for the location of the new Clythe Treatment Facility pending further stakeholder input.

6.1 Proposed Development

The total footprint of the proposed Clythe Treatment Facility, including an access laneway and parking area, is estimated to be 35 x 90m or 0.315ha. Depending on the site selected, the City may utilize the site for other operations as well. For instance, Sites 2 and 8 are quite large, and only a portion of the site would be required for the Clythe Treatment Facility.

6.2 Preliminary Constraints Analysis of Selected Sites

Preliminary constraint mapping was completed for Sites 2, 3, and 8 (Maps 2-4). Constraint mapping was based on standard buffers recommended in the City of Guelph's Official Plan (2014), which identifies woodland buffers as 10m and wetland buffers as 30m. Upon further site-specific study, it may be possible to reduce the buffers slightly, for instance in areas that are currently already impacted through development and maintenance (e.g. Site 3), or where further studies identify no SWH or SAR from adjacent lands.

Site 2

Site 2 has the potential to provide habitat for 9 SAR and 7 SWH (Tables 10 and 11). After considering the necessary 30m wetland and 10m woodland buffers, Site 2 has a total potential area available for development of 2.10ha (Map 2). The majority of Site 2, however, falls within the GRCA regulation limit, which would require permitting from the Conservation Authority. Only 0.25ha of Site 2 falls outside of the GRCA Regulation Area and outside of natural heritage features and their preliminary buffers. Access to Site 2 may also be difficult, as the proposed access from Watson Road is constrained by the

PSW and its buffer, GRCA Regulated area, as well as trees (which could provide habitat for SAR bats). Access to Site 2 from Highway 7 may be blocked by railway tracks.

Site 3

Although Site 3 had a lower total ranking than Sites 2 and 8 (Table 11) with 5 potential SAR and 4 potential SWH (Table 10), it is a much smaller property. The potentially developable area has been shown on Map 3 as following the dripline of the woodland in the vicinity of the house, pool, and garage; 10m from the dripline where there is no structure; and following the dripline of the trees along the southeastern property boundary, which are not part of the contiguous woodland. The 30m buffer from the PSW does not overlap with Site 3. That provides an area of 0.28ha for potential development. As the total footprint of the proposed facility is 0.315ha, Site 3 does not meet the size requirement of the new Clythe Treatment Facility, even with reduced buffers due to existing development (i.e. house, pool, garage, manicured lawn), especially given its irregular shape. Site 3 is also entirely within the GRCA Regulated Area.

Site 8

Site 8 ranked equally in the Alternative Site Analysis to Site 2, based on the potential number of SAR (9) and SWH (7; Tables 10 and 11) within the site. After considering the necessary 30m wetland and 10m woodland buffers, Site 8 has a total potentially area available for development of 6.03ha (Map 4). A portion of Site 8 falls within the GRCA regulation limit, which would require permitting from the Conservation Authority; however, 3.26ha of Site 8 are outside of the GRCA Regulation Area and outside of natural heritage features and their preliminary buffers, providing ample space for the proposed development. Access to Site 8 is also unhindered from a natural heritage perspective.

Given the large unconstrained area within Site 8, and easy access, Site 8 is the preferred site.

6.3 Recommended Fieldwork of Selected Sites

The following is a list of the possible constraints from a natural heritage perspective on Site 8:

- Potential SAR:
  - Barn Swallow
  - Bobolink
  - Chimney Swift
  - Eastern Meadowlark
  - Eastern Small-footed Myotis
  - Little Brown Myotis
  - Northern Myotis
  - Tri-coloured Bat
  - Butternut

- Potential SWH:
  - Bat Maternity Colonies
  - Snake Hibernaculum
  - Other Rare Vegetation Communities
  - Waterfowl Nesting Area
  - Turtle Nesting Area
  - Terrestrial Crayfish
  - Special Concern and Rare Wildlife Species

- GRCA Regulated Area

Natural heritage features on adjacent lands may also provide a constraint to the proposed development, especially if the proposed buffers cannot be adhered to in all instances (e.g. site access).

To more fully determine the constraints on Site 8, field studies will need to be undertaken to assess which, if any, of the potential SAR and SWH listed above are found in the area. It is recommended that the scope of work be identified prior to the field season with the GRCA, MNRF, and City of Guelph. An initial site visit will be helpful in determining the scope of work. Based on the results of the SAR and SWH screening,

the following field surveys are anticipated to characterize the existing natural environment conditions of these sites and adjacent lands, and identify potential constraints:

- Vegetation community mapping including completion of detailed ELC data cards and surficial soils characterization (1 site visit)
- Spring and summer vascular flora inventory (2 site visits)
- Anuran surveys (3 site visits: April, May, and June)
- Breeding Bird Surveys (3 site visits in June)
- Turtle nest and nesting surveys (6 surveys over 3 weeks in June)
- Snake emergence surveys (3 surveys in April to early May)
- Tree cavity/bat habitat assessment (1 site visit in spring), if trees are to be removed

NRSI biologists would conduct this work in accordance with the most up-to-date agency recommendations and guidelines. In addition to the specific surveys mentioned above, all incidental wildlife observations, including direct observations, as well as signs such as dens, tracks, scats, etc., would be recorded. The location of any rare species will be documented in detail and locations will be recorded with a handheld GPS.

Should Sites 2 and 3 be considered further for the proposed treatment facility, these would require the same field studies as recommended for Site 8. Where development is proposed within the GRCA Regulation Limit, this will require a permit from the Conservation Authority. Hydrological studies will be necessary to show that the water budget to the wetland can be maintained through development.

7.0 Summary

This report summarizes the existing natural environment conditions at the 8 alternative sites for the Clythe Well Treatment Facility, based on a desktop review of natural heritage features and functions, and ranks the sites in order of suitability from a natural heritage perspective (including their potential for SAR and SWH). Multiple SAR were determined to potentially occur within the alternative sites and adjacent lands and many sites within the study area also have the potential for providing SWH.

Of the 8 alternative sites investigated, Sites 6 and 7 were the most suitable locations for the Clythe Treatment Facility from a natural heritage perspective. After taking into consideration current property availability, as well as social and economic factors, however, Sites 2, 3 and 8 were selected as the most suitable potential locations for this development. Through a constraints mapping exercise, the area available for development at Site 3 was determined to be too small to accommodate the required footprint of the facility. Therefore, Sites 2 and 8 are the most suitable sites for the development of the Clythe Treatment Facility. Sites 2 and 8 are equivalent from a natural heritage perspective, with each having the potential for 9 SAR and 7 SWH. The area available outside natural feature buffers on both of these sites is adequate to accommodate the required footprint of the treatment facility; however, based on site access and area outside of the GRCA Regulated Area, Site 8 is preferred.

Field studies are recommended to more fully determine the potential opportunities and constraints at these sites and to determine whether action or approvals would be necessary under the Endangered Species Act (2007) or the GRCA. Given that Site 8 has sufficient area outside the GRCA regulation limit, no other action or approvals may be required under Ontario Regulation 150/06 (Conservation Authorities Act 1990), depending on the selected location for development at the site. No approvals would be necessary for either site under the Canadian Fisheries Act (1985).

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MAPS

562000
563000
564000
4825000
4824000

Site 6
Severn Drive Park
Clythe Creek
Wetland Complex
SEVERN DR
WATSON RD N
EASTVIEW RD
4
7
Grange Road Park
Haduti Creek
Clythe Creek
Site 5
Joe Veroni Park
GRANGE RD
STARWOOD DR
Clythe Creek
Wetland Complex
HWY 7
WATSON PKY N
8
2
1
3
YORK RD
WATSON PKY S

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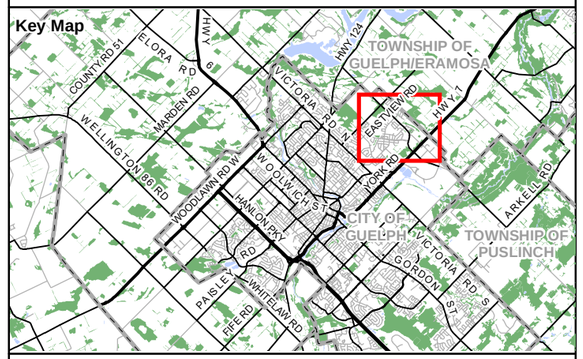
Clythe Well Treatment Class EA

Map 1

Alternative Sites



Legend

- Study Area
- Alternative Site
- Railway
- Highway
- Primary Road
- Secondary Road
- Permanent Watercourse
- Water Body
- Provincially Significant Wetland (PSW)

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1972
Date: September 6, 2017

NAD83 - UTM Zone 17
Size: 11x17"
1:9,500

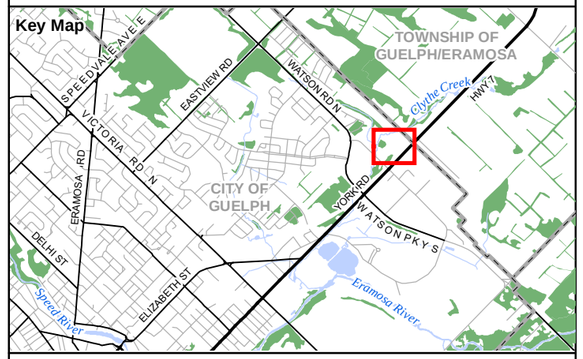
0 100 200 300 400 500 Metres

N

Map 2

Clythe Well Treatment Class EA

Alternative Site 2
Preliminary Constraints



564000 564100 564200 564300 564400

4824300 4824200 4824100 4824000

Clythe Creek Wetland Complex

2

2.10ha

HWY 7

YORK RD

WATSON RD N

Clythe Creek

Legend

- Study Area
- Alternative Site
- Potentially Developable Area
- Wetland Buffer (30m)
- Woodland Buffer (10m)
- Railway
- Permanent Watercourse
- Provincially Significant Wetland (PSW)
- GRCA Regulation Limit

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1972 Date: September 6, 2017	NAD83 - UTM Zone 17 Size: 11x17" **1:1,500**

0 20 40 60 80 100 Metres

N

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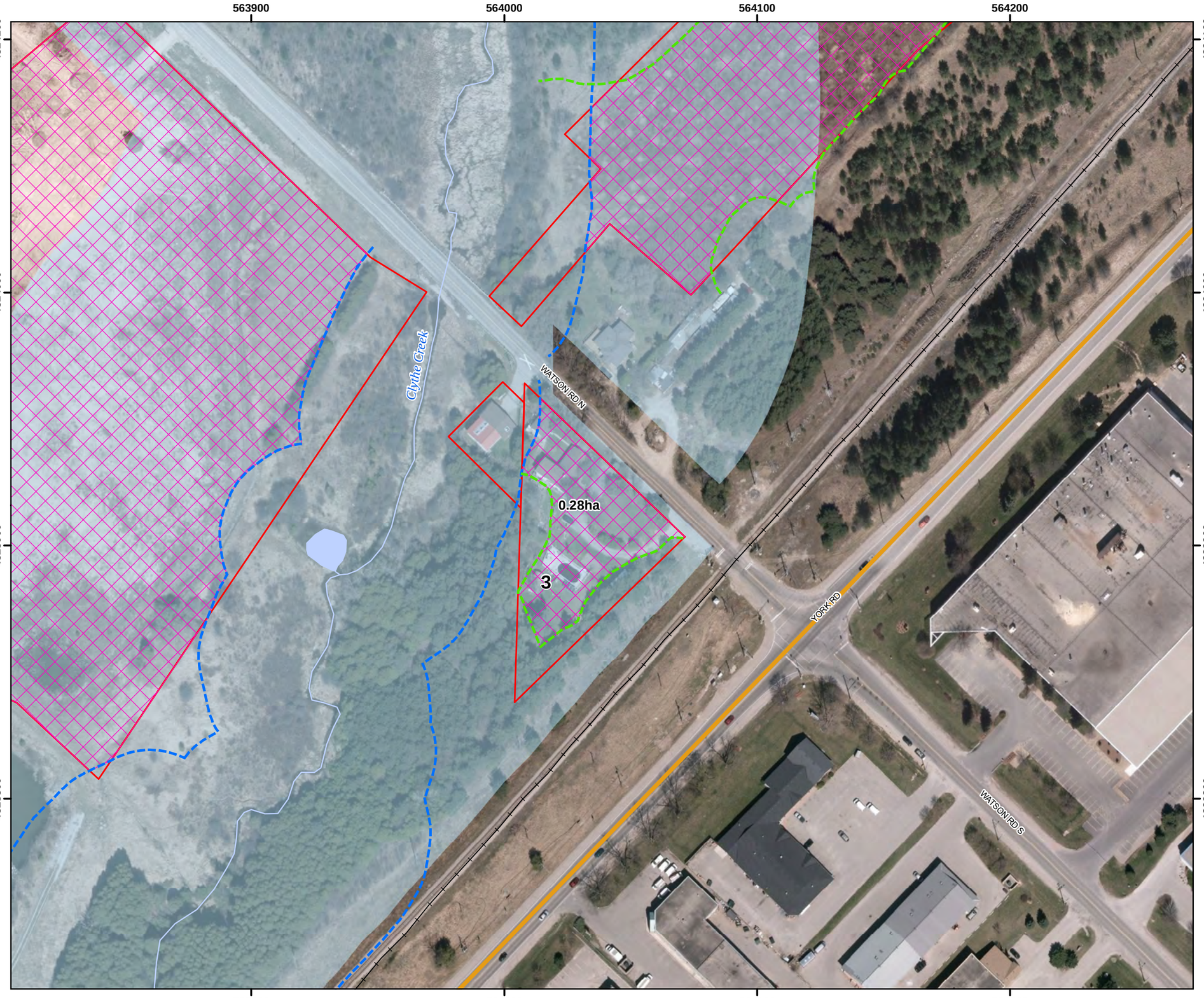
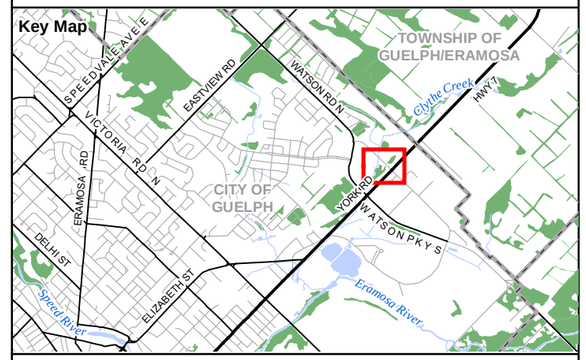
Map 3

Clythe Well Treatment Class EA

Alternative Site 3 Preliminary Constraints



Key Map



Legend

- Study Area
- Alternative Site
- Potentially Developable Area
- Wetland Buffer (30m)
- Woodland Buffer (10m)
- Railway
- Permanent Watercourse
- Water Body
- GRCA Regulation Limit

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1972 Date: September 6, 2017	NAD83 - UTM Zone 17 Size: 11x17" **1:1,500**

0 20 40 60 80 100 Metres

N

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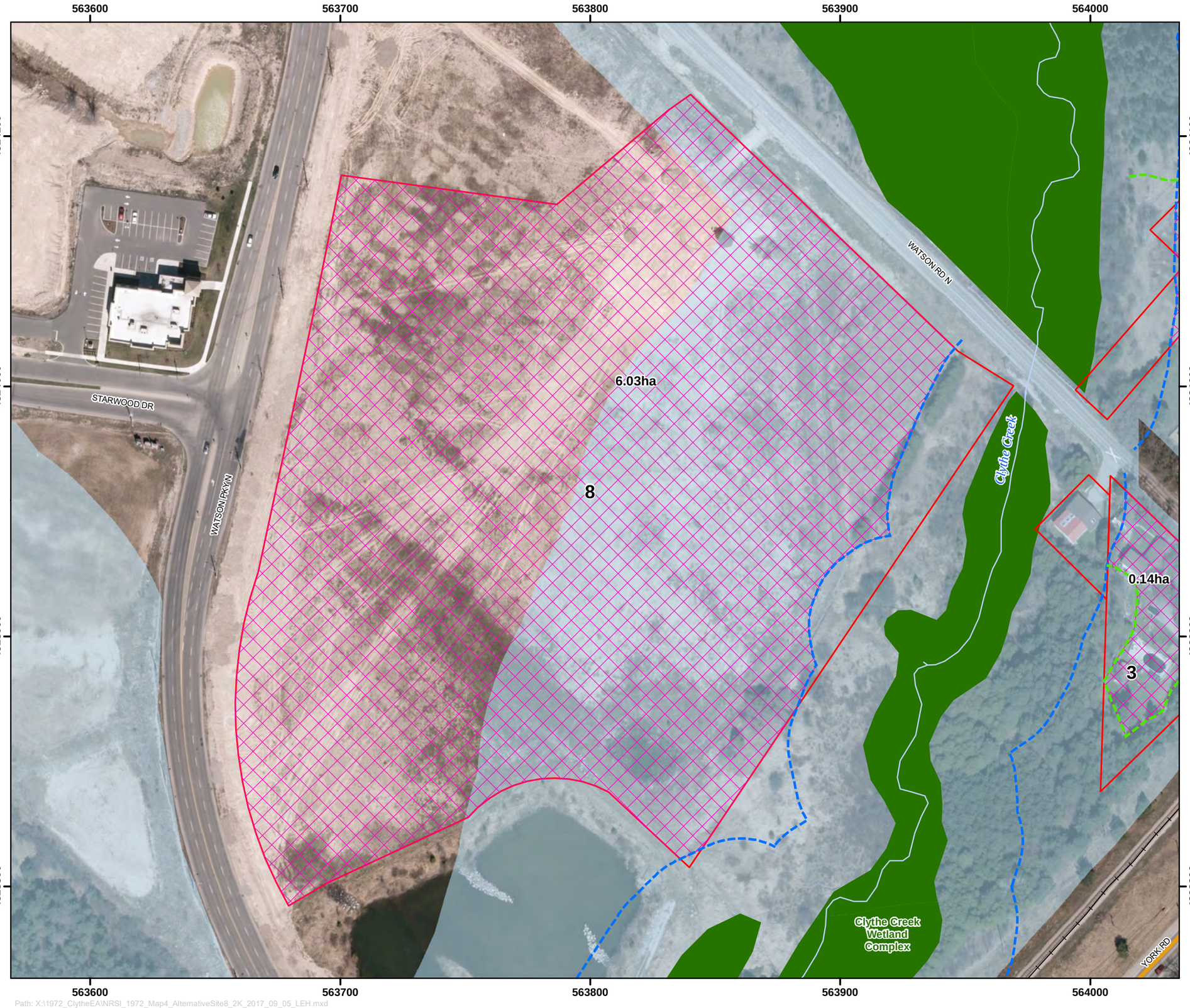
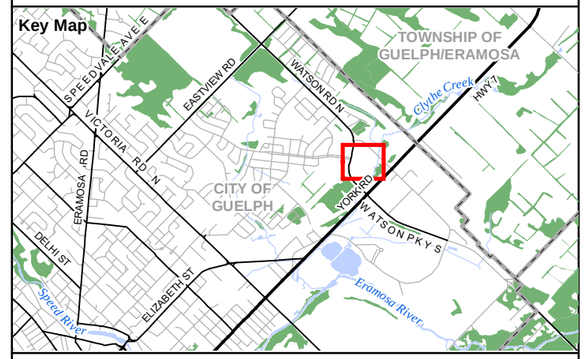
Map 4

Clythe Well Treatment Class EA

Alternative Site 8 Preliminary Constraints



Key Map



Legend

- Study Area
- Alternative Site
- Potentially Developable Area
- Wetland Buffer (30m)
- Woodland Buffer (10m)
- Railway
- Permanent Watercourse
- Water Body
- Provincially Significant Wetland (PSW)
- GRCA Regulation Limit

Natural Resource Solutions Inc.
Aquatic, Terrestrial and Wetland Biologists

Project: 1972 Date: September 6, 2017	NAD83 - UTM Zone 17 Size: 11x17" **1:1,500**

0 20 40 60 80 100 Metres

N

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APPENDIX I
Wildlife Species Lists

Bird Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[3]	Grand River Watershed Conservation Priority[4]	Wellington County Status[5]	City of Guelph Significant Species[6]	OBBA[7] (Square 17NJ62)	NHIC Data[8] (Square 17NJ62)	MNRF Wellington County SAR List[9]	MNRF - Guelph District[10]	NRSI Observed (2012)[11]
Anatidae	**Ducks, Geese & Swans**												
Branta canadensis	Canada Goose	S5							CO				
Cygnus buccinator	Trumpeter Swan	S4	NAR	NAR			√	X					
Aix sponsa	Wood Duck	S5							CO				
Anas strepera	Gadwall	S4				√	√	X					
Anas americana	American Wigeon	S4				√	√	X					
Anas rubripes	American Black Duck	S4				√	√						
Anas platyrhynchos	Mallard	S5							CO				X
Anas discors	Blue-winged Teal	S4				√	√						
Anas clypeata	Northern Shoveler	S4					√	X					
Anas acuta	Northern Pintail	S5				√	√	X					
Anas crecca	Green-winged Teal	S4					√	X					
Aythya valisneria	Canvasback	S1B,S4N				√	√						
Aythya americana	Redhead	S2B, S4N					√						
Aythya collaris	Ring-necked Duck	S5				√	√	X					
Aythya affinis	Lesser Scaup	S4				√		X					
Lophodytes cucullatus	Hooded Merganser	S5B, S5N				√	√						
Mergus merganser	Common Merganser	S5B, S5N					√	X	CO				
Mergus serrator	Red-breasted Merganser	S5B, S5N					√	X					
Oxyura jamaicensis	Ruddy Duck	S4B, S4N					√	X					
Odontophoridae	**New World Quails**												
Colinus virginianus	Northern Bobwhite	S1	END	E	Schedule 1	√	√						
Bonasa umbellus	Ruffed Grouse	S4				√			PR				
Meleagris gallopavo	Wild Turkey	S5							PO				
Podicipediformes	**Grebes**												
Podilymbus podiceps	Pied-billed Grebe	S4B, S4N				√	√		CO				
Podiceps grisegena	Red-necked Grebe	S3B, S4N	NAR	NAR			√						
Columbidae	**Pigeons & Doves**												
Columba livia	Rock Pigeon	SNA							CO				
Zenaida macroura	Mourning Dove	S5							CO				X
Cuculiformes	**Cuckoos & Anis**												
Coccyzus americanus	Yellow-billed Cuckoo	S4B					√	X					
Coccyzus erythropthalmus	Black-billed Cuckoo	S5B				√	√*	X	PO				
Caprimulgidae	**Goatsuckers**												
Chordeiles minor	Common Nighthawk	S4B	SC	T	Schedule 1	√	√					X	
Caprimulgus vociferus	Eastern Whip-poor-will	S4B	THR	T	Schedule 1	√	√						
Apodidae	**Swifts**												
Chaetura pelagica	Chimney Swift	S4B, S4N	THR	T	Schedule 1		√		PR			X	
Trochilidae	**Hummingbirds**												
Archilochus colubris	Ruby-throated Hummingbird	S5B				√			PR				
Rallidae	**Railes, Gallinules & Coots**												
Rallus elegans	King Rail	S2B	END	E	Schedule 1	√							
Rallus limicola	Virginia Rail	S5B				√			PR				
Porzana carolina	Sora	S4B				√	√		PR				
Gallinula galeata	Common Gallinule	S4B				√	√	X					
Fulica americana	American Coot	S4B	NAR	NAR		√	√	X					
Gruidae	**Cranes**												
Grus canadensis	Sandhill Crane	S5B					√	X					
Charadriidae	**Plovers**												
Charadrius vociferus	Killdeer	S5B, S5N							CO				
Scolopacidae	**Waders**												
Bartramia longicauda	Upland Sandpiper	S4B				√	√	X					
Gallinago delicata	Wilson's Snipe	S5B				√			PO				
Scolopax minor	American Woodcock	S4B				√			PR				
Actitis macularia	Spotted Sandpiper	S5				√			CO				
Phalaropus tricolor	Wilson's Phalarope	S3B				√	√						
Laridae	**Gulls, Terns & Skimmers**												
Larus delawarensis	Ring-billed Gull	S5B, S4N					**	X					
Larus argentatus	Herring Gull	S5B, S5N					**	X					

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[3]	Grand River Watershed Conservation Priority[4]	Wellington County Status[5]	City of Guelph Significant Species[6]	OBBA[7] (Square 17NJ62)	NHIC Data[8] (Square 17NJ62)	MNRF Wellington County SAR List[9]	MNRF - Guelph District[10]	NRSI Observed (2012)[11]
Hydroprogne caspia	Caspian Tern	S3B	NAR	NAR			√						
Chlidonias niger	Black Tern	S3B	SC	NAR		√	**				X		
Sterna hirundo	Common Tern	S4B	NAR	NAR		√							
Graviidae	**Loons**												
Gavia immer	Common Loon	S5B, S5N	NAR	NAR		√	√	X	PO				
Phalacrocoracidae	**Cormorants**												
Phalacrocorax auritus	Double-crested Cormorant	S5B	NAR	NAR			**	X					
Ardeidae	**Herons & Bitterns**												
Botaurus lentiginosus	American Bittern	S4B				√	√	X					
Ixobrychus exilis	Least Bittern	S4B	THR	T	Schedule 1	√	√		PO				
Ardea herodias	Great Blue Heron	S4B					**	X	PR				
Ardea alba	Great Egret	S2B					√						
Butorides virescens	Green Heron	S4B				√	**	X	CO				
Nycticorax nycticorax	Black-crowned Night-Heron	S3B,S3N					√						
Cathartidae	**Vultures**												
Cathartes aura	Turkey Vulture	S5B				√	√		PO				X
Accipitridae	**Hawks, Kites, Eagles & Allies**												
Pandion haliaetus	Osprey	S5B				√	√		CO				
Haliaeetus leucocephalus	Bald Eagle	S2N, S4B	SC	NAR			√				X	X	
Circus cyaneus	Northern Harrier	S4B	NAR	NAR		√	√*	X	PO				
Accipiter striatus	Sharp-shinned Hawk	S5	NAR			√	√*	X	PR				
Accipiter cooperii	Cooper's Hawk	S4	NAR	NAR		√	√*	X	CO				
Accipiter gentilis	Northern Goshawk	S4	NAR	NAR		√	√	X					
Buteo lineatus	Red-shouldered Hawk	S4B	NAR	NAR	Schedule 3	√	√	X					
Buteo platypterus	Broad-winged Hawk	S5B				√	√	X	PO				
Buteo jamaicensis	Red-tailed Hawk	S5	NAR	NAR					CO				X
Tytonidae	**Barn Owls**												
Tyto alba	Barn Owl	S1	END	E	Schedule 1	√	√						
Strigidae	**Typical Owls**												
Megascops asio	Eastern Screech-Owl	S4	NAR	NAR					CO				
Bubo virgianus	Great Horned Owl	S4							CO				
Strix varia	Barred Owl	S5				√	√	X					
Asio otus	Long-eared Owl	S4				√	√	X	CO				
Asio flammeus	Short-eared Owl	S2N, S4B	SC	SC	Schedule 3	√	√				X		
Aegolius acadicus	Northern Saw-whet Owl	S4				√	√	X					
Alcedinidae	**Kingfishers**												
Megaceryle alcyon	Belted Kingfisher	S4B					√	X	CO				
Picidae	**Woodpeckers**												
Melanerpes erythrocephalus	Red-headed Woodpecker	S4B	SC	T	Schedule 1	√	√		PO			X	
Melanerpes carolinus	Red-bellied Woodpecker	S4				√	√	X					
Sphyrapicus varius	Yellow-bellied Sapsucker	S5B				√	√*	X					
Picoides pubescens	Downy Woodpecker	S5							CO				
Picoides villosus	Hairy Woodpecker	S5					√*	X	CO				
Colaptes auratus	Northern Flicker	S4B					√*	X	CO				
Dryocopus pileatus	Pileated Woodpecker	S5				√	√*	X	PR				
Falconidae	**Caracaras & Falcons**												
Falco sparverius	American Kestrel	S4				√	√*	X	PO				
Falco columbarius	Merlin	S5B	NAR	NAR			√	X					
Tyrannidae	**Tyrant Flycatchers**												
Contopus cooperi	Olive-sided Flycatcher	S4B	SC	T	Schedule 1	√	√						
Contopus virens	Eastern Wood-Pewee	S4B	SC	SC			√	X	PR			X	
Empidonax flaviventris	Yellow-bellied Flycatcher	S5B						X					
Empidonax virescens	Acadian Flycatcher	S2S3B	END	E	Schedule 1	√	√						
Empidonax alnorum	Alder Flycatcher	S5B				√			PR				
Empidonax traillii	Willow Flycatcher	S5B					√	X	PO				
Empidonax minimus	Least Flycatcher	S4B				√	√	X	PR				
Sayornis phoebe	Eastern Phoebe	S5B				√			CO				
Myiarchus crinitus	Great Crested Flycatcher	S4B							CO				
Tyrannus tyrannus	Eastern Kingbird	S4B				√	√*	X	CO				
Laniidae	**Shrikes**												
Lanius ludovicianus	Loggerhead Shrike	S2B	END	E (ssp. *migrans*)	Schedule 1	√	√				X		

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[3]	Grand River Watershed Conservation Priority[4]	Wellington County Status[5]	City of Guelph Significant Species[6]	OBBA[7] (Square 17NJ62)	NHIC Data[8] (Square 17NJ62)	MNRF Wellington County SAR List[9]	MNRF - Guelph District[10]	NRSI Observed (2012)[11]
Vireonidae	**Vireos**												
Vireo griseus	White-eyed Vireo	S2B				√							
Vireo flavifrons	Yellow-throated Vireo	S4B					√	X					
Vireo solitarius	Blue-headed Vireo	S5B				√	√	X					
Vireo gilvis	Warbling Vireo	S5B							CO				
Vireo olivaceus	Red-eyed Vireo	S5B							CO				
Corvidae	**Crows & Jays**												
Cyanocitta cristata	Blue Jay	S5							CO				X
Corvus brachyrhynchos	American Crow	S5B							CO				X
Corvus corax	Common Raven	S5					√	X	PO				
Alaudidae	**Larks**												
Eremophila alpestris	Horned Lark	S5B				√			PR				
Hirundinidae	**Swallows**												
Progne subis	Purple Martin	S4B				√	√						
Tachycineta bicolor	Tree Swallow	S4B							CO				
Stelgidopteryx serripennis	Northern Rough-winged Swallow	S4B				√			CO				
Riparia riparia	Bank Swallow	S4B	THR	T		√	ant in nesting	X	CO			X	
Petrochelidon pyrrhonota	Cliff Swallow	S4B				√	ificant in nesting	X	CO				
Hirundo rustica	Barn Swallow	S4B	THR	T		√			CO		X	X	
Paridae	**Chickadees & Titmice**												
Poecile atricapillus	Black-capped Chickadee	S5				√			CO				X
Baeolophus bicolor	Tufted Titmouse	S4				√	√	X					
Sittidae	**Nuthatches**												
Sitta canadensis	Red-breasted Nuthatch	S5				√	√*	X	CO				
Sitta carolinensis	White-breasted Nuthatch	S5							CO				
Certhiidae	**Creepers**												
Certhia americana	Brown Creeper	S5B				√	√*	X	CO				
Troglodytidae	**Wrens**												
Troglodytes aedon	House Wren	S5B							CO				
Troglodytes hiemalis	Winter Wren	S5B					√*	X	PR				
Cistothorus platensis	Sedge Wren	S4B	NAR	NAR		√	√	X					
Cistothorus palustris	Marsh Wren	S4B				√	√		PO				
Thryothorus ludovicianus	Carolina Wren	S4				√	√	X	CO				
Polioptilidae	**Gnatcatchers**												
Polioptila caerulea	Blue-gray Gnatcatcher	S4B				√	√	X					
Regulidae	**Kinglets**												
Regulus satrapa	Golden-crowned Kinglet	S5B				√	√						
Regulus calendula	Ruby-crowned Kinglet	S4B				√	√	X					
Turdidae	**Thrushes**												
Sialia sialis	Eastern Bluebird	S5B	NAR	NAR		√			CO				
Catharus fuscescens	Veery	S4B				√	√*	X	PR				
Catharus ustulatus	Swainson's Thrush	S4B					√	X					
Catharus guttatus	Hermit Thrush	S5B				√	√	X					
Hylocichla mustelina	Wood Thrush	S4B	SC	T			√*	X	PR			X	
Turdus migratorius	American Robin	S5B							CO				X
Mimidae	**Mockingbirds, Thrashers & Allies**												
Dumetella carolinensis	Gray Catbird	S4B				√			PR				X
Toxostoma rufum	Brown Thrasher	S4B				√	√	X	CO				
Mimus polyglottos	Northern Mockingbird	S4				√	√	X					
Sturnidae	**Starlings**												
Sturnus vulgaris	European Starling	SNA							CO				
Bombycillidae	**Waxwings**												
Bombycilla cedrorum	Cedar Waxwing	S5B							CO				
Passeridae	**Old World Sparrows**												
Passer domesticus	House Sparrow	SNA							PR				
Fringillidae	**Finches & Allies**												
Carpodacus mexicanus	House Finch	SNA							CO				
Carpodacus purpureus	Purple Finch	S4B				√			CO				
Loxia curvirostra	Red Crossbill	S4B				√		X					
Loxia leucoptera	White-winged Crossbill	S5B						X					
Spinus pinus	Pine Siskin	S4B						X	PR				

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Spinus tristis	American Goldfinch	S5B				√			CO				X
Coccothraustes vespertinus	Evening Grosbeak	S4B						X					
Parulidae	**Wood Warblers**												
Seiurus aurocapillus	Ovenbird	S4B				√	√*	X	CO				
Parkesia motacilla	Louisiana Waterthrush	S3B	THR	SC	Schedule 1	√	√						
Parkesia noveboracensis	Northern Waterthrush	S5B				√			CO				
Vermivora chrysoptera	Golden-winged Warbler	S4B	SC	T	Schedule 1	√	√					X	
Vermivora cyanoptera	Blue-winged Warbler	S4B				√	√	X	PO				
Mniotilta varia	Black-and-white Warbler	S5B				√	√*	X	CO				
Protonotaria citrea	Prothonotary Warbler	S1B	END	E	Schedule 1	√	√						
Oreothlypis peregrina	Tennessee Warbler	S5B					√	X					
Oreothlypis ruficapilla	Nashville Warbler	S5B				√			PR				
Geothylpis philadelphia	Mourning Warbler	S4B				√			PR				
Geothylpis formosus	Kentucky Warbler	SNA					√						
Geothylpis trichas	Common Yellowthroat	S5B							CO				
Setophaga citrina	Hooded Warbler	S4B	NAR	NAR	Schedule 1	√	√						
Setophaga ruticilla	American Redstart	S5B				√	√*	X	PR				
Setophaga cerulea	Cerulean Warbler	S3B	THR	E	Schedule 1	√	√						
Setophaga americana	Northern Parula	S4B					√	X					
Setophaga magnolia	Magnolia Warbler	S5B				√	√	X	PO				
Setophaga castanea	Bay-breasted Warbler	S5B					√	X					
Setophaga fusca	Blackburnian Warbler	S5B				√	√	X	PO				
Setophaga petechia	Yellow Warbler	S5B							CO				
Setophaga pensylvanica	Chestnut-sided Warbler	S5B				√			PO				
Setophaga caerulescens	Black-throated Blue Warbler	S5B				√	√	X					
Setophaga pinus	Pine Warbler	S5B				√	√*	X	PR				
Setophaga coronata	Yellow-rumped Warbler	S5B				√			PR				
Setophaga discolor	Prairie Warbler	S3B	NAR	NAR		√	√						
Setophaga virens	Black-throated Green Warbler	S5B				√	√	X	PR				
Cardellina canadensis	Canada Warbler	S4B	SC	T	Schedule 1	√	√					X	
Icteria virens	Yellow-breasted Chat	S2B	END	E	Schedule 1	√	√				X	X	
Emberizidae	**New World Sparrows & Allies**												
Pipilo erythrophthalmus	Eastern Towhee	S4B				√	√*	X	CO				
Spizella passerina	Chipping Sparrow	S5B							CO				
Spizella pallida	Clay-colored Sparrow	S4B				√	√		CO				
Spizella pusilla	Field Sparrow	S4B				√	√*	X	CO				
Pooecetes gramineus	Vesper Sparrow	S4B				√	√*	X					
Passerculus sandwichensis	Savannah Sparrow	S4B				√	√*	X	CO				
Ammodramus savannarum	Grasshopper Sparrow	S4B	SC	SC		√	√	X	PR				
Ammodramus henslowii	Henslow's Sparrow	SHB	END	E	Schedule 1	√	√				X		
Ammodramus leconteii	Le Conte's Sparrow	S4B				√	√	X					
Melospiza melodia	Song Sparrow	S5B							CO				
Melospiza lincolnii	Lincoln's Sparrow	S5B					√	X					
Melospiza georgiana	Swamp Sparrow	S5B				√			CO				
Zonotrichia albicollis	White-throated Sparrow	S5B				√			PR				
Junco hyemalis	Dark-eyed Junco	S5B				√	√	X					

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Cardinalidae	**Cardinals, Grosbeaks & Allies**												
Piranga olivacea	Scarlet Tanager	S4B				√	√	X	PO				
Cardinalis cardinalis	Northern Cardinal	S5							CO				X
Pheucticus ludovicianus	Rose-breasted Grosbeak	S4B					√*	X	PR				
Passerina cyanea	Indigo Bunting	S4B							PR				
Icteridae	**Blackbirds**												
Dolichonyx oryzivorus	Bobolink	S4B	THR	T	No Schedule	√	√*		PR		X	X	
Agelaius phoeniceus	Red-winged Blackbird	S4							CO				
Sturnella magna	Eastern Meadowlark	S4B	THR	T	No Schedule	√	√*		PR		X	X	
Sturnella neglecta	Western Meadowlark	S3B				√	√	X					
Euphagus cyanocephalus	Brewer's Blackbird	S4B					√	X					
Quiscalus quiscula	Common Grackle	S5B							CO				
Molothrus ater	Brown-headed Cowbird	S4B							CO				
Icterus spurius	Orchard Oriole	S4B				√	√	X					
Icterus galbula	Baltimore Oriole	S4B					√*	X	CO				
Total						**122**	**132**	**95**	**112**	**0**	**9**	**13**	**11**

[1]MNRF 2015a; [2]MNRF 2017a; [3]Government of Canada 2017; [4]Couturier 2000; [5]Dougan & Associates 2009; [6]City of Guelph 2012; [7]BSC 2008; [8]MNRF 2014; [9]MNRF 2016a; [10]MNRF 2017b; [11]NSRI 2012

Reptile and Amphibian Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[3]	Wellington County Status[4]	City of Guelph Significant Species[5]	Ontario Reptile and Amphibian Atlas[6] (Square 17NJ62)	NHIC Data[7] (Square 17NJ62)	MNRF Wellington County SAR List[8]	MNRF - Guelph District[9]	NRSI Observed (2012)[10]
Turtles												
Chelydra serpentina serpentina	Snapping Turtle	S3	SC	SC	Schedule 1	R		X		X	X	X
Chrysemys picta marginata	Midland Painted Turtle	S5				X		X				
Emydoidea blandingii	Blanding's Turtle (*Great Lakes/St Lawrence population*)	S3	THR	T	Schedule 1	R		X		X	X	
Graptemys geographica	Northern Map Turtle	S3	SC	SC	Schedule 1	R		X	X	X		
Snakes												
Lampropeltis taylori triangulum	Eastern Milksnake	S4	NAR	SC		R		X	X			
Opheodrys vernalis	Smooth Greensnake	S4				R	X	X				
Nerodia sipedon sipedon	Common Watersnake	S5	NAR	NAR		R	X	X				
Storeria dekayi dekayi	Northern Brownsnake	S5	NAR	NAR		R	X	X				
Storeria occipitomaculata occipitom	Northern Red-bellied Snake	S5				R	X	X				X
Thamnophis butleri	Butler's Gartersnake	S2	END	E	Schedule 1	R				X		
Thamnophis sauritus septentrionali	Eastern Ribbonsnake	S3	SC	SC	Schedule 1	R		X	X	X	X	
Thamnophis sirtalis sirtalis	Eastern Gartersnake	S5				X		X				X
Salamanders												
Ambystoma jeffersonianum	Jefferson Salamander	S2	END	E	Schedule 1	R				X	X	
Ambystoma hybrid pop. 1	Jefferson x Blue-spotted Salamander; Jefferson genome dominates	S2				R	X	X				
Ambystoma laterale	Blue-spotted Salamander	S4				R		X				
Ambystoma maculatum	Spotted Salamander	S4				R	X	X				
Necturus maculosus	Mudpuppy	S4	NAR	NAR		R	X	X				
Notophthalmus viridescens viridesc	Red-spotted Newt	S5				R	X	X				
Plethodon cinereus	Eastern Red-backed Salamander	S5				X		X				
Toads and Frogs												
Anaxyrus americanus	American Toad	S5				X		X				
Hyla versicolor	Tetraploid Gray Treefrog	S5				X		X				
Pseudacris triseriata pop. 1	Western Chorus Frog *(Carolinian Population)*	S4	NAR	NAR				X				
Pseudacris crucifer	Spring Peeper	S5				X		X				
Lithobates catesbeiana	American Bullfrog	S4				R	X	X				
Lithobates clamitans melanota	Northern Green Frog	S5				X		X				
Lithobates palustris	Pickerel Frog	S4	NAR	NAR		R	X	X				
Lithobates pipiens	Northern Leopard Frog	S5	NAR	NAR		X		X				X
Lithobates septentrionalis	Mink Frog	S5				R	X	X				
Lithobates sylvatica	Wood Frog	S5				X		X				
Total						**41**	**13**	**27**	**3**	**6**	**4**	**4**

[1]MNRF 2015a; [2]MNRF 2017a; [3]Government of Canada 2017; [4]Dougan & Associates 2009; [5]City of Guelph 2012; [6]Ontario Nature 2017; [7]MNRF 2014; [8]MNRF 2016a; [9]MNRF 2017b; [10]NSRI 2012

Mammal Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[3]	Wellington County Status[4]	City of Guelph Significant Species[5]	Ontario Mammal Atlas[6]	NHIC Data[7] (Square 17NJ62)	MNRF Wellington County SAR List[8]	MNRF - Guelph District[9]	NRSI Observed (2012)[10]
Didelphimorphia	**Opossums**											
Didelphis virginiana	Virginia Opossum	S4				X		X				X
Insectivora	**Shrews and Moles**											
Blarina brevicauda	Northern Short-tailed Shrew	S5				X		X				
Condylura cristata	Star-nosed Mole	S5				X		X				
Parascalops breweri	Hairy-tailed Mole	S4				R	X	X				
Sorex cinereus	Masked Shrew	S5				X		X				
Sorex fumeus	Smoky Shrew	S5				X		X				
Sorex hoyi	Pygmy Shrew	S4				R	X					
Sorex palustris	Water Shrew	S5				R	X	X				
Chiroptera	**Bats**											
Eptesicus fuscus	Big Brown Bat	S4				X		X				
Lasionycteris noctivagans	Silver-haired Bat	S4				X		X				
Lasiurus borealis	Eastern Red Bat	S4				X		X				
Lasiurus cinereus	Hoary Bat	S4				X		X				
Myotis leibii	Eastern Small-footed Myotis	S2S3	END			R		X			X	
Myotis lucifugus	Little Brown Myotis	S4	END	E	Schedule 1	X					X	
Myotis septentrionalis	Northern Myotis	S3	END	E	Schedule 1	R					X	
Perimyotis subflavus	Tri-colored Bat	S3?	END	E	Schedule 1	R		X			X	
Lagomorpha	**Rabbits and Hares**											
Lepus americanus	Snowshoe Hare	S5				R	X					
Lepus europaeus	European Hare	SNA				X		X				
Sylvilagus floridanus	Eastern Cottontail	S5				X		X				X
Rodentia	**Rodents**											
Castor canadensis	Beaver	S5				X		X				
Erethizon dorsatum	Porcupine	S5				X		X				
Clethrionomys gapperi	Southern Red-backed Vole	S5				R	X					
Glaucomys sabrinus	Northern Flying Squirrel	S5				R	X	X				
Glaucomys volans	Southern Flying Squirrel	S4	NAR	NAR		R	X					
Marmota monax	Woodchuck	S5				X		X				
Microtus pennsylvanicus	Meadow Vole	S5				X		X				X
Microtus pinetorum	Woodland Vole	S3?	SC	SC	Schedule 1	R						
Mus musculus	House Mouse	SNA				X						
Napaeozapus insignis	Woodland Jumping Mouse	S5				R	X	X				
Ondatra zibethicus	Muskrat	S5				X		X				
Peromyscus leucopus	White-footed Mouse	S5				X		X				
Peromyscus maniculatus	Deer Mouse	S5				X		X				
Rattus norvegicus	Norway Rat	SNA				X		X				
Sciurus carolinensis	Eastern Gray Squirrel	S5				X		X				

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Synaptomys cooperi	Southern Bog Lemming	S4				R	X					
Tamiasciurus hudsonicus	Red Squirrel	S5				X		X				
Tamias striatus	Eastern Chipmunk	S5				X						
Zapus hudsonius	Meadow Jumping Mouse	S5				X		X				
Carnivora	**Carnivores**											
Canis latrans	Coyote	S5				X		X				
Lontra canadensis	North American River Otter	S5				R	X					
Lynx canadensis	Canada Lynx	S5	NAR	NAR		R	X					
Lynx rufus	Bobcat	S4				R	X					
Mephitis mephitis	Striped Skunk	S5				X		X				
Mustela erminea	Ermine	S5				X						
Mustela frenata	Long-tailed Weasel	S4				R	X					
Mustela nivalis	Least Weasel	SU				R	X					
Mustela vison	American Mink	S4				X						
Procyon lotor	Northern Raccoon	S5				X		X				X
Puma concolor	Cougar	SU	END	DD		R						
Taxidea taxus jacksoni	American Badger	S2	END	E	Schedule 1	R						
Urocyon cinereoargenteus	Grey Fox	S1	THR	T	Schedule 1	R						
Ursus americanus	American Black Bear	S5	NAR	NAR		R	X					
Vulpes vulpes	Red Fox	S5				X		X				
Artiodactyla	**Deer and Bison**											
Odocoileus virginianus	White-tailed Deer	S5				X		X				X
Total						**54**	**15**	**33**	**0**	**0**	**4**	**5**

[1]MNRF 2015a; [2]MNRF 2017a; [3]Government of Canada 2017; [4]Dougan & Associates 2009; [5]City of Guelph 2012; [6]Dobbyn 1994; [7]MNRF 2014; [8]MNRF 2016a; [9]MNRF 2017b; [10]NSRI 2012

Butterfly Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[3]	Wellington County Status[4]	City of Guelph Status[5]	TEA Atlas[6] (17NJ62)	NHIC Data[7] (Square 17NJ62)	MNRF Wellington County SAR List[8]	MNRF - Guelph District[9]	NRSI Observed (2012)[10]
Hesperiidae	**Skippers**											
Amblyscirtes hegon	Pepper and Salt Skipper	S4				X	X					
Anatrytone logan	Delaware Skipper	S4				X	X	X				
Ancyloxypha numitor	Least Skipper	S5						X				
Carterocephalus palaemon	Arctic Skipper	S5						X				
Epargyreus clarus	Silver-spotted Skipper	S4						X				
Erynnis baptisiae	Wild Indigo Duskywing	S4				X	X	X				
Erynnis brizo	Sleepy Duskywing	S1				X						
Erynnis icelus	Dreamy Duskywing	S5						X				
Erynnis juvenalis	Juvenal's Duskywing	S5						X				
Erynnis martialis	Mottled Duskywing	S2	END	E		X						
Euphyes conspicua	Black Dash	S3				X						
Euphyes dion	Dion Skipper	S4				X						
Euphyes vestris	Dun Skipper	S5						X				
Hylephila phyleus	Fiery Skipper	SNA						X				
Pholisora catullus	Common Sootywing	S3				X						
Poanes hobomok	Hobomok Skipper	S5						X				
Poanes massasoit	Mulberry Wing	S4				X	X					
Poanes viator	Broad-winged Skipper	S4						X				
Polites mystic	Long Dash Skipper	S5						X				
Polites peckius	Peck's Skipper	S5						X				
Polites themistocles	Tawny-edged Skipper	S5						X				
Pompeius verna	Little Glassywing	S4				X	X	X				
Pyrgus communis	Common Checkered Skipper	SNA						X				
Thorybes bathyllus	Southern Cloudywing	S3				X						
Thymelicus lineola	European Skipper	SNA						X				
Wallengrenia egeremet	Northern Broken Dash	S5						X				
Papilionidae	**Swallowtails**											
Papilio cresphontes	Giant Swallowtail	S4				X		X				
Papilio glaucus	Eastern Tiger Swallowtail	S5						X				
Papilio polyxenes	Black Swallowtail	S5						X				
Pieridae	**Whites and Sulphurs**											
Colias eurytheme	Orange Sulphur	S5						X				
Colias interior	Pink-edged Sulphur	S5						X				
Colias philodice	Clouded Sulphur	S5						X				X
Pieris oleracea	Mustard White	S4						X				
Pieris rapae	Cabbage White	SNA						X				X
Pieris virginiensis	West Virginia White	S3		SC		X		X			X	
Pontia protodice	Checkered White	SNA						X				

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[3]	Wellington County Status[4]	City of Guelph Status[5]	TEA Atlas[6] (17NJ62)	NHIC Data[7] (Square 17NJ62)	MNRF Wellington County SAR List[8]	MNRF - Guelph District[9]	NRSI Observed (2012)[10]
Lycaenidae	**Harvesters, Coppers, Hairstreaks, Blues**											
Callophrys gryneus	Juniper (Olive) Hairstreak	S2				X						
Callophrys niphon	Eastern Pine Elfin	S5						X				
Celastrina lucia	Northern Spring Azure	S5						X				
Cupido comyntas	Eastern Tailed Blue	S5						X				
Erora laeta	Early Hairstreak	S2				X						
Lycaena helliodes	Purplish Copper	S3				X						
Lycaena hyllus	Bronze Copper	S5						X				
Satyrium calanus	Banded Hairstreak	S4						X				
Satyrium caryaevorus	Hickory Hairstreak	S4				X						
Satyrium liparops	Striped Hairstreak	S5						X				
Satyrium titus	Coral Hairstreak	S5						X				
Strymon melinus	Grey Hairstreak	S4				X	X					
Nymphalidae	**Brush-footed Butterflies**											
Asterocampa celtis	Hackberry Emperor	S2				X						
Asterocampa clyton	Tawny Emperor	S2S3				X						
Boloria bellona	Meadow Fritillary	S5						X				
Cercyonis pegala	Common Wood-Nymph	S5						X				
Chlosyne gorgone	Gorgone Checkerspot	S2				X						
Coenonympha tullia	Common Ringlet	S5						X				
Danaus plexippus	Monarch	S2N, S4B	SC	SC	Schedule 1	X*		X			X	
Euphydryas phaeton	Baltimore Checkerspot	S4						X				
Euptoieta claudia	Variegated Fritillary	SNA						X				
Junonia coenia	Common Buckeye	SNA						X				
Lethe anthedon	Northern Pearly-Eye	S5						X				
Lethe eurydice	Eyed Brown / Northern Eyed	S5						X				
Limenitis archippus	Viceroy	S5						X				X
Limenitis arthemis arthemis	White Admiral/Banded	S5						X				
Limenitis arthemis astyanax	Red-spotted Purple	S5						X				
Megisto cymela	Little Wood-Satyr	S5						X				
Nymphalis antiopa	Mourning Cloak	S5						X				X
Phyciodes cocyta	Northern Crescent	S5						X				
Phyciodes tharos	Pearl Crescent	S4						X				
Polygonia comma	Eastern Comma	S5						X				
Polygonia comma	Eastern Comma/Hop	S5						X				
Polygonia interrogationis	Question Mark	S5						X				
Polygonia progne	Grey Comma	S5						X				
Speyeria aphrodite	Aphrodite Fritillary	S5						X				
Speyeria cybele	Great Spangled Fritillary	S5						X				
Vanessa atalanta	Red Admiral	S5						X				
Vanessa cardui	Painted Lady	S5						X				
Vanessa virginiensis	American Lady	S5						X				
Total						**22**	**6**	**60**	**0**	**0**	**2**	**4**

[1]MNRF 2015a; [2]MNRF 2017a; [3]Government of Canada 2017; [4]Dougan & Associates 2009; [5]City of Guelph 2012; [6]Macnaughton 2017; [7]MNRF 2014;
[8]MNRF 2016a; [9]MNRF 2017b; [10]NSRI 2012

Dragonfly and Damselfly Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[3]	Wellington County Status[4]	City of Guelph Significant Species[5]	NHIC Data[6] (Square 17NJ62)	MNRF Wellington County SAR List[7]	MNRF - Guelph District[8]
Calopterygidae	**Broadwinged Damselflies**									
Hetaerina titia	Smoky Rubyspot	S2				P				
Lestidae	**Spreadwings**									
Lestes eurinus	Amber-winged Spreadwing	S3				PR				
Lestes forcipatus	Sweetflag Spreadwing	S4				X				
Lestes inaequalis	Elegant Spreadwing	S4				PR				
Lestes vigilax	Swamp Spreadwing	S5				PR				
Coenagrionidae	**Narrow-winged Damselflies**									
Amphiagrion saucium	Eastern Red Damsel	S4				X				
Argia apicalis	Blue-fronted Dancer	S4				PR				
Argia sedula	Blue-ringed Dancer	S2				P				
Argia tibialis	Blue-tipped Dancer	S3				PR				
Argia translata	Dusky Dancer	S2				P				
Chromagrion conditum	Aurora Damsel	S5				X				
Coenagrion resolutum	Taiga Bluet	S5				X				
Enallagma anna	River Bluet	S2				X				
Enallagma annexum	Northern Bluet	S4				X				
Enallagma aspersum	Azure Bluet	S3				X				
Enallagma basidens	Double-striped Bluet	S3				P				
Enallagma geminatum	Skimming Bluet	S4				PR				
Enallagma vesperum	Vesper Bluet	S4				PR				
Ischnura hastata	Citrine Forktail	SNA				X				
Nehalennia gracilis	Sphagnum Sprite	S4				X				
Aeshnidae	**Darners**									
Aeshna clepsydra	Mottled Darner	S3				X				
Aeshna interrupta	Variable Darner	S5				X				
Aeshna verticalis	Green-striped Darner	S3				P				
Basiaeschna janata	Springtime Darner	S5				X				
Boyeria grafiana	Ocellated Darner	S4				P				
Epiaeschna heros	Swamp Darner	S2S3				PR				
Gomphaeschna furcillata	Harlequin Darner	S3				P				
Nasiaeschna pentacantha	Cyrano Darner	S3				PR				
Rhionaeschna mutata	Spatterdock Darner	S1				P				

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[3]	Wellington County Status[4]	City of Guelph Significant Species[5]	NHIC Data[6] (Square 17NJ62)	MNRF Wellington County SAR List[7]	MNRF - Guelph District[8]
Gomphidae	**Clubtails**									
Arigomphus furcifer	Lilypad Clubtail	S3				X				
Arigomphus villosipes	Unicorn Clubtail	S2S3				PR				
Dromogomphus spinosus	Black-shouldered Spinyleg	S5				X				
Gomphus descriptus	Harpoon Clubtail	S3				X				
Gomphus fraternus	Midland Clubtail	S4				PR				
Gomphus graslinellus	Pronghorn Clubtail	S3				PR				
Gomphus lividus	Ashy Clubtail	S4				X				
Gomphus quadricolor	Rapids Clubtail	S1	END	E	Schedule 1	P				
Gomphus spicatus	Dusky Clubtail	S5				X				
Gomphus vastus	Cobra Clubtail	S1				P				
Gomphus ventricosus	Skillet Clubtail	SH				P				
Gomphus viridifrons	Green-faced Clubtail	S1				P				
Hagenius brevistylus	Dragonhunter	S5				X				
Ophiogomphus carolus	Riffle Snaketail	S2S3				P				
Ophiogomphus rupinsulens	Rusty Snaketail	S4				X				
Stylogomphus albistylus	Least Clubtail	S4				P				
Stylurus amnicola	Riverine Clubtail	S1	END	E		P				
Stylurus laurae	Laura's Clubtail	S1		E		P				
Stylurus notatus	Elusive Clubtail	S2				P				
Stylurus scudderi	Zebra Clubtail	S4				P				
Stylurus spiniceps	Arrow Clubtail	S2				P				
Cordulegasteridae	**Spiketails**									
Cordulegaster diastatops	Delta-spotted Spiketail	S4				PR				
Cordulegaster maculata	Twin-spotted Spiketail	S4				?				
Cordulegaster obliqua	Arrowhead Spiketail	S2				P				
Macromiidae	**Cruisers**									
Macromia illinoiensis	Illinois (Swift) River Cruiser	S4				?				
Corduliidae	**Emeralds**									
Cordulia shurtleffii	American Emerald	S5				?				
Dorocordulia libera	Racket-tailed Emerald	S5				?				
Epitheca spinigera	Spiny Baskettail	S5				?				
Neurocordulia yamaskanen	Stygian Shadowdragon	S4				?				
Somatochlora forcipata	Forcipate Emerald	S3				P				
Somatochlora kennedyi	Kennedy's Emerald	S4				P				
Somatochlora linearis	Mocha Emerald	S1				P				
Somatochlora minor	Ocellated Emerald	S4				P				
Somatochlora tenebrosa	Clamp-tipped Emerald	S2S3				X				
Somatochlora walshii	Brush-tipped Emerald	S4				X	X			
Somatochlora williamsoni	Williamson's Emerald	S4				X	X			
Williamsonia fletcheri	Ebony Boghaunter	S2				P				

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[3]	Wellington County Status[4]	City of Guelph Significant Species[5]	NHIC Data[6] (Square 17NJ62)	MNRF Wellington County SAR List[7]	MNRF - Guelph District[8]
Libellulidae	**Skimmers**									
Celithemis eponina	Halloween Pennant	S4				X	X	X		
Ladona julia	Chalk-fronted Corporal	S5				X	X			
Leucorrhinia frigida	Frosted Whiteface	S5				X	X			
Leucorrhinia glacialis	Crimson-ringed Whiteface	S4				X	X			
Leucorrhinia hudsonica	Hudsonian Whiteface	S5				X	X			
Leucorrhinia proxima	Red-waisted (Belted) Whiteface	S5				X	X			
Libellula incesta	Slaty Skimmer	S4				P	X			
Libellula semifasciata	Painted Skimmer	S2				X				
Nannothemis bella	Elfin Skimmer	S4				P	X			
Perithemis tenera	Eastern Amberwing	S4				X	X			
Sympetrum corruptum	Variegated Meadowhawk	S3				P				
Sympetrum costiferum	Saffron-bordered Meadowhawk	S4				X	X			
Sympetrum danae	Black Meadowhawk	S4				P	X			
Total						**79**	**13**	**1**	**0**	**0**

[1]MNRF 2015a; [2]MNRF 2017a; [3]Government of Canada 2017; [4]Dougan & Associates 2009; [5]City of Guelph 2012; [6]MNRF 2014; [7]MNRF 2016a; [8]MNRF 2017b

Fish Species Reported from the Study Area

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[3]	NHIC Data[4] (Square 17NJ62)	DFO SAR List[5] (Square SW 16)	MNRF Wellington County SAR List[6]	MNRF - Guelph District[7]
Cyprinidae	**Carps and Minnows**								
Chrosomus eos	Northern Redbelly Dace	S5							X[8], X[9]
Chrosomus neogaeus	Finescale Dace	S5							X[9]
Clinostomus elongatus	Redside Dace	S2	END	E (April 2007)	Schedule 3			X	
Luxilus cornutus	Common Shiner	S5							X[8], X[9]
Nocomis biguttatus	Hornyhead Chub	S4	NAR	NAR (April 1988)					X[9]
Notropis atherinoides	Emerald Shiner	S5							X[9]
Notropis photogenis	Silver Shiner	S2S3	THR	T (May 2011)	Schedule 3			X	
Pimephales notatus	Bluntnose Minnow	S5	NAR	NAR (April 1998)					X[9]
Pimephales promelas	Fathead Minnow	S5							X[8], X[9]
Rhinichthys atratulus	Blacknose Dace	SNR							X[9]
Semotilus atromaculatus	Creek Chub	S5							X[8], X[9]
Catostomidae	**Suckers**								
Catostomus commersonii	White Sucker	S5							X[8]
Moxostoma duquesnei	Black Redhorse	S2	THR	T (May 2005)				X	
Ictaluridae	**North American Catfishes**								
Ameiurus nebulosus	Brown Bullhead	S5							X[9]
Umbridae	**Mudminnows**								
Umbra limi	Central Mudminnow	S5							X[8], X[9]
Salmonidae	**Trouts and Salmons**								
Salvelinus fontinalis	Brook (Speckled) Trout	S5							X[9]
Gasterosteidae	**Sticklebacks**								
Culaea inconstans	Brook Stickleback	S5							X[8], X[9]
Cottidae	**Sculpins**								
Cottus bairdii	Mottled Sculpin	S5							X[9]
Centrarchidae	**Sunfishes and Basses**								
Lepomis gibbosus	Pumpkinseed	S5							X[8], X[9]
Micropterus dolomieu	Smallmouth Bass	S5							X[8]
Micropterus salmoides	Largemouth Bass	S5							X[9]
Pomoxis nigromaculatus	Black Crappie	S4							X[9]
Percidae	**Perches and Darters**								
Etheostoma blennioides	Greenside Darter	S4	NAR	NAR (Nov 2006)	Schedule 3	X			X[9]
Etheostoma exile	Iowa Darter	S5							X[9]
Etheostoma flabellare	Fantail Darter	S4							X[9]
Total						**1**	**0**	**3**	**22**

[1]MNRF 2015a; [2]MNRF 2017a; [3]Government of Canada 2017a; [4]MNRF 2014; [5]Government of Canada 2017b; [6]MNRF 2016a; [7]MNRF 2017b

[8]Recorded in Hadati Creek

[9]Recorded in Clythe Creek

Freshwater Mussel Species Reported from the Study Area

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA SCHEDULE[3]	NHIC Data[4] (Square 17NJ62)	MNRF Wellington County SAR List[5]	MNRF - Guelph District[6]
Lampsilinae								
Lampsilis fasciola	Wavy-rayed Lampmussel	S1	THR	SC	Schedule 1		X	
Total						**0**	**1**	**0**

[1]MNRF 2015a; [2]MNRF 2017a; [3]Government of Canada 2017a; [4]MNRF 2014; [5]MNRF 2016a; [6]MNRF 2017b

APPENDIX II

Species at Risk Screening Table

Species at Risk Screening

Scientific Name	Common Name	S-Rank[1]	COSEWIC[2]	COSSARO[3]	SARA[4]	Background Source	Habitat Preference [2,3,5,6]	Suitable Habitat	Rationale	Suitable Habitat Within Alternative Sites							
										1	2	3	4	5	6	7	8
Birds																	
Haliaeetus leucocephalus	Bald Eagle	S2N, S4B	NAR	SC	No schedule	MNRF 2016a, MNRF 2017b	Require large continuous area of deciduous or mixed woods around large lakes, rivers; require area of 255 ha for nesting, shelter, feeding, roosting; prefer open woods with 30 to 50% canopy cover; nest in tall trees 50 to 200 m from shore; require tall, dead, partially dead trees within 400 m of nest for perching; sensitive to toxic chemicals. Bald Eagles nest in a variety of habitats and forest types, almost always near a major lake or river where they do most of their hunting.They usually nest in large trees such as pine and poplar.	No	There are no large rivers or lakes with surrounding deciduous or mixed woods in the study area.							
Riparia riparia	Bank Swallow	S4B	THR	THR	Proposed to be added to Schedule 1	BSC et al. 2008, MNRF 2017b	Sand, clay or gravel river banks or steep riverbank cliffs; lakeshore bluffs of easily crumbled sand or gravel; gravel pits, road-cuts, grassland or cultivated fields that are close to water; nesting sites are limiting factor for species presence.	No	No known sand, clay or gravel banks or steep cliffs, gravel pits or road cuts in the study area.								
Hirundo rustica	Barn Swallow	S4B	THR	THR	Proposed to be added to Schedule 1	BSC et al. 2008, MNRF 2016a, MNRF 2017b	Farmlands or rural areas; cliffs, caves, rock niches; buildings or other man-made structures for nesting; open country near body of water.	Yes	Man-made structures (i.e. barns or other structures used for nesting) are not present within the study area, although sites 2, 4, and 8 may be used for foraging.		Yes		Yes	Yes	Yes		Yes
Chlidonias niger	Black Tern	S3B	NAR	SC	No Schedule	MNRF 2016a	Black Terns build floating nests in loose colonies in shallow marshes, coastal or inland marshes; large cattail marshes, marshy edges of rivers, lakes or ponds, wet open fens, wet meadows; returns to same area to nest each year in loose colonies; must have shallow (0.5 to 1 m deep) water and areas of open water near nests; requires marshes >20 ha in size; feeds over adjacent grasslands for insects; also feeds on fish, crayfish and frogs.	No	No large marshes or marshy edges of rivers or lakes in the study area.							
Dolichonyx oryzivorus	Bobolink	S4B	THR	THR	No Schedule	BSC et al. 2008, MNRF 2016a, MNRF 2017b	Large, open expansive grasslands with dense ground cover; hayfields, meadows or fallow fields; marshes; requires tracts of grassland >50 ha.	Yes	Open meadow habitats are present within the study area.		Yes		Yes				Yes
Cardellina canadensis	Canada Warbler	S4B	THR	SC	Schedule 1	MNRF 2017b	Generally prefers wet coniferous, decidiuous and mixed forest types, with a dense shrub layer. Nests on the ground, on logs or hummocks, and uses dense shrub layer to conceal the nest.	No	May be present within the study area in the Clythe Creek Wetland Complex, however there is no suitable habitat within the Alternative Sites.								
Chaetura pelagica	Chimney Swift	S4B,S4N	THR	THR	Schedule 1	BSC et al. 2008, MNRF 2017b	Nest on cave walls and in hollow trees or tree cavities in old growth forests. Also likely to be found in and around urban settlements where they nest and roost (rest or sleep) in chimneys and other manmade structures. They also tend to stay close to water as this is where the flying insects they eat congregate.	Yes	Man made structures are not present within the study area, although sites 2, 4 and 8 may have suitable cavities trees.		Yes		Yes				Yes
Chordeiles minor	Common Nighthawk	S4B	THR	SC	Schedule 1	MNRF 2017b	Generally prefer open, vegetationfree habitats, including dunes, beaches, recently harvested forests, burnt-over areas, logged areas, rocky outcrops, rocky barrens, grasslands, pastures, peat bogs, marshes, lakeshores, and river banks. This species also inhabits mixed and coniferous forests. Can also be found in urban areas (nest on flat roof-tops).	Yes	Open areas, cultural meadows are present within the study area.		Yes		Yes	Yes	Yes	Yes	Yes

Species at Risk Screening

Scientific Name	Common Name	S-Rank[1]	COSEWIC[2]	COSSARO[3]	SARA[4]	Background Source	Habitat Preference [2,3,5,6]	Suitable Habitat	Rationale	Suitable Habitat Within Alternative Sites							
										1	2	3	4	5	6	7	8
Sturnella magna	Eastern Meadowlark	S4B	THR	THR	No Schedule	BSC et al. 2008, MNRF 2016a, MNRF 2017b	Open, grassy meadows, farmland, pastures, hayfields or grasslands with elevated singing perches; cultivated land and weedy areas with trees; old orchards with adjacent, open grassy areas >10 ha in size.	Yes	Open meadow habitats are present within the sites 2, 4 and 8.		Yes		Yes				Yes
Contopus virens	Eastern Wood-Pewee	S4B	SC	SC	No Schedule	BSC et al. 2008, MNRF 2017b	Lives in the mid-canopy layer of forest clearings and edges of deciduous and mixed forests. It is most abundant in intermediate-age mature forest stands with little understory vegetation.	Yes	Decidous and mixed forest is present adjacent to alternative sites (with the exception of site 6).	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Vermivora chrysoptera	Golden-winged Warbler	S4B	THR	SC	Schedule 1	MNRF 2017b	Generally prefer areas of early successional vegetation, found primarily on field edges, hydro or utility right-of-ways, or recently logged areas.	Yes	Areas of early sucessional vegetation and field edges found in the study area.	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Ammodramus savannarum	Grasshopper Sparrow	S4B	SC	SC	No Schedule	BSC et al. 2008	Lives in open grassland areas with well-drained, sandy soil. It will also nest in hayfields and pasture, as well as alvars, prairies and occasionally grain crops such as barley. It prefers areas that are sparsely vegetated.	Yes	Open meadow habitats are present within the sites 2, 4 and 8.		Yes		Yes				Yes
Ammodramus henslowii	Henslow's Sparrow	SHB	END	END	Schedule 1	MNRF 2016a	It has been found in abandoned farm fields, pastures, and wet meadows. It tends to avoid fields that have been grazed or are crowded with trees and shrubs. It prefers extensive, dense, tall grasslands where it can more easily conceal its small ground nest.	No	Species is possibly Extirpated from Ontario. Therefore it is very unlikely to be within the study area.								
Ixobrychus exilis	Least Bittern	S4B	THR	THR	Schedule 1	BSC et al. 2008	Generally located near pools of open water in relatively large marshes and swamps that are dominated by cattail and other robust emergent plants	No	Suitable wetland habitats not present within study area.								
Lanius ludovicianus	Loggerhead Shrike	S2B	END	END	Schedule 1	MNRF 2016a	Prefers pasture or other grasslands with scattered low trees and shrubs. It lives in fields or alvars (areas of exposed bedrock) with short grass, which makes it easier to spot prey.	No	There are no records of this species in the subject area.								
Melanerpes erythrocephalus	Red-headed Woodpecker	S4B	THR	SC	Schedule 1	BSC et al. 2008, MNRF 2017b	Open, deciduous forest with little understory; fields or pasture lands with scattered large trees; wooded swamps; orchards, small woodlots or forest edges; groves of dead or dying trees; requires cavity trees with at least 40 cm dbh; require about 4 ha for a territory.	No	Open, deciduous forest with little understory and of a suitable size not present in the study area.								
Asio flammeus	Short-eared Owl	S2N, S4B	SC	SC	Schedule 3	MNRF 2016a	Grasslands, open areas or meadows that are grassy or bushy; marshes, bogs or tundra; both diurnal and nocturnal habits; ground nester; destruction of wetlands by drainage for agriculture is an important factor in the decline of this species; home range 25 -125 ha; requires 75-100 ha of contiguous open habitat.	No	Large, contiguous open areas not present in the study area.								
Hylocichla mustelina	Wood Thrush	S4B	THR	SC	No Schedule	BSC et al. 2008, MNRF 2017b	Mature deciduous and mixed (conifer-deciduous) forests. They seek moist stands of trees with well-developed undergrowth and tall trees for singing perches. These birds prefer large forests, but will also use smaller stands of trees. They build their nests in living saplings, trees or shrubs, usually in sugar maple or American beech.	No	No mature deciduous or mixed forests in the Alternative Sites in the subject area.								
Icteria virens	Yellow-breasted Chat	S2B	END	END	Schedule 1	MNRF 2016a, MNRF 2017b	Dense thickets around wood edges, riparian areas, tall tangles of shrubbery beside streams, ponds; overgrown bushy clearings with deciduous thickets; nests above ground in bush, vines etc. The Ontario population is very dependent on successional habitats of thick shrubbery.	No	Dense thickets around forest edges not present in study area.								

Species at Risk Screening

Scientific Name	Common Name	S-Rank[1]	COSEWIC[2]	COSSARO[3]	SARA[4]	Background Source	Habitat Preference [2,3,5,6]	Suitable Habitat	Rationale	Suitable Habitat Within Alternative Sites							
										1	2	3	4	5	6	7	8
Herpetofauna																	
Emydoidea blandingii	Blanding's Turtle	S3	THR	THR	Schedule 1	MNRF 2016a, Ontario Nature 2017, MNRF 2017b, Wedgewood pers. comm. 2017	Shallow water marshes, bogs, ponds or swamps, or coves in larger lakes with soft muddy bottoms and aquatic vegetation; basks on logs, stumps, or banks; surrounding natural habitat is important in summer as they frequently move from aquatic habitat to terrestrial habitats; hibernates in bogs; not readily observed.	No	Swamps in the Clythe Creek Wetland Complex could provide habitat for Blanding's turtle, however the MNRF has no records of Blanding's Turtle from the study area.								
Thamnophis butleri	Butler's Gartersnake	S2	END	END	Schedule 1	MNRF 2016a	Open, moist habitats, such as dense grasslands and old fields, with small wetlands where it can feed on leeches and earthworms. Burrows made by small mammals and even crayfish are sometimes used as hibernation sites, called hibernacula. This species is also commonly found in rock piles or old stonewalls.	No	Suitable habitat exists within the study area (wetlands and old fields), however, there are no known occurrences of Butler's Gartersnake from the Guelph area.								
Thamnophis sauritus	Eastern Ribbonsnake (Great Lakes population)	S3	SC	SC	Schedule 1	MNRF 2014, MNRF 2016a, Ontario Nature 2017, MNRF 2017b	Sunny grassy areas with low dense vegetation near bodies of shallow permanent quiet water; wet meadows grassy marshes or sphagnum bogs; borders of ponds, lakes or streams; hibernates in groups.	Yes	Sunny grassy areas with low vegetation adjacent to permanent water bodies present in the study area.				Yes			Yes	Yes
Ambystoma jeffersonianum	Jefferson Salamander	S2	END	END	Schedule 1	MNRF 2016a, Ontario Nature 2017, MNRF 2017b	Damp shady deciduous forest, swamps, moist pasture, lakeshores; temporary woodland pools for breeding; hides under leaf litter, stones or in decomposing logs.	No	Deciduous forests and swamps are present in the study area adjacent to many of the alternative sites. It is possible that there are suitable vernal pools for breeding.								
Graptemys geographica	Northern Map Turtle	S3	SC	SC	Schedule 1	MNRF 2014, MNRF 2016a, Ontario Nature 2017	Rivers and lakeshores where it basks on emergent rocks and fallen trees throughout the spring and summer. In winter, the turtles hibernate on the bottom of deep, slow-moving sections of river. They require high-quality water that supports the female's mollusc prey. Their habitat must contain suitable basking sites, such as rocks and deadheads, with an unobstructed view from which a turtle can drop immediately into the water if startled.	No	There are no large rivers or lakes in the study area								
Chelydra serpentina serpentina	Snapping Turtle	S3	SC	SC	Schedule 1	MNRF 2016a, Ontario Nature 2017, MNRF 2017b	Permanent or semi-permanent fresh water; marshes, swamps or bogs; rivers and streams with soft muddybanks or bottoms. The species often uses soft soil or clean dry sand on south-facing slopes for nest sites and may nest at some distance from water.	Yes	Swamps in the Clythe Creek Wetland Complex and storm water ponds in the study area could provide habitat for Snapping turtle. Turtles could also be nesting in the adjacent open areas in the alternative sites.	Yes	Yes	Yes	Yes	Yes		Yes	Yes

Species at Risk Screening

Scientific Name	Common Name	S-Rank[1]	COSEWIC[2]	COSSARO[3]	SARA[4]	Background Source	Habitat Preference [2,3,5,6]	Suitable Habitat	Rationale	Suitable Habitat Within Alternative Sites							
										1	2	3	4	5	6	7	8
Mammals																	
Myotis leibii	Eastern Small-footed Myotis	S2S3		END	No schedule	Dobbyn 1994, MNRF 2017b	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius Maternal Roosts: primarily under loose rocks on exposed rock outcrops, crevices and cliffs, and occasionally in buildings, under bridges and highway overpasses and under tree bark.	Yes	Trees present within study area may provide suitable roosting habitat. No potential hibernation sites are present.	Yes	Yes	Yes	Yes				Yes
Myotis lucifungus	Little Brown Myotis	S4	END	END	Schedule 1	Dobbyn 1994, MNRF 2017b	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, forest edges.	Yes	Trees present within study area may provide suitable roosting habitat. No potential hibernation sites are present.	Yes	Yes	Yes	Yes				Yes
Myotis septentrionalis	Northern Myotis	S3	END	END	Schedule 1	Dobbyn 1994, MNRF 2017b	Northern Myotis roosts within tree crevices, hollows and under the bark of live and dead trees, particularly when trees are located within a forest gap.	Yes	Trees present within study area may provide suitable roosting habitat. No potential hibernation sites are present.	Yes	Yes	Yes	Yes				Yes
Perimyotis subflavus	Tri-coloured Bat	S3?	END	END	Schedule 1	Dobbyn 1994, MNRF 2017b	Open woods near water; roosts in trees, cliff crevices, buildings or caves; hibernates in damp, draft-free, warm caves, mines or rock crevices.	Yes	Trees present within study area may provide suitable roosting habitat. No potential hibernation sites are present.	Yes	Yes	Yes	Yes				Yes
Plants																	
Castanea dentata	American Chestnut	S1S2	END	END	Schedule 1	MNRF 2016a	Moist to well drained forests on sand, occasionally heavy soils.	No	High quality, well-drained forests are not present within the study area.								
Juglans cinerea	Butternut	S3?	END	END	Schedule 1	MNRF 2017b	Generally grows in rich, moist, and well-drained soils often found along streams. It may also be found on well-drained gravel sites, especially those made up of limestone. It is also found, though seldomly, on dry, rocky and sterile soils. In Ontario, the Butternut generally grows alone or in small groups in deciduous forests as well as in hedgerows.	Yes	Rich, moist, and well-drained gravel soils are present in the study area.	Yes	Yes	Yes	Yes				Yes
Carex lupuliformis	False Hop Sedge	S1	END	END	Schedule 1	MNRF 2016a	Riverine swamps and marshes, and around temporary forest ponds. It prefers open areas and areas under forest canopy openings, with lots of sunlight.	No	This species could be present within the Clythe Creek Wetland Complex, but would not be in the upland alternative sites.								
Asplenium scolopendrium	Hart's-tongue Fern	S3	SC	SC	Schedule 1	MNRF 2016a	Riverine swamps and marshes, and around temporary forest ponds. It prefers open areas and areas under forest canopy openings, with lots of sunlight.	No	This species could be present within the Clythe Creek Wetland Complex, but would not be in the upland alternative sites.								
Potamogeton hillii	Hill's Pondweed	S2	SC	SC	Schedule 1	MNRF 2016a	Hill's Pondweed is found in slow-moving streams, ditches, ponds, lakes and wetlands. It grows in clear, cold alkaline waters.	No	This species could be present within the Clythe Creek Wetland Complex, but would not be in the upland alternative sites.								

Species at Risk Screening

Scientific Name	Common Name	S-Rank[1]	COSEWIC[2]	COSSARO[3]	SARA[4]	Background Source	Habitat Preference [2,3,5,6]	Suitable Habitat	Rationale	Suitable Habitat Within Alternative Sites							
										1	2	3	4	5	6	7	8
Fish and Mussels																	
Moxostoma duquesnei	Black Redhorse	S2	THR	THR	No Schedule	MNRF 2016a	The Black Redhorse lives in pools and riffle areas of medium-sized rivers and streams that are usually less than two metres deep. These rivers usually have few aquatic plants, a moderate to fast current, and a sandy or gravel bottom. In the spring, it migrates to breeding habitat where eggs are laid on gravel in fast water. The winter is spent in deeper pools.	No	There is no small river present in the study area. In addition, the Black Redhorse are not known from the Eramosa River downstream.								
Clinostomus elongatus	Redside Dace	S2	END	END	Schedule 3	MNRF 2016a	The Redside dace is found in pools and slow-moving areas of small streams and headwaters with a gravel bottom. They are generally found in areas with overhanging grasses and shrubs, and can leap up to 10 cm out of the water to catch insects. During spawning, they can be found in shallow parts of streams, which are also popular spawning areas for other minnow species.	No	There is no small stream present in the study area. In addition, Redside Dace are not known from the Eramosa River downstream.								
Notropis photogenis	Silver Shiner	S2S3	THR	THR	Schedule 3	MNRF 2016a	Silver shiners prefer moderate to large size streams with swift currents that are free of weeds and have clean gravel or boulder bottoms. They live in schools and feed on crustaceans and adult flies that fall in the water or fly just above the surface. In June or July, they spawn by scattering their eggs over gravel riffles.	No	There is no small to medium river present in the study area. In addition, Silver Shiner are not known from the Eramosa River downstream.								
Lampsilis fasciola	Wavy-rayed Lampmussel	S1	SC	THR	Schedule 1	MNRF 2016a	The Wavy-rayed lampmussel is usually found in small to medium rivers with clear water. It lives in shallow riffle areas with clean gravel or sand bottoms. The Wavy-rayed lampmussel's fish hosts are the Largemouth bass and Smallmouth bass.	No	There is no small to medium river present in the study area. In addition, the Wavy-rayed lampmussel's fish hosts, Largemouth bass and Smallmouth bass, would not be present in Clythe Creek.								
Insects																	
Danaus plexippus	Monarch Butterfly	S2N, S4B	END	SC	Schedule 1	Macnaughton et al. 2017, MNRF 2017b	Monarch caterpillars feed on milkweed plants and are confined to meadows and open areas where milkweed grows. Adult butterflies can be found in more diverse habitats where they feed on nectar from a variety of wildflowers.	Yes	Open areas with milkweed could be present within study area.	Yes	Yes	Yes	Yes				Yes
Bombus affinis	Rusty-patched Bumble Bee	S1	END	END	Schedule 1	MNRF 2016a, MNRF 2017b	Open habitat such as mixed farmland, urban settings, savannah, open woods and sand dunes. The most recent sightings have been in oak savannah, which contains both woodland and grassland flora and fauna.	No	Some potentially suitable habitat exists in the study area (open, urban), however the only recent observations in Ontario were in the Pinery Provincial Park in 2002, so it is very unlikely.								
Pieris virginiensis	West Virginia White	S3	SC	SC	No schedule	Macnaughton et al. 2017, MNRF 2017b	Generally prefer moist, deciduous woodlands. The larvae feed only on the leaves of the two-leaved toothwort (Cardamine diphylla), which is a small, spring-blooming plant of the forest floor. It avoids edges and open fields in fra gmented landscapes.	No	Suitable habitat may exit within the study area but not within the Alternative Sites.								
Total Number of Species at Risk Per Potential Site										**9**	**15**	**9**	**16**	**5**	**2**	**5**	**16**

[1]MNRF 2016a, [2]MNRF 2017a, [3]Government of Canada 2017, [4]OMNR 2000, [5]Oldham and Brinker 2009

APPENDIX III

Significant Wildlife Habitat Screening Table

Significant Wildlife Habitat Assessment Tables

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

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Waterfowl Stopover and Staging Areas (Terrestrial)					
Rationale: Habitat important to migrating waterfowl.	American Black Duck Wood Duck Green-winged Teal Blue-winged Teal Mallard Northern Pintail Northern Shoveler American Wigeon Gadwall	CUM1 CUT1 - Plus evidence of annual spring flooding from melt water or run-off within these Ecosites.	Fields with sheet water during Spring (mid March to May). • Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl. • Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have spring sheet water available[exlviii]. Information Sources • Anecdotal information from the landowner, adjacent landowners or local naturalist clubs may be good information in determining occurrence. • Reports and other information available from Conservation Authorities (CAs) • Sites documented through waterfowl planning processes (eg. EHJV implementation plan) • Field Naturalist Clubs • Ducks Unlimited Canada • 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] • Any mixed species aggregations of 100 or more individuals required. • The area of the flooded field ecosite habitat plus a 100-300m radius buffer dependent on local site conditions and adjacent land use is the significant wildlife habitat[cxlviii]. • 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). • SWHMiST[cxlix] Index #7 provides development effects and mitigation measures.	Fields with sheet water are not present. **Not SWH**
Wildlife Habitat: Waterfowl Stopover and Staging Areas (Aquatic)					
Rationale: 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 Cackling Goose Snow Goose American Black Duck Northern Pintail Northern Shoveler American Wigeon Gadwall Green-winged Teal Blue-winged Teal Hooded Merganser Common Merganser Lesser Scaup Greater Scaup Long-tailed Duck Surf Scoter White-winged Scoter Black Scoter Ring-necked Duck Common Goldeneye Bufflehead Redhead Ruddy Duck Red-breasted Merganser Brant Canvasback	MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 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. • These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water). Information Sources • Environment Canada • Naturalist clubs often are aware of staging/stopover areas. • OMNRF Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging. • Sites documented through waterfowl planning processes (eg. EHJV implementation plan) • Ducks Unlimited projects • Element occurrence specification by Nature Serve: http://www.natureserve.org • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of: • Aggregations of 100[l] or more of listed species for 7 days[l], results in > 700 waterfowl use days. • Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH[cxlix] • The combined area of the ELC ecosites and a 100m radius area is the SWH[cxlviii] • Wetland area and shorelines associated with sites identified within the SWHTG[cxlviii] Appendix K[cxlix] are significant wildlife habitat. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • 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). • SWHMiST[cxlix] Index #7 provides development effects and mitigation measures.	There is one pond in the suject area (adjacent to site 8), however it is unlikely to support aggregations of 100 or more of the listed species. There are no ponds within the potential sites. **Not SWH**

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

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Shorebird Migratory Stopover Area					
Rationale: High quality shorebird stopover habitat is extremely rare and typically has a long history of use.	Greater Yellowlegs Lesser Yellowlegs Marbled Godwit Hudsonian Godwit Black-bellied Plover American Golden-Plover Semipalmated Plover Solitary Sandpiper Spotted Sandpiper Semipalmated Sandpiper Pectoral Sandpiper White-rumped Sandpiper Baird's Sandpiper Least Sandpiper Purple Sandpiper Stilt Sandpiper Short-billed Dowitcher Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling Dunlin Whimbrel	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 SDO1 SDS2 SDT1 MAM1 MAM2 MAM3 MAM4 MAM5	Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. 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. Information Sources • Western hemisphere shorebird reserve network. • Canadian Wildlife Service (CWS) Ontario Shorebird Survey. • Bird Studies Canada • Ontario Nature • Local birders and naturalist clubs • Natural Heritage Information Center (NHIC) Shorebird Migratory Concentration Area	Studies confirming: • Presence of 3 or more of listed species and > 1000 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) • Whimbrel stop briefly (<24hrs) during spring migration, any site with >100 Whimbrel used for 3 years or more is significant. • The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100m radius area[cxlviii] • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #8 provides development effects and mitigation measures.	There are no large bodies of water such as lakes, rivers or large wetlands within the study area. **Not SWH**
Wildlife Habitat: Raptor Wintering Area					
Rational: Sites used by multiple species, a high number of individuals and used annually are most significant	Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl Special Concern: Short-eared Owl Bald Eagle	Hawks/Owls: Combination of ELC Community Series; need to have present one Community Series from each land class: Forest: FOD, FOM, FOC Upland: CUM, CUT, CUS, CUW	The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. Raptor wintering sites need to be > 20 ha[cxlviii, cxlix] with a combination of forest and upland.[xvi, xvii, xviii, xix, xx, xxi] Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands[cxlix] Field area of the habitat is to be wind swept with limited snow depth or accumulation. Eagle sites have open water, large trees and snags available for roosting Information Sources • OMNRF Ecologist or Biologist • Field Natural Clubs • Natural Heritage Information Center (NHIC) Raptor Winter Concentration Area • Data from Bird Studies Canada • Reports and other information available from Conservation Authorities CAs.	Studies confirm the use of these habitats by: • One or more Short-eared Owls or; One or more Bald Eagles or; At least 10 individuals and two listed hawk/owl species • To be significant a site must be used regularly (3 in 5 years)[cxlix] for a minimum of 20 days by the above number of birds • The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #10 and #11 provides development effects and mitigation measures.	No suitably large, open fields and woodlands for wintering raptors in the study area. **Not SWH**

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

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Bat Hibernacula					
Rationale Bat hibernacula are rare habitats in Ontario landscapes.	Big Brown Bat Tri-coloured Bat	Bat Hibernacula may be found in these ecosites: CCR1 CCR2 CCA1 CCA2 (Note: buildings are not considered to be SWH)	• Hibernacula may be found in caves, mine shafts, underground foundations and Karsts. • Active mine sites should not be considered as SWH • The locations of bat hibernacula are relatively poorly known. Information Sources • OMNRF for possible locations and contact for local experts • Natural Heritage Information Center (NHIC) Bat Hibernaculum • Ministry of Northern Development and Mines for location of mine shafts. • Clubs that explore caves (eg. Sierra Club) • University Biology Departments with bat experts.	• All sites with confirmed hibernating bats are SWH. • The habitat area includes a 200m radius around the entrance of the hibernaculum[cxlviii, ccvii] for most. • Studies are to be conducted during the peak swarming period (Aug. – Sept.). Surveys should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects"[ccv] • SWHMiST[cxlix] Index #1 provides development effects and mitigation measures.	No suitable hibernacula habitat on subject property. **Not SWH**
Wildlife Habitat: Bat Maternity Colonies					

Rationale:
Known locations of forested bat maternity colonies is extremely rare in all Ontario landscapes.
	Big Brown Bat
	Silver-haired Bat
		Maternity colonies considered SWH are found in forested Ecosites.
		
		All ELC Ecosites in ELC Community Series:
		FOD
		FOM
		SWD
		SWM
			Maternity colonies can be found in tree cavities, vegetation and often in buildings[xxii, xxv, xxvi, xxvii, xxxi] (buildings are not considered to be SWH).
			• Maternity roosts are not found in caves and mines in Ontario[xxii]
			• Maternity colonies located in Mature deciduous or mixed forest stands[ccix, ccx] with >10/ha large diameter (>25cm dbh) wildlife trees[ccvii]
			• Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3[ccxiv] or class 1 or 2[ccxii]
			• Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred[ccx]
			
			Information Sources
			• OMNRF for possible locations and contact for local experts
			• University Biology Departments with bat experts.
				• Maternity Colonies with confirmed use by:
				  • >10 Big Brown Bats
				  • >5 Adult Female Silver-haired Bats
				• The area of the habitat includes the entire woodland or a forest stand ELC Ecosite or an Ecoelement containing the maternity colonies.
				• Evaluation methods for maternity colonies should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for wind Power Projects[ccv]
				• SWHMiS T[cxlix] Index #12 provides development effects and mitigation measures.
					Cavity trees may be present throughout the study area that may provide suitable maternity habitat for bats.
					
					Candidate SWH

Wildlife Habitat: Turtle Wintering Area					
Rationale: Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant	Midland Painted Turtle Special Concern: Northern Map Turtle Snapping Turtle	Snapping and Midland Painted Turtles - ELC Community Classes: SW, MA, OA and SA; ELC Community Series: FEO and BOO Northern Map Turtle - Open Water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.	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. • Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen[cix, cx, cxi, cxviii]. • Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH. Information Sources • EIS studies carried out by Conservation Authorities. • Local field naturalists and experts, as well as university herpetologists may also know where to find some of these sites. • OMNRF ecologist or biologist • Natural Heritage Information Center (NHIC)	• Presence of 5 over-wintering Midland Painted Turtles is significant. • One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant. • The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH. • 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. – May)[cvii] • Congregation of turtles is more common where wintering areas are limited and therefore significant[cix, cx, cxi, cxii]. • SWHMiST[cxlix] Index #28 provides development effects and mitigation measures for turtle wintering habitat.	Suitable habitat exists within the study area (in the Clythe Creek Wetland Complex and the pond south of site 8), however there are no suitable overwintering areas within the sites themselves. **Not SWH**

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

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Snake Hibernaculum					
Rationale: Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant	Snakes: Eastern Gartersnake Northern Watersnake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake Special Concern: Eastern Ribbonsnake Lizard: Special Concern (Southern Shield population): Five-lined Skink	For all snakes, habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice and Cave, and Alvar sites may be directly related to these habitats. Observations of congregations of snakes on sunny warm days in the spring or fall is a good indicator. For Five-lined Skink, ELC Community Series of FOD and FOM and Ecosites: FOC1 FOC3	• For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural locations. The existence of features that go below the frost line; such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH. • 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. • Five-lined skink prefer mixed forests with rock outcrop openings providing cover rock overlaying granite bedrock with fissures cciii. Information Sources • In spring, local residents or landowners may have observed the emergence of snakes on their property (e.g. old dug wells). • Reports and other information from CAs. • Local Field naturalists and experts, as well as university herpetologists may also know where to find some of these sites. clubs • Natural Heritage Information Center (NHIC) • OMNRF ecologist or biologist may be aware of locations of wintering skinks	Studies confirming: • Presence of snake hibernacula used by a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. • 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). • Note: If there are Special Concern Species present, then site is SWH • Note: Sites for hibernation possess specific habitat parameters (e.g. temperature, humidity, etc.) and consequently are used annually, often by many of the same individuals of a local population [i.e. strong hibernation site fidelity]. Other critical life processes (e.g. mating) often take place in close proximity to hibernacula. The feature in which the hibernacula is located plus a 30m buffer is the SWH[l] • SWHMiST[cxlix] Index #13 provides development effects and mitigation measures for snake hibernacula. • Presence of any active hibernaculum for skink is significant. • SWHMiST[cxlix] Index #37 provides development effects and mitigation measures for five-lined skink wintering habitat.	Suitable characteristics of hibernacula features may be present within the study area (sites 1, 2, 3, 4, and 8). **Candidate SWH**
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Bank and Cliff)					
Rationale: 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 populations are declining in Ontario.	Cliff Swallow 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 Cliff faces, bridge abutments, silos, barns Habitat found in the following ecosites: CUM1 CUT1 CUS1 BLO1 BLS1 BLT1 CLO1 CLS1 CLT1	• Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area. • Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles. • Does not include a licensed/permitted Mineral Aggregate Operation. Information Sources • Reports and other information available from CAs • Ontario Breeding Bird Atlas [ccv] • Bird Studies Canada; *NatureCounts* http://www.birdscanada.org/birdmon/ • Field Naturalist clubs	Studies confirming: • 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. • A colony identified as SWH will include a 50m radius habitat area from the peripheral nests[ccvii] • 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] • SWHMiST[cxlix] Index #4 provides development effects and mitigation measures	Eroding banks and slopes are not present study area. **Not SWH**

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

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs)					
Rationale: Large Colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Great Blue Heron Black-crowned Night-heron Great Egret Green Heron	SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1	• Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used. • Most nests in trees are 11 to 15m from ground, near the top of the tree. Information Sources • Ontario Breeding Bird Atlas[ccv], colonial nest records. • Ontario Heronry Inventory 1991 available from Bird Studies Canada or NHIC (OMNR). • NHIC Mixed Wader Nesting Colony • Aerial photographs can help identify large heronries • Reports and other information available from CAs • MNRF District Offices • Local naturalist clubs	Studies confirming: • Presence of 5[l] or more active nests of Great Blue Heron or other listed species. • The habitat extends from 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] • Confirmation of active heronries are to be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells • SWHMiST[cxlix] Index #5 provides development effects and mitigation measures.	The swamps of the Clythe Creek Wetland Complex are not known to be a nesting site for Great Blue Herons or Green Herons (the two species known to occur in the study area). **Not SWH**
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Ground)					
Rationale: Colonies are important to local bird populations, typically sites are only known colony in area and are used annually.	Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern 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). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird) MAM1 – 6 MAS1 – 3 CUM CUT CUS	• Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas. • Brewers Blackbird colonies are found loosely on the ground in or in low bushes in close proximity to streams and irrigation ditches within farmlands. Information Sources • Ontario Breeding Bird Atlas[ccv], rare/colonial species records. • Canadian Wildlife Service • Reports and other information available from CAs • Natural Heritage Information Center (NHIC) Colonial Waterbird Nesting Area • MNRF District Offices • Field naturalist clubs	Studies confirming: • Presence of >25 active nests for Herring Gulls or Ring-billed Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern[l]. • Presence of 5 or more pairs for Brewer's Blackbird. • Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant. • The edge of the colony and a minimum 150m area of habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH[cc, ccvii] • Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #6 provides development effects and mitigation measures.	No suitable open water or marshy habitats in the study area. **Not SWH**

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

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Migratory Butterfly Stopover Areas					
Rationale: Butterfly stopovers areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter.	Painted Lady Red Admiral Special Concern: Monarch	Combination of ELC Community Series: Need to have present one Community Series from each landclass: Field: CUM CUS CUT Forest: FOC FOM FOD CUP Anecdotally, a candidate sight for butterfly stopover will have a history of butterflies being observed.	A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present, and will be located within 5 km of Lake Ontario[cxlix]. • The habitat is typically a combination of field and forest, and provides the butterflies with a location to rest prior to their long migration south[xxxii, xxxiii, xxxiv, xxxv, xxxvi.] • 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. • 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.] Information Sources • OMNRF (NHIC) • Agriculture Canada in Ottawa may have list of butterfly experts. • Field Naturalist Clubs • Toronto Entomologists Association	Studies confirm: • 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 between years and multiple years of sampling should occur [xl, xlii]. • Observational studies are to be completed and need to be done frequently during the migration period to estimate MUD • MUD of >5000 or >3000 with the presence of Painted Ladies or Red Admiral's is to be considered significant. • SWHMiST[cxlix] Index #16 provides development effects and mitigation measures.	The open meadows of the study area are not 10 ha in size and the study area is not within 5km of Lake Ontario. **Not SWH**
Wildlife Habitat: Landbird Migratory Stopover Areas					
Rationale: Sites with a high diversity of species as well as high number are most significant	All migratory songbirds. Canadian Wildlife Service Ontario website: http://www.on.ec.gc.ca/wildlife_e.html All migrant raptors species: Ontario Ministry of Natural Resources: Fish and Wildlife Conservation Act, 1997. Schedule 7: Specially Protected Birds (Raptors)	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD	Woodlots need to be >10 ha[l] in size and within 5km [iv, v, vi, vii, viii, ix, x, xi, xii, xiii, xiv, xv] of Lake Ontario. • If multiple woodlands are located along the shoreline, those woodlands <2km from Lake Ontario are more significant[cxlix] • Sites have a variety of habitats; forest, grassland and wetland complexes[cxlix]. • The largest sites are more significant[cxlix] • Woodlots and forest fragments are important habitats to migrating birds[ccxviii], these features located along the shore and located within 5km of Lake Ontario are Candidate SWH[cxlviii]. Information Sources • Bird Studies Canada • Ontario Nature • Local birders and naturalist club • Ontario Important Bird Areas (IBA) Program	Studies confirm: • Use of the woodlot by >200 birds/day and with >35 spp. with at least 10 bird spp. recorded on at least 5 different survey dates. This abundance and diversity of migrant bird species is considered above average and significant. • Studies should be completed during spring (Apr/May) and fall (Aug/Oct) migration using standardized assessment techniques. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #9 provides development effects and mitigation measures.	No suitable habitat in the study area (woodlots are not >10ha and not within 5km of Lake Ontario) **Not SWH**

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

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Deer Yarding Areas					
Rationale: Winter habitat for deer is considered to be the main factor for northern deer populations. In winter, deer congregate in "yards" to survive severe winter conditions. Deer yards typically have a long history of annual use by deer, yards typically represent 10-15% of an areas summer range.	White-tailed Deer	Note: OMNRF to determine this habitat. ELC Community Series providing a thermal cover component for a deer yard would include: FOM, FOC, SWM and SWC. Or these ELC Ecosites: CUP2 CUP3 FOD3 CUT	• Deer yarding areas or winter concentration areas (yards) are areas deer move to in response to the onset of winter snow and cold. This is a behavioural response and deer will establish traditional use areas. The yard is composed of two areas referred to as Stratum I and Stratum II. Stratum II covers the entire winter yard area and is usually a mixed or deciduous forest with plenty of browse available for food. Agricultural lands can also be included in this area. Deer move to these areas in early winter and generally, when snow depths reach 20cm, most of the deer will have moved here. If the snow is light and fluffy, deer may continue to use this area until 30cm snow depth. In mild winters, deer may remain in the Stratum II area the entire winter. • The Core of a deer yard (Stratum I) is located within the Stratum II area and is critical for deer survival in areas where winters become severe. It is primarily composed of coniferous trees (pine, hemlock, cedar, spruce) with a canopy cover of more than 60%[cxciv]. • OMNRF determines deer yards following methods outlined in "Selected Wildlife and Habitat Features: Inventory Manual"[cxcv] • Woodlots with high densities of deer due to artificial feeding are not significant.	No Studies Required: • Snow depth and temperature are the greatest influence on deer use of winter yards. Snow depths > 40cm for more than 60 days in a typically winter are minimum criteria for a deer yard to be considered as SWH[lvi, lvii, lviii, lix, lx, l]. • Deer Yards are mapped by OMNRF District offices. Locations of Core or Stratum 1 and Stratum 2 Deer yards considered significant by OMNRF will be available at local MNRF offices or via Land Information Ontario (LIO). • Field investigations that record deer tracks in winter are done to confirm use (best done from an aircraft). Preferably, this is done over a series of winters to establish the boundary of the Stratum I and Stratum II yard in an "average" winter. MNRF will complete these field investigations[cxcv]. • If a SWH is determined for Deer Wintering Area or if a proposed development is within Stratum II yarding area then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMiST[cxlix] Index #2 provides development effects and mitigation measures.	No suitable habitat in study area. **Not SWH**
Wildlife Habitat: Deer Winter Congregation Areas					
Rationale: Deer movement during winter in the southern areas of Ecoregion 6E 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[exlviii]	White-tailed Deer	All Forested Ecosites with these ELC Community Series: FOC FOM FOD SWC SWM SWD Conifer plantations much smaller than 50ha may also be used.	• Woodlots will typically be >100 ha in size. Woodlots <100ha may be considered as significant based on MNRF studies or assessment. • Deer movement during winter in the southern areas of Eco-region 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands[cxlviii]. • If deer are constrained by snow depth refer to the Deer Yarding Area habitat within Table 1.1 of this Schedule. • 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]. • Woodlots with high densities of deer due to artificial feeding are not significant. Information Sources • MNRF District Offices • LIO/NRVIS	Studies confirm: • Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF[cxlviii]. • 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 MNR[l]. • 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]. • If a SWH is determined for Deer Wintering Area of if a proposed development is within Stratum II yarding area then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMiST[cxlix] Index #2 provides development effects and mitigation measures.	No suitable habitat in study area (woodlots are not >100ha in size). **Not SWH**

[1]MNRF 2015b

Significant Wildlife Habitat Assessment Tables

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 6E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Cliff and Talus Slopes					
Rationale: Cliffs and Talus Slopes are extremely rare habitats in Ontario.	Any ELC Ecosite within Community Series: TAO CLO TAS CLS TAT CLT	A Cliff is vertical to near vertical bedrock >3m in height. 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. Information Sources • The Niagara Escarpment Commission has detailed information on location of these habitats. • OMNRF District • Natural Heritage Information Center (NHIC) has location information on their website • Local naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Cliffs or Talus Slopes[lxxviii] • SWHMiST[cxlix] Index #21 provides development effects and mitigation measures.	No cliff or talus slopes within the study area. **Not SWH**
Sand Barrens					
Rationale: Sand barrens are rare in Ontario and support rare species. Most Sand Barrens have been lost due to cottage development and forestry.	ELC Ecosites: SBO1 SBS1 SBT1 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%.	Any sand barren area, >0.5ha in size. Information Sources • OMNRF Districts. • Natural Heritage Information Center (NHIC) has location information on their website • Field naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Sand Barrens[lxxviii] • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics)[i]. • SWHMiST[cxlix] Index #20 provides development effects and mitigation measures.	No sand barrens within the study area. **Not SWH**

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 6E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Alvar					
Rationale: Alvars are extremely rare habitats in Ecoregion 6E. Most alvars in Ontario are in Ecoregion 6E and 7E. Alvars in 6E are small and highly localized just north of the Palaeozoic-Precambrian contact.	ALO1 ALS1 ALT1 FOC1 FOC2 CUM2 CUS2 CUT2-1 CUW2 Five Alvar Indicator Species: 1) Carex crawei 2) Panicum philadelphicum 3) Eleochairs compressa 4) Scutellaria parvula 5) Trichostema branchiatum These indicator species are very specific to Alvars within Ecoregion 6E	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 grasslands and shrublands and comprising a number of characteristic or indicator plant. Undisturbed alvars can be phyto- and zoo geographically 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].	An Alvar site > 0.5 ha in size[lxxv]. Information Sources • Alvars of Ontario (2000), Federation of Ontario Naturalists[lxxvi]. • Ontario Nature – Conserving Great Lakes Alvars[ccviii]. • Natural Heritage Information Center (NHIC) has location information on their website • Field Naturalist clubs • Conservation Authorities	Field studies identify four of the five Alvar indicator species[lxxv, cxlix] at a Candidate Alvar site is Significant. • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotics sp.). • The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses[lxxv]. • SWHMiST[cxlix] Index #17 provides development effects and mitigation measures.	No alvars within the study area. **Not SWH**
Old Growth Forest					
Rationale: Due to historic logging practices, extensive old growth forest is rare in the Ecoregion. Interior habitat provided by old growth forests is required by many wildlife species.	Forest Community Series: FOD FOC FOM SWD SWC SWM	Old Growth forests are characterized by heavy mortality or turnover of over-storey 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 Stands areas 30ha or greater in size or with at least 10 ha interior habitat assuming 100m buffer at edge of forest Í. Information Sources • OMNRF Forest Resource Inventory mapping • OMNRF Forester, Ecologist or Biologist • Field Local naturalist clubs • Conservation Authorities • Sustainable Forestry License (SFL) companies will possibly know locations through field operations. • Municipal forestry departments	Field Studies will determine: • If dominant trees species of the ecosite are >140 years old, then stand is Significant Wildlife Habitat[cxlviii] • The stand will have experienced no recognizable forestry activities[cxlviii] • The area of Forest Ecosites combined to make up the stand is the SWH. • Determine ELC Vegetation Type for forest stand[lxxviii] • SWHDSS[cxlix] Index #23 provides development effects and mitigation measures.	No large old growth woodlots within the study area. **Not SWH**

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 6E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Savannah					
Rationale: Savannahs are extremely rare habitats in Ontario.	TPS1 TPS2 TPW1 TPW2 CUS2	A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%.	• No minimum size to site Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. Information Sources • Natural Heritage Information Center (NHIC) has location information on their website • OMNRF Ecologists • Field naturalists clubs • Conservation Authorities	Field studies confirm one or more of the Savannah indicator species listed in[lxxv] Appendix N should be present. Note: Savannah plant spp. list from Ecoregion 6E should be used[cxlviii]. • Area of the ELC Ecosite is the SWH. • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics sp.). • SWHMiST[cxlix] Index #18 provides development effects and mitigation measures.	No savannahs within the study area. **Not SWH**
Tallgrass Prairie					
Rationale: Tallgrass Prairies are extremely rare habitats in Ontario.	TPO1 TPO2	A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover.	• No minimum size to site Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. Information Sources • OMNR Districts • Natural Heritage Information Center (NHIC) has location information available on their website • Field naturalists clubs • Conservation Authorities	Field studies confirm one or more of the Prairie indicator species listed in[lxxv] Appendix N should be present. Note: Prairie plant spp. list from Ecoregion 6E should be used[cxlviii]. • Area of the ELC Ecosite is the SWH • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). • SWHMiST[cxlix] Index #19 provides development effects and mitigation measures.	No tallgrass prairie within the study area. **Not SWH**
Other Rare Vegetation Communities					

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 6E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Rationale: 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] The OMNR/NHIC will have up to date listing for rare vegetation communities. Information Sources • Natural Heritage Information Center (NHIC) has location information available on their website • OMNRF Districts • Field naturalists clubs • 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]. • Area of the ELC Vegetation Type polygon is the SWH. • SWHMiST[cxlix] Index #37 provides development effects and mitigation measures.	There may be undocumented rare vegetation communities within the study area. **Candidate SWH**

[1]MNRF 2015b

Significant Wildlife Habitat Assessment Tables

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Waterfowl Nesting Area					
Rationale: Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant.	American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard	All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SWT1 SWT2 SWD1 SWD2 SWD3 SWD4 Note: includes adjacency to Provincially Significant Wetlands	A waterfowl nesting area extends 120m[cxlix] from a wetland (> 0.5 ha) or a wetland (>0.5ha) and any 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]. • Upland areas should be at least 120m wide so that predators such as raccoons, skunks, and foxes have difficulty finding nests. • Wood Ducks and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites. Information Sources • Ducks Unlimited staff may know the locations of particularly productive nesting sites. • OMNRF Wetland Evaluations for indication of significant waterfowl nesting habitat. • Reports and other information available from CAs	Studies confirmed: • Presence of 3 or more nesting pairs for listed species excluding Mallards, or • Presence of 10 or more nesting pairs for listed species including Mallards. • Any active nesting site of an American Black Duck is considered significant. • 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] • 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. • SWHMiST[cxlix] Index #25 provides development effects and mitigation measures.	Possible suitable habitat at sites 2, 4 and 8. **Candidate SWH**

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Bald Eagle and Osprey Nesting, Foraging and Perching Habitat					
Rationale: Nest sites are fairly uncommon in Eco-region 6E are used annually by these species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat.	Osprey Special Concern: 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. • 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. • Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms). Information Sources • Natural Heritage Information Center (NHIC) compiles all known nesting sites for Bald Eagles in Ontario. • MNRF values information (LIO/NRVIS) will list known nesting locations. Note: data from NRVIS is provided as a point and does not represent all the habitat. • Nature Counts, Ontario Nest Records Scheme data. • OMNRF Districts • Sustainable Forestry License (SFL) companies will identify additional nesting locations through field operations. • Check the Ontario Breeding Bird Atlas[ccv] or Rare Breeding Birds in Ontario for species documented • Reports and other information available from CAs. • Field naturalists clubs	Studies confirm the use of these nests by: • One or more active Osprey or Bald Eagle nests in an area[cxlviii]. • 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. • For an Osprey, the active nest and a 300m radius around the nest or the contiguous woodland stand is the SWHccvii, maintaining undisturbed shorelines with large trees within this area is important[cxlviii]. • 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 dependent on site lines from the nest to the development and inclusion of perching and foraging habitat[cvi]. • 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] • Observational studies to determine nest site use, perching sites and foraging areas need to be done from mid March to mid August. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #26 provides development effects and mitigation measures	Suitable habitat not present within the study area. **Not SWH**

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Woodland Raptor Nesting Habitat					
Rationale: Nests sites for these species are rarely identified; these area sensitive habitats and are often used annually by these species.	Northern Goshawk Cooper's Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk	May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3.	All natural or conifer plantation woodland/forest stands >30ha with >10ha of interior habitat[lxxxviiii, lxxxix, xc, xci, xciii, xciv, xcv, xcvi, cxxxiii]. Interior habitat determined with a 200m buffer[cxlviii]. • 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 Cooper's hawk nest along forest edges sometimes on peninsulas or small off-shore islands. • In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest. Information Sources • OMNRF • Check the Ontario Breeding Bird Atlas[ccv] or Rare Breeding Birds in Ontario for species documented. • Check data from Bird Studies Canada • Reports and other information available from CAs	Studies confirm: • Presence of 1 or more active nests from species list is considered significant[cxlviii]. • Red-shouldered Hawk and Northern Goshawk – a 400m radius around the nest or 28ha area of habitat is the SWH[ccvii]. • Barred Owl – a 200m radius around the nest is the SWH[ccvii]. • Broad-winged Hawk and Coopers Hawk – a 100m radius around the nest is the SWH[ccvii]. • Sharp-shinned Hawk – a 50m radius around the nest is the SWH[ccvii]. • Conduct field investigations from mid-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. • SWHMiST[cxlix] Index #27 provides development effects and mitigation measures.	Suitable habitat is present in the Clythe Creek Wetland Complex but not in the alternative Sites. **Not SWH**
Wildlife Habitat: Turtle Nesting Area					
Rationale: These habitats are rare and when identified will often be the only breeding site for local populations of turtles	Midland Painted Turtle Special Concern: Northern Map Turtle Snapping Turtle	Exposed mineral soil (sand or gravel) areas adjacent (<100m)[cxlviii] or within the following ELC Ecosites: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 BOO1 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. • 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. • Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used. Information Sources • Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels). • 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. • Natural Heritage Information Center (NHIC) • Field Naturalist clubs and landowners	Studies confirm: • Presence of 5 or more nesting Midland Painted Turtles • One or more Northern Map Turtle or Snapping Turtle nesting is a SWH[i] • 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 dependent on slope, riparian vegetation and adjacent land use is the SWH[cxlviii]. • Travel routes from wetland to nesting area are to be considered within the SWH[cxlix]. • Field investigations should be conducted in prime nesting season typically late spring to early summer. Observational studies observing the turtles nesting is a recommended method. • SWHMiST[cxlix] Index #28 provides development effects and mitigation measures for turtle nesting habitat.	Open meadows, clearings present within the study area at Sites 2, 4, 5, 7, and 8 may be used by nesting turtles. **Candidate SWH**

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Seeps and Springs					
Rationale: Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams.	Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer 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]. • Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species[cxlx, cxx, cxxi, cxxii, cxiii, cxiv] Information Sources • Topographical Map • Thermography • Hydrological surveys conducted by CAs and MOE • Field naturalists clubs and landowners • Municipalities and Conservation Authorities may have drainage maps and headwater areas mapped.	Field Studies confirm: • Presence of a site with 2 or more seeps/springs should be considered SWH. • 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 the habitat[cxlviii] • SWHMiST[cxlix] Index #30 provides development effects and mitigation measures	Seeps/springs may be present within the Clythe Creek Wetalnd Complex, but not within the sites. **Not SWH**
Wildlife Habitat: Amphibian Breeding Habitat (Woodland)					
Rationale: These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations.	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD 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. • Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat[cxlviii] Information Sources • Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records • Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their property. • OMNRF District • OMNRF wetland evaluations • Field naturalist clubs • Canadian Wildlife Service Amphibian Road Call Survey • Ontario Vernal Pool Association: http://www.ontariovernalpools.org	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults or eggs masses)[lxxi] or 2 or more of the listed frog species with Call Level Codes of 3. • A combination of observational study and call count surveys[cviii] will be required during the spring March-June when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. • The habitat is the woodland area plus a 230m radius of woodland area[lxiii,lxv, lxvi, lxvii, lxviii, lxix, lxx, lxxi] if a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is the be included in the habitat. • SWHMiST[cxlix] Index #14 provides development effects and mitigation measures.	Suitable habitat (swamp and vernal pools) are present in the study area but not within the alternative Sites. **Not SWH**

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Amphibian Breeding Habitat (Wetland)					
Rationale: These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Tree frog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	ELC Community Classes SW, MA, FE, BO, OA and SA. 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 >500m2 (about 25m diameter)[ccvii] supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNRF mapping and could be important amphibian breeding habitats[clxxxiv]. • 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. • Bullfrogs require permanent water bodies with abundant emergent vegetation. Information Sources • Ontario Herpetofaunal Summary Atlas (or other similar atlases) • Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count. • OMNRF Districts and wetland evaluations • Reports and other information available from CAs.	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species and with at least 20 individuals (adults or eggs masses)[lxxi, lxxiii], or 2 or more of the listed frog/toad species with Call Level Codes of 3. or; Wetland with confirmed breeding Bullfrogs are significant. • The ELC ecosite wetland area and the shoreline are the SWH. • A combination of observational study and call count surveys[cviii] will be required during spring March to June) when amphibians are concentrated around suitable breeding habitat within or near the wetlands. • 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. • SWHMiST[cxlix] Index #15 provides development effects and mitigation measures.	Suitable habitat (woodland pools) present in the study area, but not within the alternative sites. **Not SWH**
Woodland Area-Sensitive Bird Breeding Habitat					
Rationale: 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 Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren Special Concern: Cerulean Warbler Canada Warbler	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD	• Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha.[cv, cxxxi, cxxxii, cxxxiii, cxxxiv, cxxv, cxxvi, cxxxvii, cxxxviii, cxxxix, cxl, cxli, cxlii, cxliii, cxliv, cxlv, cxlvi, cl, cli, clii, cliii, cliv, clv, clvi, clvii, clviii, clix • Interior forest habitats are at least 200m from forest edge habitat. Information Sources • Local bird clubs • Canadian Wildlife Service (CWS) for the location of forest bird monitoring. • Bird studies Canada conducted a 3-year study of 287 woodlands to determine the effects of forest fragmentation on forest birds and to greatest value to interior species • Reports and other information available from CAs.	• Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. • Note: any site with breeding Cerulean Warblers or Canada Warblers is to be considered SWH. • Conduct field investigations in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #34 provides development effects and mitigation measures.	Suitable sensitive breeding bird woodland habitat may be present within the study area but not within the alternative sites. **Not SWH**

[1]MNRF 2015b

Significant Wildlife Habitat Assessment Tables

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

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Marsh Bird Breeding Habitat					
Rationale: Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes.	American Bittern Virginia Rail Sora Common Gallinule American Coot Pied-billed Grebe Marsh Wren Sedge Wren Common Loon Sandhill Crane Green Heron Trumpeter Swan Special Concern: Black Tern Yellow Rail	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1 For Green Heron: All SW, MA and CUM1 sites.	• Nesting occurs in wetlands • All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present[cxciv]. • 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. Information Sources • Contact OMNRF, wetland evaluations are a good source of information. • Field naturalist clubs • Natural Heritage Information Center (NHIC) Records • Reports and other information available from CAs. • Ontario Breeding Bird Atlas[ccv]	Studies confirm: • Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or 1 pair of Sandhill Cranes; or breeding by any combination of 5 or more of the listed species[l]. • Note: any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is SWH[l]. • Area of the ELC ecosite is the SWH • Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi]. • SWHMiST[cxlix] Index #35 provides development effects and mitigation measures	Marsh or submerged shallow aquatic wetlands of sufficient size for use by marsh breeding birds are not present within the study area. **Not SWH**
Wildlife Habitat: Open Country Bird Breeding Habitat					
Rationale: 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 Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow Special Concern: Short-eared Owl	CUM1 CUM2	Large grassland areas (includes natural and cultural fields and meadows) >30 ha [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]. 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. The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species. Information Sources • Agricultural land classification maps, Ministry of Agriculture. • Ask local birders • Ontario Breeding Bird Atlas[ccv] • Reports and other information available from CAs.	Field Studies confirm: • Presence of nesting or breeding of 2 or more of the listed species. • A field with 1 or more breeding Short-eared Owl is to be considered SWH. • The area of SWH is the contiguous ELC ecosite field areas. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi]. • SWHMiST[cxlix] Index #32 provides development effects and mitigation measures.	Large fields of suitable size and composition are not present within the study area. **Not SWH**

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

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Shrub/Early Successional Bird Breeding Habitat					
Rationale: 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 cxcix.	Indicator spp.: Brown Thrasher Clay-coloured Sparrow Common spp.: Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher Special Concern: Yellow-breasted Chat Golden-winged Warbler	CUT1 CUT2 CUS1 CUS2 CUW1 CUW2 Patches of shrub ecosites can be complexed into a larger habitat for some bird species.	Large 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)[l]. Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species [clxxiii]. Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands. Information Sources • Agricultural land classification maps Ministry of Agriculture Local bird clubs • Ontario Breeding Bird Atlas[ccv] • Reports and other information available from CAs	Field Studies confirm: • Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species[l]. • A field with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat. • The area of the SWH is the contiguous ELC ecosite field/thicket area. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #33 provides development effects and mitigation measures.	Early successional fields or large thicket habitats are not present within the study area. **Not SWH**
Wildlife Habitat: Terrestrial Crayfish					
Rationale: Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare.[ccii]	Chimney or Digger Crayfish: (*Fallicambarus fodiens*) Devil Crawfish or Meadow Crayfish: (*Cambarus Diogenes*)	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2 MAS3 SWD SWT SWM	Wet meadow and edges of shallow marshes (no minimum size) identified should be surveyed for terrestrial crayfish. • Constructs burrows in marshes, mudflats, meadows, the ground can't be too moist. Can often be found far from water. • Both species are a semi-terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels. Usually the soil is not too moist so that the tunnel is well formed. Information Sources • Information sources from "Conservation Status of Freshwater Crayfishes" by Dr. Premek Hamr for the WWF and CNF March 1998	Studies Confirm: • Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable marsh meadow or terrestrial sites[cci] • Area of ELC Ecosite or an ecoelement area of meadow marsh or swamp within the larger ecosite area is the SWH • Surveys should be done April to August during in temporary or permanent water Note the presence of burrows or chemistry are often the only indicator of presence, observance or collection of individuals is very difficult[cci] • SWHMiST[cxlix] Index #36 provides development effects and mitigation measures.	The Clythe Creek Wetland Complex and sites 2,4,5,7 and 8 could provide habitat for these species. **Candidate SWH**

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

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Special Concern and Rare Wildlife Species					
Rationale: 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.	All plant and animal element occurrences (EO) within a 1 or 10km grid. 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]. Information Sources • Natural Heritage Information Centre (NHIC) will have the Special Concern and Provincially Rare (S1-S3, SH) species lists with element occurrences data. • NHIC Website: "Get Information": http://nhic.mnr.gov.on.ca • Ontario Breeding Bird Atlas[ccv] • Expert advice should be sought as many of the rare spp. have little information available about their requirements.	Studies Confirm: • Assessment/inventory of the site for the identified special concern or rare species needs to be completed during the time of year when the species is present or easily identifiable. • The area of the habitat to the finest ELC scale that protects the habitat form and function is the SWH, this must be delineated through detailed field studies. The habitat needs to be easily mapped and cover an important life stage component for a species e.g. specific nesting habitat or foraging habitat. • SWHMiST[cxlix] Index #37 provides development effects and mitigation measures.	Several Species of Conservation Concern (Special Concern or S Ranks S1-S3) are recorded from the vicinity of the study area based on the background review and may be present. These include: Common Nighthawk (*Chordeiles minor;* S4B; SC) Eastern Wood Pewee (*Contopus virens;* S4B; Special Concern) Golden-winged Warbler (*Vermivora chrysoptera*; S4B; SC) Grasshopper Sparrow (*Ammodramus savannarum*; S4B; Special Concern) Eastern Ribbonsnake (Thamnophis sauritus; S3; Special Concern) Snapping Turtle (Chelydra serpentina; S3; Special Concern) Amethyst Aster (*Symphyotrichum X amethystinum*; S3?) Cary's Sedge (*Carex careyana;* S2) Monarch (*Danaus plexippus*; S2N, S4B; Endangered) **Candidate SWH**

[1]MNRF 2015b

Significant Wildlife Habitat Assessment Tables

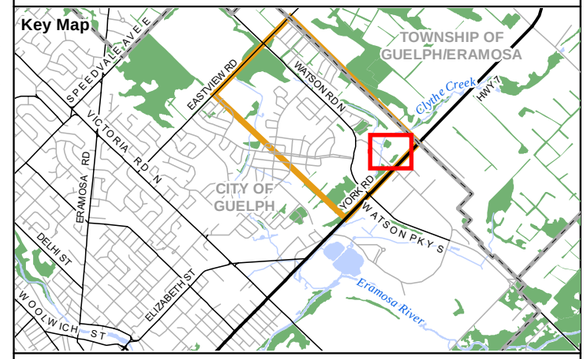
Table 5. Characteristics of Animal Movement Corridors for Ecoregion 6E.

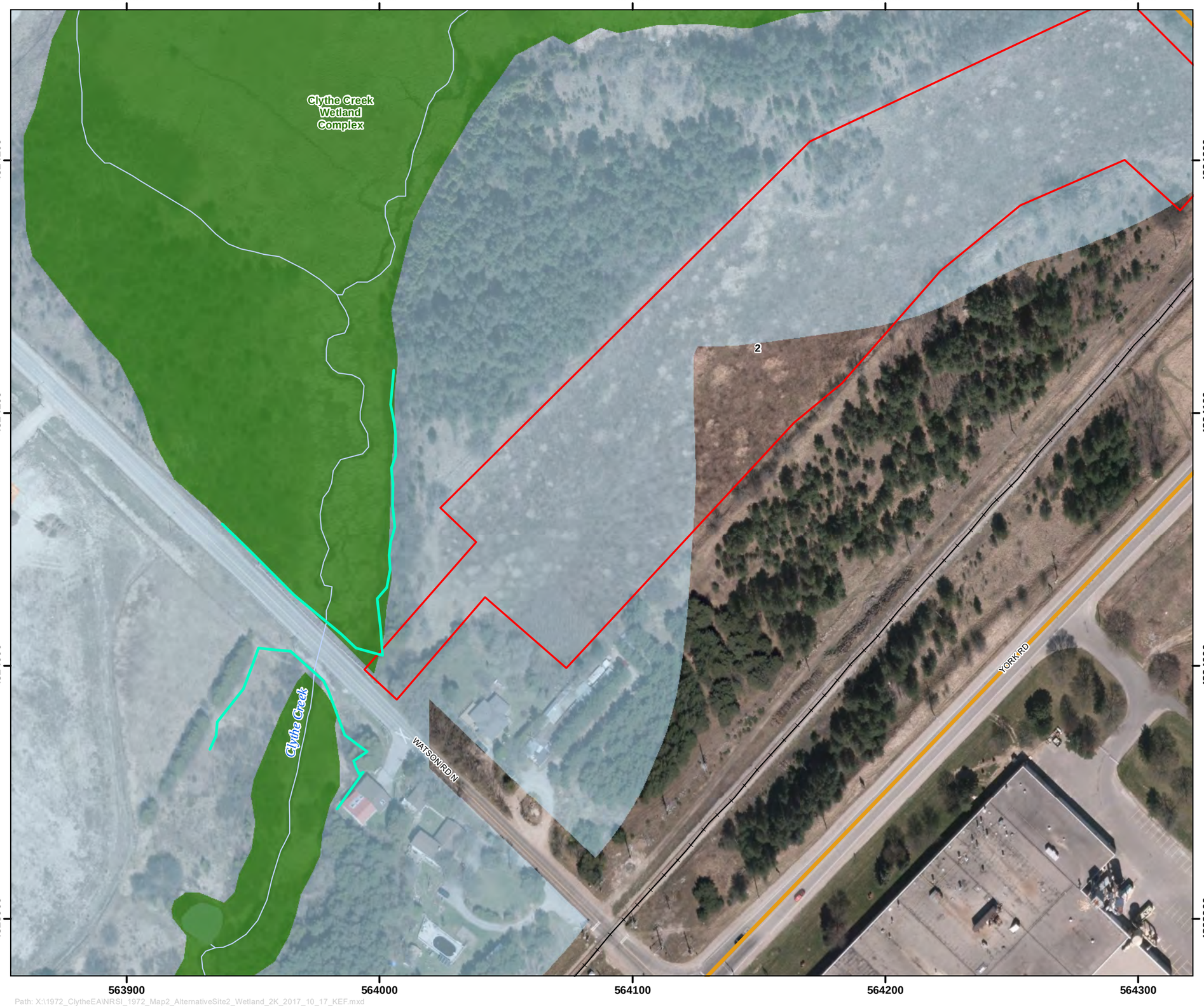
	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Amphibian Movement Corridors					
Rationale: Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	Corridors may be found in all ecosites associated with water. • 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]. Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (Amphibian Breeding Habitat – Wetland) of this Schedule[i]. Information Sources • MNRF District Office • Natural Heritage Information Center NHIC • Reports and other information available from CAs • Field Naturalist Clubs	• Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites. • Corridors should consist of native vegetation, with several layers of vegetation. Cooridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant[cxlix]. • Corridors should have at least 15m of vegetation on both sides of waterway [cxlix] or be up to 200m wide[cxlix] of woodland habitat and with gaps <20m [cxlix]. • Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat[cxlix]. • SWHMiST[cxlix] Index #40 provides development effects and mitigation measures.	There are no confirmed significant amphibian breeding habitats in the study area. **Not SWH**
Wildlife Habitat: Deer Movement Corridors					
Rationale: Corridors important for all species to be able to access seasonally important life-cycle habitats or to access new habitat for dispersing individuals by minimizing their vulnerability while travelling.	White-tailed Deer	Corridors may be found in all forested ecosites. A Project Proposal in Stratum II Deer Wintering Area has potential to contain corridors.	Movement corridor must be determined when Deer Wintering Habitat is confirmed as SWH from Table 1.1 of this schedule[i]. • A deer wintering habitat identified by the OMNRF as SWH in Table 1.1 of this Schedule will have corridors that the deer use during fall migration and spring dispersion [clxxxii, clxxxiii, cxlix, cxciv]. • Corridors typically follow riparian areas, woodlots, areas of physical geography (ravines, or ridges). Information Sources • MNRF District Office • Natural Heritage Information Center (NHIC) • Reports and other information available from CAs • Field Naturalist Clubs	• Studies must be conducted at the time of year when deer are migrating or moving to and from winter concentration areas. • Corridors that lead to a deer wintering yard should be unbroken by roads and residential areas. • Corridors should be at least 200m wide[cxlix] with gaps <20m[cxlix] and if following riparian area with at least 15m of vegetation on both sides of waterway[cxlix]. Shorter corridors are more significant than longer corridors[cxlix] • SWHMiST[cxlix] Index #39 provides development effects and mitigation measures.	No suitable wintering habitat on subject property (woodlot is not >100ha in size) so no potential for corridors. **Not SWH**

[1]MNRF 2015b

Clythe Well Treatment Class EA

Alternative Site 2 Wetland Boundary





Legend

- Study Area
- Alternative Site 2
- Railway
- Wetland Boundary (NRSI, October 12, 2017)
- Permanent Watercourse
- Water Body
- PSW (LIO, 2011)
- GRCA Regulation Limit

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1972 Date: October 17, 2017	NAD83 - UTM Zone 17 Size: 11x17" **1:1,500**

0 20 40 60 80 100 Metres

N

Path: X:\1972_ClytheEA\NRSI_1972_Map2_AlternativeSite2_Wetland_2K_2017_10_17_KEF.mxd

APPENDIX K:
STAGE 1 ARCHAEOLOGICAL ASSESSMENT REPORT

STAGE 1 ARCHAEOLOGICAL ASSESSMENT
CLYTHE STATION TREATMENT AND PUMPING STATION
PART OF LOTS 5-6, CONCESSION 3 DIVISION C AND
PART OF LOTS 4-6 CONCESSION 4 DIVISION C
(FORMER TOWNSHIP OF GUELPH)
CITY OF GUELPH
COUNTY OF WELLINGTON, ONTARIO

ORIGINAL REPORT

Prepared for:

GM BluePlan Engineering Limited
650 Woodlawn Road West
Guelph, ON N1K 1B8

Archaeological Licence #P094 (Merritt)
Ministry of Tourism, Culture and Sport PIF# P094-0241-2017
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ASI Archaeological & Cultural Heritage Services
528 Bathurst Street Toronto, ONTARIO M5S 2P9
416-966-1069 F 416-966-9723 asiheritage.ca

Stage 1 Archaeological Assessment
Clythe Station Treatment and Pumping Station
Part of Lots 5-6, Concession 3 Division C and
Part of Lots 4-6 Concession 4 Division C
(Former Township of Guelph)
City of Guelph
County of Wellington, Ontario

EXECUTIVE SUMMARY

Archaeological Services Inc. (ASI) was contracted by GM BluePlan Engineering Limited to conduct a Stage 1 Archaeological Assessment (Background Research and Property Inspection) as part of the Clythe Station Treatment, Storage and Pumping Class Environmental Assessment in the City of Guelph. ASI was previously retained to complete Stage 1 and Stage 2 archaeological assessments as part of the earlier EA which was not completed. These reports were submitted and accepted into the Ministry of Tourism, Culture, and Sport's provincial register of reports on April 1 and June 19, 2015 respectively. The current EA will be considering eight preliminary site alternatives, including those previously assessed by ASI (Sites 4 and 7).

The Stage 1 background study determined that nine previously registered archaeological sites are located within one kilometre of the Study Area. The property inspection determined that parts of the Study Area in proposed Sites 1-3, and 5 exhibit archaeological potential and will require Stage 2 assessment.

In light of these results, the following recommendations are made:

1. Parts of Sites 1 and 3 exhibit archaeological potential. These lands require Stage 2 archaeological assessment by test pit survey at five metre intervals prior to any proposed impacts to the property;

2. Sites 2, 4, 5, 6, and 7 have been previously assessed and do not require further archaeological assessment;

3. The remainder of the Study Area does not retain archaeological potential on account of deep and extensive land disturbance and does not require further archaeological assessment; and,

4. Should the proposed work extend beyond the current Study Area, further Stage 1 archaeological assessment should be conducted to determine the archaeological potential of the surrounding lands.

ASI

PROJECT PERSONNEL

Senior Project Manager:	Lisa Merritt, MSc. (P094) *Partner | Director* *Environmental Assessment Division*
Project Coordinator:	Sarah Jagelewski, Hon. BA (R405) *Archaeologist | Assistant Manager* *Environmental Assessment Division*
Project Director (Licensee):	Lisa Merritt
Project Manager:	Eliza Brandy, MA (R1109) *Archaeologist | Project Manager* *Environmental Assessment Division*
Field Director:	Peter Carruthers (P163) *Senior Associate*
Report Preparation:	Eliza Brandy
Graphics:	Blake Williams, MLitt (P383) *Archaeologist | Geomatics Specialist* *Operations Division*
Report Reviewer:	Lisa Merritt

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1.0 PROJECT CONTEXT

Archaeological Services Inc. (ASI) was contracted by GM BluePlan Engineering Limited to conduct a Stage 1 Archaeological Assessment (Background Research and Property Inspection) as part of the Clythe Station Treatment, Storage and Pumping Class Environmental Assessment in the City of Guelph. ASI was previously retained to complete Stage 1 and Stage 2 archaeological assessments as part of the earlier EA which was not completed (ASI 2013a, 2013b). These reports were submitted and accepted into the Ministry of Tourism, Culture, and Sport's (MTCS) provincial register of reports on April 1 and June 19, 2015 respectively. The current EA will be considering eight preliminary site alternatives, including those previously assessed by ASI (Sites 4 and 7) (Figure 1).

All activities carried out during this assessment were completed in accordance with the *Ontario Heritage Act* (1990, as amended in 2009) and the 2011 *Standards and Guidelines for Consultant Archaeologists* (S & G), administered by the MTCS.

In the S & G, Section 1, the objectives of a Stage 1 archaeological assessment are discussed as follows:

- To provide information about the history, current land conditions, geography, and previous archaeological fieldwork of the Study Area;
- To evaluate in detail the archaeological potential of the Study Area that can be used, if necessary, to support recommendations for Stage 2 archaeological assessment for all or parts of the Study Area; and,
- To recommend appropriate strategies for Stage 2 archaeological assessment, if necessary.

This report describes the Stage 1 archaeological assessment that was conducted for this project and is organized as follows: Section 1.0 summarizes the background study that was conducted to provide the historical and archaeological contexts for the project Study Area; Section 2.0 addresses the field methods used for the property inspection that was undertaken to document its general environment, current land use history and conditions of the Study Area; Section 3.0 analyses the characteristics of the project Study Area and evaluates its archaeological potential; Section 4.0 provides recommendations; and the remaining sections contain other report information that is required by the S & G, e.g., advice on compliance with legislation, works cited, mapping and photo-documentation.

1.1 Development Context

All work has been undertaken as required by the *Environmental Assessment Act*, RSO (1990) and regulations made under the Act, and are therefore subject to all associated legislation. This project is being conducted in accordance with the Municipal Engineers' Association document *Municipal Class Environmental Assessment* (2000 as amended in 2007, 2011 and 2015).

The *City of Guelph Official Plan*, Section 3.5.10 (City of Guelph 2014) was also consulted.

Authorization to carry out the activities necessary for the completion of the Stage 1 archaeological assessment was granted by GM BluePlan Engineering Limited on July 13, 2017.

1.2 Historical Context

The purpose of this section, according to the S & G, Section 7.5.7, Standard 1, is to describe the past and present land use and the settlement history and any other relevant historical information pertaining to the Study Area. A summary is first presented of the current understanding of the Indigenous land use of the Study Area. This is then followed by a review of the historical Euro-Canadian settlement history.

1.2.1 Indigenous Land Use and Settlement

Southern Ontario has been occupied by human populations since the retreat of the Laurentide glacier approximately 13,000 years before present (BP) (Ferris 2013). Populations at this time would have been highly mobile, inhabiting a boreal-parkland similar to the modern sub-arctic. By approximately 10,000 BP, the environment had progressively warmed (Edwards and Fritz 1988) and populations now occupied less extensive territories (Ellis and Deller 1990).

Between approximately 10,000-5,500 BP, the Great Lakes basins experienced low-water levels, and many sites which would have been located on those former shorelines are now submerged. This period produces the earliest evidence of heavy wood working tools, an indication of greater investment of labour in felling trees for fuel, to build shelter, and watercraft production. These activities suggest prolonged seasonal residency at occupation sites. Polished stone and native copper implements were being produced by approximately 8,000 BP; the latter was acquired from the north shore of Lake Superior, evidence of extensive exchange networks throughout the Great Lakes region. The earliest evidence for cemeteries dates to approximately 4,500-3,000 BP and is indicative of increased social organization, investment of labour into social infrastructure, and the establishment of socially prescribed territories (Ellis et al. 1990, 2009; Brown 1995:13).

Between 3,000-2,500 BP, populations continued to practice residential mobility and to harvest seasonally available resources, including spawning fish. Exchange and interaction networks broaden at this time (Spence et al. 1990:136, 138) and by approximately 2,000 BP, evidence exists for macro-band camps, focusing on the seasonal harvesting of resources (Spence et al. 1990:155, 164). It is also during this period that maize was first introduced into southern Ontario, though it would have only supplemented people's diet (Birch and Williamson 2013:13–15). Bands likely retreated to interior camps during the winter. It is generally understood that these populations were Algonquian-speakers during these millennia of settlement and land use.

From approximately 1,000 BP until approximately 300 BP, lifeways became more similar to that described in early historical documents. During the Early Iroquoian phase (AD 1000-1300), the communal site is replaced by the village focused on horticulture. Seasonal disintegration of the community for the exploitation of a wider territory and more varied resource base was still practised (Williamson 1990:317). By the second quarter of the first millennium BP, during the Middle Iroquoian phase (AD 1300-1450), this episodic community disintegration was no longer practised and populations now communally occupied sites throughout the year (Dodd et al. 1990:343). In the Late Iroquoian phase (AD 1450-1649) this process continued with the coalescence of these small villages into larger communities (Birch and Williamson 2013). Through this process, the socio-political organization of the First Nations, as described historically by the French and English explorers who first visited southern Ontario, was developed. By AD 1600, the communities within Simcoe County had formed the Confederation of Nations encountered by the first European explorers and missionaries. In the 1640s, the

traditional enmity between the Haudenosaunee [1]and the Huron-Wendat (and their Algonkian allies such as the Nippissing and Odawa) led to the dispersal of the Huron-Wendat.

Samuel de Champlain in 1615 reported that a group of Iroquoian-speaking people situated between the Haudenosaunee and the Huron-Wendat were at peace and remained "la nation neutre". In subsequent years, the French visited and traded among the Neutral, but the first documented visit was not until 1626, when the Recollet missionary Joseph de la Roche Daillon recorded his visit to the villages of the Attiwandaron, whose name in the Huron-Wendat language meant "those who speak a slightly different tongue" (the Neutral apparently referred to the Huron-Wendat by the same term). Like the Huron-Wendat, Petun, and Haudenosaunee, the Neutral people were settled village agriculturalists. Several discrete settlement clusters have been identified in the lower Grand River, Fairchild-Big Creek, Upper Twenty Mile Creek, Spencer-Bronte Creek drainages, Milton, Grimsby, Eastern Niagara Escarpment and Onondaga Escarpment areas, which are attributed to Iroquoian populations. These settlement clusters are believed by some scholars to have been inhabited by populations of the Neutral Nation or pre- (or ancestral) Neutral Nation (Lennox and Fitzgerald 1990).

Between 1647 and 1651, the Neutral were decimated by epidemics and ultimately dispersed by the Haudenosaunee, who subsequently settled along strategic trade routes on the north shore of Lake Ontario for a brief period during the mid seventeenth-century. Compared to settlements of the Haudenosaunee, the "Iroquois du Nord" occupation of the landscape was less intensive. Only seven villages are identified by the early historic cartographers on the north shore, and they are documented as considerably smaller than those in New York State. The populations were agriculturalists, growing maize, pumpkins, and squash. These settlements also played the important alternate role of serving as stopovers and bases for Haudenosaunee travelling to the north shore for the annual beaver hunt (Konrad 1974).

After the dispersal, the Haudenosaunee established a series of settlements at strategic locations along the trade routes inland from the north shore of Lake Ontario, including Teiaiagon, near the mouth of the Humber River; and Ganestiquiagon, near the mouth of the Rouge River. Their locations near the mouths of the Humber and Rouge Rivers, two branches of the Toronto Carrying Place, strategically linked these settlements with the upper Great Lakes through Lake Simcoe. The west branch of the Carrying Place followed the Humber River valley northward over the drainage divide, skirting the west end of the Oak Ridges Moraine, to the East Branch of the Holland River. Another trail followed the Don River watershed.

When the Senecas established Teiaiagon at the mouth of the Humber, they were in command of the traffic across the peninsula to Lake Simcoe and the Georgian Bay. Later, Mississauga and earliest European presence along the north shore, was therefore also largely defined by the area's strategic importance for accessing and controlling long established economic networks. Prior to the arrival of the Seneca, these economic networks would have been used by indigenous groups for thousands of years. While the trail played an important part during the fur trade, people would also travel the trail in order to exploit the resources available to them across south-central Ontario, including the various spawning runs, such as the salmon coming up from Lake Ontario or herring or lake trout in Lake Simcoe.

[1] The Haudenosaunee are also known as the New York Iroquois or Five Nations Iroquois and after 1722 Six Nations Iroquois. They were a confederation of five distinct but related Iroquoian–speaking groups - the Seneca, Onondaga, Cayuga, Oneida, and Mohawk. Each lived in individual territories in what is now known as the Finger Lakes district of Upper New York. In 1722 the Tuscarora joined the confederacy.

Due, in large part, to increased military pressure from the French upon their homelands south of Lake Ontario, the Haudenosaunee abandoned their north shore frontier settlements by the late 1680s, although they did not relinquish their interest in the resources of the area, as they continued to claim the north shore as part of their traditional hunting territory. The territory was immediately occupied or re-occupied by Anishinaabek groups, including the Mississauga, Ojibwa (or Chippewa) and Odawa, who, in the early seventeenth century, occupied the vast area extending from the east shore of Georgian Bay, and the north shore of Lake Huron, to the northeast shore of Lake Superior and into the upper peninsula of Michigan. Individual bands were politically autonomous and numbered several hundred people. Nevertheless, they shared common cultural traditions and relations with one another and the land. These groups were highly mobile, with a subsistence economy based on hunting, fishing, gathering of wild plants, and garden farming. Their movement southward also brought them into conflict with the Haudenosaunee.

Peace was achieved between the Haudenosaunee and the Anishinaabek Nations in August of 1701 when representatives of more than twenty Anishinaabek Nations assembled in Montreal to participate in peace negotiations (Johnston 2004:10). During these negotiations captives were exchanged and the Iroquois and Anishinaabek agreed to live together in peace. Peace between these nations was confirmed again at council held at Lake Superior when the Iroquois delivered a wampum belt to the Anishinaabek Nations.

In 1763, following the fall of Quebec, New France was transferred to British control at the Treaty of Paris. The British government began to pursue major land purchases to the north of Lake Ontario in the early nineteenth century, the Crown acknowledged the Mississaugas as the owners of the lands between Georgian Bay and Lake Simcoe and entered into negotiations for additional tracts of land as the need arose to facilitate European settlement.

During the American Revolution, Mississauga warriors supported the English military. Rebel forces destroyed the villages of the Six Nations Iroquois in New York and many people were forced to move to the Niagara area. When Six Nations Iroquois leaders learned that the English planned to make a peace treaty with the Americans and establish a boundary line that would give away their homelands they were angry. The English government offered to protect Six Nations Iroquois peoples and give them land within their boundaries. On August 8, 1783, Lord North instructed Governor Haldimand to set apart land for the Six Nations Iroquois and ensure that they carried on their hunting and fur trading with the British. On May 22, 1784, a tract of land along the Grand River was purchased by the British government from the Mississaugas who lived in the vicinity (Johnston 1964; Lytwyn 2005). The land set apart is called the Haldimand Tract. Joseph Brant led Haudenosaunee loyalists (1600 people) to the Haldimand tract in 1784 and in the fall of 1784, Sir Frederick Haldimand formally awarded the tract to the Mohawks “and others of the Six Nations [Iroquois].” They were authorized to “Settle upon the Banks of the River” and were allotted “for that Purpose six miles [10 km] deep from each Side of [it] beginning at Lake Erie, & extending in the Proportion to [its] Head.” The precise boundaries of the grant were unclear as there was no survey; for example, the northern boundary of the original deed from the Mississaugas to the Crown stated that the line extended “from the creek that falls from a small lake into…the bay known by the name of Waghquata [Burlington Bay]…until it strikes the river La Tranche [Thames].” The 1790 survey by Augustus Jones intentionally failed to include the headwaters of the Grand, an action made all the more difficult to address given the unclear description of the extent in the original deeds (Johnston 1964; Lytwyn 2005).

Brant regarded the territory as his own to manage on behalf of the Confederacy and interpreted the proclamation as tantamount to full national recognition of the Mohawks and fellow tribesmen. This interpretation was strongly denied by the British (Johnston 1964; Lytwyn 2005). Appointed as Lieutenant Governor of the new colony of Upper Canada in 1791, Simcoe refused to permit the Six Nations Iroquois

to sell/lease any part of their reserve because they were arranged independently of the Crown. Brant, on the other hand, argued for the Six Nations Iroquois' need for an immediate assured income from land sales as they could no longer hope to survive by hunting exclusively. Simcoe thought that if such practices were permitted, it could lead to other Europeans attempting to seize control by any means of the better part of the Six Nations Iroquois' reserve and it was therefore unresolved as to whether Six Nations Iroquois people could dispose of their lands directly to whomever they chose (Johnston 1964; Lytwyn 2005).

In the first few years, Brant, who had been described, by some, as a Europeanized entrepreneur, took the initiative and invited white friends and acquaintances to the tract and provided them with rough land titles. Over the next 25 years (1784-1810), a considerable number of Europeans and Americans obtained similar leases authorizing them (in Brant's opinion) to occupy and improve lots overlooking the river (Johnston 1964; Lytwyn 2005).

The subsequent Peter Russel administration (1797-1798), however, recognized the leases and the sales that Brant arranged with white settlers along the Grand River Valley. Trustees were appointed to act on the behalf of the Six Nations Iroquois with the authority to receive payment of purchases. On the other hand, some Six Nations Iroquois thought that the land sale practices violated the ancient principle that land was not a "commodity which could be conveyed." Two Mohawk sachems even tried to take up arms to depose Brant because they did not agree with his ways. Their efforts were for naught and they returned to the Bay of Quinte where other Six Nation Iroquois peoples, led by Sachem John Deseronto, had settled after the American Revolution (Johnston 1964; Lytwyn 2005).

A formal investigation of the matter was launched in 1812 although leases were not set aside. Due to problems of white encroachment including squatters without titles, settlers who bought land from individuals or through other transactions with Six Nations Iroquois, many of the leases were confirmed by the Crown in 1834-5. Unauthorized sales and agreements remained rampant (Johnston 1964; Lytwyn 2005).

In 1841, Samuel P. Jarvis (Indian Superintendent) informed the Six Nations Iroquois that the only way to keep white intruders off their land would be for them to surrender it to the Crown, to be administered for their sole benefit. With this plan, the Six Nations Iroquois would retain lands that they actually occupied and a reserve of approximately 8,094 ha. The surrender of land was made by the Confederacy in January, 1841 (Johnston 1964; Lytwyn 2005).

Today, this history and those surrenders are still contested and there are numerous specific land claims that have been filed by the Six Nations Iroquois with the federal government in regard to lands within the Haldimand Tract (Johnston 1964; Lytwyn 2005).

The eighteenth century saw the ethnogenesis in Ontario of the Métis, when Métis people began to identify as a separate group, rather than as extensions of their typically maternal First Nations and paternal European ancestry (Métis National Council n.d.). Living in both Euro-Canadian and Indigenous societies, the Métis acted as agents and subagents in the fur trade but also as surveyors and interpreters. Métis populations were predominantly located north and west of Lake Superior, however, communities were located throughout Ontario (MNC n.d.; Stone and Chaput 1978:607,608). During the early nineteenth century, many Métis families moved towards locales around southern Lake Huron and Georgian Bay, including Kincardine, Owen Sound, Penetanguishene, and Parry Sound (MNC n.d.). By the mid-twentieth century, Indigenous communities, including the Métis, began to advance their rights within Ontario and across Canada, and in 1982, the Métis were federally recognized as one of the distinct Indigenous peoples

in Canada. Recent decisions by the Supreme Court of Canada (Supreme Court of Canada 2003, 2016) have reaffirmed that Métis people have full rights as one of the Indigenous people of Canada under subsection 91(24) of the Constitution Act, 1867.

1.2.2 Euro-Canadian Land Use: Township Survey and Settlement

Historically, the Study Area is located in the Former Guelph Township, County of Wellington in part of Lots 4-6, Concession 3-4.

The S & G stipulates that areas of early Euro-Canadian settlement (pioneer homesteads, isolated cabins, farmstead complexes), early wharf or dock complexes, pioneer churches, and early cemeteries are considered to have archaeological potential. Early historical transportation routes (trails, passes, roads, railways, portage routes), properties listed on a municipal register or designated under the *Ontario Heritage Act* or a federal, provincial, or municipal historic landmark or site are also considered to have archaeological potential.

For the Euro-Canadian period, the majority of early nineteenth century farmsteads (i.e., those that are arguably the most potentially significant resources and whose locations are rarely recorded on nineteenth century maps) are likely to be located in proximity to water. The development of the network of concession roads and railroads through the course of the nineteenth century frequently influenced the siting of farmsteads and businesses. Accordingly, undisturbed lands within 100 m of an early settlement road are also considered to have potential for the presence of Euro-Canadian archaeological sites.

The first Europeans to arrive in the area were transient merchants and traders from France and England, who followed Indigenous pathways and set up trading posts at strategic locations along the well-traveled river routes. All of these occupations occurred at sites that afforded both natural landfalls and convenient access, by means of the various waterways and overland trails, into the hinterlands. Early transportation routes followed existing Indigenous trails, both along the lakeshore and adjacent to various creeks and rivers (ASI, (Archaeological Services Inc.) 2006).

Guelph Township

Guelph Township is named after the Royal House of Brunswick, family of the English monarch, George IV. Guelph Township was surveyed by John MacDonald in 1830 and the land in the township was purchased by the Canada Company, which consisted of a group of British speculators who acquired more than two million acres of land in Upper Canada for colonization purposes (Mika and Mika 1981:186). A large number of settlers arrived in the township before it was surveyed. The first settler in the township was Samuel Rife, who squatted near the western limits of the township around the year 1825. Waterloo Road, formerly Broad Road, was built by Absalom Shade and was finished around 1827, the year the Town of Guelph was founded (Mika and Mika 1981:186). Many settlers arrived in the township between the years 1827 and 1830.

City of Guelph

While the present boundaries for the City of Guelph fall within the former Townships of Puslinch and Guelph, the historic community of Guelph was situated on the River Speed in Guelph Township. Guelph was founded by a novelist named John Galt, secretary to the Canada Company, in 1827. The original plan for the town depicted lots reserved for the company offices, a saw mill, a market square, two churches

and a burial ground. Registered plans of subdivision for this village date from 1847-1865. The first settlers were attracted here in the next few years. By the late 1840s, the population of Guelph had reached 1,480, and it was incorporated as a town in 1850. It was also selected as the capital of Wellington County, and it was also deemed to be an inland port of entry. The population had reached 6,878 by 1873. By April 1879, the population exceeded 10,000 and Guelph was incorporated as a city. Guelph contained a wide variety of trades and professions by the 1840s (Johnson 1977:83). By the 1870s, Guelph contained churches, banks, insurance agencies, a library, two newspapers, telegraph offices, hotels, stores, flour, saw, and planing mills, woollen factories, foundries, machinery works, sewing machine works, musical instrument manufacturers, tanneries, soap and candle factories, shoemakers, wooden ware manufacturers, and two breweries. It was a station for both the Grand Trunk and Canadian Pacific Railways. Guelph was built on a number of hills which gives it a picturesque appearance, and a number of fine heritage structures in the city were built out of native limestone (Crossby 1873:134; Rayburn 1997:145; Winearls 1991:680–684; Cameron 1967; Fischer and Harris 2007:132; Scott 1997:94–95).

Grand Trunk Railway

The Grand Trunk Railway Company (GTR) of Canada was incorporated by the Canadian government in 1852 and was planned to connect Toronto to Montreal. It began in 1853 by purchasing five existing railways: the St. Lawrence and Atlantic Railroad Company, the Quebec and Richmond Railroad Company, the Toronto and Guelph Railroad Company, the Grand Junction Railroad Company, and the Grand Trunk Railway Company of Canada East. By 1853, the Toronto and Guelph Railroad Company had already begun construction of its line. After its merge with the GTR, the line was redirected from its original route and extended to Sarnia to be a hub for Chicago bound traffic. By 1856 the line had been built from Montreal to Sarnia via Toronto. The company fell into great debt in 1861 and while it was saved from bankruptcy by the Canadian government, in 1919 the company was bankrupt following its expansion west in an attempt to compete with the Canadian Pacific and Canadian Northern Railways (Library and Archives Canada 2005).

1.2.3 Historical Map Review

The 1861 *Map of the County of Wellington* (Leslie and Wheelock 1861) and the 1877-1881 *Illustrated Historical Atlas of the Counties of Waterloo and Wellington,* Township of Guelph page (H. Parsell & Co. 1881) were examined to determine the presence of historic features within the Study Area during the nineteenth century (Figures 2 and 3).

It should be noted, however, that not all features of interest were mapped systematically in the Ontario series of historical atlases, given that they were financed by subscription, and subscribers were given preference with regard to the level of detail provided on the maps. Moreover, not every feature of interest would have been within the scope of the atlases.

In addition, the use of historical map sources to reconstruct/predict the location of former features within the modern landscape generally proceeds by using common reference points between the various sources. These sources are then geo-referenced in order to provide the most accurate determination of the location of any property on historic mapping sources. The results of such exercises are often imprecise or even contradictory, as there are numerous potential sources of error inherent in such a process, including the vagaries of map production (both past and present), the need to resolve differences of scale and resolution, and distortions introduced by reproduction of the sources. To a large degree, the significance of such margins of error is dependent on the size of the feature one is attempting to plot, the constancy of

reference points, the distances between them, and the consistency with which both they and the target feature are depicted on the period mapping.

Table 1: Nineteenth-century property owner(s) and historical features(s) within or adjacent to the Study Area

		1868		*1877-1881*	
Con #	**Lot #**	**Property Owner(s)**	**Historical Feature(s)**	**Property Owner(s)**	**Historical Feature(s)**
3	5	D. Duggan	None	Mrs. Duggan	GTR, House
	6	Jas. Lynn	None	G. H. Carter	GTR, House
4	4	Wm. Creighton	None	W. Creighton	House
	5	R. Campbell	None	Mrs. Campbell	House
	6	Mrs. Lynn	None	G. H. Carter	House

No structures are shown adjacent to the Study Area in 1861, however the 1877-1881 map indicates that a house in Lot 6, Concession 3 is within the Study Area and a house in Lot 5, Concession 3 is adjacent to the Study Area. Both maps indicate that the original alignment of Watson Road/Parkway and Eastview Road and York Road were historically surveyed roads, and illustrates the GTR its present alignment. The maps also indicate the historical town limits of Guelph to the southwest of the Study Area.

1.2.4 Twentieth-Century Mapping Review

The 1935 and 1975 National Topographic System Guelph sheets (Department of National Defence 1935; Department of Energy, Mines and Resources 1975), as well as the 1954 air photo of Guelph (University of Toronto 1954), were examined to determine the extent and nature of development and land uses within the Study Area (Figures 4-6). The 1935 map illustrates four structures within the Study Area, however this does not appear to be the same house shown in 1881 on Lot 5, Concession 3 adjacent to the GTR. The 1975 map illustrates the house within Site 3 had been constructed. A race track is indicated in the southwestern part of Site 8. The 1954 photo indicates that the Study Area remained within a rural landscape adjacent to the railway in the eastern limits of the City of Guelph into the mid twentieth-century.

A review of available Google satellite imagery since 2006 shows that the Study Area has remained within the growing suburban residential area of the eastern part of the City of Guelph. In 2006, Sites 5, 6 and 8 are shown to have been subject to topsoil stripping, heavy grading, and construction activities associated with the adjacent residential subdivisions (Figure 7).

1.3 Archaeological Context

This section provides background research pertaining to previous archaeological fieldwork conducted within and in the vicinity of the Study Area, its environmental characteristics (including drainage, soils or surficial geology and topography, etc.), and current land use and field conditions. Three sources of information were consulted to provide information about previous archaeological research: the site record forms for registered sites available online from the MTCS through “Ontario’s Past Portal”; published and unpublished documentary sources; and the files of ASI.

1.3.1 Current Land Use and Field Conditions

A Stage 1 property inspection was conducted on that noted the Study Area is located in the residential subdivision of Grangehill East in the City of Guelph, roughly bounded by Eastview Road in the north and York Road in the south, east of Starwood Drive and Watson Parkway. The Study Area is comprised of eight sites, two of which (Sites 4 and7) have been previously assessed and do not require further archaeological assessment.

Site 1 is 0.1 ha at the existing Clythe Pumping Station located north of York Road on the west side of Watson Road North, southeast of Clythe Creek. The area is surrounded by woodlot and wetland along the creek.

Site 2 is 4.51 ha located east of Watson Road and north of York Road, south of Clythe Creek. It contains woodlot and meadow on the northwest side of the railway corridor.

Site 3 is 0.39 ha located at 18 Watson Road North southeast of Site 1 and is a twentieth-century residential property northwest of the railway corridor and York Road.

Site 5 is 1.15 ha located within Joe Veroni Park, north of Fleming Road and east of Watson Parkway North. The park contains paved pathways and basketball court, as well as sand playground.

Site 6 is 2.78 ha located within Severn Drive Park, east of Severn Drive and north of Grange Road. The park contains paved pathways and basketball court, a gravel parking lot, and a sand playground and volleyball court.

Site 8 is 6.45 ha roughly bounded by Watson Parkway North, Watson Road North, and York Road. It consists of heavily graded lands with the topsoil stripped.

1.3.2 Geography

In addition to the known archaeological sites, the state of the natural environment is a helpful indicator of archaeological potential. Accordingly, a description of the physiography and soils are briefly discussed for the Study Area.

The S & G stipulates that primary water sources (lakes, rivers, streams, creeks, etc.), secondary water sources (intermittent streams and creeks, springs, marshes, swamps, etc.), ancient water sources (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, etc.), as well as accessible or inaccessible shorelines (high bluffs, swamp or marsh fields by the edge of a lake, sandbars stretching into marsh, etc.) are characteristics that indicate archaeological potential.

Water has been identified as the major determinant of site selection and the presence of potable water is the single most important resource necessary for any extended human occupation or settlement. Since water sources have remained relatively stable in Ontario since 5,000 BP (Karrow and Warner 1990:Figure 2.16), proximity to water can be regarded as a useful index for the evaluation of archaeological site potential. Indeed, distance from water has been one of the most commonly used variables for predictive modeling of site location.

Other geographic characteristics that can indicate archaeological potential include: elevated topography (eskers, drumlins, large knolls, and plateaux), pockets of well-drained sandy soil, especially near areas of heavy soil or rocky ground, distinctive land formations that might have been special or spiritual places, such as waterfalls, rock outcrops, caverns, mounds, and promontories and their bases. There may be physical indicators of their use, such as burials, structures, offerings, rock paintings or carvings. Resource areas, including; food or medicinal plants (migratory routes, spawning areas) are also considered characteristics that indicate archaeological potential (S & G, Section 1.3.1).

The study area is situated within the Guelph Drumlin Field physiographic region of southern Ontario in a former spillway (Chapman and Putnam 1984) (Figure 7). The Guelph Drumlin Field physiographic region (Chapman and Putnam 1984: 137-139) centres upon the City of Guelph and Guelph Township and occupies roughly 830 km^2. Within the Guelph Drumlin Field, there are approximately 300 drumlins of varying sizes. For the most part these hills are of the broad oval type with slopes less steep than those of the Peterborough drumlins and are not as closely grouped as those in some other areas. The till in these drumlins is loamy and calcareous, and was derived mostly from dolostone of the Amabel Formation that can be found exposed below the Niagara Escarpment. Spillways are the former glacial meltwater channels. They are often found in association with moraines but in opposition are entrenched rather than elevated landforms. They are often, though not always, occupied by stream courses, the fact of which raises the debate of their glacial origin. Spillways are typically broad troughs floored wholly or in part by gravel beds and are typically vegetated by cedar swamps in the lowest beds (Chapman and Putnam 1984:15).

Figure 8 depicts surficial geology for the Study Area. The surficial geology mapping demonstrates that the Study Area is underlain by till, organic deposits of peat and muck, ice-contact stratified deposits of sand and gravel, Paleozoic bedrock, and modern alluvial deposits (Ontario Geological Survey 2010). Soils in the Study Area consist of Guelph loam and Burford loam, both grey-brown podzolic soils with good drainage (Figure 9).

The Study Area is within the Clythe Creek Subwatershed, including Hadati Creek in the northwestern part of the Study area. This subwatershed drains a portion of the northeast corners of the City of Guelph and adjacent township lands. Clythe Creek is considered a cold water system with a band of wetland vegetation found along its length (City of Guelph 1997). Wetlands associated with the Clythe Creek system border the study area on the north and east. The subwatershed is part of the larger Eramosa River-Speed River watershed, which are major tributaries in the north-east part of the Grand River watershed. Historically, the Grand River has been utilized as a navigable waterway, as a power source (such power sites served as settlement nuclei), and above Brantford as a course for driving logs (Chapman and Putnam 1984:98). It is also the focus of the Haldimand Tract; Joseph Brant was awarded six miles (10 km) on either side of the river (Johnston 1964:35–38; Lytwyn 2005). The Grand River (and its tributaries the Nith, Conestogo, Speed and Eramosa Rivers) was designated as a Canadian Heritage River in 1994 for its cultural history and recreation (Canadian Heritage Rivers System 2016).

1.3.3 Previous Archaeological Research

In Ontario, information concerning archaeological sites is stored in the Ontario Archaeological Sites Database (OASD) maintained by the MTCS. This database contains archaeological sites registered within the Borden system. Under the Borden system, Canada has been divided into grid blocks based on latitude and longitude. A Borden block is approximately 13 km east to west, and approximately 18.5 km north to

south. Each Borden block is referenced by a four-letter designator, and sites within a block are numbered sequentially as they are found. The Study Area under review is located in Borden block *AjHb*.

According to the OASD, nine previously registered archaeological sites are located within one kilometre of the Study Area (Ministry of Tourism, Culture and Sport 2016). A summary of the sites is provided below.

Table 2: List of previously registered sites within one kilometre of the Study Area

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AjHb-49	Fabio	Middle Archaic	Findspot	Parker 2001
AjHb-50	Simon-Wood	Late Archaic	Findspot	Parker 2001
AjHb-51	Carter	Euro-Canadian	Homestead	Parker 2001
AjHb-52	*N/A*	*Indigenous Pre-Contact*	*Findspot*	*Archeoworks 2002*
AjHb-53	*N/A*	*Late Archaic*	*Findspot*	*Archeoworks 2002*
AjHb-54	N/A	Euro-Canadian	Homestead	*Archeoworks* 2002
AjHb-55	*Creighton*	*Euro-Canadian; Indigenous Pre-Contact*	*Homestead; Findspot*	*Archeoworks 2002*
AjHb-72	Murphy	Euro-Canadian	Homestead	Parker 2006; MTCS 2006
AjHb-80	Guelph Grangehill	Euro-Canadian	Agricultural, unknown	TLA 2008

Sites in *italics* are within 50m of the Study Area
TLA – This Land Archaeology Inc.

According to the OASD, the Creighton site (AjHb-55) is within 50 metres of the areas previously assessed by ASI as part of Site 4 which does not require further archaeological survey.

According to the background research, four previous reports detail fieldwork within 50 m of the Study Area.

ASI (2013a, 2013b) conducted Stage 1 and Stage 2 archaeological assessments for the previous Clythe Station Treatment, Storage and Pumping Class Environmental Assessment in the City of Guelph. This EA was never completed. The project involved returning the Clythe Well to service, relocating the inter-zone pumping boundary and providing additional pumping and storage capacity to meet identified needs. The Clythe water well has not been in operation since 1999, due to issues with aesthetic water quality. The Stage 1 property inspection determined that three previously identified archaeological sites were within 50 metres of the study area and that while portions of the study area retain archaeological potential, the majority of lands do not exhibit archaeological potential due to deep and extensive disturbance and permanently low and wet conditions. The assessment consisted of the lands within the current Study Area Sites 4 and 7. The Stage 2 survey was conducted by test pit survey at five metre intervals on all lands within the Stage 2 study area that were identified as having archaeological potential. No archaeological resources were identified and Sites 4 and 7 were considered clear of further archaeological concern.

Detritus Consulting Limited (2016) conducted a Stage 1-2 archaeological assessment of the property at 78 Starwood Drive on Part of Lot 4, Concession 3 Div C, south of Starwood Drive and west of Watson

Parkway North. The Stage 2 consisted of pedestrian survey at five metre intervals, however no archaeological material was recovered and the site was considered clear of further archaeological concern.

Parker Archaeological Consulting (PAC) (2001) conducted an archaeological assessment ahead of the proposed subdivision 23T-98501 on part of Lot 6, Concession 3 and Lot 6, Concession 4, Division C. The study area was within undeveloped land roughly between Eastview Road and York Road on the northeast side of Watson Road/Parkway. The survey consisted of test pitting and screening through six millimetre mesh or pedestrian survey, both at five metre intervals, excluding areas that were low and wet along the Clythe Creek, or designated "no-impact" wetlands. Three archaeological sites were identified: AjHb-49, AjHb-50 and AjHb-51, none of which are within 50 metres of the current Study Area.

2.0 FIELD METHODS: PROPERTY INSPECTION

A Stage 1 property inspection must adhere to the S & G, Section 1.2, Standards 1-6, which are discussed below. The entire property and its periphery must be inspected. The inspection may be either systematic or random. Coverage must be sufficient to identify the presence or absence of any features of archaeological potential. The inspection must be conducted when weather conditions permit good visibility of land features. Natural landforms and watercourses are to be confirmed if previously identified. Additional features such as elevated topography, relic water channels, glacial shorelines, well-drained soils within heavy soils and slightly elevated areas within low and wet areas should be identified and documented, if present. Features affecting assessment strategies should be identified and documented such as woodlots, bogs or other permanently wet areas, areas of steeper grade than indicated on topographic mapping, areas of overgrown vegetation, areas of heavy soil, and recent land disturbance such as grading, fill deposits and vegetation clearing. The inspection should also identify and document structures and built features that will affect assessment strategies, such as heritage structures or landscapes, cairns, monuments or plaques, and cemeteries.

The Stage 1 archaeological assessment property inspection was conducted under the field direction of Peter Carruthers (P163) of ASI, on August 23, 2017, in order to gain first-hand knowledge of the geography, topography, and current conditions and to evaluate and map archaeological potential of the Study Area. It was a visual inspection only and did not include excavation or collection of archaeological resources. Fieldwork was only conducted when weather conditions were deemed suitable, per S & G Section 2. Previously identified features of archaeological potential were examined; additional features of archaeological potential not visible on mapping were identified and documented as well as any features that will affect assessment strategies. Field observations are compiled onto the existing conditions of the Study Area in Section 7.0 (Figures 11-14) and associated photographic plates are presented in Section 8.0 (Plates 1-9).

3.0 ANALYSIS AND CONCLUSIONS

The historical and archaeological contexts have been analyzed to help determine the archaeological potential of the Study Area. These data are presented below in Section 3.1. Results of the analysis of the Study Area property inspection are presented in Section 3.2.

3.1 Analysis of Archaeological Potential

The S & G, Section 1.3.1, lists criteria that are indicative of archaeological potential. The Study Area meets the following criteria indicative of archaeological potential:

- Previously identified archaeological sites (see Table 2);
- Water sources: primary, secondary, or past water source (Clythe Creek, Hadati Creek, Eramosa River);
- Early historic transportation routes (GTR, Watson Road/Parkway, York Road, Eastview Road);
- Proximity to early settlements (Guelph); and
- Well-drained soils (Guelph loam, Burford loam)

According to the S & G, Section 1.4 Standard 1e, no areas within a property containing locations listed or designated by a municipality can be recommended for exemption from further assessment unless the area can be documented as disturbed. The Municipal Register of Cultural Heritage Properties was consulted and no properties within the Study Area are Listed or Designated under the Ontario Heritage Act.

These criteria are indicative of potential for the identification of Indigenous and Euro-Canadian archaeological resources, depending on soil conditions and the degree to which soils have been subject to deep disturbance.

3.2 Analysis of Property Inspection Results

Proposed Sites 2, 4, 5, 6, and 7 have been previously assessed under a Stage 1 by ASI or PAC and do not require further archaeological assessment (Figures 11-14: areas highlighted in pink, purple, and orange).

The property inspection determined that part of proposed Sites 1 and 3 exhibit archaeological potential in (Plates 1-3; Figure 12: areas highlighted in green). These areas will require Stage 2 archaeological assessment by test pit survey at five metre intervals prior to any development. According to the S & G Section 2.1.2, test pit survey is required on terrain where ploughing is not viable, such as wooded areas, properties where existing landscaping or infrastructure would be damaged, overgrown farmland with heavy brush or rocky pasture, and narrow linear corridors up to 10 metres wide.

The remainder of the Study Area has been subjected to deep soil disturbance events (including all of proposed 8 and parts of Sites 1 and 3) and according to the S & G Section 1.3.2 do not retain archaeological potential (Plates 1-9; Figure 12: areas highlighted in yellow). These areas do not require further survey.

3.3 Conclusions

The Stage 1 background study determined that nine previously registered archaeological sites are located within one kilometre of the Study Area. The property inspection determined that parts of the Study Area in proposed Sites 1-3, and 5 exhibit archaeological potential and will require Stage 2 assessment.

4.0 RECOMMENDATIONS

In light of these results, the following recommendations are made:

1. Parts of Sites 1 and 3 exhibit archaeological potential. These lands require Stage 2 archaeological assessment by test pit survey at five metre intervals prior to any proposed impacts to the property;

2. Sites 2, 4, 5, 6, and 7 have been previously assessed and do not require further archaeological assessment;

3. The remainder of the Study Area does not retain archaeological potential on account of deep and extensive land disturbance and does not require further archaeological assessment; and,

4. Should the proposed work extend beyond the current Study Area, further Stage 1 archaeological assessment should be conducted to determine the archaeological potential of the surrounding lands.

NOTWITHSTANDING the results and recommendations presented in this study, ASI notes that no archaeological assessment, no matter how thorough or carefully completed, can necessarily predict, account for, or identify every form of isolated or deeply buried archaeological deposit. In the event that archaeological remains are found during subsequent construction activities, the consultant archaeologist, approval authority, and the Cultural Programs Unit of the MTCS should be immediately notified.

5.0 ADVICE ON COMPLIANCE WITH LEGISLATION

ASI also advises compliance with the following legislation:

- This report is submitted to the Minister of Tourism, Culture and Sport as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, RSO 1990, c 0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological field work and report recommendations ensure the conservation, preservation and protection of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Tourism, Culture and Sport, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

- It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed archaeological field work on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeology Reports referred to in Section 65.1 of the *Ontario Heritage Act.*

- Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with sec. 48 (1) of the *Ontario Heritage Act*.

- The *Cemeteries Act*, R.S.O. 1990 c. C.4 and the *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 (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.

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7.0 MAPS

Figure 1: Clythe Station Treatment and Pumping Station - Location of the Study Area

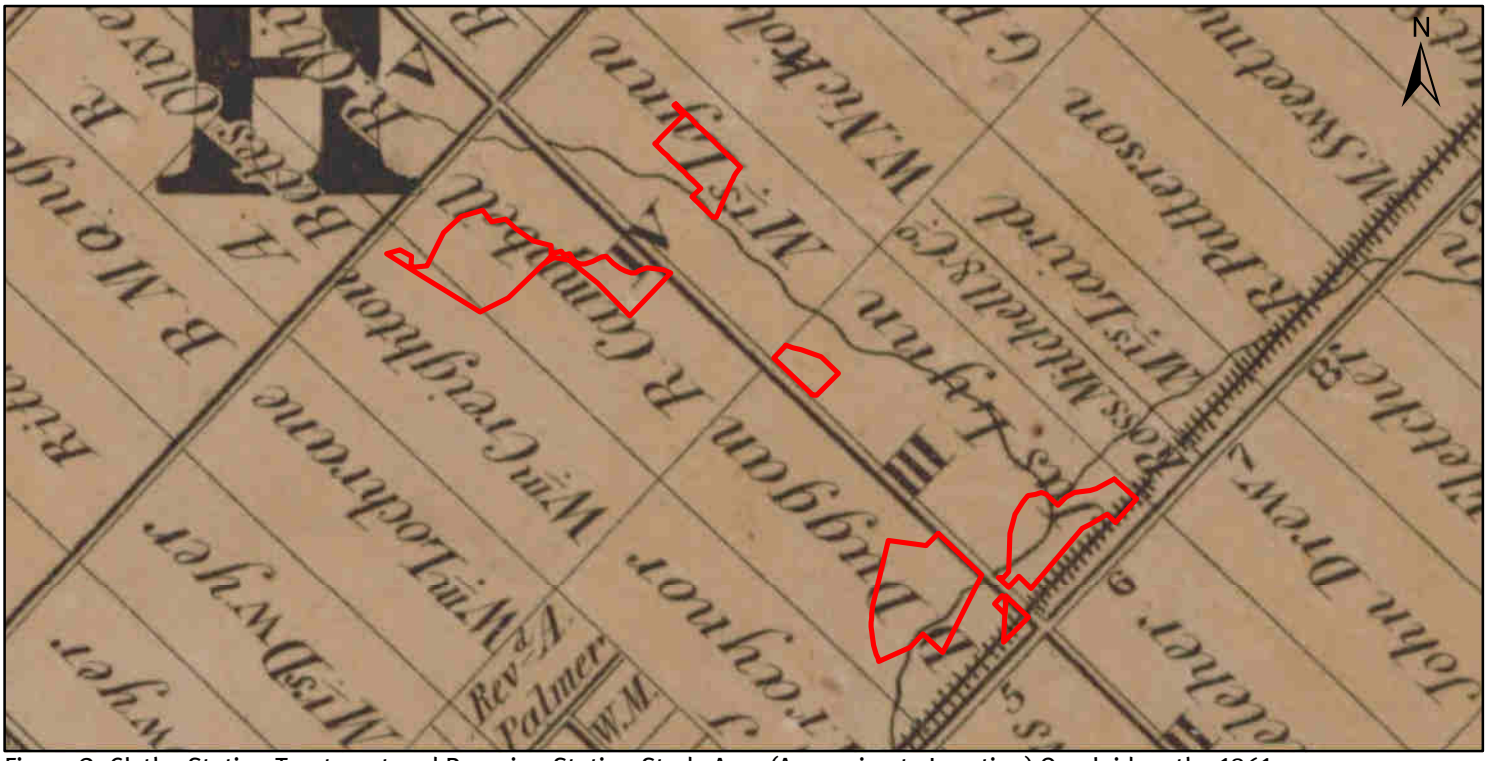

Figure 2: Clythe Station Treatment and Pumping Station Study Area (Approximate Location) Overlaid on the 1861 Map of the County of Wellington

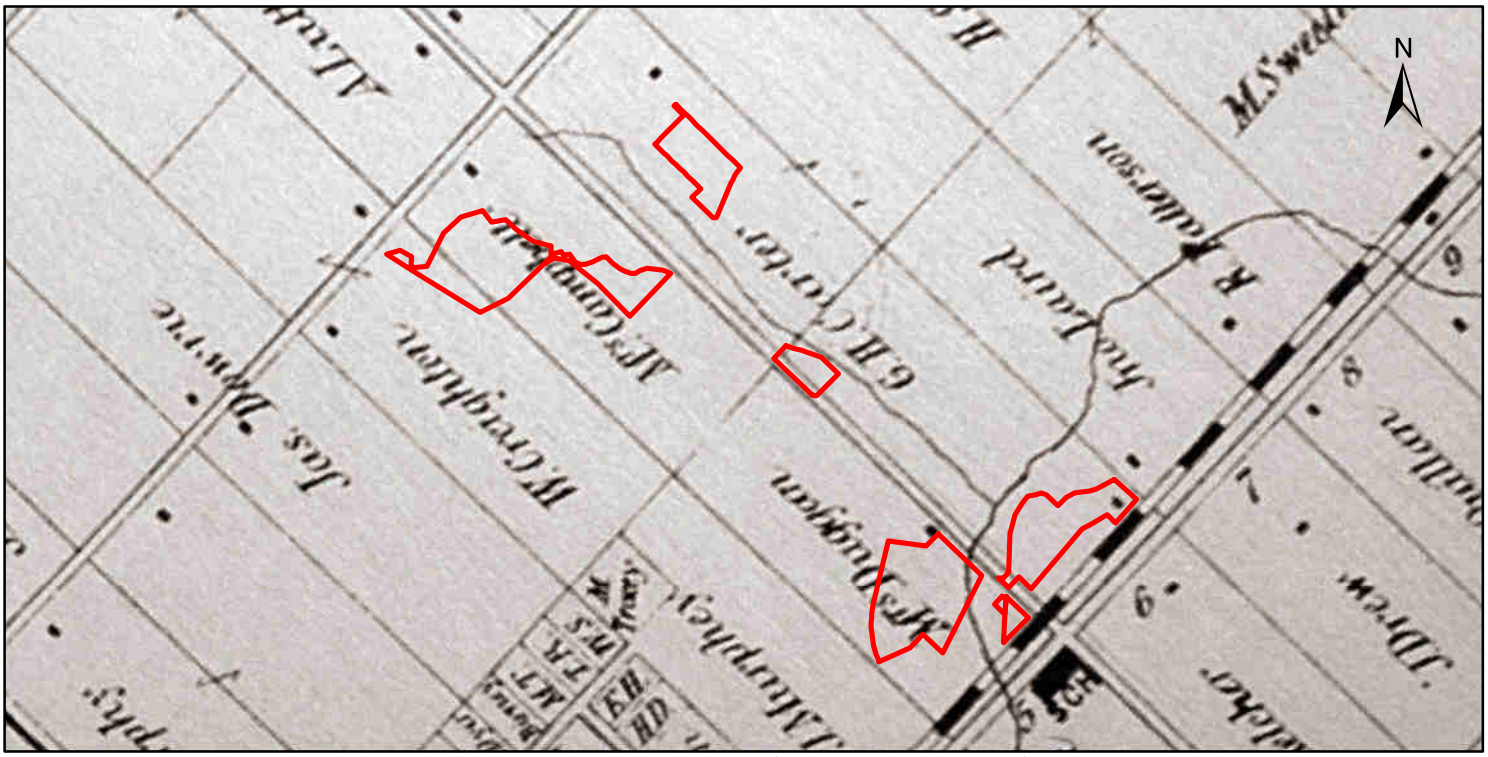

Figure 3: Clythe Station Treatment and Pumping Station Study Area (Approximate Location) Overlaid on the 1881 Illustrated Historical Atlas of the Township of Guelph

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528 Bathurst Street Toronto, ONTARIO M5S 2P9
416-966-1069 | F416-966-9723 | asiheritage.ca

Study Area

0 500
Metres

ASI PROJECT NO.: 17EA-090
DATE: 16-Aug-17

DRAWN BY: BW
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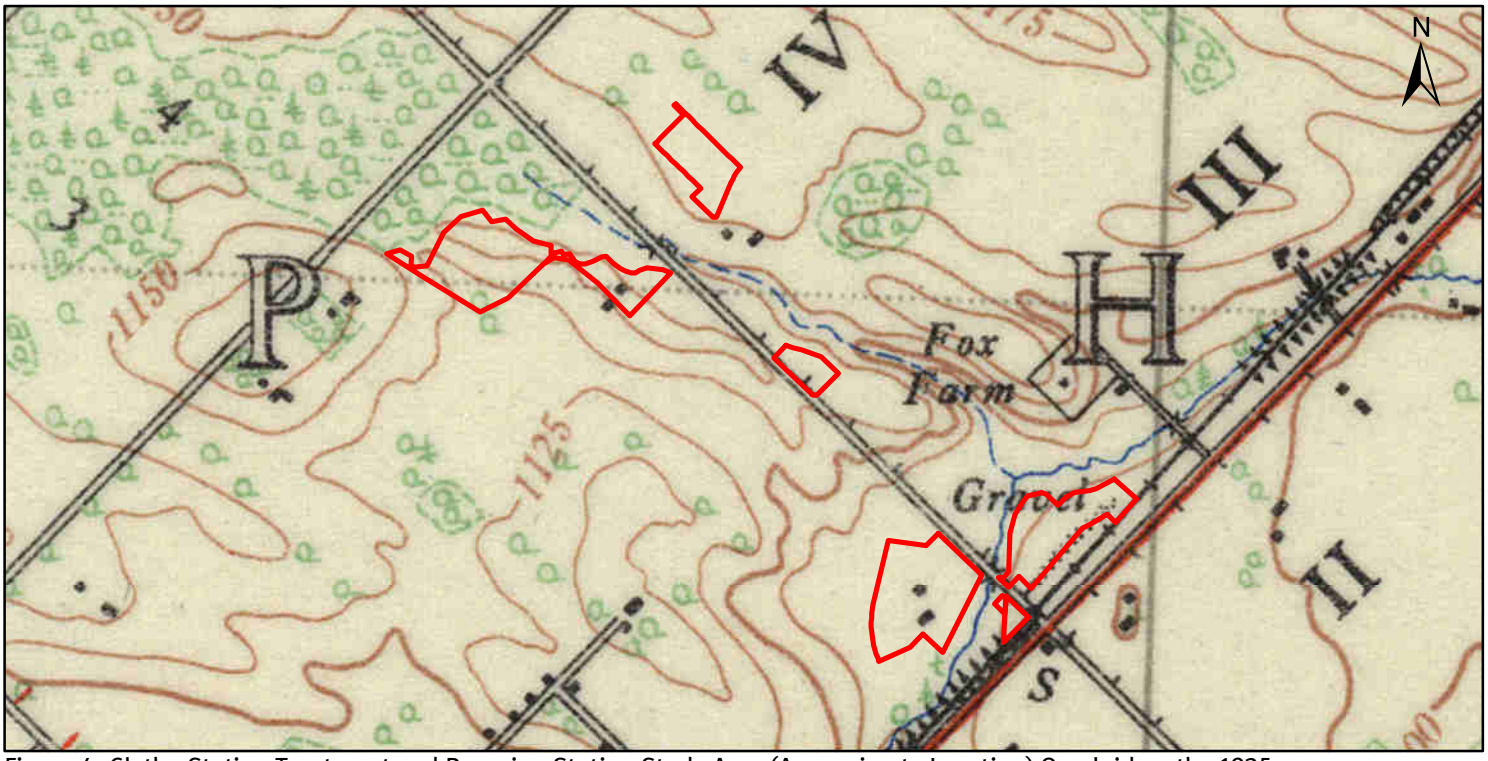

Figure 4: Clythe Station Treatment and Pumping Station Study Area (Approximate Location) Overlaid on the 1935 National Topographic System Guelph Sheet

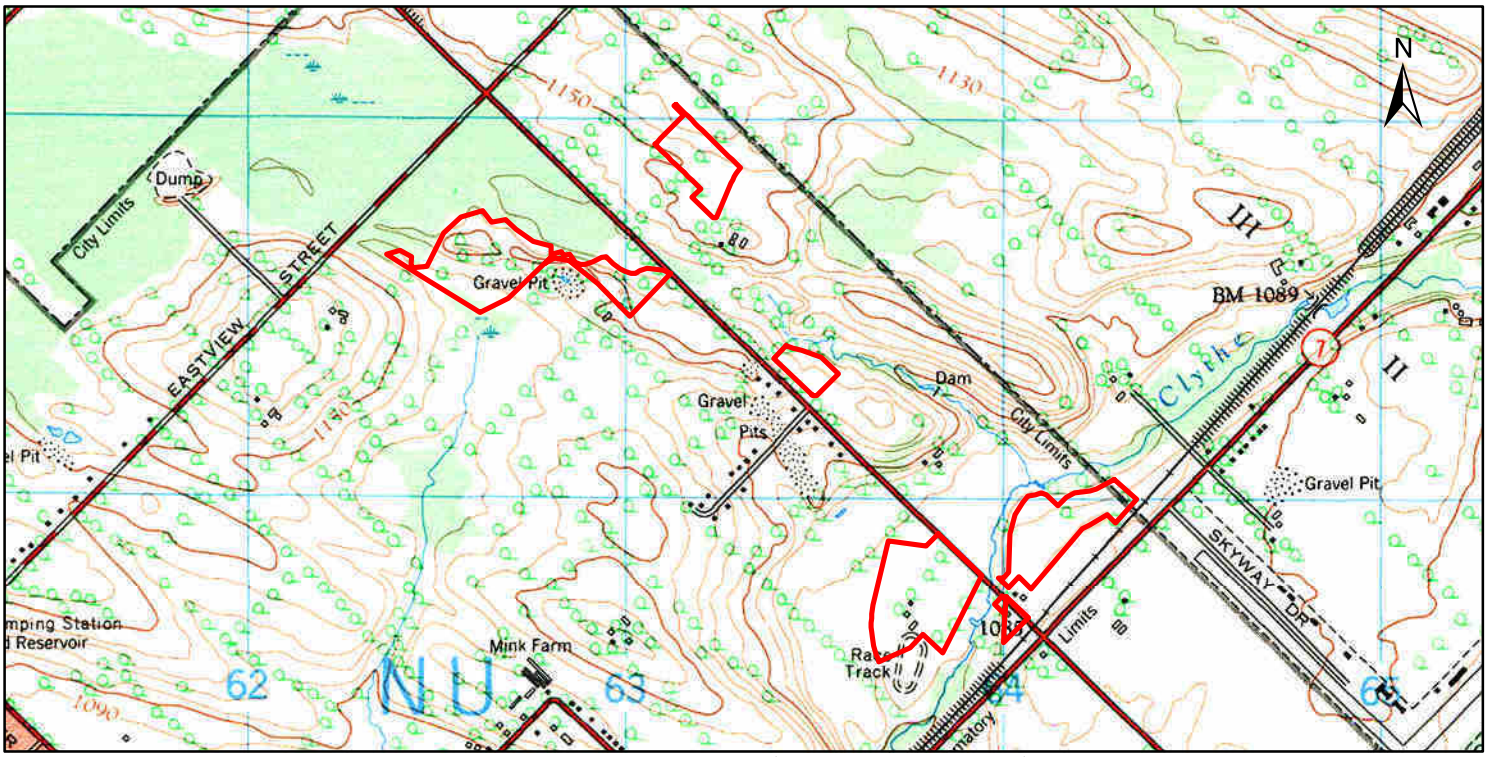

Figure 5: Clythe Station Treatment and Pumping Station Study Area (Approximate Location) Overlaid on the 1975 National Topographic System Guelph Sheet

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Study Area

0 500
Metres

ASI PROJECT NO.: 17EA-090
DATE: 31-Aug-17

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Study Area

0 500
Metres

ASI PROJECT NO.: 17EA-090
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Figure 6: Clythe Station Treatment and Pumping Station Study Area (Approximate Location) Overlaid on the 1954 Air Photo of Guelph

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ASI PROJECT NO.: 17EA-090
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Figure 7: Clythe Station Treatment and Pumping Station Study Area Overlaid on 2006 Google Imagery

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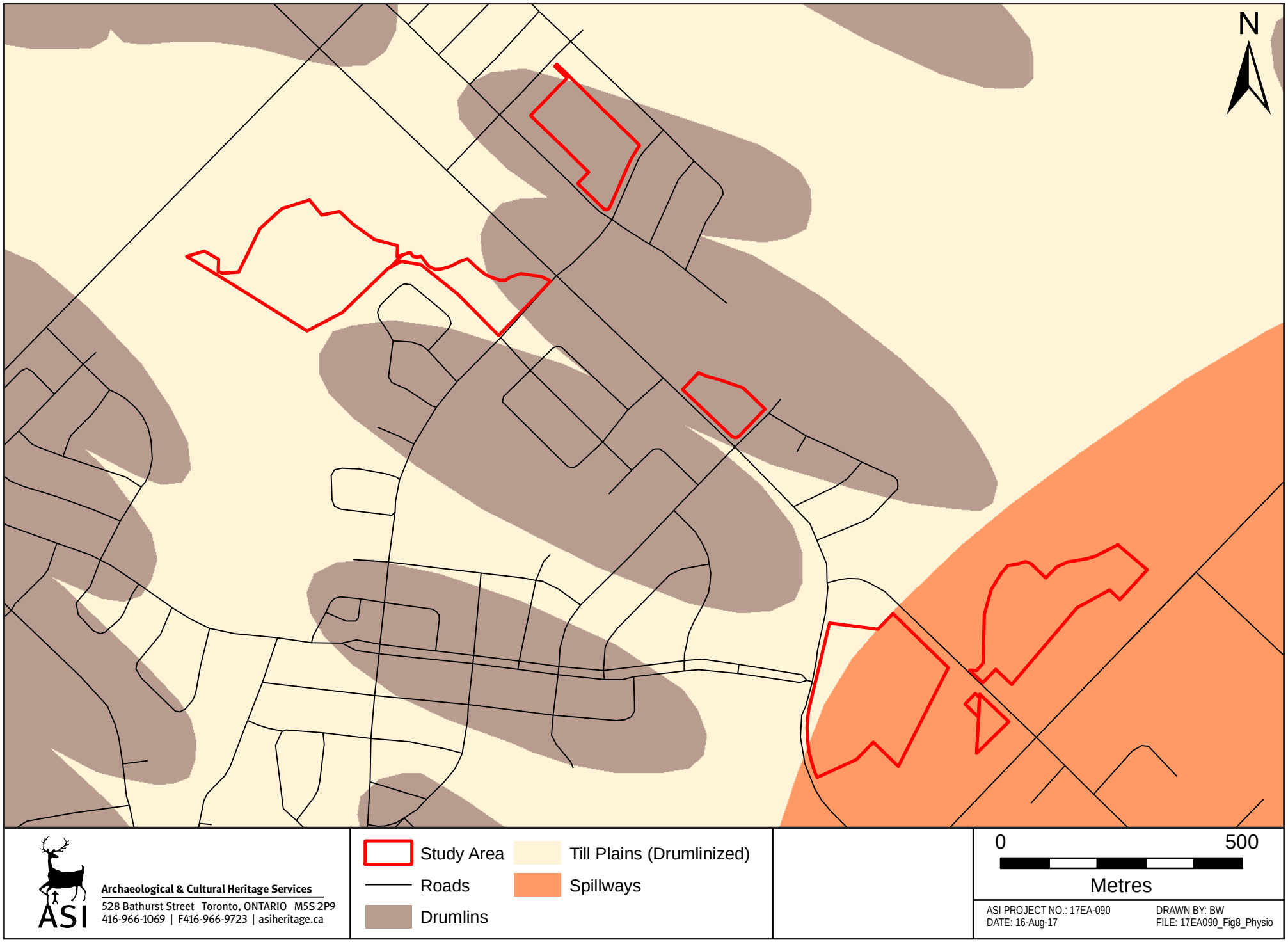

Figure 8: Clythe Station Treatment and Pumping Station Study Area - Physiographic Landforms

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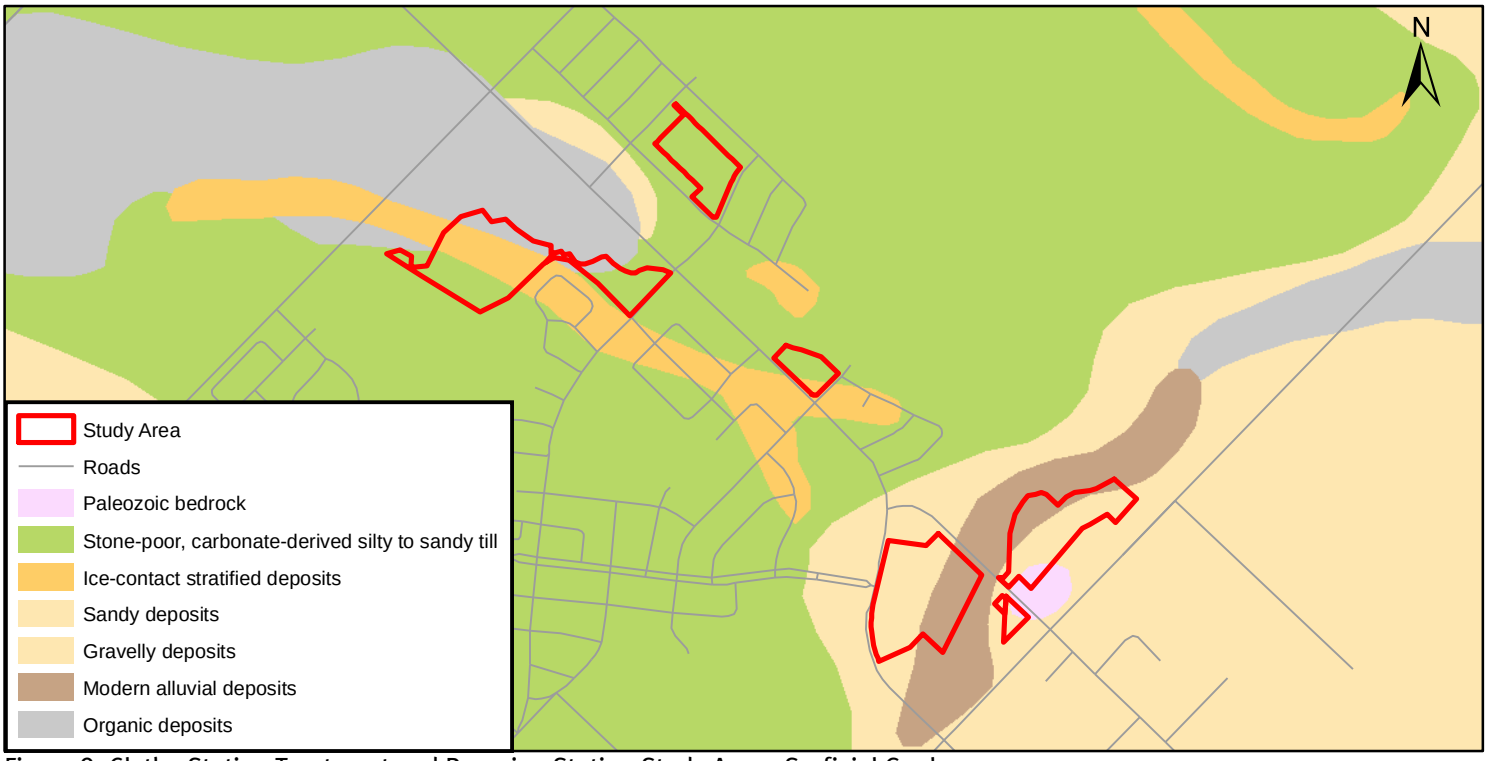

Figure 9: Clythe Station Treatment and Pumping Station Study Area - Surficial Geology

Figure 10: Clythe Station Treatment and Pumping Station Study Area - Soil Drainage

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0 500
Metres

ASI PROJECT NO.: 17EA-090
DATE: 29-Aug-17
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Study Area
Previously assessed (ASI 2013a)
Parcel Data
Previously assessed (ASI 2013b)
Roads

BASE:
Ortho
Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

0 50
Metres

ASI PROJECT NO.: 17EA-090
DATE: 27-Jul-17
DRAWN BY: BW
FILE: 17EA090_S2_Wetland

Figure 11: Clythe Station Treatment and Pumping Station Study Area - Results of the Property Inspection (Sites 4 and 7)

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Study Area
Photo Plate
Disturbed - No Stage 2 Required
Previously Assessed (Parker 2001) - No Stage 2 Required
Potential - Stage 2 Test Pit Survey Required

BASE:
Ortho
Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

0 100
Metres

ASI PROJECT NO.: 17EA-090
DATE: 2017-08-30
DRAWN BY: BW/AB
FILE: 17EA090_Fig12_Stg1

Figure 12: Clythe Station Treatment and Pumping Station Study Area - Results of the Property Inspection (Sites 1, 2, 3, & 8)

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416-966-1069 | F416-966-9723 | asiheritage.ca

Study Area

Previously Assessed (Parker 2001) - No Stage 2 Required

BASE:
Ortho
Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

0 50
Metres

ASI PROJECT NO.: 17EA-090
DATE: 2017-08-30

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FILE: 17EA090_Fig13_Stg1

Figure 13: Clythe Station Treatment and Pumping Station Study Area - Results of the Property Inspection (Site 6)

Archaeological & Cultural Heritage Services
528 Bathurst Street Toronto, ONTARIO M5S 2P9
416-966-1069 | F416-966-9723 | asiheritage.ca

Study Area
Previously Assessed (Parker 2001) - No Stage 2 Required

BASE:
Ortho
Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

0 50
Metres

ASI PROJECT NO.: 17EA-090
DATE: 2017-08-30
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FILE: 17EA090_Fig14_Stg1

Figure 14: Clythe Station Treatment and Pumping Station Study Area - Results of the Property Inspection (Site 5)

8.0 IMAGES

Plate 1: West view of Site 3; Area beyond disturbed structures and driveway exhibits potential, requires Stage 2 survey

Plate 2: West view of Site 3; Area exhibits potential, requires Stage 2 survey

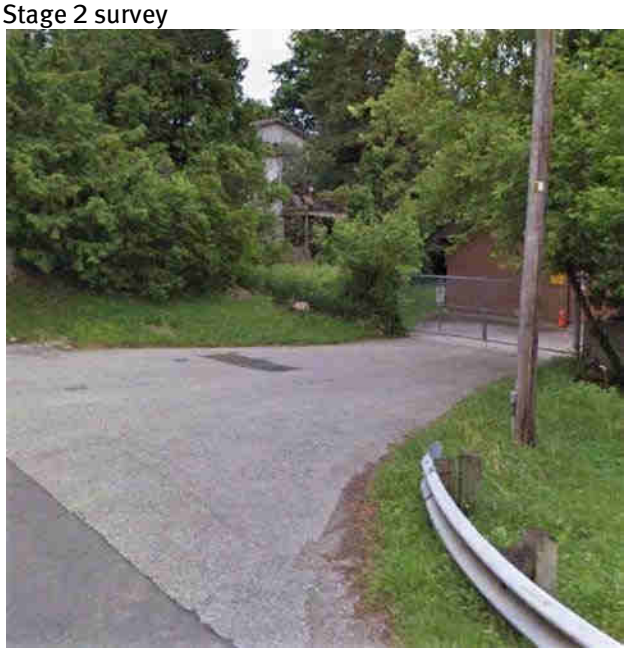

Plate 3: South view of Site 1; Area exhibits potential, requires Stage 2 survey

Plate 4: Northwest view of Site 8; Area is disturbed no Stage 2 survey required

Plate 5: Northeast view of Site 8; Area is disturbed no Stage 2 survey required

Plate 6: Southeast view of Site 8; Area is disturbed no Stage 2 survey required

Plate 7: Southwest view of Site 8; Area is disturbed no Stage 2 survey required

Plate 8: West view of Site 8; Area is disturbed no Stage 2 survey required

Plate 9: Northwest view of Site 8; Area is disturbed no Stage 2 survey required