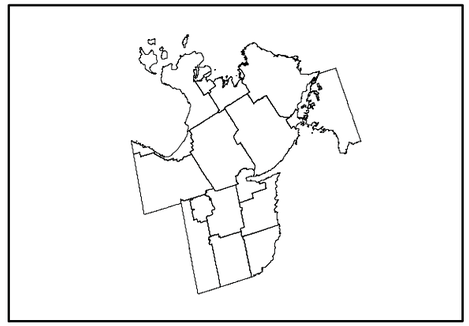
APPENDIX A-1: GENERAL BACKGROUND INFORMATION AND FIGURES

Figure 1.3.1
Project Study Area
(Simcoe County Official Plan-Adopted 2008)



Legend

- Water Courses
- Railway Active
- Railway Non-Active
- Provincial Highway
- County Road
- Niagara Escarpment Plan Boundary
- Oak Ridges Moraine Area
- Settlement Areas
- Municipal Border

1:400,000

0 3.75 7.5 15 Kilometers

N
W E
S

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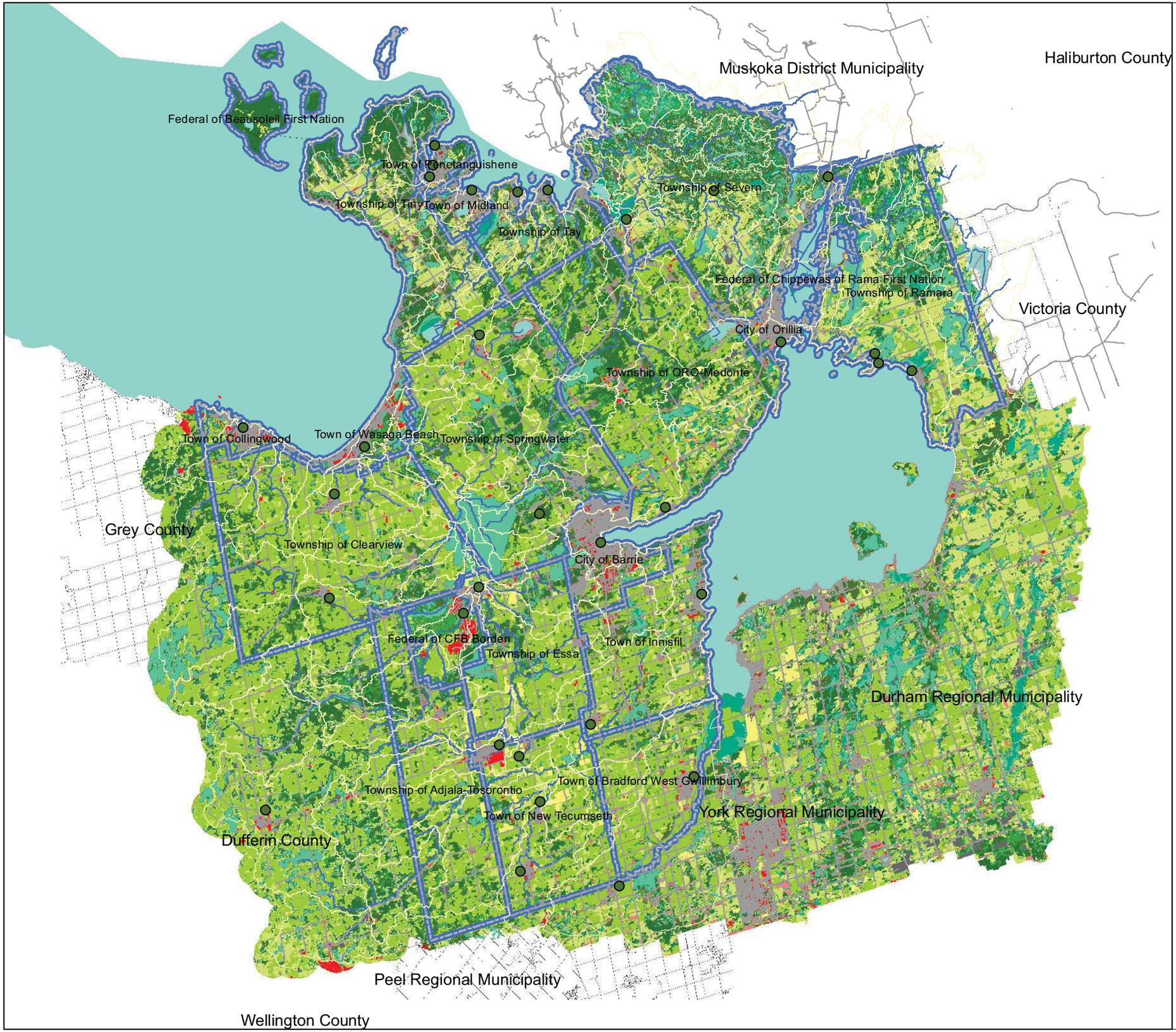
Figure 2.1.1
County of Simcoe
Existing Landuse



N

Legend

- Point Source
- Stream
- Municipal Border
- Catchments

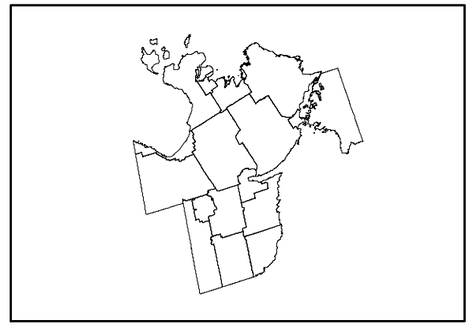
Landuse

- Water
- LID
- HID
- Pasture
- Row Crops
- Coniferous Woodland
- Mixed Woodland
- Deciduous Woodland
- Woody Wetland
- Emergent Wetland
- Quarries
- Transitional
- Sod Farm
- Roads

1:450,000

0 5,000 10,000 20,000 30,000 40,000 Meters

Figure 3.1.1
County of Simcoe Natural Heritage Features (Simcoe County Official Plan-Adopted 2008)



Legend

- Water Courses
- Railway Active
- Railway Non-Active
- Provincial Highway
- County Road
- Niagara Escarpment Plan Boundary
- Oak Ridges Moraine Area
- Provincially Significant Wetland
- Locally Significant Wetland
- Marsh
- Provincial ANSI
- Regional ANSI
- Settlement Areas
- Municipal Border

1:400,000

0 3.75 7.5 15 Kilometers

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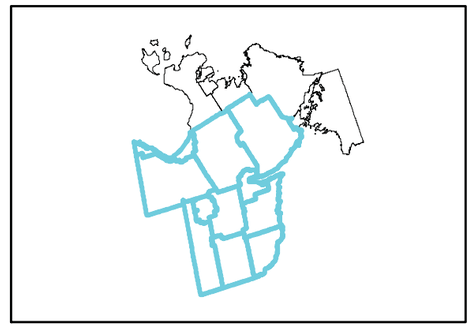
N W E S

Figure 3.1.2
County of Simcoe
Niagara Escarpment Plan and Oak Ridges Moraine Areas



Legend

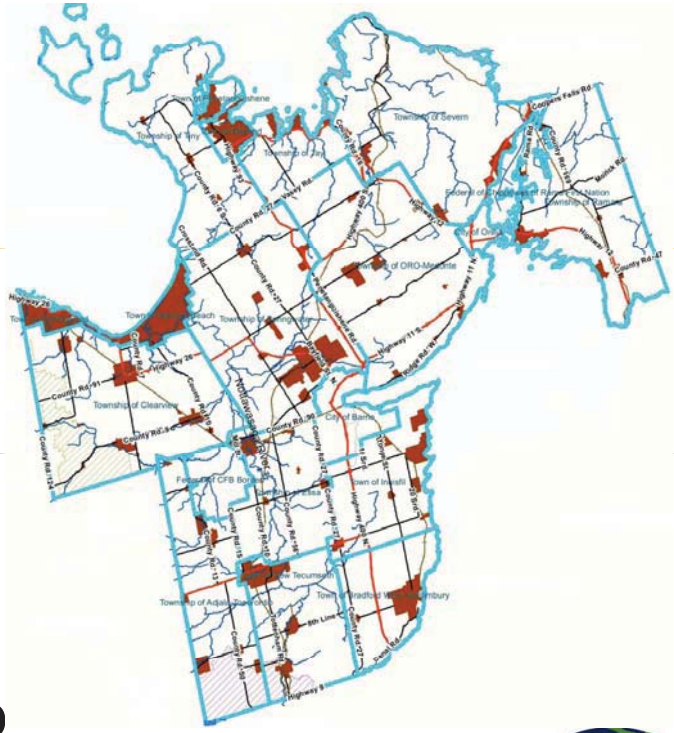
- Water Courses
- Railway Active
- Railway Non-Active
- Provincial Highway
- County Road
- Niagara Escarpment Plan Boundary
- Oak Ridges Moraine Area
- Settlement Areas
- Municipal Border

1:300,000

0 2.5 5 10 Kilometers

County of Simcoe Water and Wastewater Visioning Strategy

Overview of Background Information Brief and Servicing Gap Analysis



Presentation to County CAO's Group (January 19th , 2010)

GREENLAND® Group of Companies
"An Engineering and Technologies Enterprise"
www.grnland.com

Presentation Outline

PART 'A' - Background

- County Council Resolution CCW-007-09 (Adopted December 2009)
- Project Goal, Objectives, and County - Greenland Staffs Responsibilities
- Study Area and Completed Data Collection / Background Information Process
- Overview of County Official Plan Population and Employment
- Overview of Septage and Leachate Systems Summaries
- Examples of Completed Servicing Gap Analyses (Adjala-Tosorontio and Essa)
- In-kind Contributions (CANWET™ and Concurrent U.S. / Mexico Initiative)

PART 'B' – Opportunities and Constraints

- Septage and Leachate Systems
- Examples of Completed Level '1' Approach (Clearview and Ramara)
- Level '2' Approach (Innisfil and Growth Areas) – For Consideration

• With the development of recent Provincial planning policies by the Ontario Government, the County of Simcoe is facing intense growth pressures.

• Forecasts from both the public and the private sectors identify Simcoe County as one of the key areas for planned employment and population growth opportunities.

• Demand for growth also presents opportunities for the County to enhance the area's future prosperity with long term sustainable employment and an opportunity for residents to live, work and play in well planned communities based on sound and sustainable solutions.

In response to this vision, County Council adopted **Resolution CCW-007-09** at the December 2009 general meeting in order to complete a County-wide water and wastewater visionary strategy:

THAT County staff, in consultation with the staff of the member municipalities, the separated cities, neighbouring municipalities, first nation partners and the development community, be required to prepare a report on the existing water and wastewater system requirements, agreements and plans (including septage and leachate), as well as analysis of the current and potential delivery matrix & options with respect to long term solutions regarding co-ordination of this service delivery;

AND THAT the Provincial and Federal governments and the assistance of an outside engineering consulting firm be utilized to accomplish this task.

To address Simcoe County Resolution CCW-007-09, and to provide current information that would assist potential/future infrastructure strategies to be initiated by the Province, the County retained the Greenland Group to complete the primary project goal, namely:

•To prepare a Servicing Gap Analysis that assesses existing water and wastewater system requirements for all County member municipalities, the separated cities, and federal lands within Simcoe County.

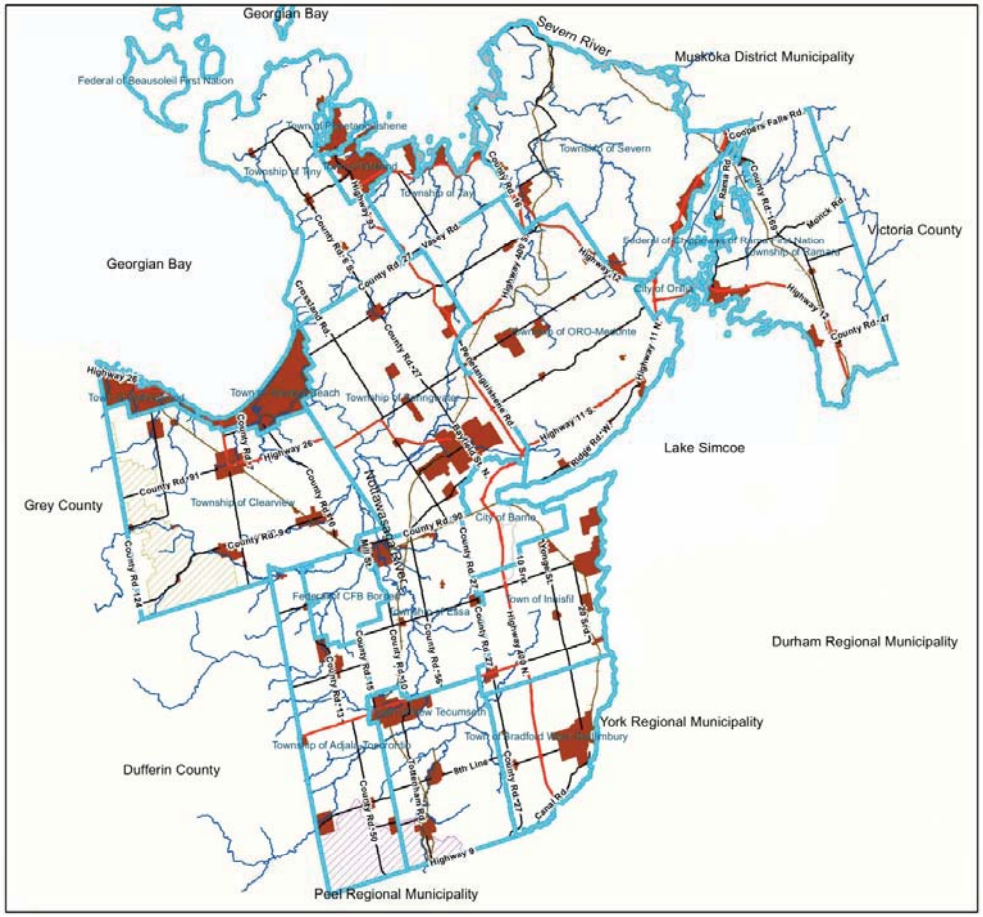
Greenland interpreted that the **primary goal** could be achieved through the completion of the following document **objectives**:

1) Assess the existing water and wastewater system capacities with respect to servicing existing and proposed population growth identified in the County of Simcoe adopted 2008 Official Plan (No other land use changes were considered);

2) Compile a general review of existing environmental (natural, socio-economic) conditions for the County of Simcoe and utilizing available/local science; and,

3) Based on Greenland's assessment and review of the above 2 objectives, prepare individual summaries of water and wastewater servicing opportunities and constraints and which should also consider baseline condition results from *Greenland's technology in-kind* (CANWET™) provided during the project.

Study Area


Georgian Bay
Severn River
Muskoka District Municipality
Federal of Beausoleil First Nation
Victoria County
Georgian Bay
Lake Simcoe
Grey County
Durham Regional Municipality
York Regional Municipality
Dufferin County
Peel Regional Municipality
Project Study Area
Simcoe County Official Plan - Adopted 2008
Legend
Water Courses
Railway Active
Railway Non-Active
Provincial Highway
County Road
Niagara Escarpment Plan Boundary
Oak Ridges Moraine Area
Settlement Areas
Municipal Border
1:400,000
0 3.75 7.5 15 Kilometers
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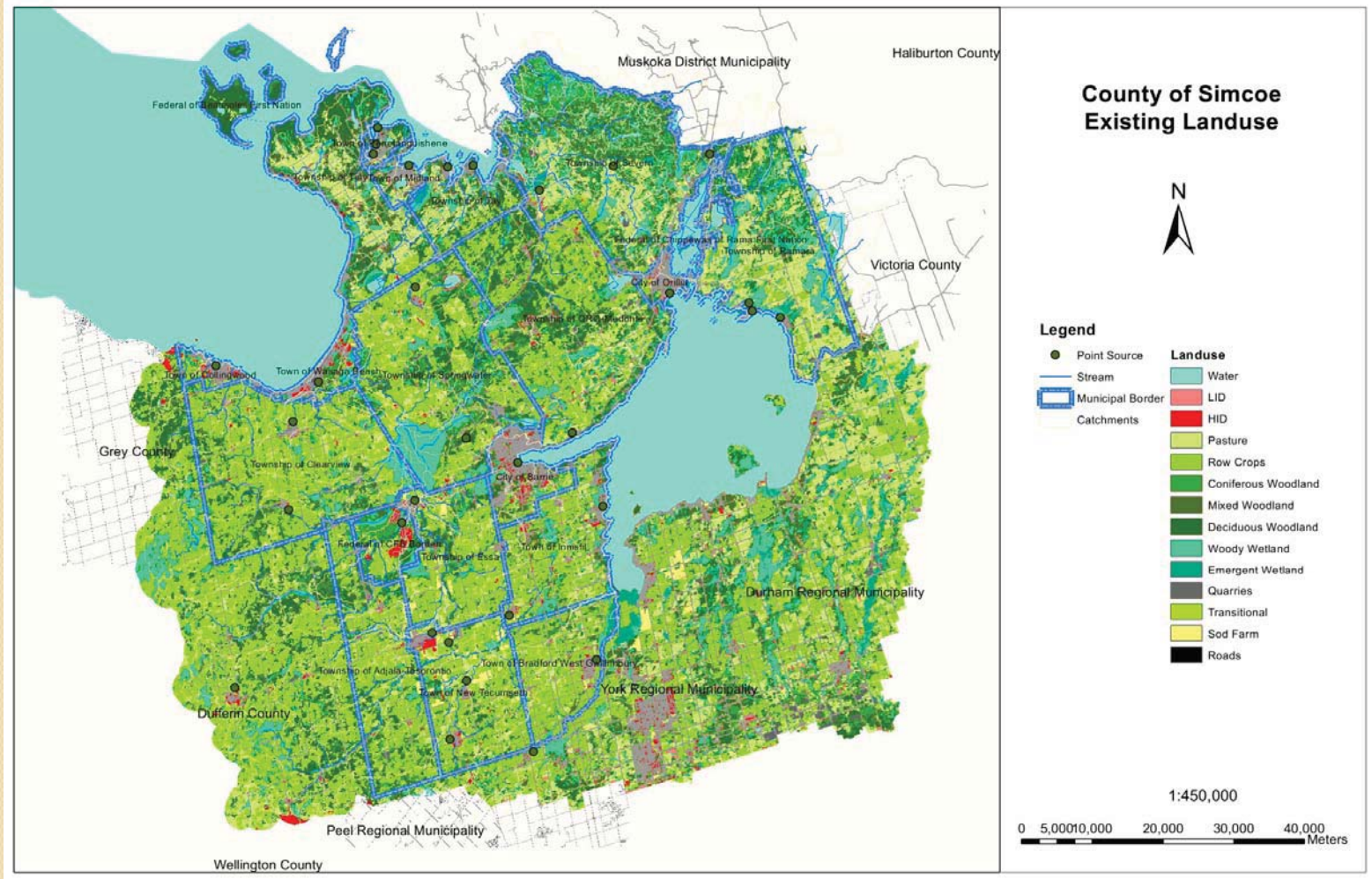
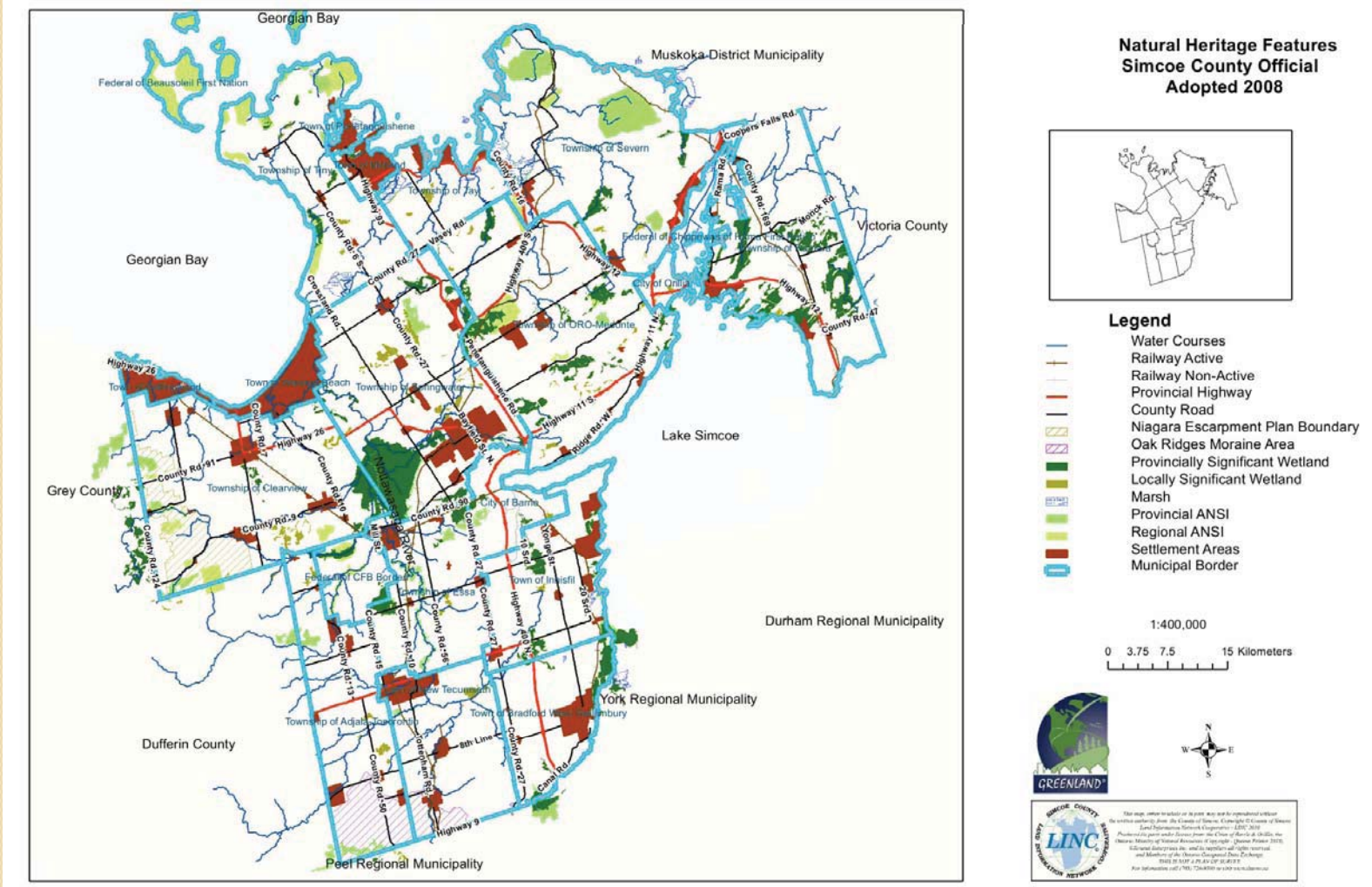
LINC

Study Area (cont'd)



Study Area (cont'd)



Overview of County Official Plan Population and Employment

Simcoe County Official Plan (Revised Plan): Population Growth Rates in Simcoe County, Barrie and Orillia

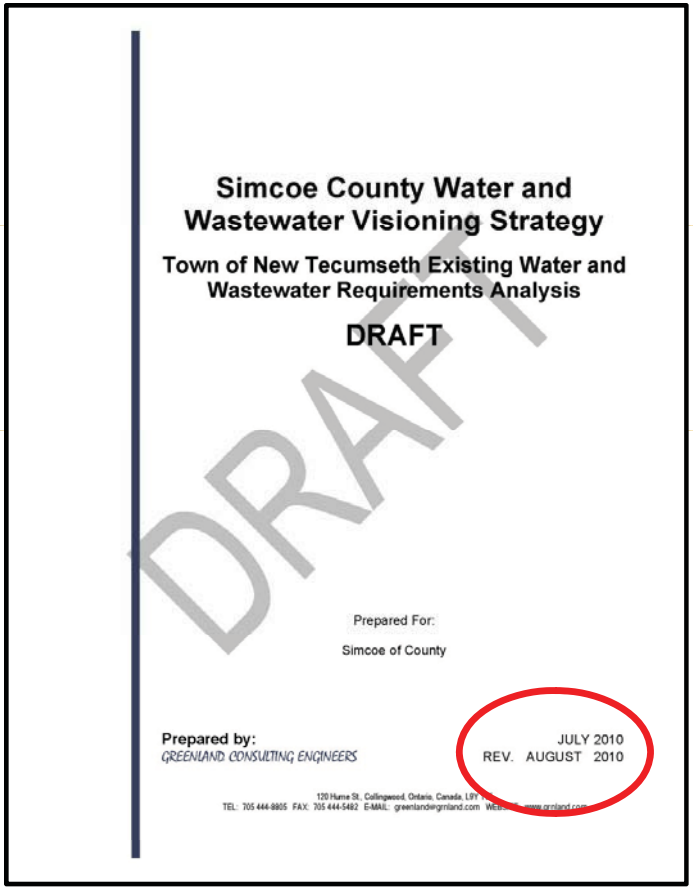
Region	Town/Township	2006 Census Population (Persons)	Simcoe County Official Plan (Adopted) 2031 Population Allocation (Persons)	Population Growth 2006 - 2031 (Persons)	Percent Growth From 2006 - 2031 Population
SIMCOE COUNTY	Township of Adjala-Tosorontio	11,100	14,200	3,100	128%
	Town of Bradford West Gwillimbury	25,000	49,700	24,700	199%
	Township of Clearview	14,600	26,000	11,400	178%
	Township of Collingwood	18,000	30,200	12,200	168%
	Township of Essa	17,600	22,900	5,300	130%
	Town of Innisfil	32,400	65,000	32,600	201%
	Town of Midland	16,900	19,700	2,800	117%
	Town of New Tecumseth	28,800	49,000	20,200	170%
	Township of Oro-Medonte	20,800	28,100	7,300	135%
	Town of Penetanguishene	9,700	12,300	2,600	127%
	Township of Ramara	9,800	15,500	5,700	158%
	Township of Severn	12,500	20,200	7,700	162%
	Township of Springwater	18,100	26,500	8,400	146%
	Township of Tay	10,100	11,300	1,200	112%
	Township of Tiny	11,200	13,900	2,700	124%
	Town of Wasaga Beach	15,600	35,000	19,400	224%
	Total Population	**272,200**	**439,500**	**167,300**	**161%**
Other	City of Barrie	166,400	227,500	61,100	137%
	City of Orillia				
	Total Population	**438,600**	**667,000**	**228,400**	152%

Overview of County Official Plan Population and Employment (cont'd)

Simcoe County Official Plan (Revised Plan): Employment Growth Rates in Simcoe County, Barrie and Orillia

Region	Town/Township	2006 Census Employment (Persons)	Simcoe County Official Plan (Adopted) 2031 Employment Allocation (Persons)	Employment Growth 2006 - 2031 (Persons)	Percent Growth From 2006 - 2031 Population
SIMCOE COUNTY	Township of Adjala-Tosorontio	1,600	2,100	500	131%
	Town of Bradford West Gwillimbury	8,000	16,200	8,200	203%
	Township of Clearview	4,400	5,800	1,400	132%
	Township of Collingwood	10,800	14,400	3,600	133%
	Township of Essa	7,700	10,300	2,600	134%
	Town of Innisfil	5,700	13,100	7,400	230%
	Town of Midland	12,000	16,000	4,000	133%
	Town of New Tecumseth	19,700	26,300	6,600	134%
	Township of Oro-Medonte	4,700	6,200	1,500	132%
	Town of Penetanguishene	5,300	7,000	1,700	132%
	Township of Ramara	1,900	2,500	600	132%
	Township of Severn	3,900	5,300	1,400	136%
	Township of Springwater	5,000	6,700	1,700	134%
	Township of Tay	1,500	2,000	500	133%
	Township of Tiny	1,400	1,900	500	136%
	Town of Wasaga Beach	3,100	4,100	1,000	132%
	Total Employment	**96,700**	**139,900**	**43,200**	**145%**
Other	City of Barrie	87,100	114,100	27,000	131%
	City of Orillia				
	Total Employment	**183,800**	**254,000**	**70,200**	**138%**

Data Collection / Background Information Process (e.g. New Tecumseth)



Simcoe County Water and Wastewater Visioning Strategy

Town of New Tecumseth Existing Water and Wastewater Requirements Analysis

DRAFT

DRAFT

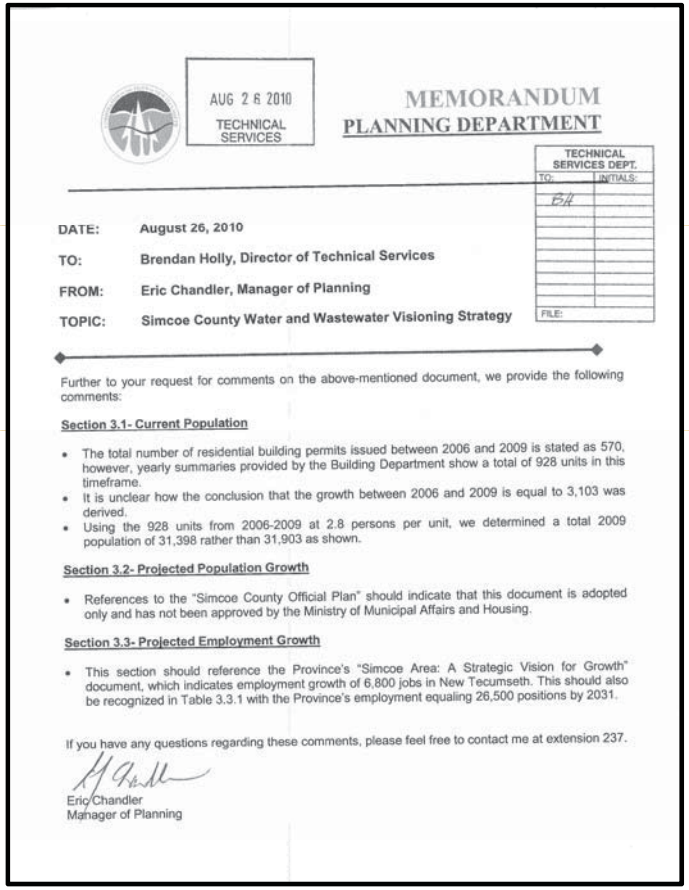
Prepared For:

Simcoe of County

Prepared by:
GREENLAND CONSULTING ENGINEERS

JULY 2010
REV. AUGUST 2010

120 Hume St., Collingwood, Ontario, Canada, L9Y
TEL: 705 444-8805 FAX: 705 444-5482 E-MAIL: greenland@grnland.com WEB:



AUG 2 6 2010
TECHNICAL SERVICES

MEMORANDUM
PLANNING DEPARTMENT

TECHNICAL SERVICES DEPT.
TO: | INITIALS:
BH

DATE: August 26, 2010

TO: Brendan Holly, Director of Technical Services

FROM: Eric Chandler, Manager of Planning

TOPIC: Simcoe County Water and Wastewater Visioning Strategy

FILE:

Further to your request for comments on the above-mentioned document, we provide the following comments:

Section 3.1- Current Population

- The total number of residential building permits issued between 2006 and 2009 is stated as 570, however, yearly summaries provided by the Building Department show a total of 928 units in this timeframe.
- It is unclear how the conclusion that the growth between 2006 and 2009 is equal to 3,103 was derived.
- Using the 928 units from 2006-2009 at 2.8 persons per unit, we determined a total 2009 population of 31,398 rather than 31,903 as shown.

Section 3.2- Projected Population Growth

- References to the "Simcoe County Official Plan" should indicate that this document is adopted only and has not been approved by the Ministry of Municipal Affairs and Housing.

Section 3.3- Projected Employment Growth

- This section should reference the Province's "Simcoe Area: A Strategic Vision for Growth" document, which indicates employment growth of 6,800 jobs in New Tecumseth. This should also be recognized in Table 3.3.1 with the Province's employment equaling 26,500 positions by 2031.

If you have any questions regarding these comments, please feel free to contact me at extension 237.

Eric Chandler
Manager of Planning

Septage and Leachate Summaries

Estimated Quantity of Septic Systems within Simcoe County, Barrie and Orillia

	Town/Township	Estimated Septic Systems: Simcoe Area					
		2009 Population (Persons)	2009 Municipal Wastewater Servicing Population (Persons)	2009 Estimated Septic Servicing Population (Persons)	2009 Septic Service Population (Persons)	Persons Per Unit (PPU)	Estimated Number of Private Septic Systems (Units)
SIMCOE COUNTY	Township of Adjala-Tosorontio	11,085	300	10,785	10,785	3.00	3,595
	Town of Bradford West Gwillimbury	26,871	18,575	8,295	8,295	3.10	2,676
	Township of Clearview	15,111	5,971	9,140	9,140	2.80	3,264
	Township of Collingwood	19,078	18,048	1,030	1,030	2.60	396
	Township of Essa	19,076	7,247	11,829	11,829	2.70	4,381
	Town of Innisfil	34,932	24,148	10,784	10,784	3.00	3,595
	Town of Midland	17,329	14,429	2,900	2,900	2.70	1,074
	Town of New Tecumseth	31,398	23,050	8,348	8,348	2.80	2,982
	Township of Oro-Medonte	20,455	0	20,455	20,455	2.60	7,867
	Town of Penetanguishene	10,055	6,701	3,354	3,354	2.60	1,290
	Township of Ramara	9,968	3,179	6,789	6,789	2.49	2,727
	Township of Severn	12,997	4,000	8,997	8,997	2.70	3,332
	Township of Springwater	19,446	3,282	16,164	16,164	2.80	5,773
	Township of Tay	10,383	5,819	4,564	4,564	2.80	1,630
	Township of Tiny	11,454	0	11,454	11,454	2.80	4,091
	Town of Wasaga Beach	17,385	17,385	0	0	2.10	0
	Total	287,023	156,825	130,198	130,198	2.10	61,999
OTHER	City of Barrie	138,448	138,448	0	0	2.60	0
	City of Orillia	31,221	31,221	0	0	2.60	0
	First Nations	NA	NA	NA	NA	NA	NA

General Notes:

Assuming all residents have either a private/communal type septic system or is servicing serviced from a local municipal wastewater treatment system.

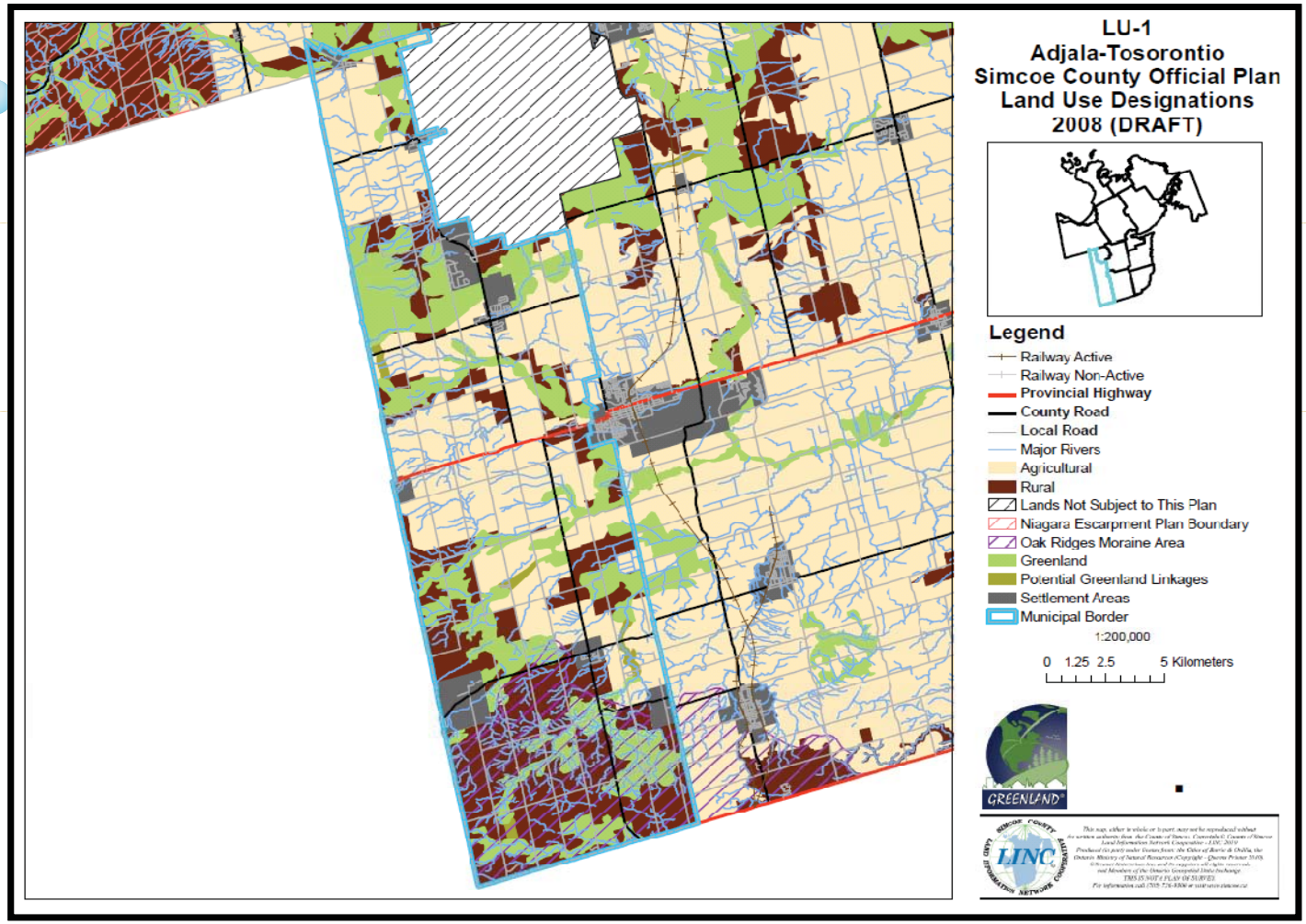
Persons Per Unit (PPU) was based on Servicing Gap Analysis.

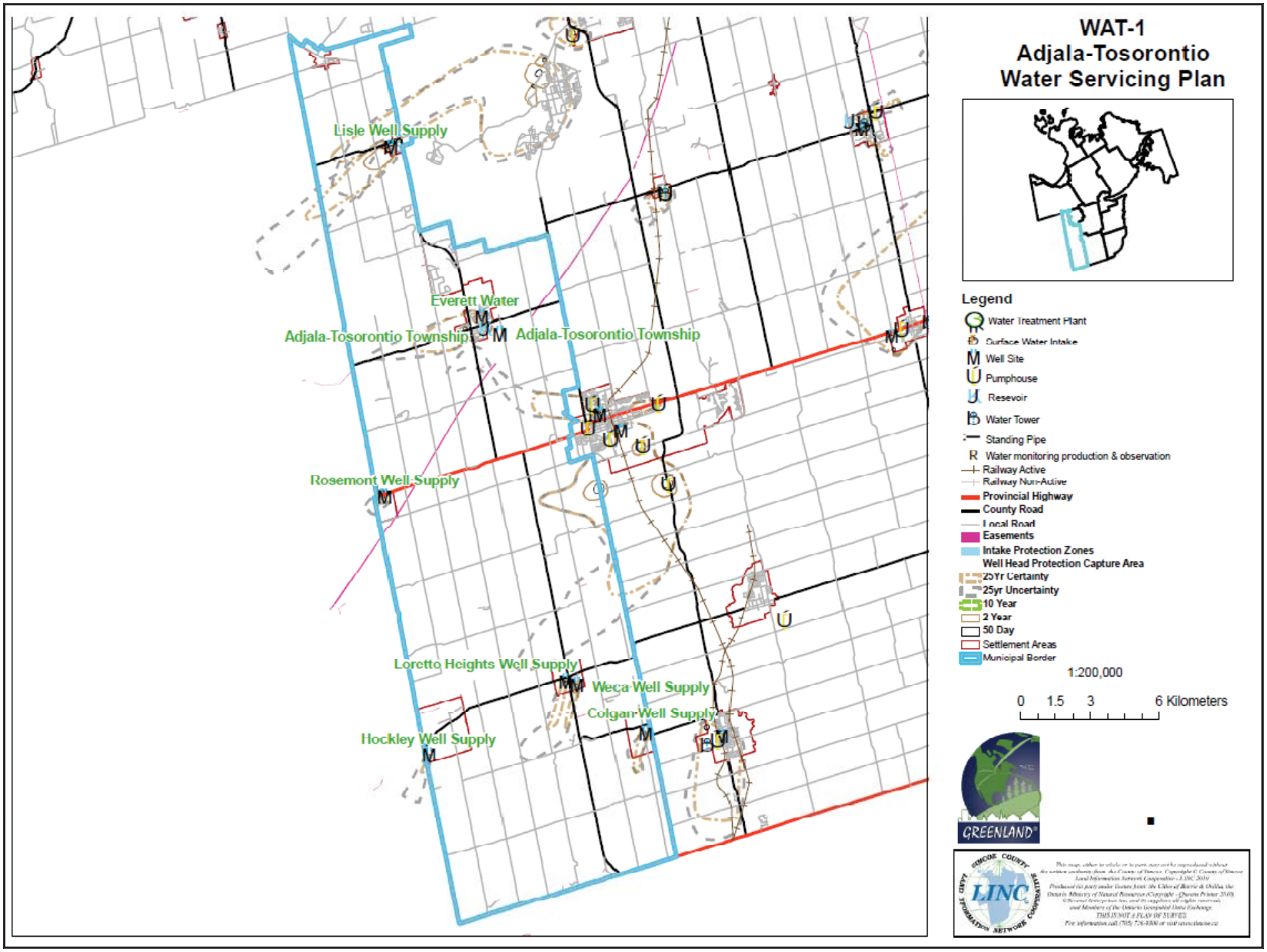
Septage and Leachate Summaries (cont'd)

2009 Leachate Production (m^3) within the County of Simcoe

2009 LEACHATE GENERATION														
		Leachate Volume Production (m^3)												
Landfill	Location	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec	Total
Site 4 (Essa)	Part Lot 13, Concession 5, Essa	363	642	535	466	258	387	86	129	129	43	165		3,203
Site 10 (Nottawasaga)	5715 30-31 Sideroad, Stayner		760	1,129	1,205	1,444	602	237	93	72	183	131	88	5,943
Site 11 (Oro)	610 Old Barrie Road West, Edgar	2,018	2,013	2,929	3,534	147	1,548	1,973	989	1,118	1,763	1,376	1,070	20,478
Site 13 (Adjala Tosorontio)	6815 Concession Road 4, Everett		936	703	1,161	1,039	704	676	581	406	636	287	705	7,834
Site 15 (Wasaga Beach)	Part Lot 21, Concession 9, Wasaga Beach	324	2,715	1,191	1,548	602	1,032	344	301	129	215	258	238	8,897
Site 16 (Bradford West Gwillimbury)	2960 Line 12, Bradford	211	334	344	172	215	346	430	172	215	215	172	167	2,993
Total		**2,916**	**7,401**	**6,830**	**8,085**	**3,704**	**4,618**	**3,746**	**2,265**	**2,069**	**3,055**	**2,389**	**2,268**	**49,347**

Example of Completed Servicing Gap Analysis (Adjala Tosorontio)




WAT-1
Adjala-Tosorontio
Water Servicing Plan
Lisle Well Supply
Everett Water
Adjala-Tosorontio Township
Adjala-Tosorontio Township
Rosemont Well Supply
Loretto Heights Well Supply
Weca Well Supply
Colgan Well Supply
Hockley Well Supply
Legend
Water Treatment Plant
Surface Water Intake
Well Site
Pumphouse
Resevoir
Water Tower
Standing Pipe
Water monitoring production & observation
Railway Active
Railway Non-Active
Provincial Highway
County Road
Local Road
Easements
Intake Protection Zones
Well Head Protection Capture Area
25Yr Certainty
25yr Uncertainty
10 Year
2 Year
50 Day
Settlement Areas
Municipal Border
1:200,000
0 1.5 3 6 Kilometers
GREENLAND
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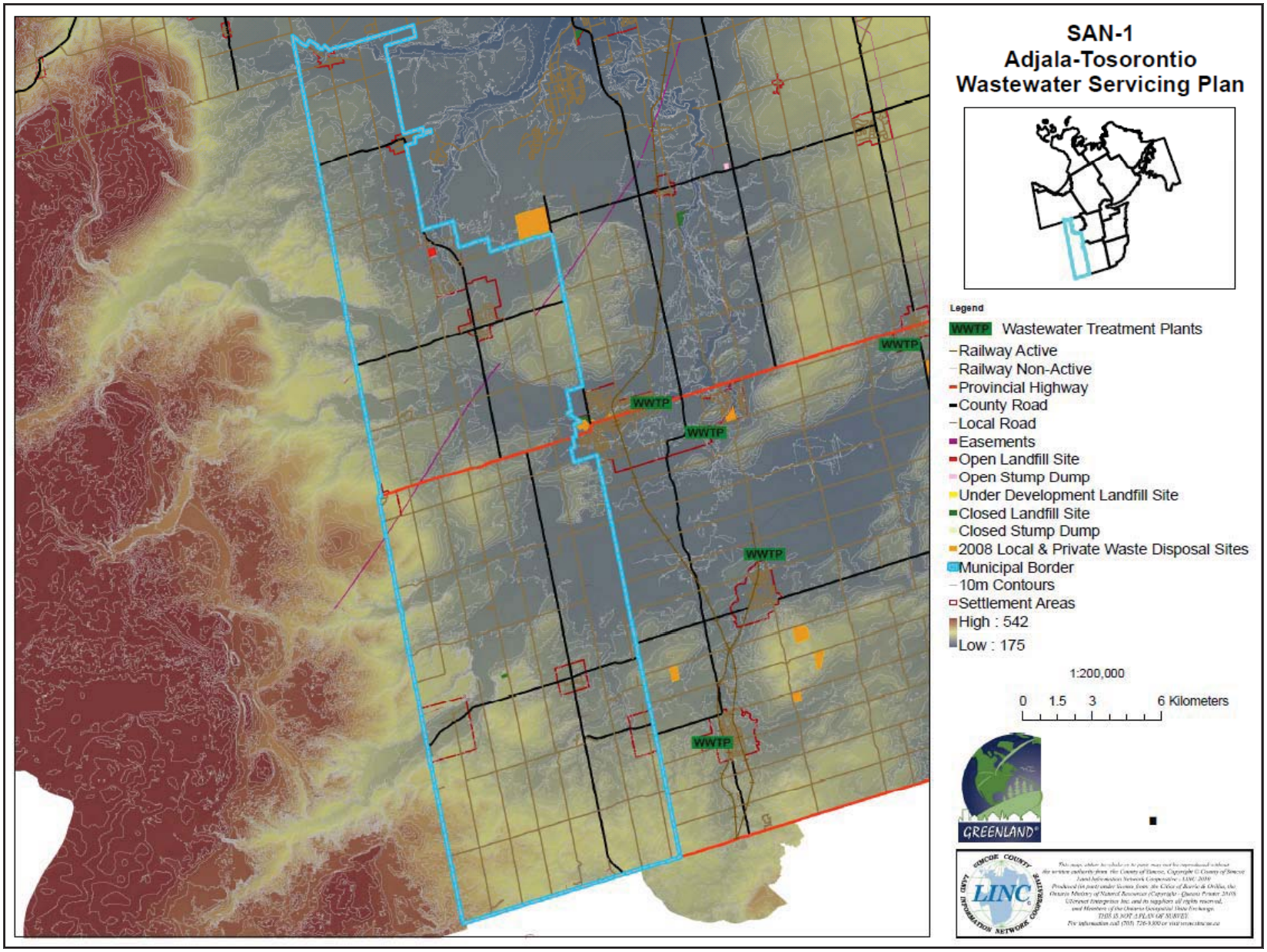

SAN-1
Adjala-Tosorontio
Wastewater Servicing Plan
Legend
WWTP Wastewater Treatment Plants
Railway Active
Railway Non-Active
Provincial Highway
County Road
Local Road
Easements
Open Landfill Site
Open Stump Dump
Under Development Landfill Site
Closed Landfill Site
Closed Stump Dump
2008 Local & Private Waste Disposal Sites
Municipal Border
10m Contours
Settlement Areas
High : 542
Low : 175
1:200,000
0 1.5 3 6 Kilometers
WWTP
WWTP
WWTP
WWTP
WWTP
GREENLAND
LINC

SERVICING GAP ANALYSIS - TOWNSHIP ADJALA-TOSORONTIO

Water Supply Systems

Water Supply System	2006 Ainley Data					2009 Data					Servicing Gaps				
	Rated Capacity (m^3/day)	Equivalent Population (Persons)	MDD (m^3/day)	Serviced Population (Persons)	Existing Residual Capacity (Persons)	Rated Capacity (m^3/day)	Equivalent Population (Persons)	MDD (m^3/day)	Serviced Population (Persons)	Existing Residual Capacity (Persons)	Committed Capacity Increase (Persons)	Simcoe County Official Plan APP (Persons)	2031 Projected Employment Growth (Equivalent Persons)	Servicing Gap (Persons)	Servicing Gap (m^3/day)
Everett	3,917	5,403	1,253	1,902	3,500	3,917	6,945	1,088	1,929	5,016					
Colgan	157	168	182	213	-50	263	392	143	213	179					
Lisle	657	842	119	168	650	1,313	2,626	117	234	2,392					
Loretto Heights	137	139	70	78	50	164	469	49	141	328	**Data unavailable at this time**				
Rosemont	73	154	61	141	0	85	59	68	47	12					
Weca	916	707	290	246	450	916	1,053	227	261	792					
Hockley	90	55	62	42	0	90	98	39	43	55					
Total	**5,947**	**7,468**	**2,037**	**2,790**	**4,600**	**6,748**	**11,643**	**2,094**	**2,868**	**8,775**	**0**	**3,115**	**250**	**5,410**	**3,136**

Wastewater Treatment System

Wastewater Treatment System	2006 Ainley Data					2009 Data					Servicing Gaps				
	Rated Capacity (m^3/day)	Equivalent Population (Persons)	ADF (m^3/day)	Serviced Population (Persons)	Existing Residual Capacity (Persons)	Rated Capacity (m^3/day)	Equivalent Population (Persons)	ADF (m^3/day)	Serviced Population (Persons)	Existing Residual Capacity (Persons)	Committed Capacity Increase (Persons)	Simcoe County Official Plan APP (Persons)	2031 Projected Employment Growth (Equivalent Persons)	Servicing Gap (Persons)	Servicing Gap (m^3/day)
New Horizon	NA	NA	NA	NA	NA	175	706	74	300	406	0	3,115	250	-2,959	-734
Total	**0**	**NA**	**NA**	**NA**	**NA**	**175**	**706**	**74**	**300**	**406**	**0**	**3,115**	**250**	**-2,959**	**-734**

GENERAL NOTES:

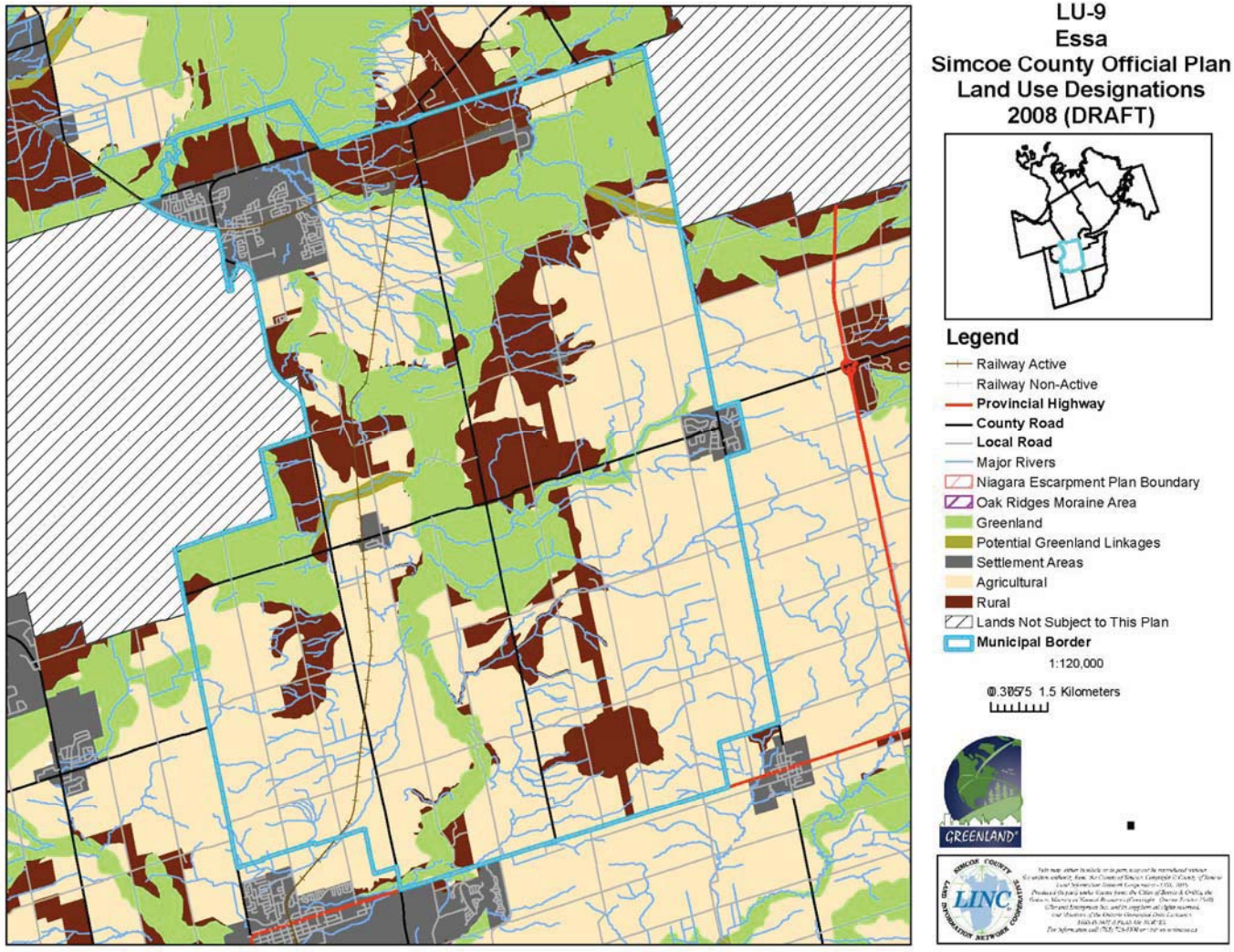
Average Daily Flows and Maximum Daily Demand (MDD) per capita for 2009 data was obtained by the Township.

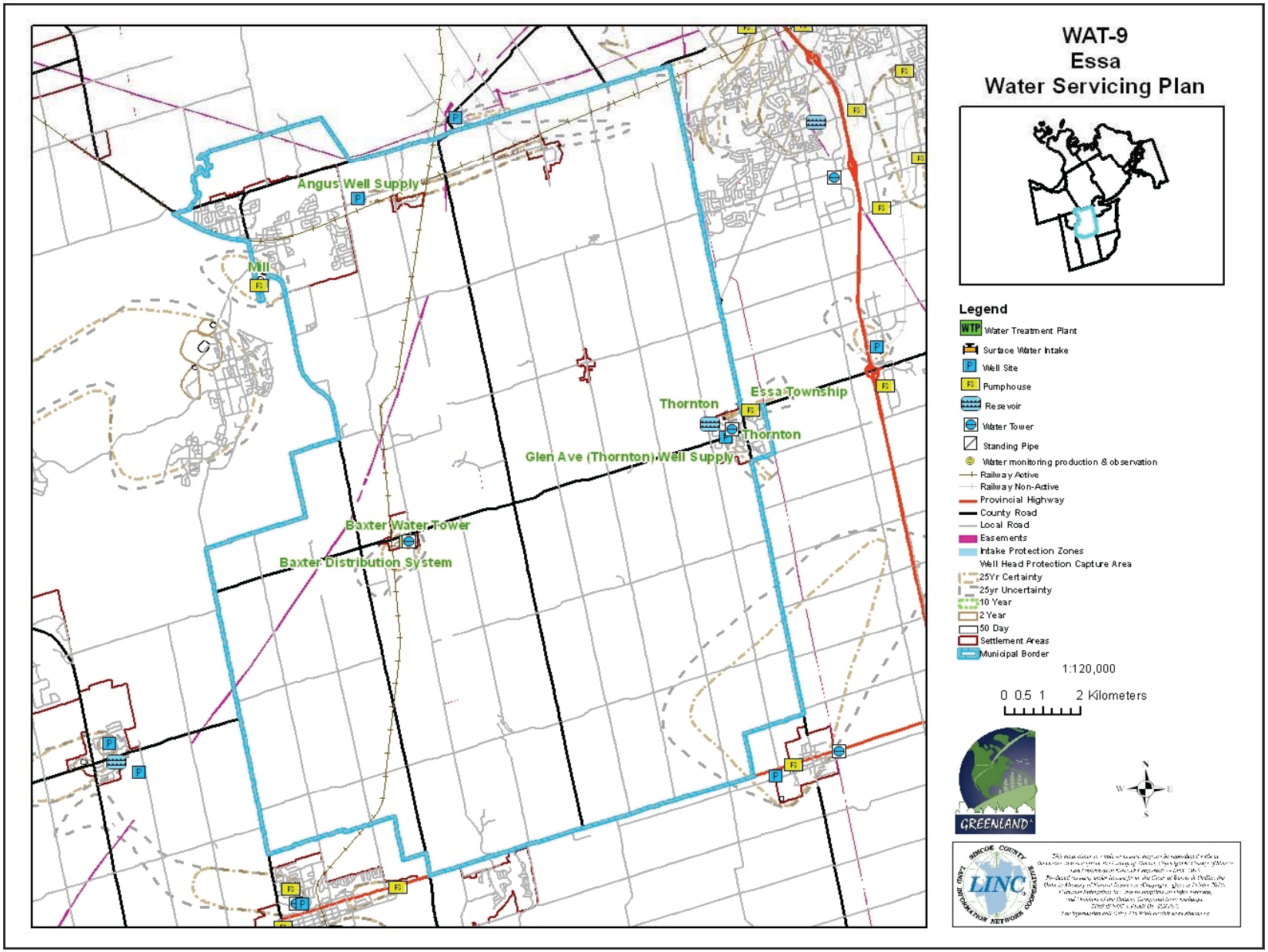
Serviced Population for 2009 assumed that all new growth within this Township would be fully serviced.

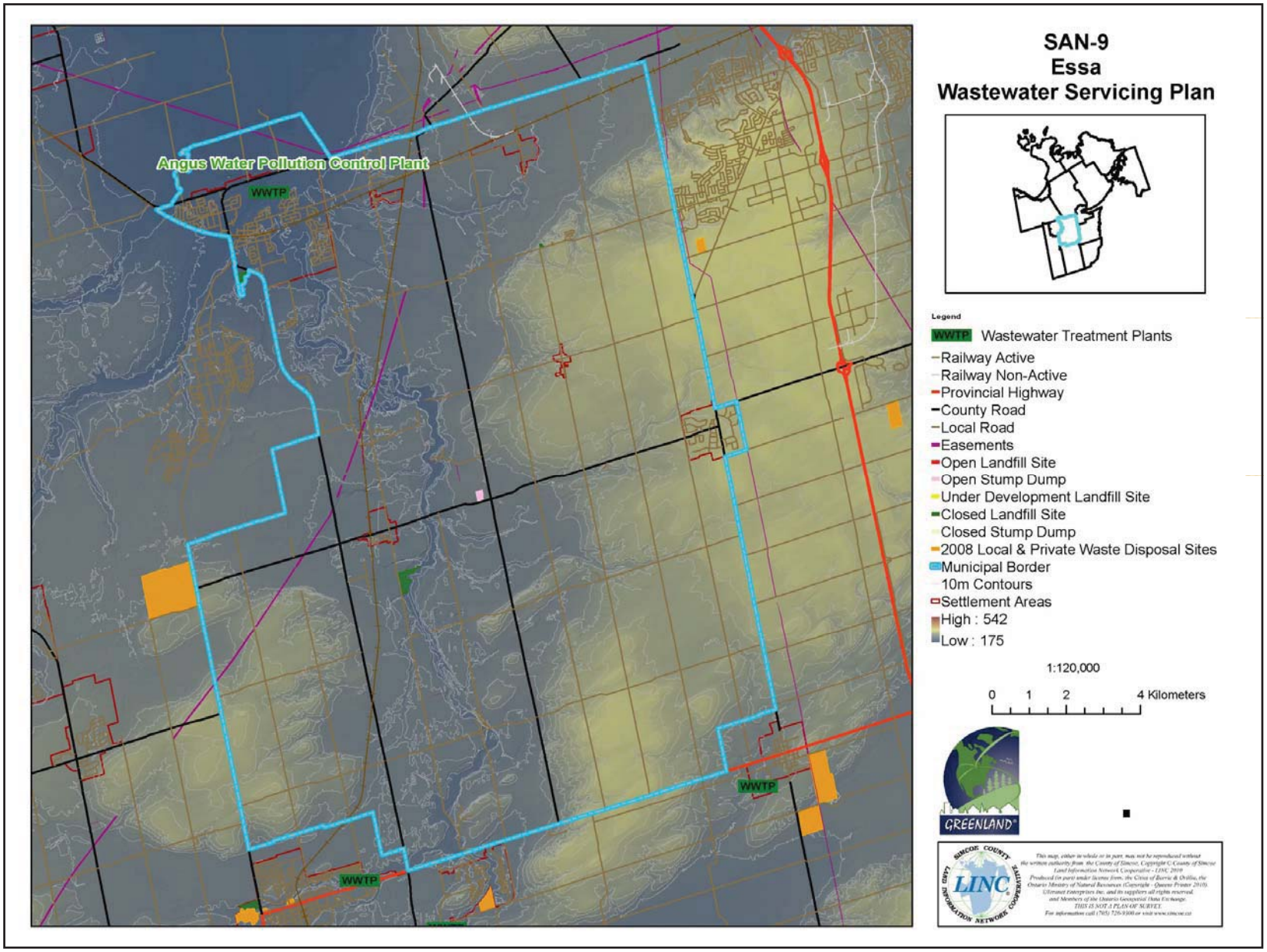
2009 Rated Capacity data was obtained through the Township of Adjala-Tosorontio's website.

2009 Equivalent Population was based on 2009 Design per capita flows and demands.

Example of Completed Servicing Gap Analysis (Township of Essa)




WAT-9
Essa
Water Servicing Plan
Angus Well Supply
Mill
Thornton
Essa Township
Thornton
Glen Ave (Thornton) Well Supply
Baxter Water Tower
Baxter Distribution System
Legend
WTP Water Treatment Plant
Surface Water Intake
Well Site
Pumphouse
Reservoir
Water Tower
Standing Pipe
Water monitoring production & observation
Railway Active
Railway Non-Active
Provincial Highway
County Road
Local Road
Easements
Intake Protection Zones
Well Head Protection Capture Area
25Yr Certainty
25yr Uncertainty
10 Year
2 Year
50 Day
Settlement Areas
Municipal Border
1:120,000
0 0.5 1 2 Kilometers
GREENLAND
LINC


Angus Water Pollution Control Plant
WWTP
WWTP
WWTP
SAN-9
Essa
Wastewater Servicing Plan
Legend
WWTP Wastewater Treatment Plants
Railway Active
Railway Non-Active
Provincial Highway
County Road
Local Road
Easements
Open Landfill Site
Open Stump Dump
Under Development Landfill Site
Closed Landfill Site
Closed Stump Dump
2008 Local & Private Waste Disposal Sites
Municipal Border
10m Contours
Settlement Areas
High : 542
Low : 175
1:120,000
0 1 2 4 Kilometers
GREENLAND
LINC

SERVICING GAP ANALYSIS - TOWNSHIP ESSA

Water Supply System

	2006 Ainley Data					2009 Data					Servicing Gaps				
Water Supply System	Rated Capacity (m^3/day)	Equivalent Population (Persons)	MDD (m^3/day)	Serviced Population (Persons)	Existing Residual Capacity (Persons)	Rated Capacity (m^3/day)	Equivalent Population (Persons)	MDD (m^3/day)	Serviced Population (Persons)	Existing Residual Capacity (Persons)	Committed Capacity Increase (Persons)	Simcoe County Official Plan APP (Persons)	2031 Projected Employment Growth (Equivalent Persons)	Servicing Gap (Persons)	Servicing Gap (m^3/day)
Angus	6,554	11,958	3,094	6,210	5,450	10,805	22,882	3,422	7,247	15,635	0				
Thornton-Glen	1,540	1,596	658	750	850	1,540	1,531	1,304	1,296	235	0	**Data not available at this time**			
Baxter	225	242	132	156	100	100	177	84	149	28	0				
Total	**8,319**	**13,796**	**3,884**	**7,116**	**6,400**	**12,445**	**24,589**	**4,810**	**8,691**	**15,898**	**0**	**3,824**	**1,300**	**10,774**	**5,453**

Wastewater Treatment Systems

	2006 Ainley Data					2009 Data					Servicing Gaps				
Wastewater Treatment Systems	Rated Capacity (m^3/day)	Equivalent Population (Persons)	ADF (m^3/day)	Serviced Population (Persons)	Existing Residual Capacity (Persons)	Rated Capacity (m^3/day)	Equivalent Population (Persons)	ADF (m^3/day)	Serviced Population (Persons)	Existing Residual Capacity (Persons)	Committed Capacity Increase (Persons)	Simcoe County Official Plan APP (Persons)	2031 Projected Employment Growth (Equivalent Persons)	Servicing Gap (Persons)	Servicing Gap (m^3/day)
Angus	5,511	13,911	2,233	6,200	7,700	5,511	13,911	2,585	7,247	6,664	0	3,824	1,300	1,540	610
Total	**5,511**	**13,911**	**2,233**	**6,200**	**7,700**	**17,956**	**13,911**	**2,585**	**7,247**	**6,664**	**0**	**3,824**	**1,300**	**1,540**	**610**

GENERAL NOTES:

Maximum Daily Demand (MDD) per capita for 2009 data was obtained by the Township.

Average Daily Flow (ADF) per capita for 2009 Data was obtained by the Township.

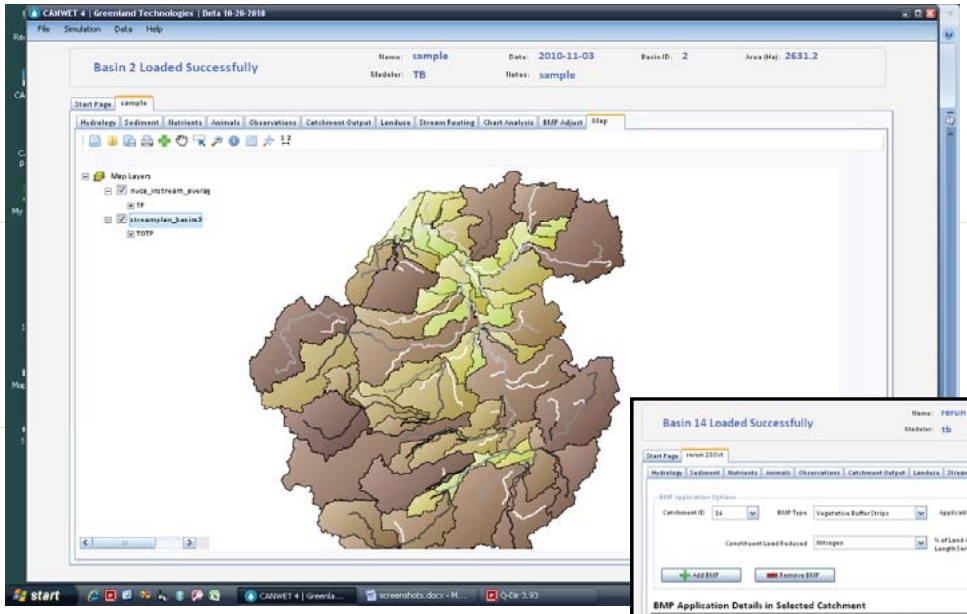
Serviced Population for 2009 was based on 2009 Water Consumption Report

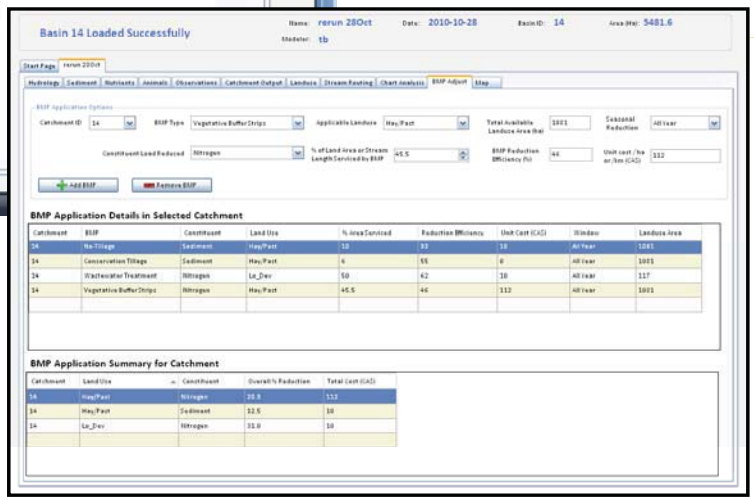
2009 Rated Capacity data was obtained through the Township of Essa.

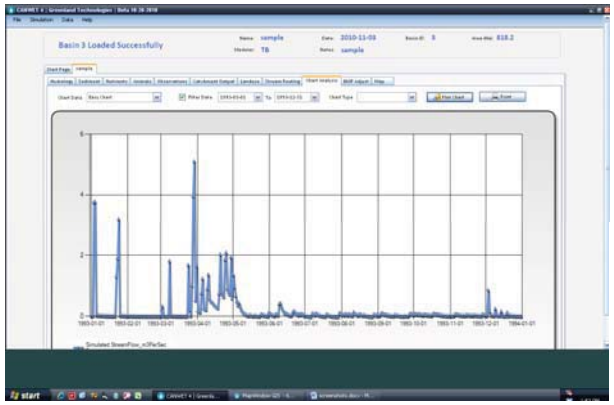
100 m^3/day Water Supply for Baxter Water Supply System is supplied by the Town of Collingwood's RAB Water Treatment Facility

2009 Equivalent Population was based on 2009 Design per capita flows and demands.

In-kind Project Contributions by the Greenland Group
(CANWET™ and Concurrent U.S. / Mexico Initiative)

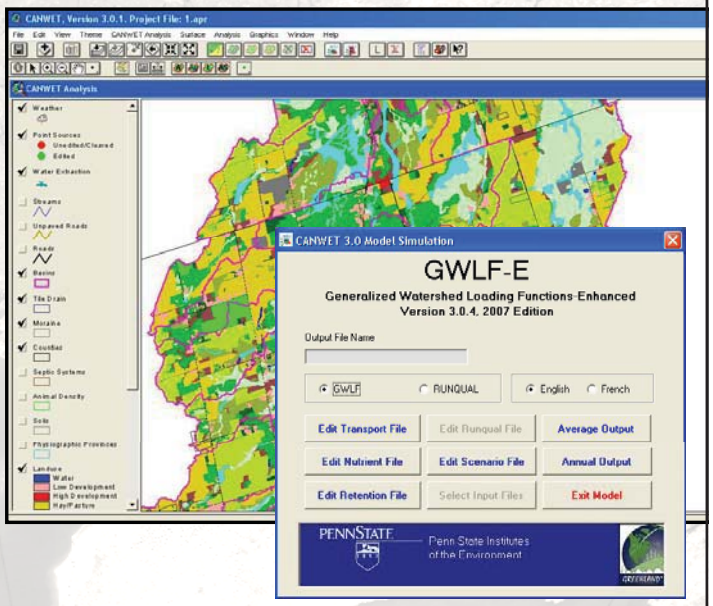






CANWET™ APPLICATIONS

- A continuous, GIS-based modeling tool for TMDL, assimilative capacity, nutrient target setting and source water protection projects.
- In-stream water quality and aquatic habitat protection studies.
- Watershed and Master Servicing Plans for water and wastewater systems.
- BMP cost and benefit analyses.
- Impact assessment for land use change (scenario tool) and growth projects.
- Tier '1' & '2' water budget and water use stress assessments.
- Facilitate WQT programs.
- Nutrient management plans.



CANWET™ Canadian Nutrient and Water Evaluation Tool

GREENLAND

Greenland Group Development Partners

University of Guelph & Penn State University

SECURITY AND SOURCE PROTECTION

▲ Continued from page 27

Electric Water & Process Technologies (formerly Zenon Environmental Inc.) to develop ways to improve membrane filtration and reduce costs.

What makes Guelph's $1-million pilot facility unique are the large-scale ZeeWeed 500 membrane pilot plants fully dedicated to university research. The first major installation occurred five years ago; the facility underwent a significant upgrade last year.

Zhou says the technology has evolved step-by-step, resulting in lower costs not only for the membranes but also for the bioreactor operation and maintenance. In fact, they cost 80 per cent less than they did a decade ago.

The technology is integral to meeting increasingly strict regulations for removing contaminants, says Zhou. The bioreactor can remove nutrients such as nitrogen and phosphorus, which otherwise contribute to algae blooms that compete with fish for oxygen. It may also remove many biologically persistent organic contaminants.

This research and its benefits can span the globe, says Zhou, who believes the technology could also be used in developing countries to clean water. Some areas even take advantage of closed-loop systems where waste water is directly recycled without being returned to the environment.

"Our research is not only for Guelph," he says. "It makes a contribution in water-treatment knowledge that can be used worldwide."

Zhou works on membrane technologies with a number of collaborators: Steven Liss, associate vice-president (research services); Profs. Richard Zytner and Khosrow Farahbakhsh, School of Engineering; visiting scholar Shuguo Zhang; research associate David Heipel; graduate students Chris Potvin, Amanda Farquharson, Victor Zhang, Jennifer Pawloski, Zebo Long and Syed Wajahatand; and University of Waterloo civil engineering professor Wayne Parker.

This research is sponsored by General Electric Water & Process Technologies, the Canadian Water Network, the City of Guelph, the Ontario Research Fund, the Ontario Centres of Excellence, Environment Canada, and the Natural Sciences and Engineering Research Council.

Next:

The local water movement

Creating Ontario-specific models will better protect the province's water sources

BY ARTHUR CHURCHYARD

Computer programs currently used by planners should be adjusted to Ontario conditions to better predict water quantity and quality with local information from provincial sources, say U of G researchers.

Profs. Ramesh Rudra and Bahram Gharabaghi of the School of Engineering are dissecting existing watershed models to learn how they could be improved. The enhanced programs could give water-resource managers better tools to keep water sources safe and clean.

"We are analyzing the strengths and weaknesses of these computer models to give Ontario water planners a reliable source of advice," says Rudra. "We hope our recommendations significantly improve the application of models for use in unique Ontario conditions."

Many of the water-planning models now used in Ontario were developed for conditions in the United States. But Rudra says a watershed model must be based on local hydrology to get the most out of it. That's why the Guelph team began studying information from Ontario government and conservation authorities to pinpoint the unique provincial conditions that should be represented in current watershed models.

The team has found that improving current watershed models to account for Ontario hydrological conditions will greatly enhance their accuracy. Rudra notes, for example, that spring melting sends large water quantities, soil particles and pollution into streams and lakes. Quantifying these contributions during the spring will help water planners, treatment facilities and dam managers handle the extra water volumes.

He also believes the water-purifying effects of wetlands should be given more weight in Ontario watershed models. Wetlands are needed in provincial water systems as a natural way of protecting drinking-water sources and should be conserved, he says.

Water-source protection is taken seriously by environmental guardians such as the Lake Simcoe Region Conservation Authority. The authority uses a watershed model called the Canadian Nutrient and Water Evaluation Tool (CANWET). This model weighs economic costs and benefits, considers options based on social acceptability and then recommends the best management practices. These practices can sometimes be complicated, but they can also be as simple as planting a strip of vegetation beside a riverbank to prevent erosion along waterways. The Guelph Watershed Research Group has been involved in enhancing CANWET for application in Ontario conditions.

Distributed by Ontario-based Greenland International Consulting Engineers, CANWET is moving towards a user-friendly web-based service that could be used nationwide. Greenland International is staffed largely by University of Guelph alumni and hopes to incorporate the Guelph engineers' recommendations into their models.

Models such as CANWET aren't used just by conservation authorities, says Rudra. Governments use these models to make development plans such as Ontario's "Places to Grow" initiative, which encourages development in areas where the impact on source water will be minimal. By improving the suitability of these models, he and his colleagues in the Guelph Watershed Research Group will be improving the ability of water planners to protect water consumers from source to tap.

Funding for this research has been provided by the Ontario Ministry of Agriculture, Food and Rural Affairs; the Ontario Ministry of the Environment; the Ontario Ministry of Natural Resources; the Greenland International Group of Companies; and Ontario conservation authorities.

More information about the Guelph Watershed Research Group can be found at www.soe.uoguelph.ca/webfiles/watershed/Guelphwatershed.htm

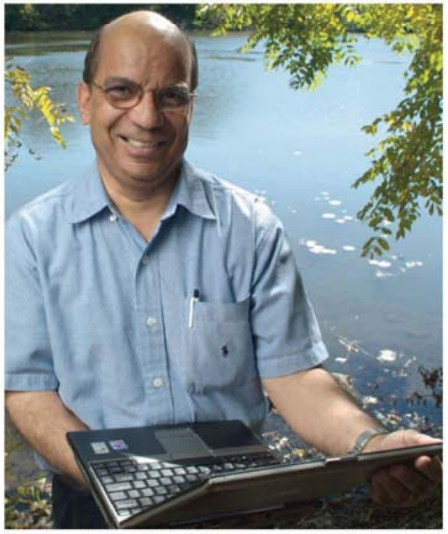


Photo caption to go here. Photo caption to go here. Photo caption to go here. | Photo by Xxxx Xxxxxxxx

History & Applications of CANWET™

- **2002-04 *"Nutrient Management Pilot Project"*** included the selection and customization of established software tools (that were eventually included in "CANWET™") for three (3) river basins in Southern Ontario. Original modules included the *Generalized Watershed Loading Function (GWLF)* and *PRedICT* tool in order to calculate basin loads and evaluate/compare BMP mitigative strategies.

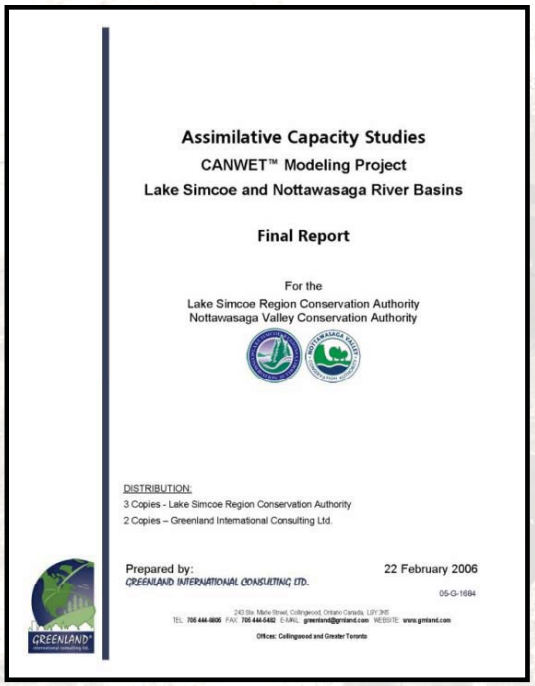
- **2005-06 *"Assimilative Capacity Studies (ACS)"*** about the Lake Simcoe and Nottawasaga River Basins included additional and customized features – incl. in-stream modeling and wetland reductions. The CANWET™ (v.2) results were used with hydrodynamic models of Lake Simcoe and Nottawasaga Bay. Nutrient and sediment loads estimated using CANWET (v.2) were used as the main data source for the ongoing phosphorus target setting process by the Province.

- **2006 *"Inter-Governmental Action Plan (IGAP)" Analysis*** used the CANWET (v.2) models from the ACS to examine various growth options in Simcoe County.

- **2007-10 Version '3' Upgrades** used for Source Water Protection projects (incl. Tiered Water Budgets, Nutrient Loading, Water Takings and Quantity Stress Assessments), WPCP Class E.A.s, Master Servicing Plans and the Preparation of the Lake Simcoe Protection Plan by the Government of Ontario.

- **2009 -11 Version '4' Development (Completion = February 2011)**

Ontario's Assimilative Capacity and IGAP Studies (2005-06) and the Use of CANWET™


Assimilative Capacity Studies
CANWET™ Modeling Project
Lake Simcoe and Nottawasaga River Basins

Final Report

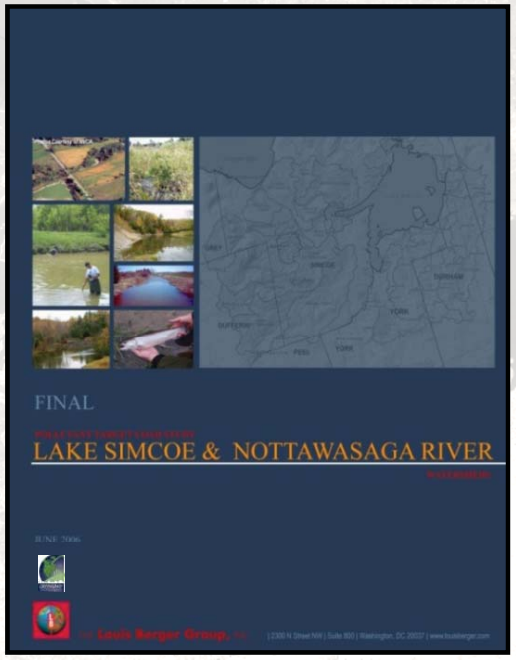
For the
Lake Simcoe Region Conservation Authority
Nottawasaga Valley Conservation Authority

DISTRIBUTION:
3 Copies - Lake Simcoe Region Conservation Authority
2 Copies – Greenland International Consulting Ltd.

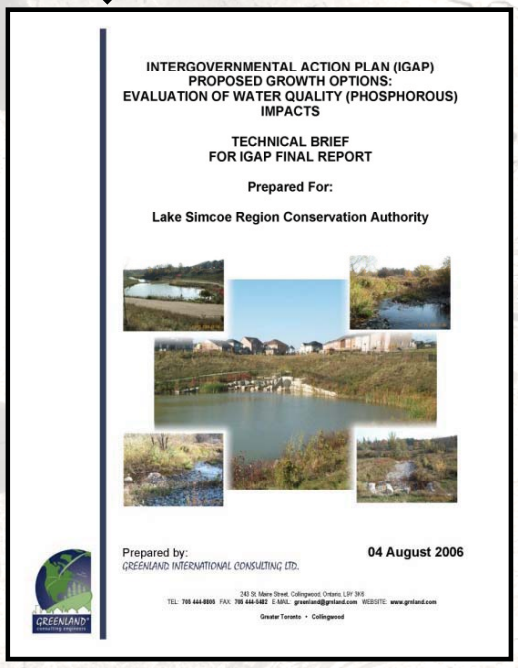
Prepared by:
GREENLAND INTERNATIONAL CONSULTING LTD.

22 February 2006

05-G-1684


FINAL

LAKE SIMCOE & NOTTAWASAGA RIVER


INTERGOVERNMENTAL ACTION PLAN (IGAP)
PROPOSED GROWTH OPTIONS:
EVALUATION OF WATER QUALITY (PHOSPHOROUS) IMPACTS

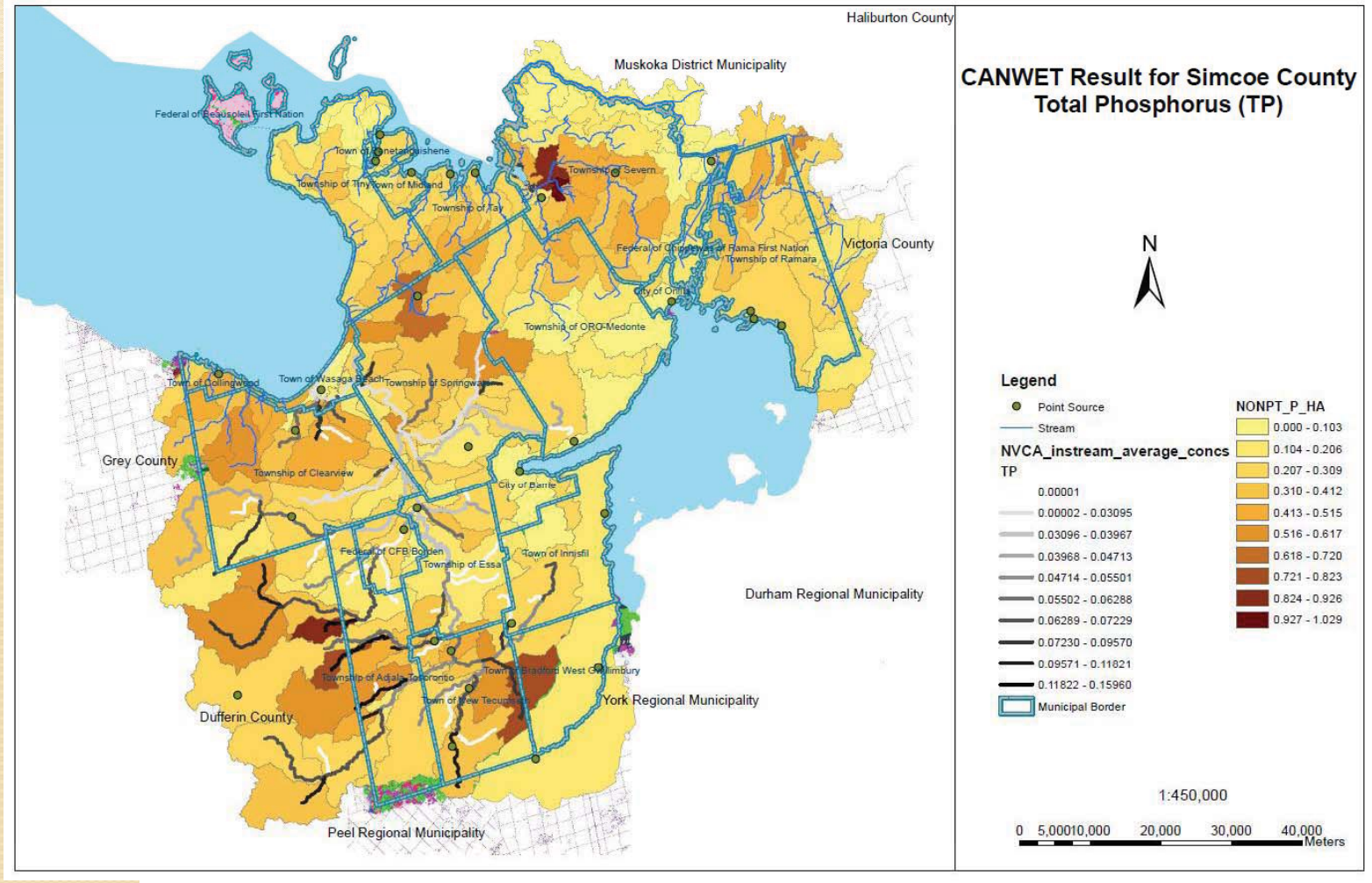
TECHNICAL BRIEF
FOR IGAP FINAL REPORT

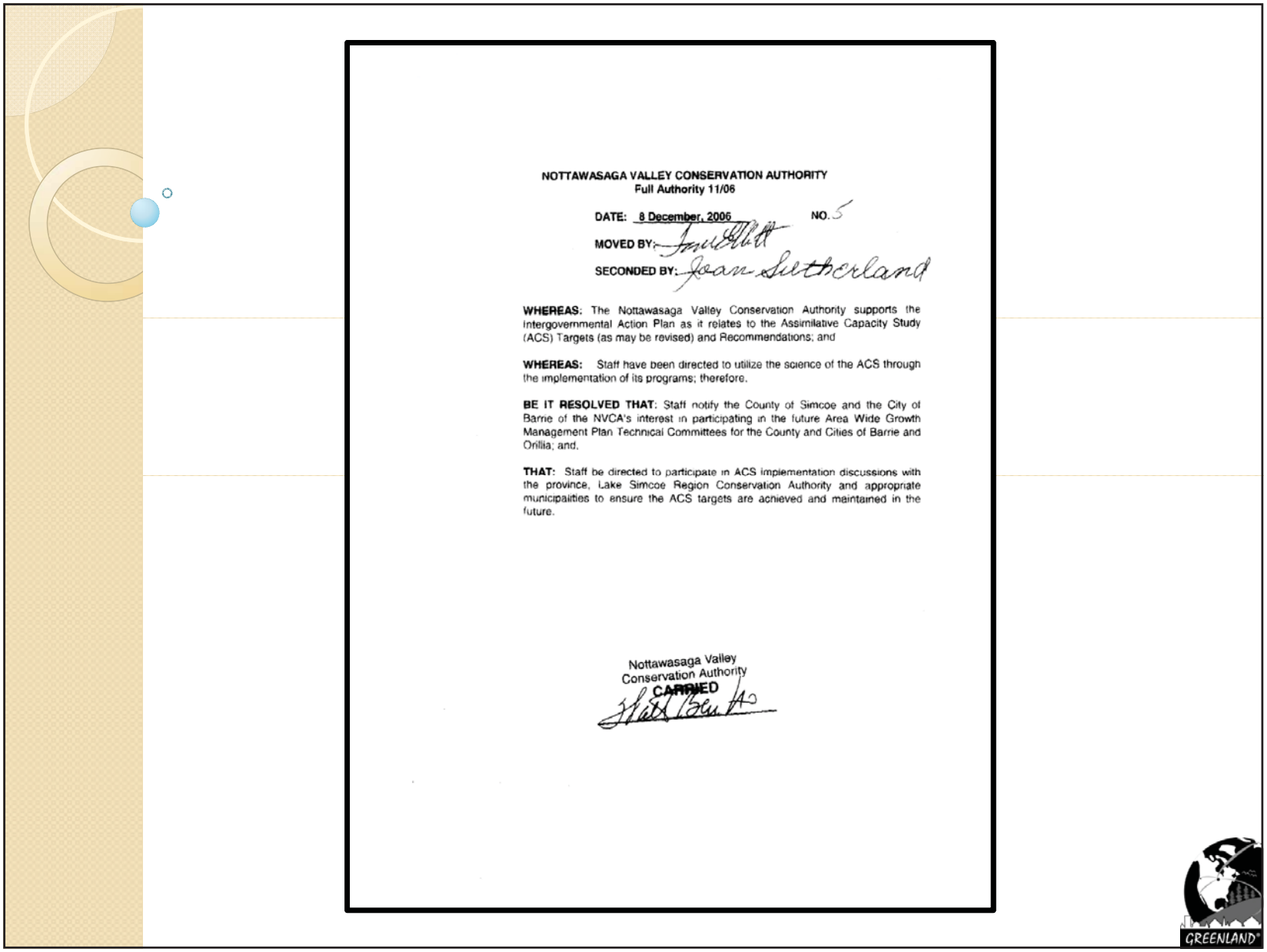
Prepared For:

Lake Simcoe Region Conservation Authority

Prepared by:
GREENLAND INTERNATIONAL CONSULTING LTD.

04 August 2006


Haliburton County
Muskoka District Municipality
Federal of Beausoleil First Nation
Township of Severn
Township of Tay
Township of Tiny
Victoria County
Federal of Chippewas of Rama First Nation
Township of Ramara
City of Orillia
Township of ORO-Medonte
Town of Collingwood
Township of Springwater
Grey County
Township of Clearview
City of Barrie
Federal of CFB Borden
Township of Essa
Town of Innisfil
Durham Regional Municipality
Township of Adjala-Tosorontio
York Regional Municipality
Dufferin County
Peel Regional Municipality
CANWET Result for Simcoe County
Total Phosphorus (TP)
N
Legend
Point Source
Stream
NVCA_instream_average_concs
TP
0.00001
0.00002 - 0.03095
0.03096 - 0.03967
0.03968 - 0.04713
0.04714 - 0.05501
0.05502 - 0.06288
0.06289 - 0.07229
0.07230 - 0.09570
0.09571 - 0.11821
0.11822 - 0.15960
Municipal Border
NONPT_P_HA
0.000 - 0.103
0.104 - 0.206
0.207 - 0.309
0.310 - 0.412
0.413 - 0.515
0.516 - 0.617
0.618 - 0.720
0.721 - 0.823
0.824 - 0.926
0.927 - 1.029
1:450,000
0 5,00010,000 20,000 30,000 40,000
Meters



NOTTAWASAGA VALLEY CONSERVATION AUTHORITY
Full Authority 11/06

DATE: 8 December, 2006 **NO.** 5

MOVED BY: [illegible]

SECONDED BY: Joan Sutherland

WHEREAS: The Nottawasaga Valley Conservation Authority supports the Intergovernmental Action Plan as it relates to the Assimilative Capacity Study (ACS) Targets (as may be revised) and Recommendations; and

WHEREAS: Staff have been directed to utilize the science of the ACS through the implementation of its programs; therefore,

BE IT RESOLVED THAT: Staff notify the County of Simcoe and the City of Barrie of the NVCA's interest in participating in the future Area Wide Growth Management Plan Technical Committees for the County and Cities of Barrie and Orillia; and,

THAT: Staff be directed to participate in ACS implementation discussions with the province, Lake Simcoe Region Conservation Authority and appropriate municipalities to ensure the ACS targets are achieved and maintained in the future.

Nottawasaga Valley
Conservation Authority
CARRIED

CITY HALL
70 COLLIER STREET
TEL. (705) 739-4207
FAX. (705) 739-4247

The City of BARRIE

P.O. BOX 400
BARRIE, ONTARIO
L4M 4T5

THE CORPORATION OF THE CITY OF BARRIE
Engineering Department
"Committed to Service Excellence"

November 3, 2007

RECEIVED
NOV - 8 2007

File: A03-CA

Greenland Technologies Group
120 Hume Street
Collingwood, Ontario
L9Y 1V5

Attention: Mr. Mark Palmer, P. Eng.
President

Dear Mr. Palmer:

RE: Canadian Nutrient and Water Evaluation Tool
CANWET™ (v 3.0) Software

The Greenland Technologies Group has completed an *Urban Water Quality Modelling Pilot Study* in the *Whiskey Creek Sub-Watershed Area* in Barrie. The project was undertaken using the RUNQUAL module in the CANWET™ (v 3.0) (Canadian Nutrient and Water Evaluation Tool-Enhanced, 2007 Edition).

The City of Barrie's Engineering Department would like to continue developing water quality modelling in-house using the CANWET™ (v 3.0) software for the remaining Sub-Watershed Areas within Barrie. As a result, the City is interested in purchasing the complete CANWET™ (v 3.0) software license and all its modules, along with advance on-site training. This includes; model input data (GIS and Time Series) preparation, model set-up, model calibration and BMP application, etc. It is also recognized that a few hours of Consulting Services from the Greenland Technologies Group might help City Staff to proceed with in-house model development.

As a result, the City requires a price quote and written proposal from The Greenland® Group of Companies for the following: *(Note: GST and PST should not be included in your price quote)*

1. Purchase of the CANWET™ Software (Including all Modules and Manuals).
2. "Advanced" 2-Day Training Session.
3. Consulting Services (i.e. developing data set, model set-up, calibration, etc.).
   (Hourly Rate of up to 10 hours, as required, which would include e-mail responses, telephone calls, meetings, etc.)

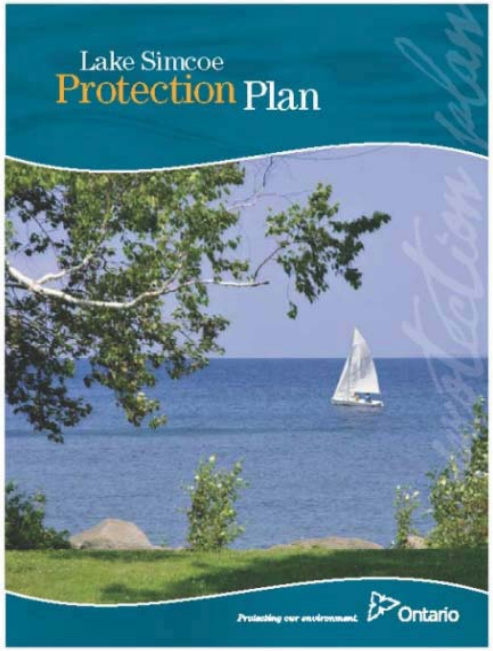
The software purchase price and training costs can be billed in one invoice and any additional Consulting Services can be billed separately on an hourly-rate-basis. It is understood that there are no fees associated with the software maintenance and technical support.

Please forward the above mentioned information to the attention of Mr. Ralph Scheunemann, P. Eng.; Manager of Infrastructure Planning or if you require additional information and/or clarification, please contact the same at (705) 739-4220, Ext. 4782 or E-mail rscheunemann@barrie.ca.

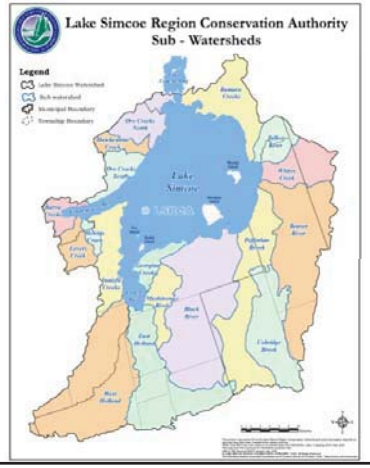
Yours truly,

R. E. Scheunemann, P. Eng.
Manager of Infrastructure Planning

GREENLAND®



CANWET™ Canadian Nutrient and Water Evaluation Tool



Tel: 905•895•1281
1•800•465•0437
Fax: 905•853•5881
E-Mail: info@lsrca.on.ca
Web: www.lsrca.on.ca

120 Bayview Parkway
Box 282
Newmarket, Ontario
L3Y 4X1

A Watershed For Life

February 26, 2010

R. Mark Palmer, P.Eng.
President
Greenland Consulting Engineers
120 Hume Street
Collingwood, ON L9Y 1V5

Dear Mr. Palmer:

Re: CANWET™ Model and Application

Please accept this letter as the Lake Simcoe Region Conservation Authority's endorsement of the CANWET™ (v.3) model. The Conservation Authority is extremely satisfied with the model's performance and accuracy and supports the continued use of this product in our watershed and others.

CANWET™ was initially developed and tested to deal with nutrient loading issues within the Lake Simcoe basin. Since this time the model has become an invaluable tool in the development of growth plans, as was demonstrated in the Lake Simcoe and Nottawassaga River Assimilative Capacity studies to support the Inter Governmental Action Plan (IGAP) process within Simcoe County. The model has also been extensively used and tested as part of the Lake Simcoe Basin's Source Water Protection program to develop Tier 1 water budgets and, most recently, the development and implementation of the provincial Lake Simcoe Protection Plan (LSPP). The tool has allowed the Authority to develop water quality and quantity targets at a sub-catchment level and is being evaluated for use under a Phosphorus Trading program being considered by the Ministry of the Environment.

Please do not hesitate to contact me should you require any further information or assistance.

Sincerely,

Michael Walters, CMM III
General Manager, Watershed Management

MW/lmc

Estimation of the Phosphorus Loadings to Lake Simcoe

Submitted to

Lake Simcoe Region Conservation Authority

Prepared by

THE Louis Berger Group, INC.
2445 M Street, NW
Washington, DC

September 2010

Final Report

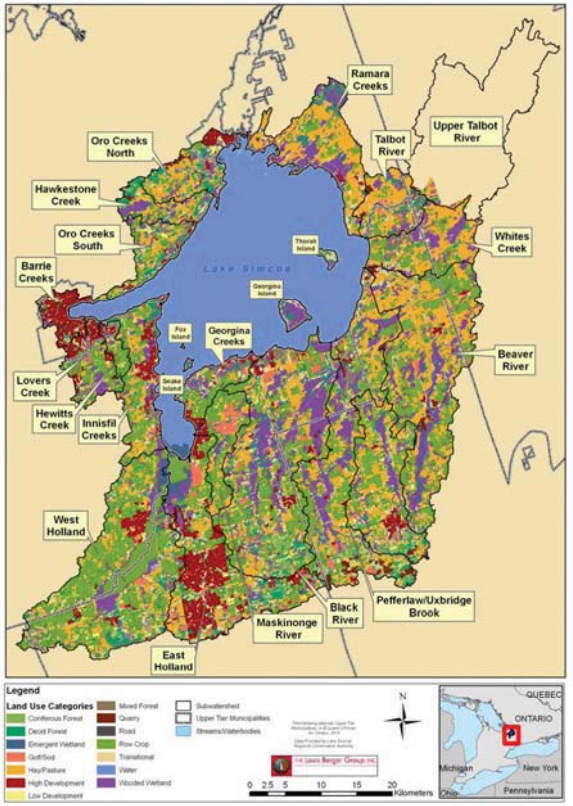


Figure 2-2. Existing Land Use for the Lake Simcoe Watershed

CANWET™ Canadian Nutrient and Water Evaluation Tool

CANWET ™ (Version '4') Development

- Addition of calibration and visualization tools.
- Open source (*MapWindow*) GIS environment.
- Addition of pathogen modeling capabilities.
- Integrated routing algorithm to provide in-stream routing and constituent concentration estimates.
- Automatic stream network and catchment delineation for *STREAMPLAN*.
- Complete re-build of structure for SQL Server databases in order to improve input and output data management; improve model efficiency; and, enable timely and cost-effective model customization for other regions of Ontario and Provinces.
- Net groundwater flux contribution in the water balance (user input).
- Improvements to overall model response including snow melt, ET and sediment transport based on recommendations from Guelph University.
- Climate change tool from the University of Guelph (Province recommended).
- Initiating access to CANWET-ready data sets for select areas.

A CANWET™ (v.4) model of the LaSalle River Basin is being prepared by Greenland for Environment Canada & Agriculture and Agri-food Canada, as part-of the Lake Winnipeg Initiative.

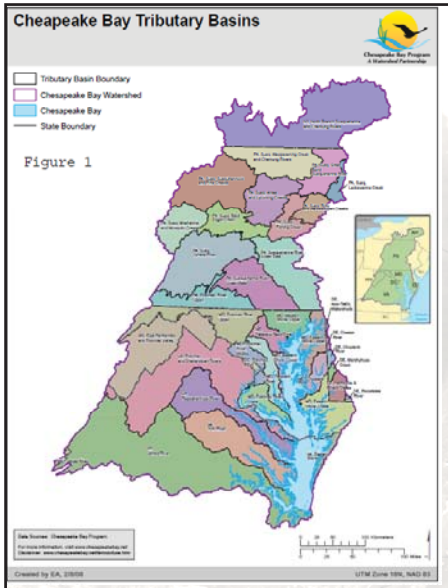
County of Simcoe

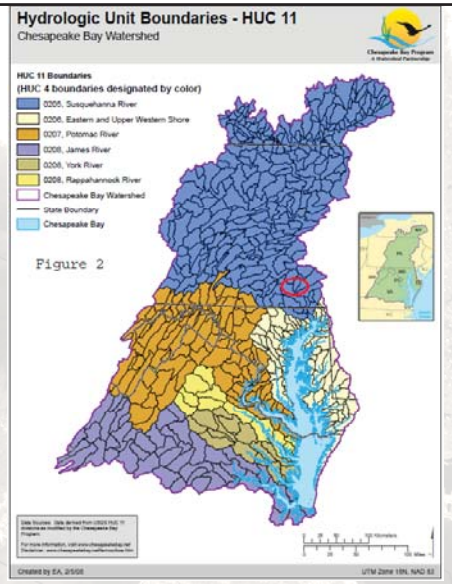
Water and Wastewater Visioning Strategy (In-kind)

U.S. Government Pilot for the Chesapeake Bay Basin Program and Invitation for Canada / Mexico Governance Knowledge and Technology Transfer Partnerships (On-going)

- Primary Focus = **Chesapeake Bay** Basin (Conewago Creek Subwatershed) for the Development of New Information Technology and Modelling Tools and Governance System Review (Fed/State/Local).
- Canadian **Great Lakes** Companion "Primary" Subwatershed is Coldwater Creek (Simcoe County).
- 2nd Canadian **Great Lakes** Companion Subwatershed Proposed is Innisfil Creek With Support from OMAFRA.

(aka the Next Evolution of CANWET™ !)


Cheapeake Bay Tributary Basins
Tributary Basin Boundary
Chesapeake Bay Watershed
Chesapeake Bay
State Boundary
Figure 1


Hydrologic Unit Boundaries - HUC 11
Chesapeake Bay Watershed
HUC 11 Boundaries
(HUC 4 boundaries designated by color)
0205, Susquehanna River
0206, Eastern and Upper Western Shore
0207, Potomac River
0208, James River
0206, York River
0208, Rappahannock River
Chesapeake Bay Watershed
State Boundary
Chesapeake Bay
Figure 2

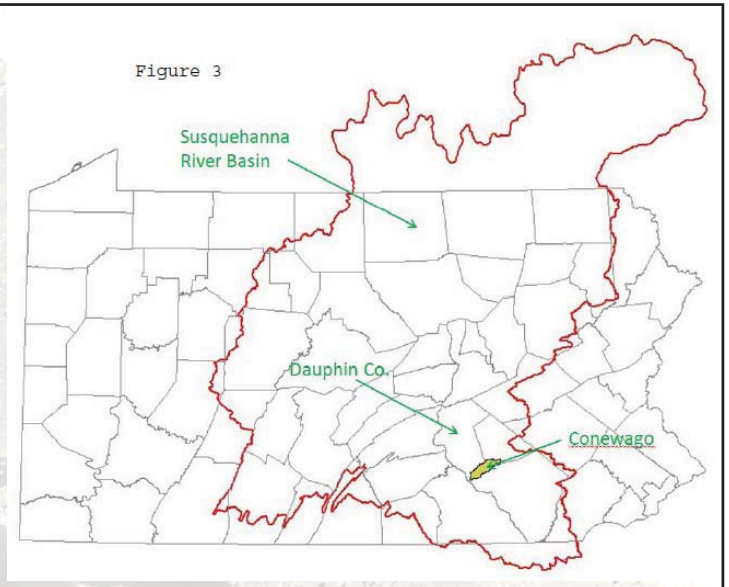
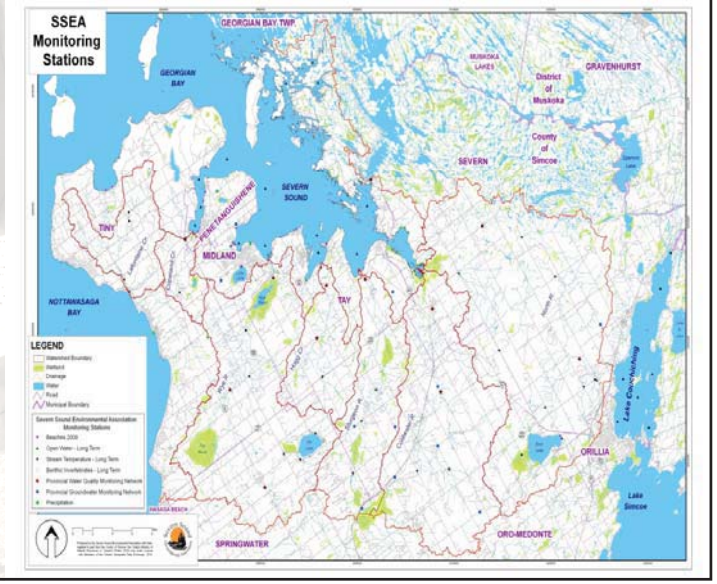


Figure 3
Susquehanna
River Basin
Dauphin Co.
Conewago


DRINKING WATER SOURCE PROTECTION
South Georgian Bay Lake Simcoe Source Protection Region
Figure 4
Muskoka
Black-Severn River
Severn Sound
Kawartha Lakes
Simcoe
Nottawasaga Valley
Lake Simcoe
Durham
Dufferin
York
Peel


Innisfil Creek
Subwatershed
Figure 6
Watercourse
Local Rd
County Rd
Provincial Rd
Utility Line
Railway
Innisfil Creek Subwatershed Boundary
Municipal Boundary
Waterbody
Oak Ridges Moraine Boundary
Simcoe County Forest
Innisfil
Essa
Bradford West Gwillimbury
New Tecumseth
Adjala-Tosorontio
Mono


SSEA Monitoring Stations
GEORGIAN BAY TWP
GEORGIAN BAY
GRAVENHURST
District of Muskoka
County of Simcoe
SEVERN
SEVERN SOUND
TINY
PENETANGUISHENE
MIDLAND
TAY
NOTTAWASAGA BAY
LEGEND
ORILLIA
Lake Simcoe
SPRINGWATER
ORO-MEDONTE

PART 'B' – Opportunities and Constraints

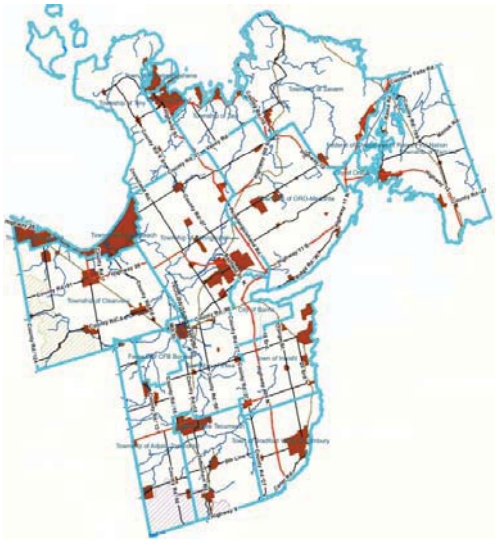
1) Septage and Leachate Systems

2) Level '1' Approach and Using CANWET™ Baseline Condition Data (NOTE: Adopted Methodology for the County's Visioning Strategy)

- *Example #1: Township of Clearview*
- *Example #2: Township of Ramara*

3) Level '2' Approach and Using CANWET™ for Master Servicing Plans (NOTE: For Consideration by the Member Municipalities)

- *Example: Town of Innisfil and Proposed OPA 1 and Campus Node*



Septage and Leachate Systems

Private Wastewater Systems

• Groundwater pollution from septic systems is a concern within more isolated, rural areas of Simcoe County were communities predominately rely on groundwater supply systems for their drinking water.

• There are approximately 130,000 people (approximately 45% of the population) in the County of Simcoe that rely on private wastewater treatment systems for their wastewater servicing needs.

• There is a potential opportunity for a portion of the population currently using private wastewater treatment systems to connect to existing or future municipal infrastructure for wastewater servicing.

For example, in the Town of Innisfil, approximately 15,200 private wastewater treatment system users are included in the Class Environmental Assessment (EA) for the Lakeshore WPCP. Therefore, subject to further analysis, other County municipalities may have the same opportunity to connect existing private septic system users to a municipal wastewater treatment system through the extension, expansion and/or the construction of these facilities and also concurrently with any proposed growth areas.

Septage and Leachate Systems (cont'd)

Landfill Leachate

• Since Site 10 (Nottawasaga) and Site 11 (Oro) have not yet reached capacity leachate generation may increase in the future.

• Presently, the majority (approximately 40%) of leachate annually produced in Simcoe County is generated from Site 11 (Oro) landfill site.

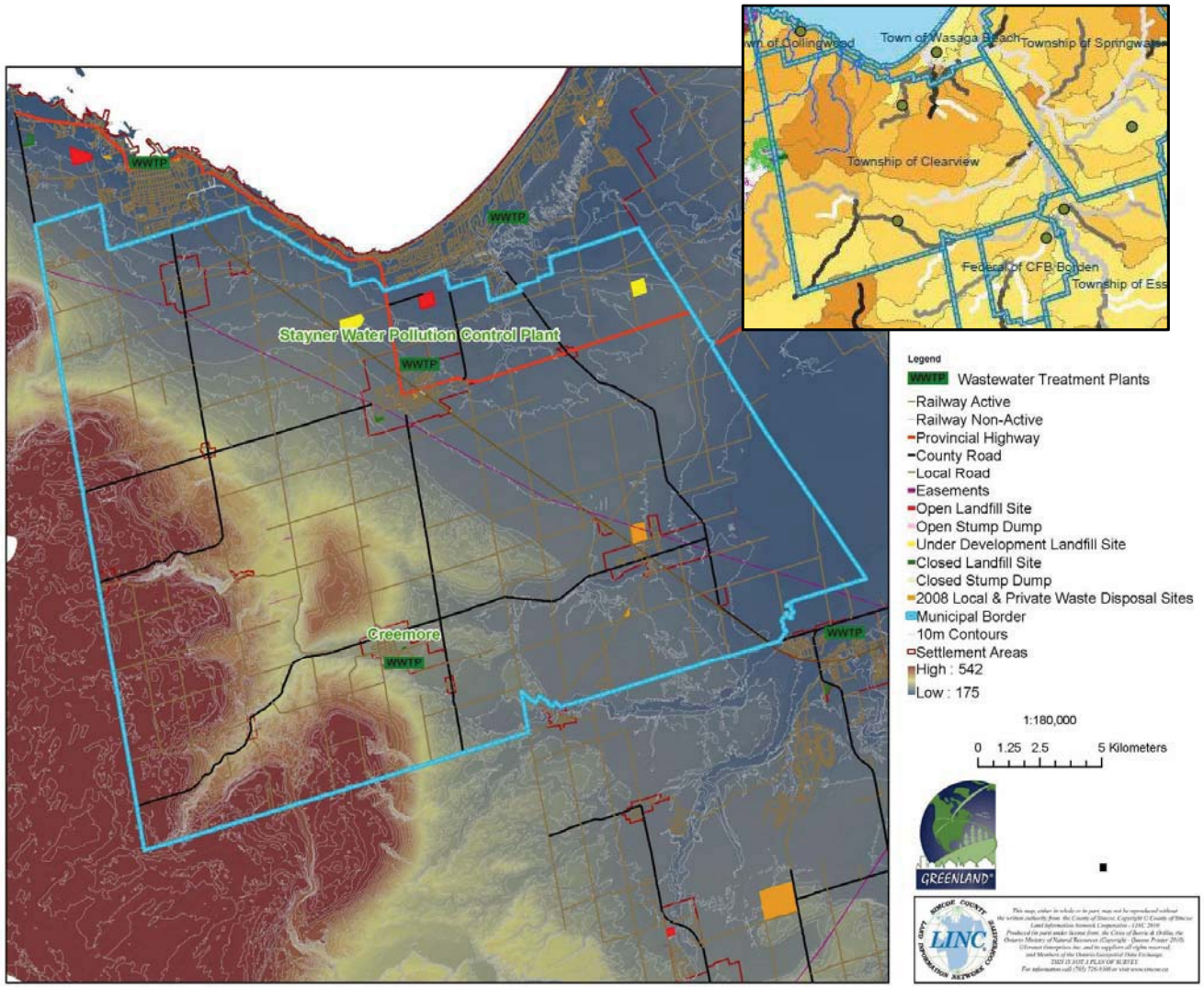
• Landfill leachate has been shown to be treatable on landfill sites, without either excessive costs, or the use of systems that require technical management and expertise. Leachate treatment technologies typically fall into two (2) basic system types - biological and physical/chemical. These system types can also be incorporated or combined for a more effective treatment process. The most common biological treatment is activated sludge, which is a suspended-growth process that uses aerobic microorganisms to degrade organic contaminants in leachate. With conventional activated sludge treatment, the leachate is aerated in an open tank with diffusers or mechanical aerators.

• At this time, the majority of leachate is being transported to the neighbouring municipalities of The Town of Blue Mountains and the City of Barrie.

• Since the majority of leachate generated within the five (5) active landfill sites located within Simcoe County is being transported to outside sources for the primary treatment and disposal, leachate transportation represents over 50% of the cost related to leachate disposal.

• There may be an opportunity to reduce leachate transportation and disposal costs by treating leachate on-site at landfills or at new, existing or improved wastewater treatment systems located closer to the subject landfills.

Level ‘1’ Approach for the County’s Visioning Strategy (e.g. Clearview)



Draft Conclusions (Wastewater):

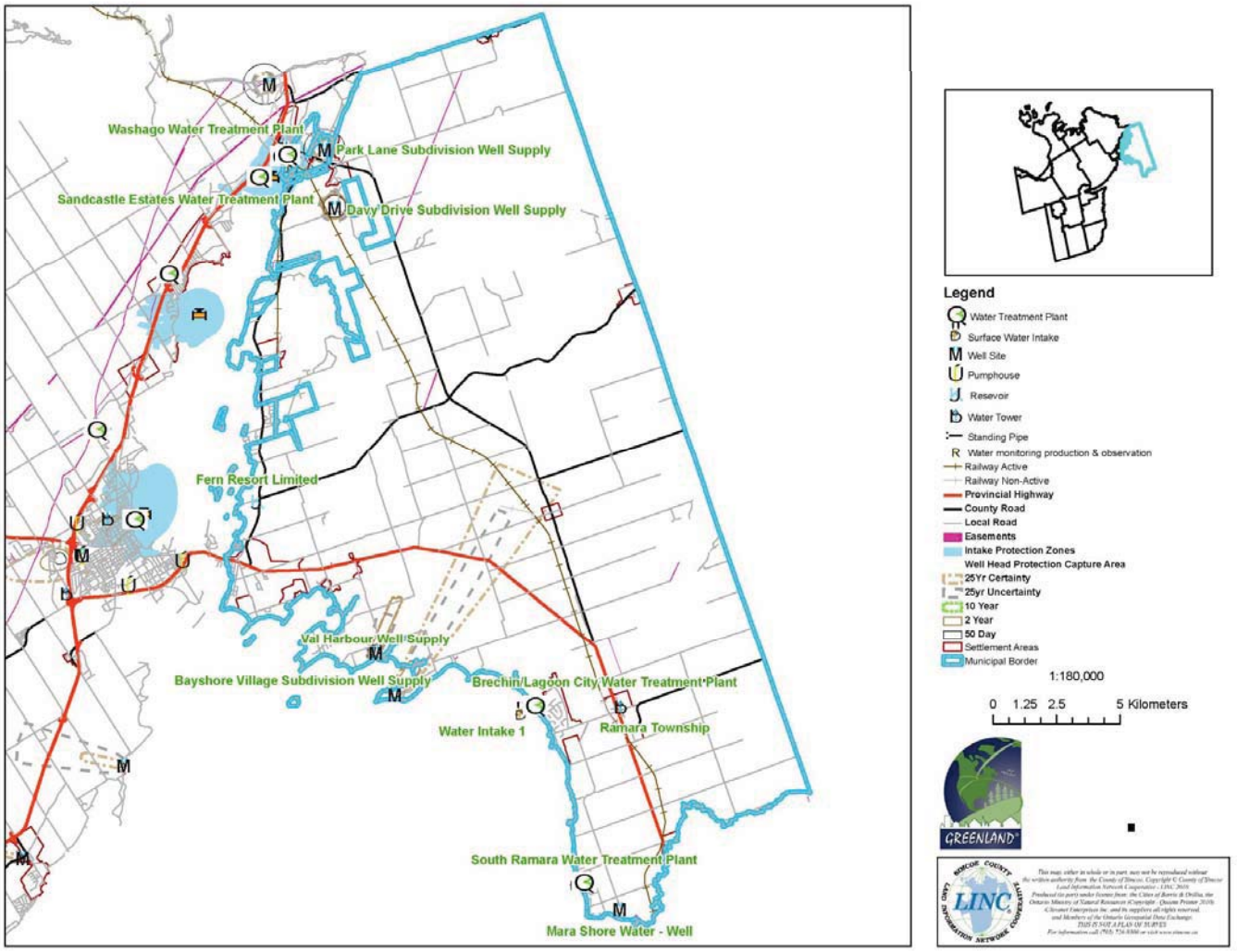
Township of Clearview has partially addressed its 2031 wastewater treatment servicing gap with the initiation of Class EAs to service the growth in the Communities of Nottawa and Stayner by the Collingwood and Wasaga Beach WPCPs, respectively.

- Presently, the Township and Town of Collingwood have discussed constructing a forcemain between the two municipalities to service the Village of Nottawa future population growth. A Class EA has already been conducted for this proposed connection.

- Presently, the Township and Town of Wasaga Beach have discussed constructing a forcemain between the two municipalities service the Village of Stayner future population growth. A Class EA has already been conducted for this proposed connection.

- *Village of New Lowell could potentially connect to the Community of Angus (Township of Essa) or CFB Borden via a forcemain to service this area of Clearview's future growth. Angus does have residual capacity that could potentially be utilized.*

Level '1' Approach for the County's Visioning Strategy (e.g. Ramara)



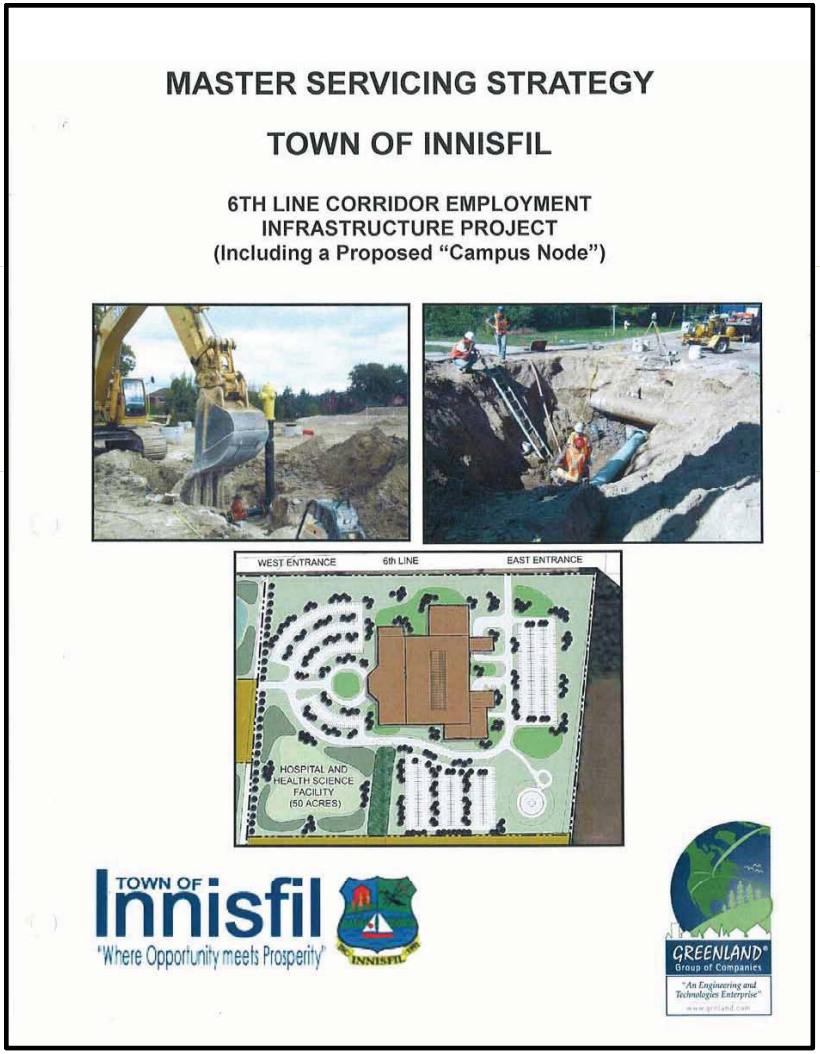
Draft Conclusions (Water and Wastewater):

Township of Ramara has not initiated plans to address its 2031 growth water supply system servicing gaps.

- There is an opportunity for the Township to connect to neighbouring Townships or the City of Orillia to provide the additional water and wastewater servicing required.

- Due to the lack of development within a centralized urban node within the Township of Ramara, constructing a new WWTP within the Township may not be an economically feasible option. In addition to this, no new WWTPs will be allowed to discharge into Lake Simcoe as a policy of the Lake Simcoe Protection Plan.

PART 'B' – Opportunities and Constraints (cont'd)



Level '2' Approach and Using CANWET™ for Master Servicing Plans

(For Consideration by the Member Municipalities)

Example: ***Town of Innisfil and Proposed OPA 1 and Campus Node (Completed: October 2009)***

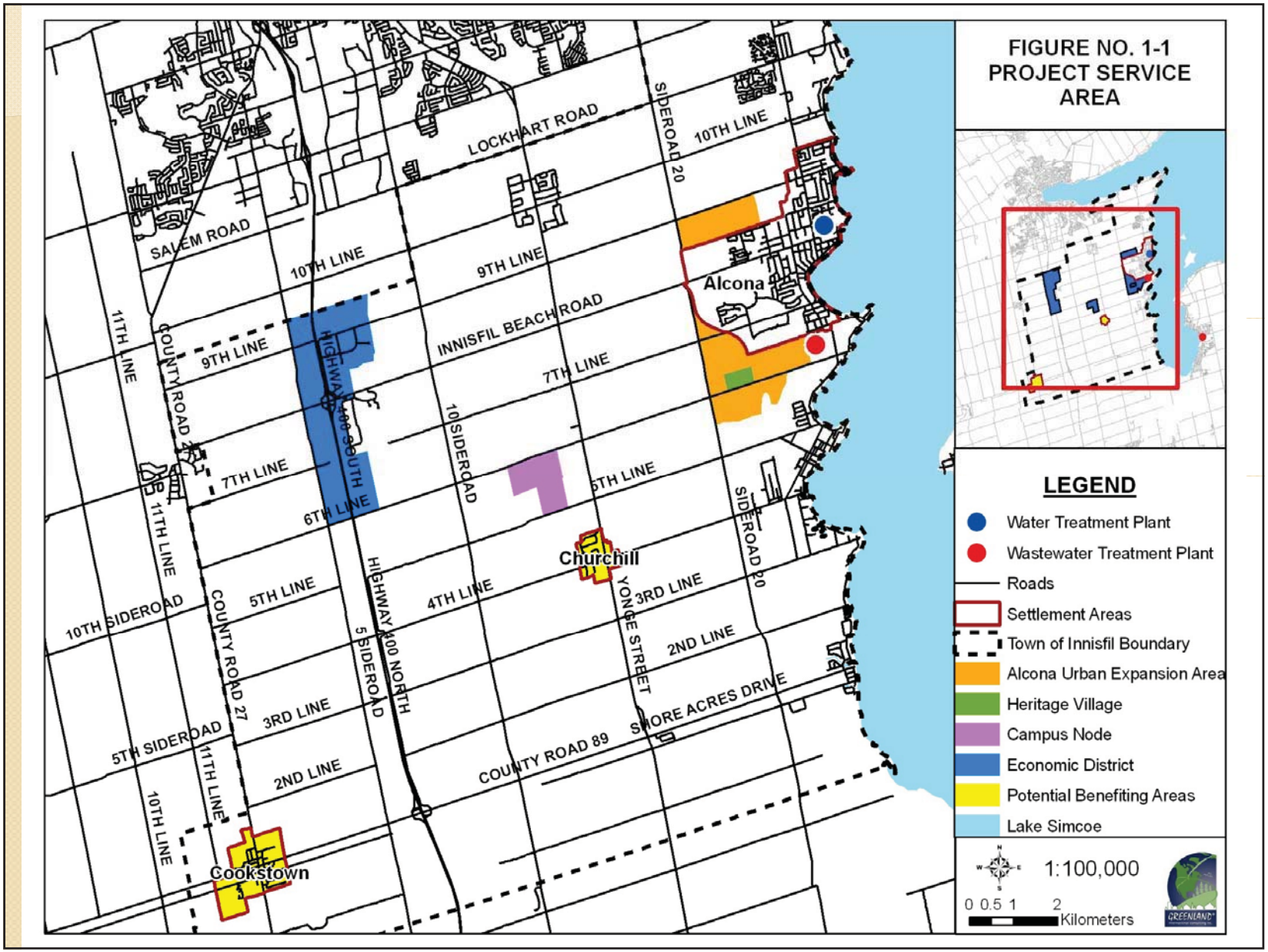


FIGURE NO. 1-1
PROJECT SERVICE AREA
LEGEND
Water Treatment Plant
Wastewater Treatment Plant
Roads
Settlement Areas
Town of Innisfil Boundary
Alcona Urban Expansion Area
Heritage Village
Campus Node
Economic District
Potential Benefiting Areas
Lake Simcoe
1:100,000
0 0.5 1 2
Kilometers
Alcona
Churchill
Cookstown
LOCKHART ROAD
SALEM ROAD
10TH LINE
9TH LINE
INNISFIL BEACH ROAD
7TH LINE
6TH LINE
5TH LINE
4TH LINE
3RD LINE
2ND LINE
11TH LINE
10TH SIDEROAD
5TH SIDEROAD
SIDEROAD 20
10 SIDEROAD
5 SIDEROAD
COUNTY ROAD 27
COUNTY ROAD 89
HIGHWAY 400 SOUTH
HIGHWAY 400 NORTH
YONGE STREET
SHORE ACRES DRIVE

Innisfil Employment Infrastructure Objectives

- **At the outset, conserve and protect all natural heritage features and other significant environmental lands;**
- Design a Master Servicing Strategy (MSS) that can also provide **net public benefits**, incl. local drainage systems, and which can implement **cost-effective technologies** to help protect Lake Simcoe;
- Comply with the **available science** from watershed management and stewardship initiatives involving the Public, Province, Town of Innisfil, County of Simcoe, and Conservation Authorities – while addressing any information deficiencies from these studies; and,
- Develop a **phased / flexible** Strategy that addresses current and future development needs of the Town and County, as well as new Provincial/Federal environmental compliance policies.

Outcome = An Integrated "Compliance / Science-Based" Strategy

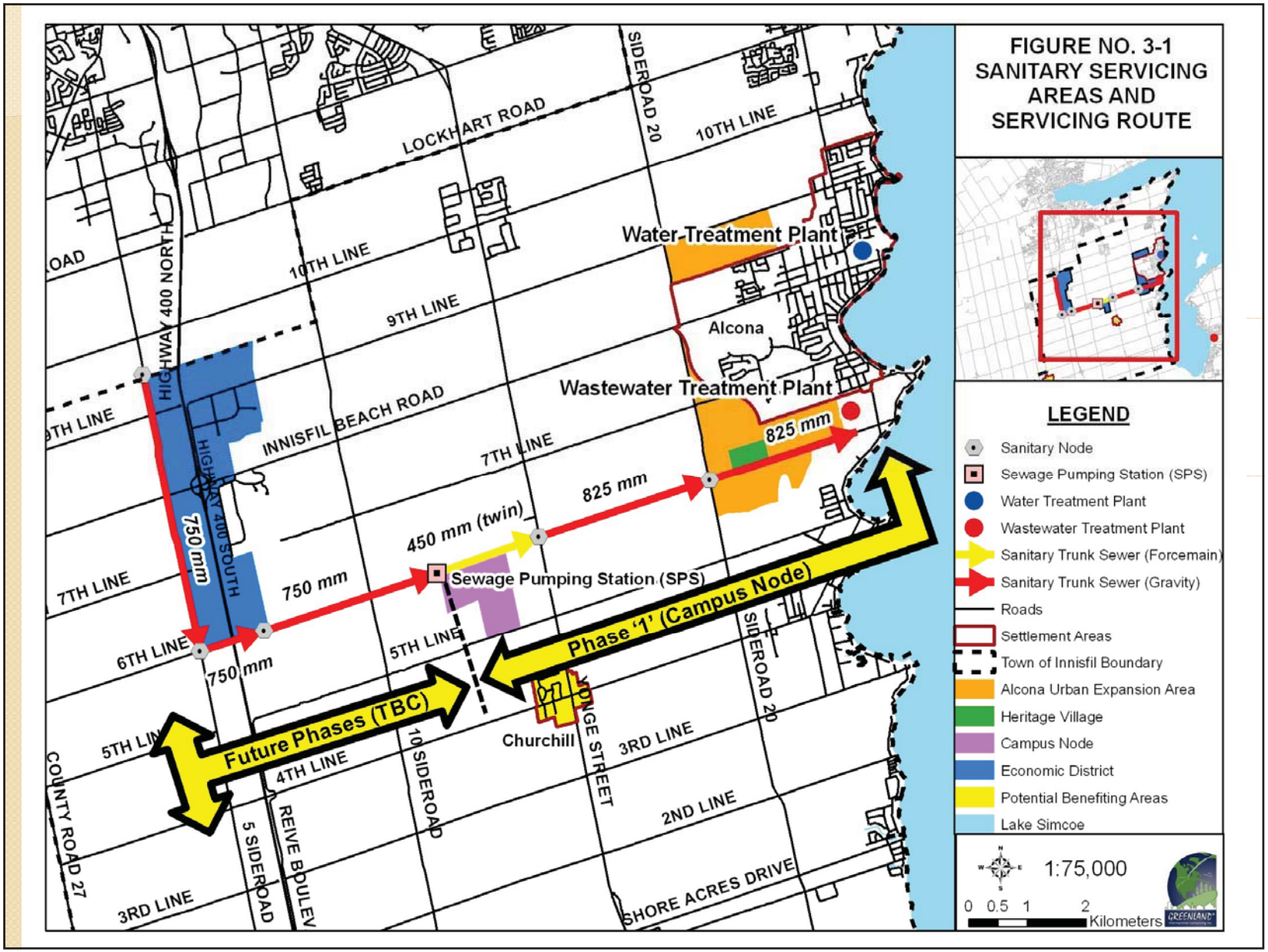


FIGURE NO. 3-1
SANITARY SERVICING AREAS AND SERVICING ROUTE
LOCKHART ROAD
SIDEROAD 20
10TH LINE
HIGHWAY 400 NORTH
9TH LINE
Water Treatment Plant
Alcona
INNISFIL BEACH ROAD
Wastewater Treatment Plant
7TH LINE
825 mm
450 mm (twin)
825 mm
750 mm
750 mm
750 mm
Sewage Pumping Station (SPS)
6TH LINE
5TH LINE
Phase '1' (Campus Node)
Future Phases (TBC)
Churchill
VERGE STREET
3RD LINE
4TH LINE
2ND LINE
10 SIDEROAD
5 SIDEROAD
REIVE BOULEV
COUNTY ROAD 27
SHORE ACRES DRIVE
LEGEND
Sanitary Node
Sewage Pumping Station (SPS)
Water Treatment Plant
Wastewater Treatment Plant
Sanitary Trunk Sewer (Forcemain)
Sanitary Trunk Sewer (Gravity)
Roads
Settlement Areas
Town of Innisfil Boundary
Alcona Urban Expansion Area
Heritage Village
Campus Node
Economic District
Potential Benefiting Areas
Lake Simcoe
1:75,000
0 0.5 1 2
Kilometers

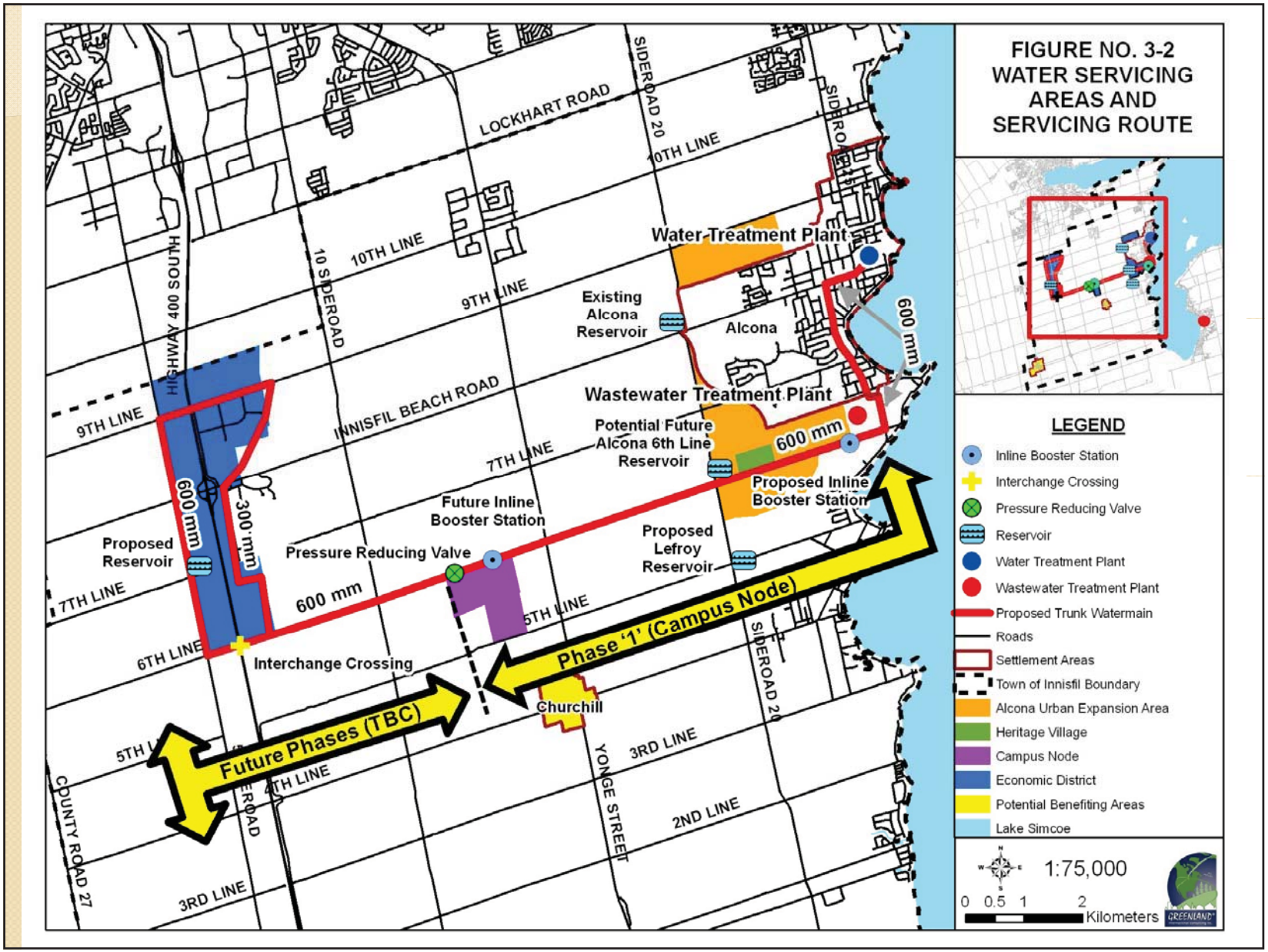
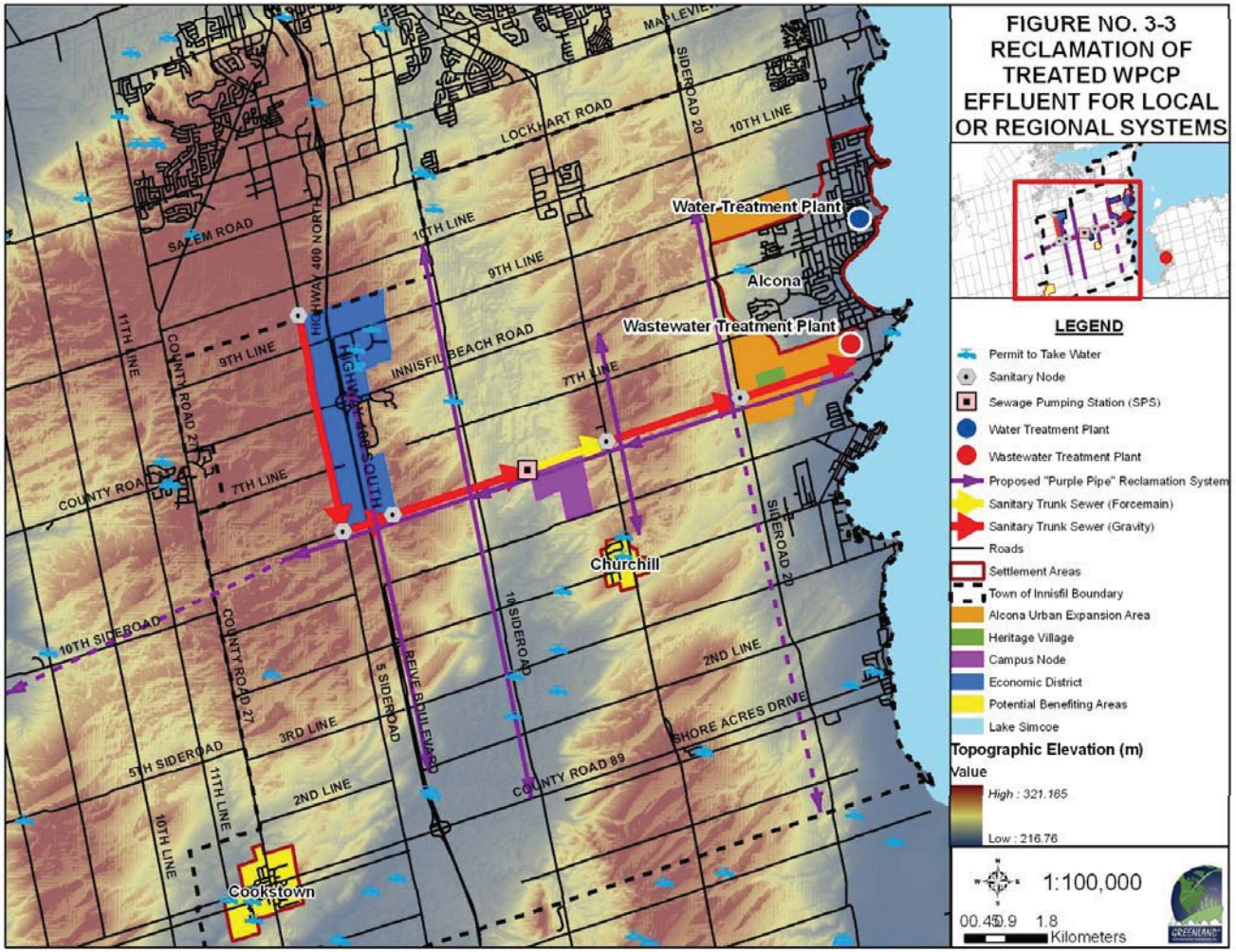


FIGURE NO. 3-2
WATER SERVICING AREAS AND SERVICING ROUTE
LOCKHART ROAD
10TH LINE
9TH LINE
7TH LINE
6TH LINE
5TH LINE
4TH LINE
3RD LINE
2ND LINE
HIGHWAY 400 SOUTH
10 SIDEROAD
SIDEROAD 20
YONGE STREET
COUNTY ROAD 27
INNISFIL BEACH ROAD
Water Treatment Plant
Existing Alcona Reservoir
Alcona
Wastewater Treatment Plant
Potential Future Alcona 6th Line Reservoir
Proposed Inline Booster Station
Future Inline Booster Station
Proposed Reservoir
Pressure Reducing Valve
Proposed Lefroy Reservoir
Interchange Crossing
Churchill
600 mm
300 mm
Phase '1' (Campus Node)
Future Phases (TBC)
LEGEND
Inline Booster Station
Interchange Crossing
Pressure Reducing Valve
Reservoir
Water Treatment Plant
Wastewater Treatment Plant
Proposed Trunk Watermain
Roads
Settlement Areas
Town of Innisfil Boundary
Alcona Urban Expansion Area
Heritage Village
Campus Node
Economic District
Potential Benefiting Areas
Lake Simcoe
1:75,000
0 0.5 1 2
Kilometers

Reclamation of Treated WPCP Effluent for Local or Other County Needs
(One of the Net Public Benefits from the Innisfil Employment Infrastructure Project)

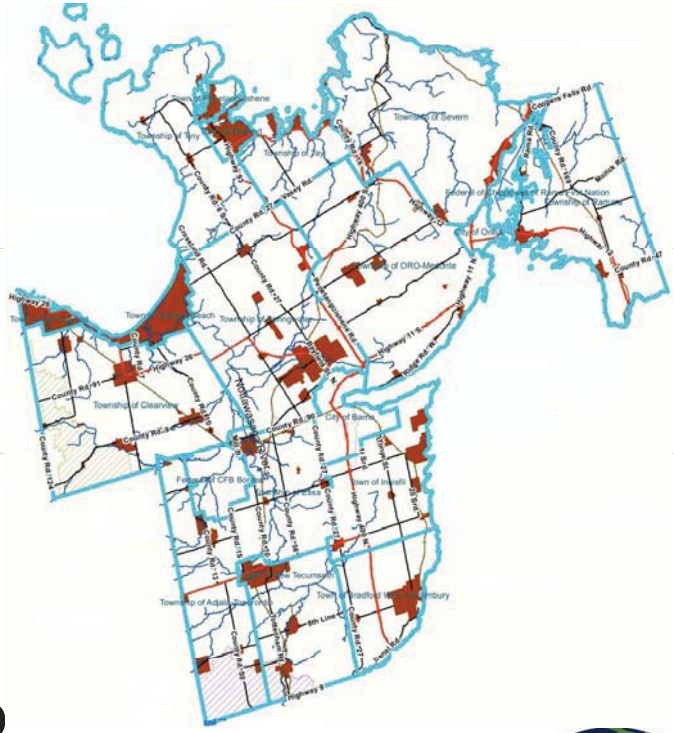


Elements of the Innisfil Employment Infrastructure MSS

- **Locations of the 1) Campus Node, 2) Economic District , 3) Proposed Alcona Development Areas , and 4) Lakeshore WPCP are not impaired by effluent receiver constraints within Lake Simcoe;**
- **Proposed developments and location/expansion of Lakeshore WPCP can be integrated cost-effectively into a water reclamation system for the Lake Simcoe and/or Nottawasaga River Basins, and potentially a "clean energy grid" resulting from heat exchange capabilities associated with the proposed water distribution and wastewater conveyance works;**
- **Master Servicing Strategy can address the interim lake phosphorus cap (imposed Feb. 2008) and the proposed 44 tonne total Lake Simcoe loading target from the *Lake Simcoe Protection Plan*.**
- **Proposed development does not rely on other MSS alternatives for implementation, such as nutrient trading or emerging "P" reduction technologies (e.g. Phoslock) to achieve its sub-watershed loading target and based on current Provincial requirements for Lake Simcoe;**
- **Master Drainage Strategy addresses environmental and flooding concerns of the Town and Lake Simcoe Region Conservation Authority, while it also provides net public benefits.**
- **The Phase 'I' project supports ongoing R&D initiatives of Provincial interest and now involving the MOE, University of Guelph, Simcoe County District School Board and local Conservation Authorities (LSRCA and TRCA), and also the future operations of a "Centre of Excellence" to be located within the proposed Campus Node along the 6th Line corridor.**

County of Simcoe Water and Wastewater Visioning Strategy

Overview of Background Information Brief and Servicing Gap Analysis



Presentation to County CAO's Group (January 19th , 2010)

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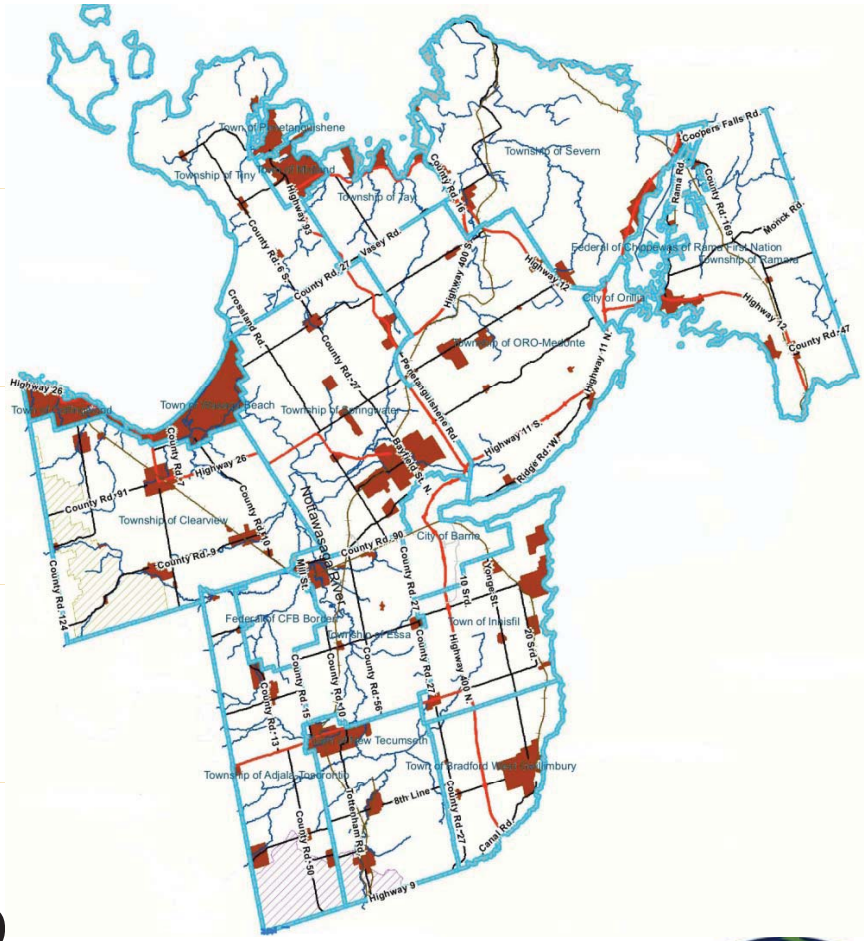
Group of Companies
"An Engineering and Technologies Enterprise"
www.grnland.com

County of Simcoe Water and Wastewater Visioning Strategy

Overview of Background Information Brief and Servicing Gap Analysis



Presentation to County CAO's Group (June 20th, 2011)

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Presentation Outline

PART 'A' - Background

Handout – Introduction and Background

- County Council Resolution CCW-007-09 (Adopted December 2009)

- Project Goal, Objectives, and County - Greenland Staffs Responsibilities

- Study Area and Completed Data Collection / Background Information Process

Handout – Socio Economic Conditions

- Overview of County Official Plan Population and Employment

Handout – Natural Heritage Conditions

- Overview of Septage and Leachate Systems Summaries

Handout – Servicing Gap Analysis Examples

- Examples of Completed Servicing Gap Analyses (Township of Essa)

- In-kind Contributions (CANWET™ and Concurrent U.S. / Mexico Initiative)

Presentation Outline

PART 'B' – Opportunities and Constraints

- Septage and Leachate Systems
- Marinas
- Examples of Completed Level '1' Approach (Clearview)
- Level '2' Approach (Town of Innisfil)

PART 'C' – Level 2 Opportunities - Handout

- Identify and Develop Opportunities for Municipalities with Current Servicing Gaps.

In response to this vision, County Council adopted **Resolution CCW-007-09** at the December 2009 general meeting in order to complete a County-wide water and wastewater visionary strategy:

THAT County staff, in consultation with the staff of the member municipalities, the separated cities, neighbouring municipalities, first nation partners and the development community, be required to prepare a report on the existing water and wastewater system requirements, agreements and plans (including septage and leachate), as well as analysis of the current and potential delivery matrix & options with respect to long term solutions regarding co-ordination of this service delivery;

AND THAT the Provincial and Federal governments and the assistance of an outside engineering consulting firm be utilized to accomplish this task.

To address Simcoe County Resolution CCW-007-09, and to provide current information that would assist potential/future infrastructure strategies to be initiated by the Province, the County retained the Greenland Group to complete the primary project goal, namely:

•To prepare a Servicing Gap Analysis that assesses existing water and wastewater system requirements for all County member municipalities, the separated cities, and federal lands within Simcoe County.

Greenland interpreted that the **primary goal** could be achieved through the completion of the following document **objectives**:

1) Assess the existing water and wastewater system capacities with respect to servicing existing and proposed population growth identified in the County of Simcoe adopted 2008 Official Plan (No other land use changes were considered);

2) Compile a general review of existing environmental (natural, socio-economic) conditions for the County of Simcoe and utilizing available/local science; and,

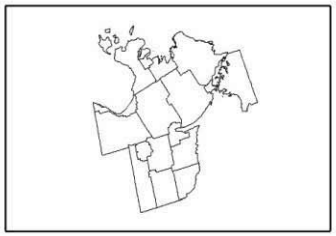
3) Based on Greenland's assessment and review of the above 2 objectives, prepare individual summaries of water and wastewater servicing opportunities and constraints and which should also consider baseline condition results from *Greenland's technology in-kind* (CANWET™) provided during the project.

4) Identify Level 2 Opportunities for each of the municipalities that are found to have a servicing gap.

Study Area

Project Study Area

Simcoe County Official Plan - Adopted 2008



Legend

- Water Courses
- Railway Active
- Railway Non-Active
- Provincial Highway
- County Road
- Niagara Escarpment Plan Boundary
- Oak Ridges Moraine Area
- Settlement Areas
- Municipal Border

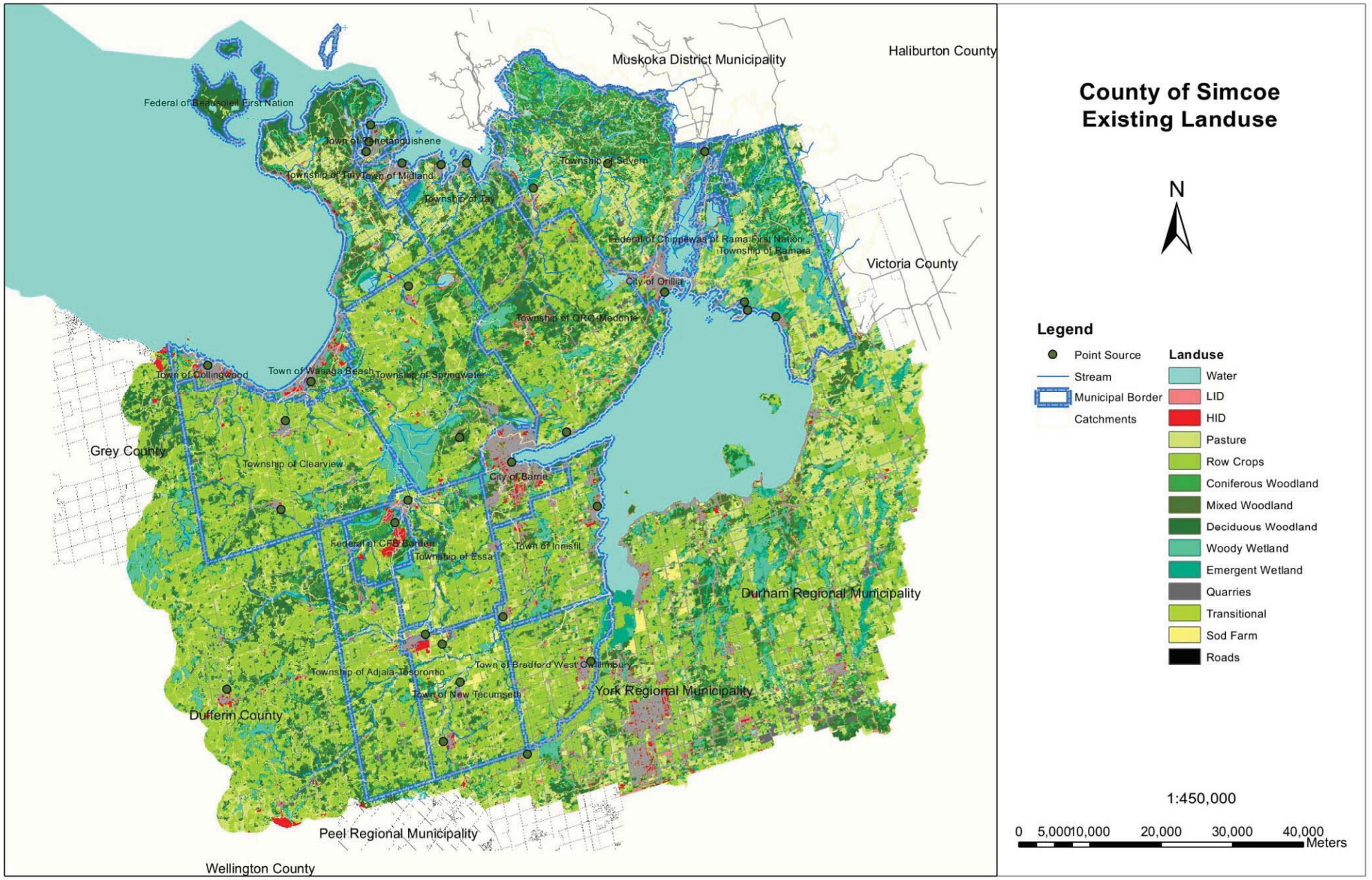
1:400,000

0 3.75 7.5 15 Kilometers

GREENLAND

N W E S

Study Area (cont'd)



Study Area (cont'd)

Natural Heritage Features
Simcoe County Official
Adopted 2008

Legend

- Water Courses
- Railway Active
- Railway Non-Active
- Provincial Highway
- County Road
- Niagara Escarpment Plan Boundary
- Oak Ridges Moraine Area
- Provincially Significant Wetland
- Locally Significant Wetland
- Marsh
- Provincial ANSI
- Regional ANSI
- Settlement Areas
- Municipal Border

1:400,000

0 3.75 7.5 15 Kilometers

GREENLAND

N W E S

Overview of County Official Plan Population and Employment

Simcoe County Official Plan (Revised Plan): Population Growth Rates in Simcoe County, Barrie and Orillia

Region	Town/Township	2006 Census Population (Persons)	Simcoe County Official Plan (Adopted) 2031 Population Allocation (Persons)	Population Growth 2006 - 2031 (Persons)	Percent Growth From 2006 - 2031 Population
SIMCOE COUNTY	Township of Adjala-Tosorontio	11,100	14,200	3,100	128%
	Town of Bradford West Gwillimbury	25,000	49,700	24,700	199%
	Township of Clearview	14,600	26,000	11,400	178%
	Township of Collingwood	18,000	30,200	12,200	168%
	Township of Essa	17,600	22,900	5,300	130%
	Town of Innisfil	32,400	65,000	32,600	201%
	Town of Midland	16,900	19,700	2,800	117%
	Town of New Tecumseth	28,800	49,000	20,200	170%
	Township of Oro-Medonte	20,800	28,100	7,300	135%
	Town of Penetanguishene	9,700	12,300	2,600	127%
	Township of Ramara	9,800	15,500	5,700	158%
	Township of Severn	12,500	20,200	7,700	162%
	Township of Springwater	18,100	26,500	8,400	146%
	Township of Tay	10,100	11,300	1,200	112%
	Township of Tiny	11,200	13,900	2,700	124%
	Town of Wasaga Beach	15,600	35,000	19,400	224%
	Total Population	**272,200**	**439,500**	**167,300**	**161%**
Other	City of Barrie	166,400	227,500	61,100	137%
	City of Orillia				
	Total Population	**438,600**	**667,000**	**228,400**	152%

GREENLAND

Overview of County Official Plan Population and Employment (cont'd)

Simcoe County Official Plan (Revised Plan): Employment Growth Rates in Simcoe County, Barrie and Orillia

Region	Town/Township	2006 Census Employment (Persons)	Simcoe County Official Plan (Adopted) 2031 Employment Allocation (Persons)	Employment Growth 2006 - 2031 (Persons)	Percent Growth From 2006 - 2031 Population
SIMCOE COUNTY	Township of Adjala-Tosorontio	1,600	2,100	500	131%
	Town of Bradford West Gwillimbury	8,000	16,200	8,200	203%
	Township of Clearview	4,400	5,800	1,400	132%
	Township of Collingwood	10,800	14,400	3,600	133%
	Township of Essa	7,700	10,300	2,600	134%
	Town of Innisfil	5,700	13,100	7,400	230%
	Town of Midland	12,000	16,000	4,000	133%
	Town of New Tecumseth	19,700	26,300	6,600	134%
	Township of Oro-Medonte	4,700	6,200	1,500	132%
	Town of Penetanguishene	5,300	7,000	1,700	132%
	Township of Ramara	1,900	2,500	600	132%
	Township of Severn	3,900	5,300	1,400	136%
	Township of Springwater	5,000	6,700	1,700	134%
	Township of Tay	1,500	2,000	500	133%
	Township of Tiny	1,400	1,900	500	136%
	Town of Wasaga Beach	3,100	4,100	1,000	132%
	Total Employment	**96,700**	**139,900**	**43,200**	**145%**
Other	City of Barrie	87,100	114,100	27,000	131%
	City of Orillia				
	Total Employment	**183,800**	**254,000**	**70,200**	**138%**

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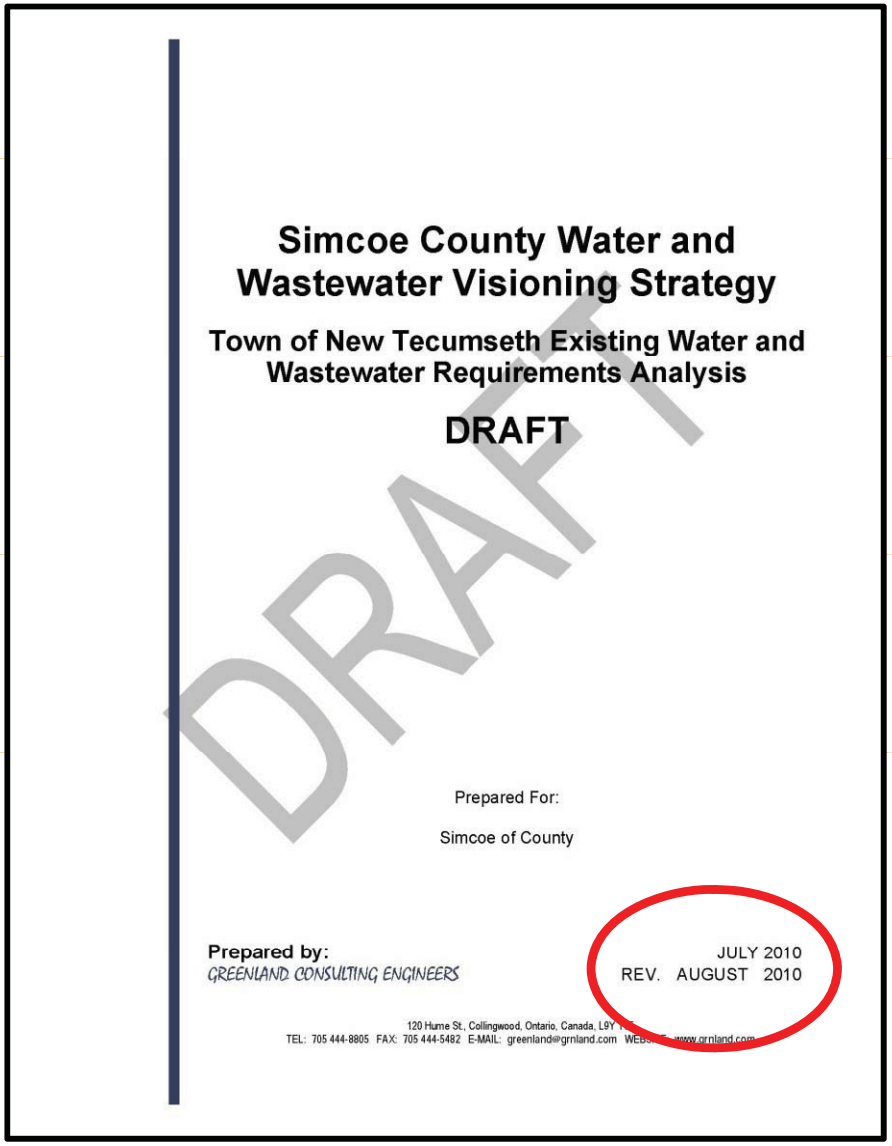
Data Collection / Background Information Process (e.g. New Tecumseth)



Simcoe County Water and Wastewater Visioning Strategy

Town of New Tecumseth Existing Water and Wastewater Requirements Analysis

DRAFT

DRAFT

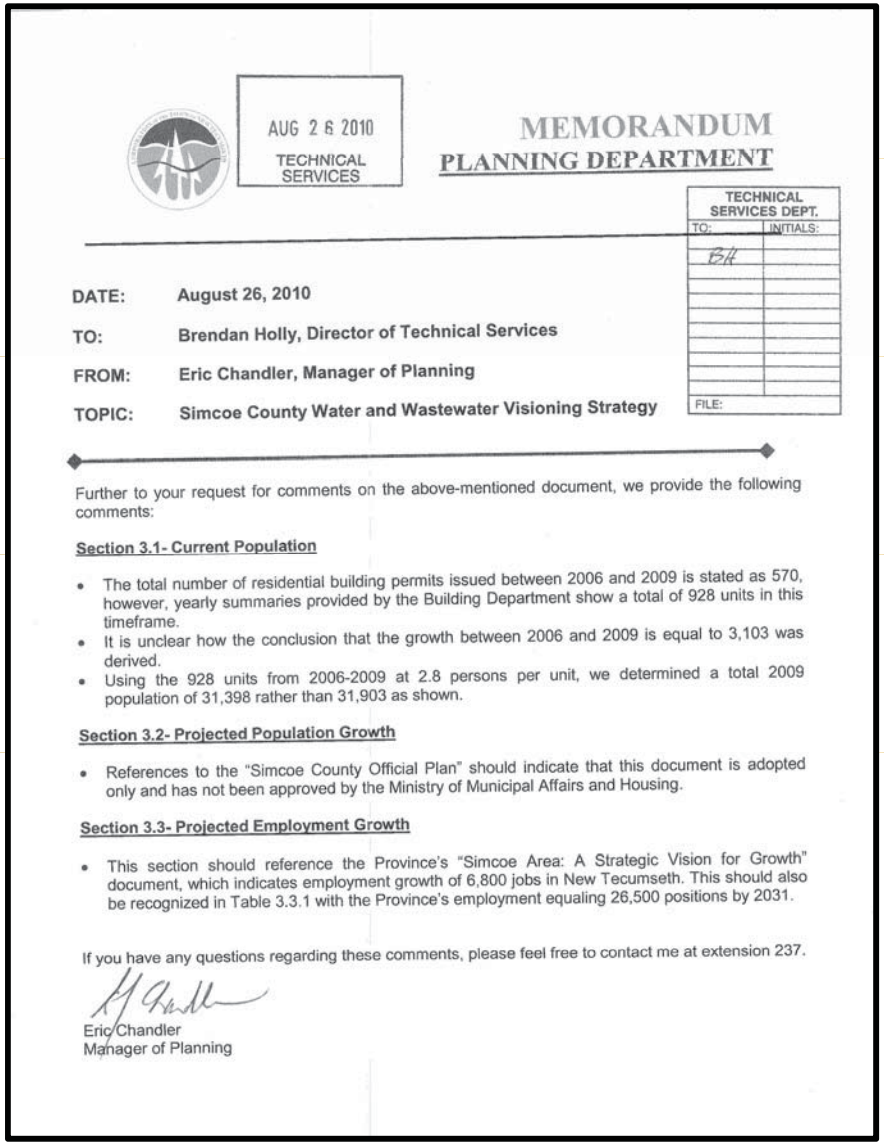
Prepared For:

Simcoe of County

Prepared by:
GREENLAND CONSULTING ENGINEERS

JULY 2010
REV. AUGUST 2010

120 Hume St., Collingwood, Ontario, Canada, L9Y
TEL: 705 444-8805 FAX: 705 444-5482 E-MAIL: greenland@grnland.com WEB: www.grnland.com



AUG 2 6 2010
TECHNICAL SERVICES

MEMORANDUM
PLANNING DEPARTMENT

TECHNICAL SERVICES DEPT.	
TO:	INITIALS:
BH	
FILE:	

DATE: August 26, 2010

TO: Brendan Holly, Director of Technical Services

FROM: Eric Chandler, Manager of Planning

TOPIC: Simcoe County Water and Wastewater Visioning Strategy

Further to your request for comments on the above-mentioned document, we provide the following comments:

Section 3.1- Current Population

- The total number of residential building permits issued between 2006 and 2009 is stated as 570, however, yearly summaries provided by the Building Department show a total of 928 units in this timeframe.
- It is unclear how the conclusion that the growth between 2006 and 2009 is equal to 3,103 was derived.
- Using the 928 units from 2006-2009 at 2.8 persons per unit, we determined a total 2009 population of 31,398 rather than 31,903 as shown.

Section 3.2- Projected Population Growth

- References to the "Simcoe County Official Plan" should indicate that this document is adopted only and has not been approved by the Ministry of Municipal Affairs and Housing.

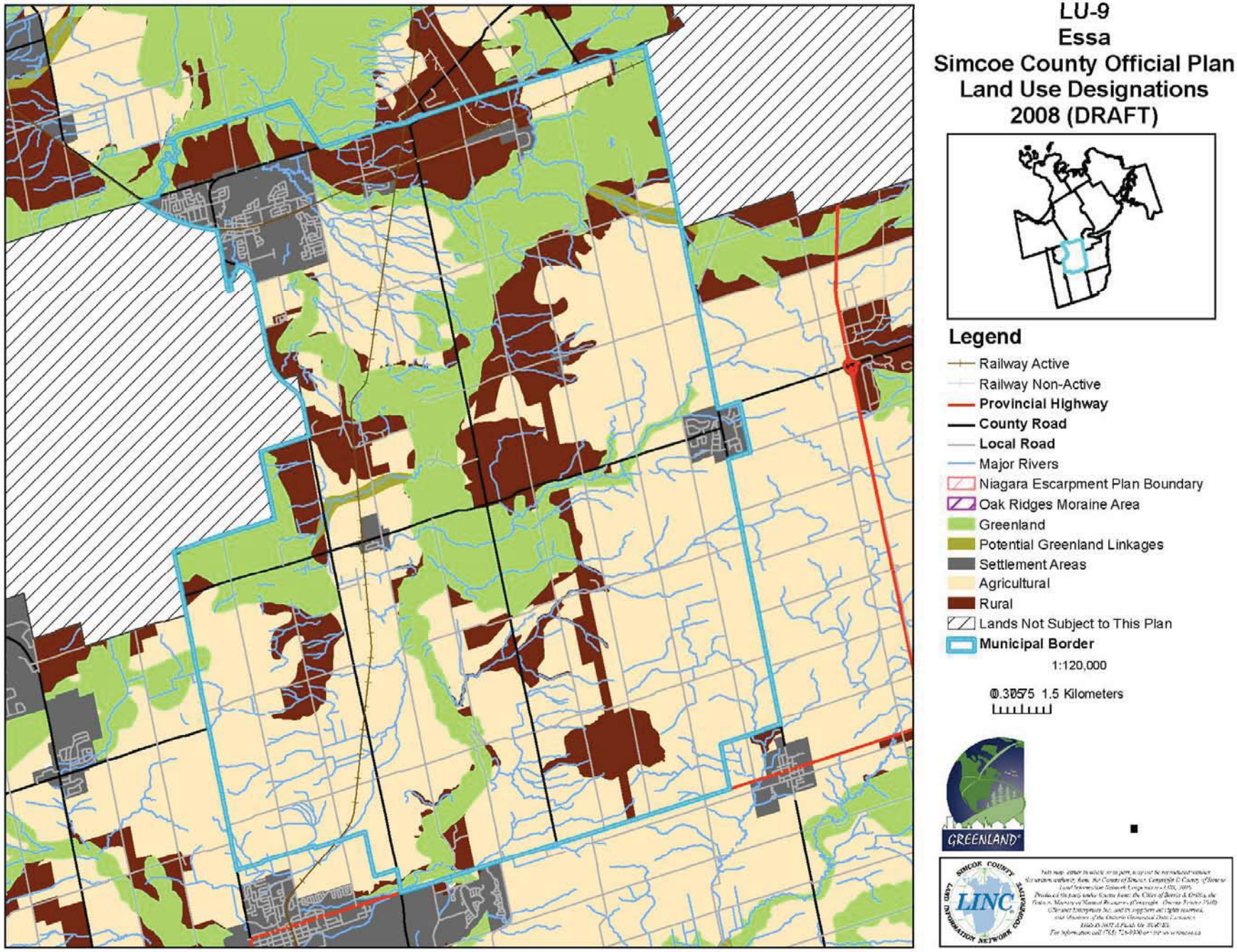
Section 3.3- Projected Employment Growth

- This section should reference the Province's "Simcoe Area: A Strategic Vision for Growth" document, which indicates employment growth of 6,800 jobs in New Tecumseth. This should also be recognized in Table 3.3.1 with the Province's employment equaling 26,500 positions by 2031.

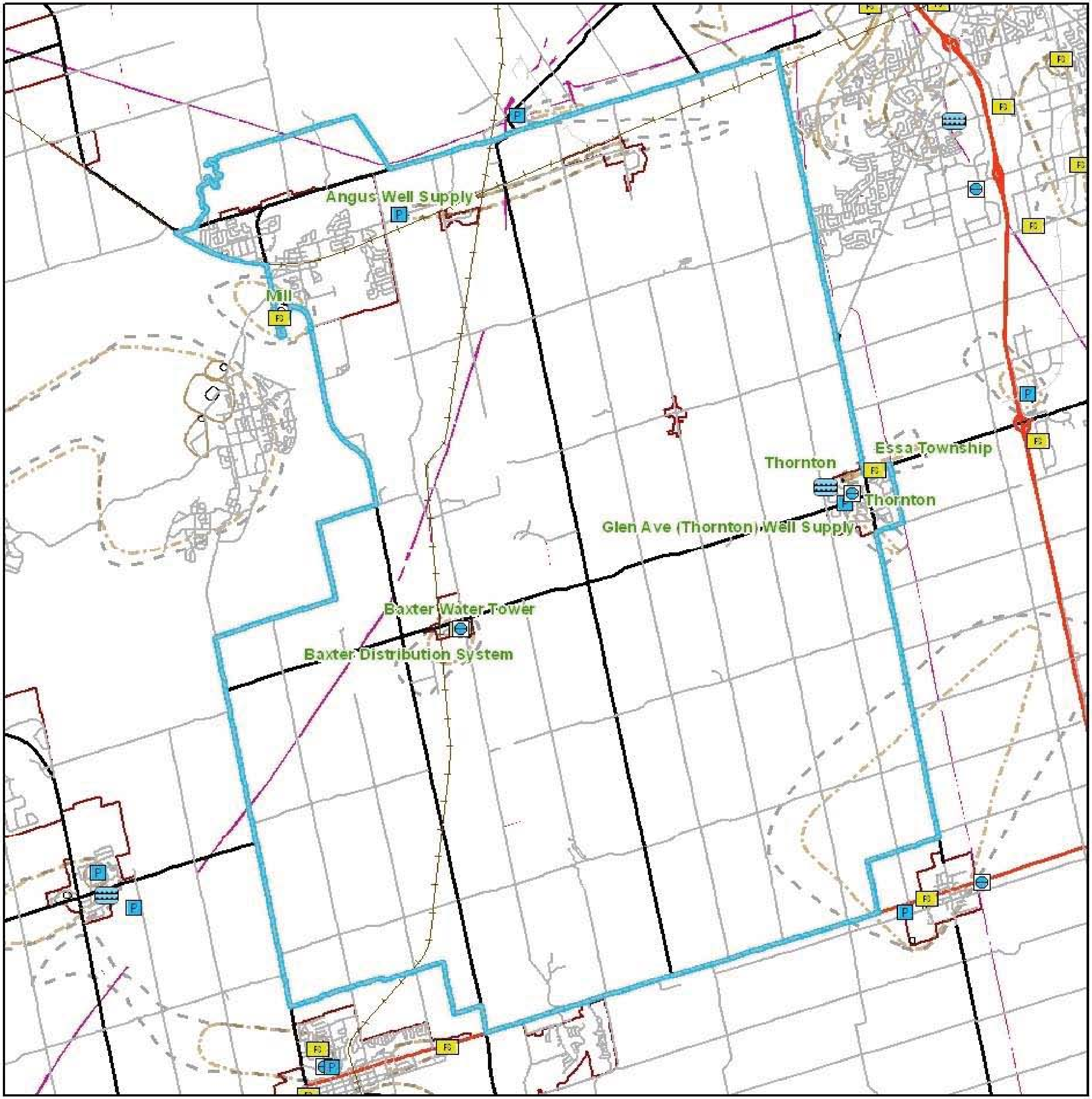
If you have any questions regarding these comments, please feel free to contact me at extension 237.

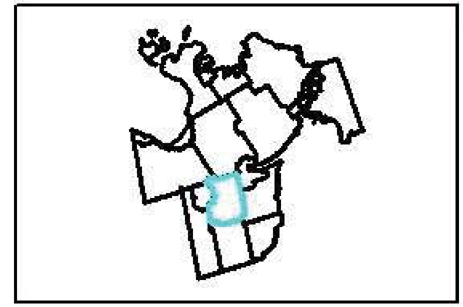
Eric Chandler
Manager of Planning

Example of Completed Servicing Gap Analysis (Township of Essa)



WAT-9
Essa
Water Servicing Plan



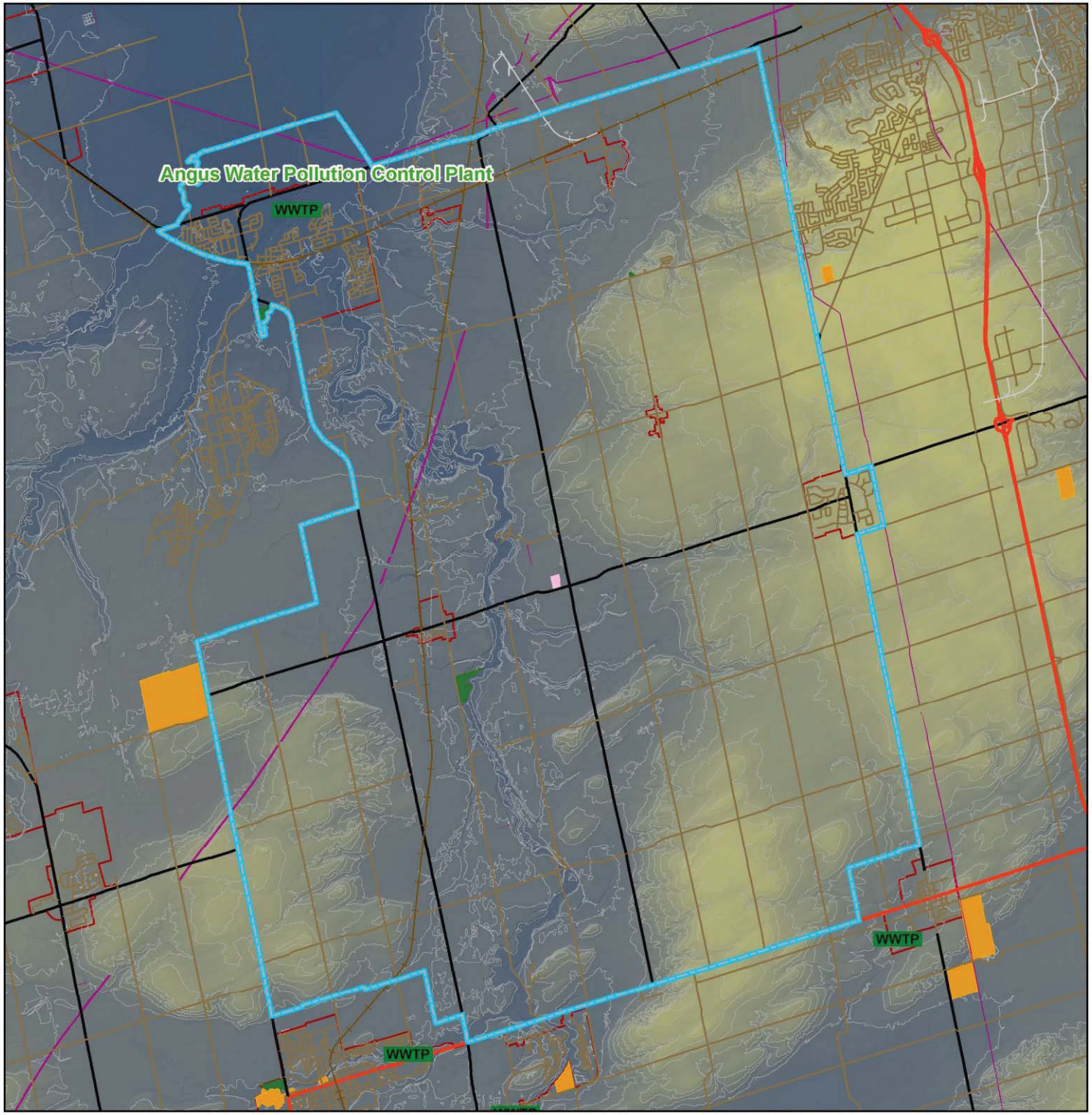


Legend

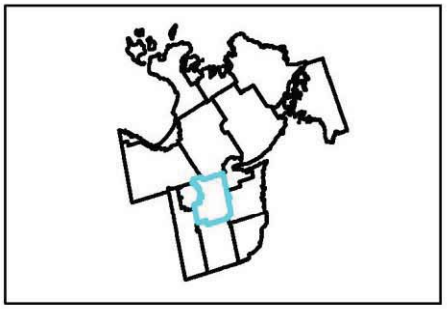
- Water Treatment Plant
- Surface Water Intake
- Well Site
- Pumphouse
- Reservoir
- Water Tower
- Standing Pipe
- Water monitoring production & observation
- Railway Active
- Railway Non-Active
- Provincial Highway
- County Road
- Local Road
- Easements
- Intake Protection Zones
- Well Head Protection Capture Area
- 25Yr Certainty
- 25yr Uncertainty
- 10 Year
- 2 Year
- 50 Day
- Settlement Areas
- Municipal Border

1:120,000

0 0.5 1 2 Kilometers



SAN-9
Essa
Wastewater Servicing Plan



Legend

- WWTP Wastewater Treatment Plants
- Railway Active
- Railway Non-Active
- Provincial Highway
- County Road
- Local Road
- Easements
- Open Landfill Site
- Open Stump Dump
- Under Development Landfill Site
- Closed Landfill Site
- Closed Stump Dump
- 2008 Local & Private Waste Disposal Sites
- Municipal Border
- 10m Contours
- Settlement Areas
- High : 542
- Low : 175

1:120,000

0 1 2 4 Kilometers

GREENLAND®

SERVICING GAP ANALYSIS - TOWNSHIP ESSA

Water Supply System

	2006 Ainley Data					2009 Data					Servicing Gaps				
Water Supply System	Rated Capacity (m^3/day)	Equivalent Population (Persons)	MDD (m^3/day)	Serviced Population (Persons)	Existing Residual Capacity (Persons)	Rated Capacity (m^3/day)	Equivalent Population (Persons)	MDD (m^3/day)	Serviced Population (Persons)	Existing Residual Capacity (Persons)	Committed Capacity Increase (Persons)	Simcoe County Official Plan APP (Persons)	2031 Projected Employment Growth (Equivalent Persons)	Servicing Gap (Persons)	Servicing Gap (m^3/day)
Angus	6,554	11,958	3,094	6,210	5,450	10,805	22,882	3,422	7,247	15,635	0				
Thornton-Glen	1,540	1,596	658	750	850	1,540	1,531	1,304	1,296	235	0	**Data not available at this time**			
Baxter	225	242	132	156	100	100	177	84	149	28	0				
Total	**8,319**	**13,796**	**3,884**	**7,116**	**6,400**	**12,445**	**24,589**	**4,810**	**8,691**	**15,898**	**0**	**3,824**	**1,300**	**10,774**	**5,453**

Wastewater Treatment Systems

	2006 Ainley Data					2009 Data					Servicing Gaps				
Wastewater Treatment Systems	Rated Capacity (m^3/day)	Equivalent Population (Persons)	ADF (m^3/day)	Serviced Population (Persons)	Existing Residual Capacity (Persons)	Rated Capacity (m^3/day)	Equivalent Population (Persons)	ADF (m^3/day)	Serviced Population (Persons)	Existing Residual Capacity (Persons)	Committed Capacity Increase (Persons)	Simcoe County Official Plan APP (Persons)	2031 Projected Employment Growth (Equivalent Persons)	Servicing Gap (Persons)	Servicing Gap (m^3/day)
Angus	5,511	13,911	2,233	6,200	7,700	5,511	13,911	2,585	7,247	6,664	0	3,824	1,300	1,540	610
Total	**5,511**	**13,911**	**2,233**	**6,200**	**7,700**	**17,956**	**13,911**	**2,585**	**7,247**	**6,664**	**0**	**3,824**	**1,300**	**1,540**	**610**

GENERAL NOTES:

Maximum Daily Demand (MDD) per capita for 2009 data was obtained by the Township.

Average Daily Flow (ADF) per capita for 2009 Data was obtained by the Township.

Serviced Population for 2009 was based on 2009 Water Consumption Report

2009 Rated Capacity data was obtained through the Township of Essa.

100 m^3/day Water Supply for Baxter Water Supply System is supplied by the Town of Collingwood's RAB Water Treatment Facility

2009 Equivalent Population was based on 2009 Design per capita flows and demands.

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Septage and Leachate Summaries

Estimated Quantity of Septic Systems within Simcoe County, Barrie and Orillia

	Town/Township	Estimated Septic Systems: Simcoe Area					
		2009 Population (Persons)	2009 Municipal Wastewater Servicing Population (Persons)	2009 Estimated Septic Servicing Population (Persons)	2009 Septic Service Population (Persons)	Persons Per Unit (PPU)	Estimated Number of Private Septic Systems (Units)
SIMCOE COUNTY	Township of Adjala-Tosorontio	11,085	300	10,785	10,785	3.00	3,595
	Town of Bradford West Gwillimbury	26,871	18,575	8,295	8,295	3.10	2,676
	Township of Clearview	15,111	5,971	9,140	9,140	2.80	3,264
	Township of Collingwood	19,078	18,048	1,030	1,030	2.60	396
	Township of Essa	19,076	7,247	11,829	11,829	2.70	4,381
	Town of Innisfil	34,932	24,148	10,784	10,784	3.00	3,595
	Town of Midland	17,329	14,429	2,900	2,900	2.70	1,074
	Town of New Tecumseth	31,398	23,050	8,348	8,348	2.80	2,982
	Township of Oro-Medonte	20,455	0	20,455	20,455	2.60	7,867
	Town of Penetanguishene	10,055	6,701	3,354	3,354	2.60	1,290
	Township of Ramara	9,968	3,179	6,789	6,789	2.49	2,727
	Township of Severn	12,997	4,000	8,997	8,997	2.70	3,332
	Township of Springwater	19,446	3,282	16,164	16,164	2.80	5,773
	Township of Tay	10,383	5,819	4,564	4,564	2.80	1,630
	Township of Tiny	11,454	0	11,454	11,454	2.80	4,091
	Town of Wasaga Beach	17,385	22,077	0	0	2.10	0
	Total	287,023	156,825	130,198	130,198	2.10	61,999
OTHER	City of Barrie	138,448	139,000	1560	1560	2.60	600
	City of Orillia	31,221	31,420	715	715	2.60	275
	First Nations	NA	NA	NA	NA	NA	NA

General Notes:

Assuming all residents have either a private/communal type septic system or is servicing serviced from a local municipal wastewater treatment system.

Persons Per Unit (PPU) was based on Servicing Gap Analysis.

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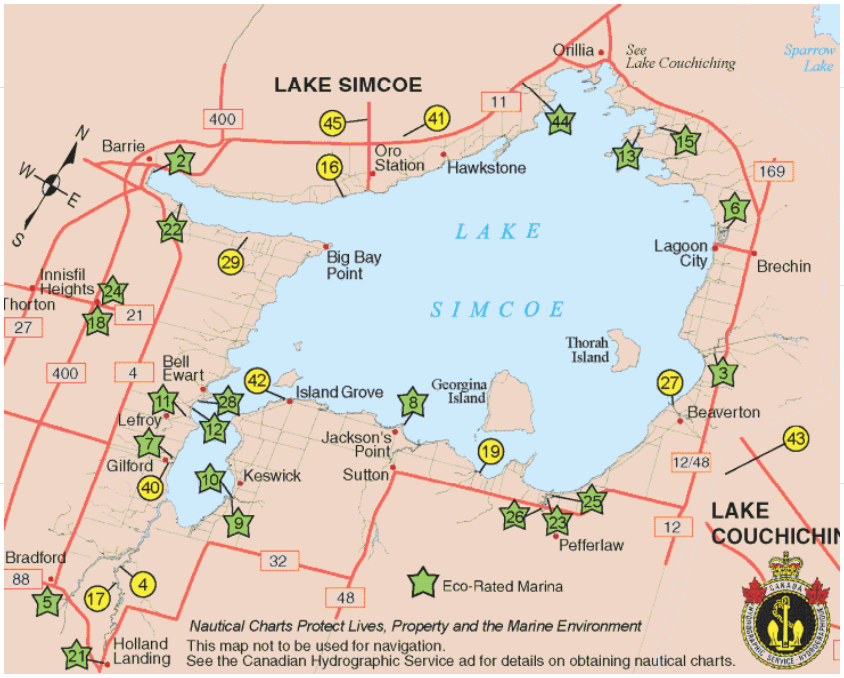
Septage and Leachate Summaries (cont'd)

2009 Leachate Production (m^3) within the County of Simcoe

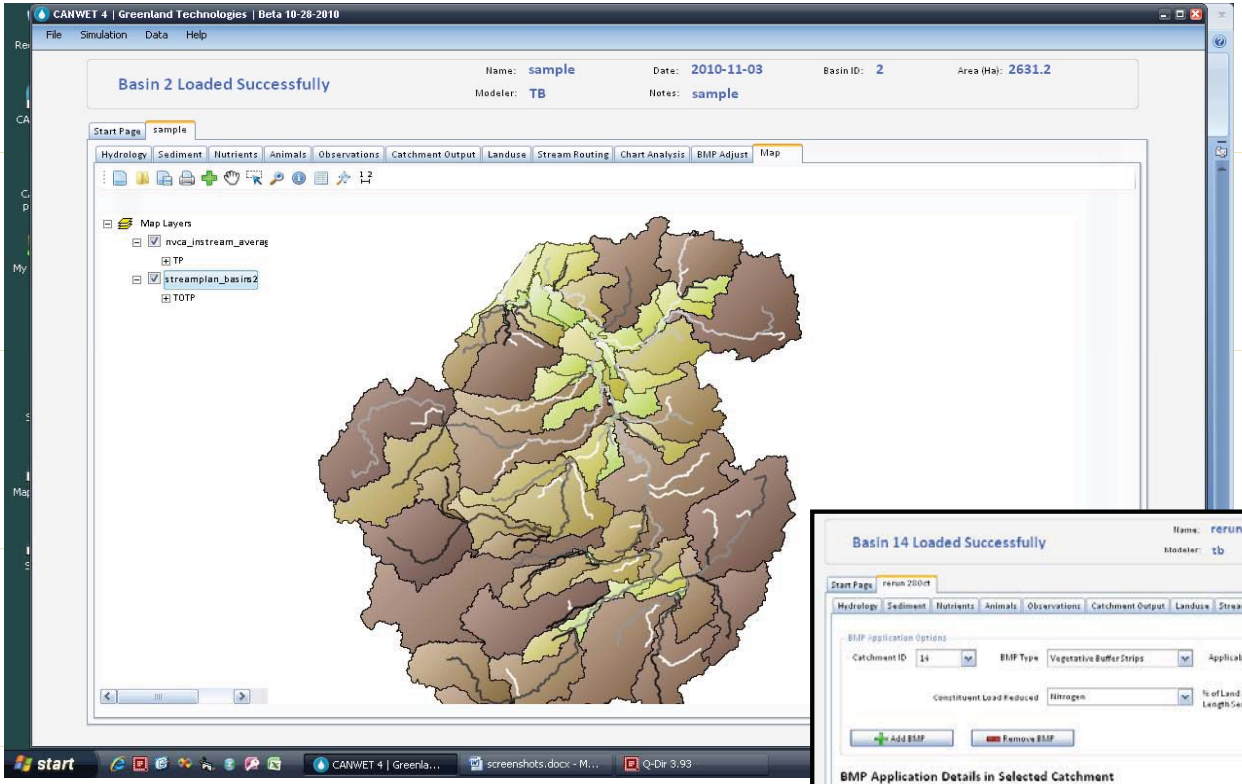
2009 LEACHATE GENERATION														
		Leachate Volume Production (m^3)												
Landfill	Location	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec	Total
Site 4 (Essa)	Part Lot 13, Concession 5, Essa	363	642	535	466	258	387	86	129	129	43	165		3,203
Site 10 (Nottawasaga)	5715 30-31 Sideroad, Stayner		760	1,129	1,205	1,444	602	237	93	72	183	131	88	5,943
Site 11 (Oro)	610 Old Barrie Road West, Edgar	2,018	2,013	2,929	3,534	147	1,548	1,973	989	1,118	1,763	1,376	1,070	20,478
Site 13 (Adjala Tosorontio)	6815 Concession Road 4, Everett		936	703	1,161	1,039	704	676	581	406	636	287	705	7,834
Site 15 (Wasaga Beach)	Part Lot 21, Concession 9, Wasaga Beach	324	2,715	1,191	1,548	602	1,032	344	301	129	215	258	238	8,897
Site 16 (Bradford West Gwillimbury)	2960 Line 12, Bradford	211	334	344	172	215	346	430	172	215	215	172	167	2,993
Total		**2,916**	**7,401**	**6,830**	**8,085**	**3,704**	**4,618**	**3,746**	**2,265**	**2,069**	**3,055**	**2,389**	**2,268**	**49,347**

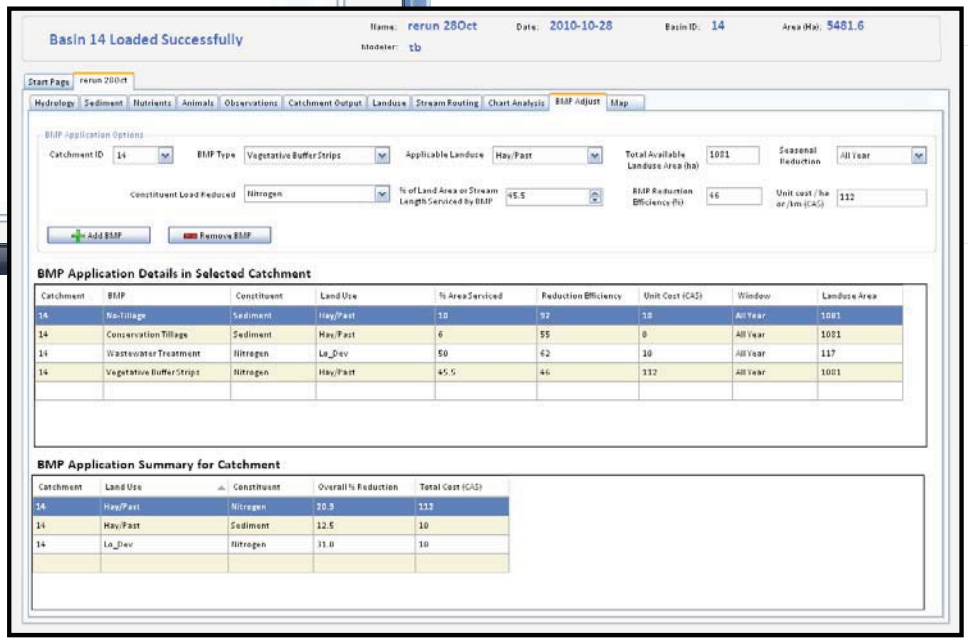
Simcoe County Marinas

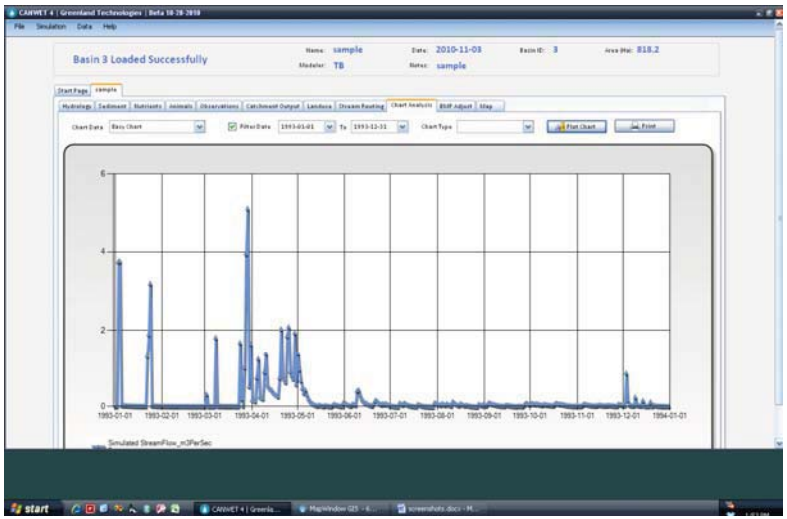
- The 49 marinas in Simcoe County were contacted to determine if sewage pump-out services were provided
- 8 dispose the pump-out sewage waste into Town sewers, 18 have it pumped out via a trucking system, 9 marinas did not respond and 14 do not pump sewage at all.
- The sewage from private holding tanks is treated at the Town of Collingwood, City of Orillia, or the Town of Midland WWTPs.



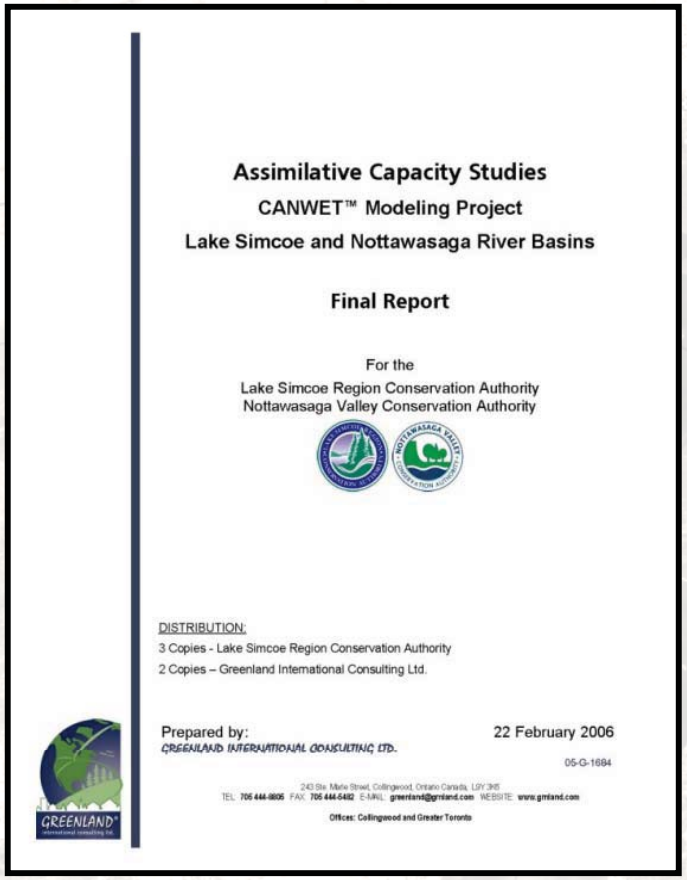
In-kind Project Contributions by the Greenland Group
(CANWET™ and Concurrent U.S. / Mexico Initiative)







Ontario's Assimilative Capacity and IGAP Studies (2005-06) and the Use of CANWET™



Assimilative Capacity Studies

CANWET™ Modeling Project

Lake Simcoe and Nottawasaga River Basins

Final Report

For the
Lake Simcoe Region Conservation Authority
Nottawasaga Valley Conservation Authority

DISTRIBUTION:
3 Copies - Lake Simcoe Region Conservation Authority
2 Copies – Greenland International Consulting Ltd.

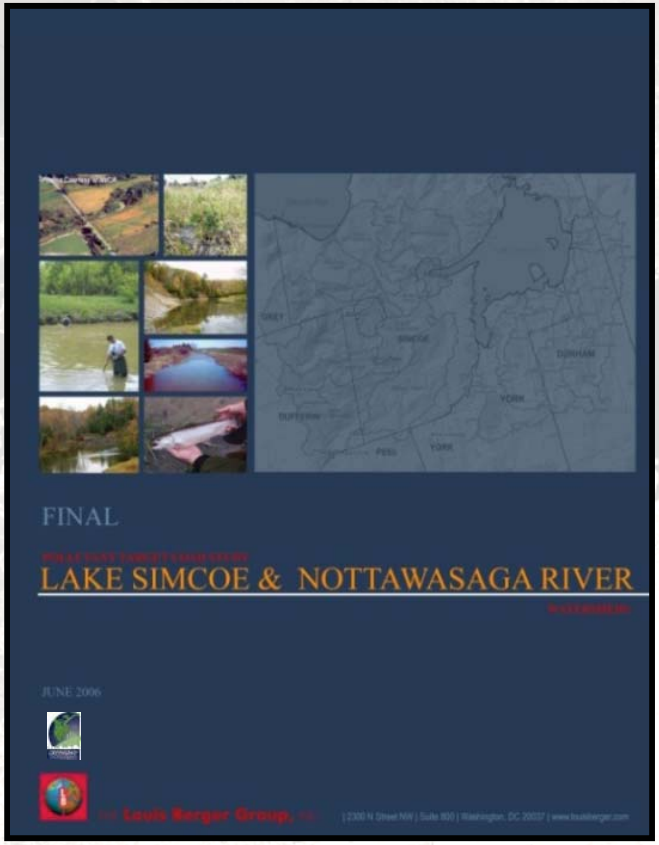
Prepared by:
GREENLAND INTERNATIONAL CONSULTING LTD.

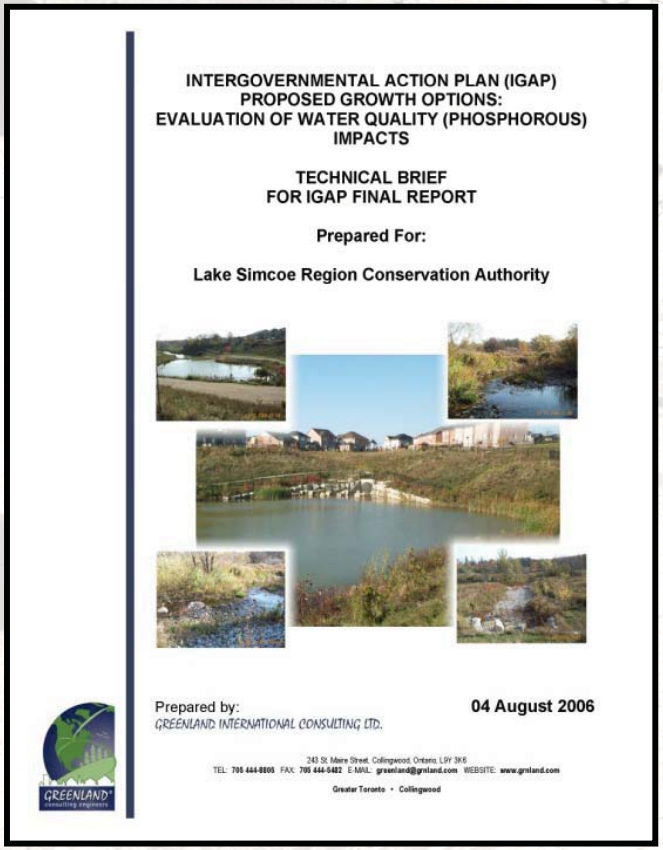
22 February 2006

05-G-1684

243 Ste. Marie Street, Collingwood, Ontario Canada, L9Y 3K6
TEL: 705 444-8805 FAX: 705 444-5482 E-MAIL: greenland@grnland.com WEBSITE: www.grnland.com

Offices: Collingwood and Greater Toronto





**INTERGOVERNMENTAL ACTION PLAN (IGAP)
PROPOSED GROWTH OPTIONS:
EVALUATION OF WATER QUALITY (PHOSPHOROUS) IMPACTS**

**TECHNICAL BRIEF
FOR IGAP FINAL REPORT**

Prepared For:

Lake Simcoe Region Conservation Authority

Prepared by:
GREENLAND INTERNATIONAL CONSULTING LTD.

04 August 2006

243 St. Marie Street, Collingwood, Ontario, L9Y 3K6
TEL: 705 444-8805 FAX: 705 444-5482 E-MAIL: greenland@grnland.com WEBSITE: www.grnland.com

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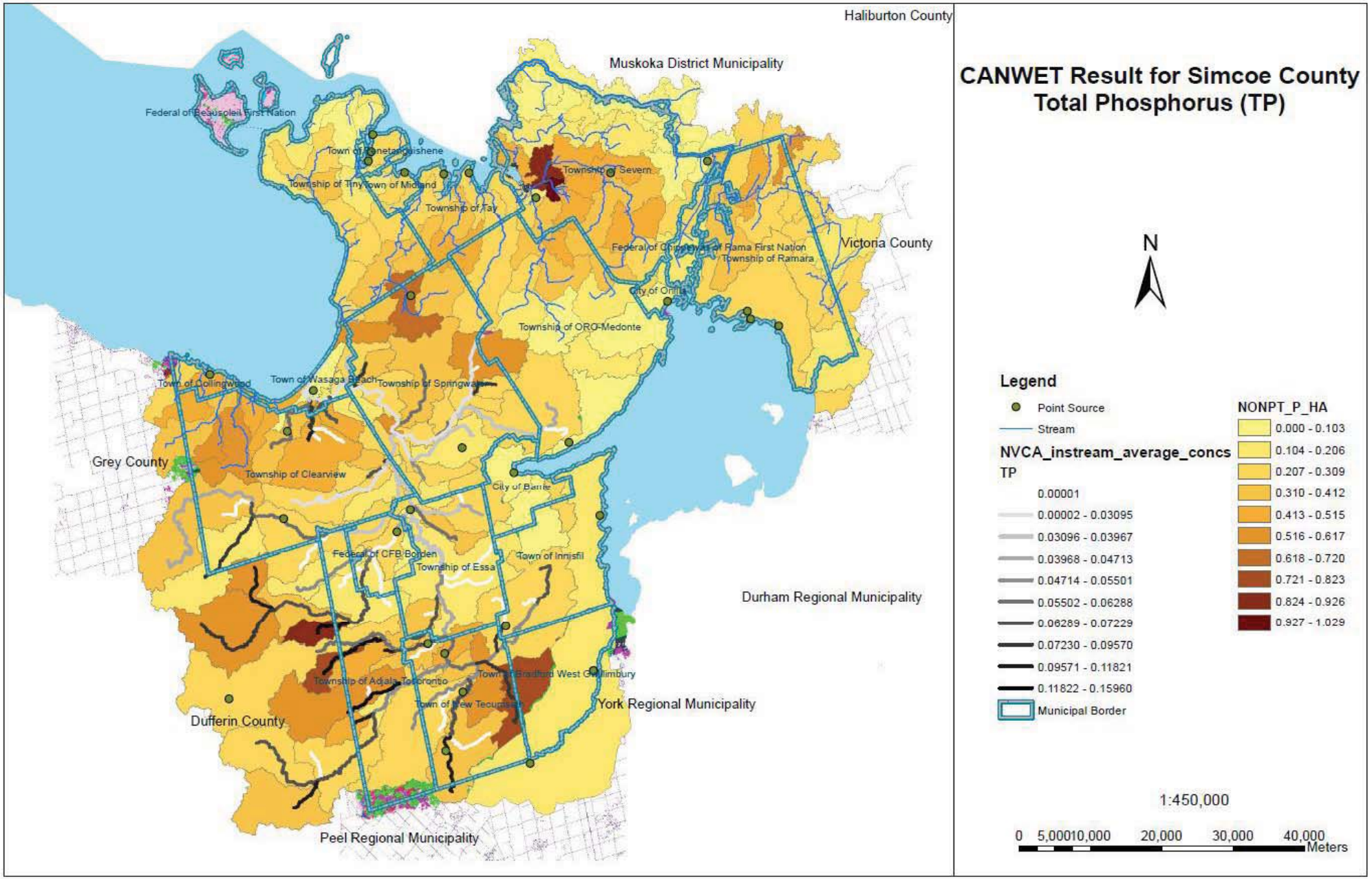
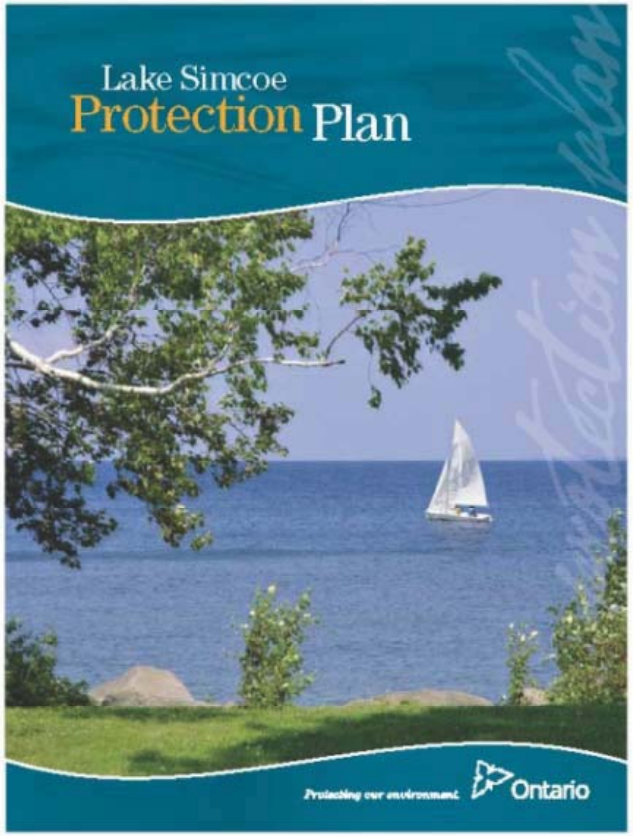
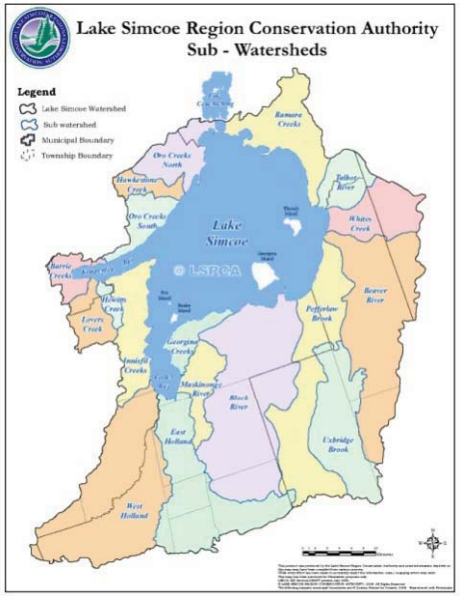

Haliburton County
Muskoka District Municipality
Federal of Beausoleil First Nation
Town of Penetanguishene
Township of Tiny
Town of Midland
Township of Tay
Township of Severn
Victoria County
Federal of Chippewas of Rama First Nation
Township of Ramara
City of Orillia
Township of ORO-Medonte
Town of Collingwood
Town of Wasaga Beach
Township of Springwater
Grey County
Township of Clearview
City of Barrie
Federal of CFB Borden
Township of Essa
Town of Innisfil
Durham Regional Municipality
Township of Adjala-Tosorontio
Town of Bradford West Gwillimbury
Town of New Tecumseth
York Regional Municipality
Dufferin County
Peel Regional Municipality
CANWET Result for Simcoe County
Total Phosphorus (TP)
N
Legend
Point Source
Stream
NVCA_instream_average_concs
TP
0.00001
0.00002 - 0.03095
0.03096 - 0.03967
0.03968 - 0.04713
0.04714 - 0.05501
0.05502 - 0.06288
0.06289 - 0.07229
0.07230 - 0.09570
0.09571 - 0.11821
0.11822 - 0.15960
Municipal Border
NONPT_P_HA
0.000 - 0.103
0.104 - 0.206
0.207 - 0.309
0.310 - 0.412
0.413 - 0.515
0.516 - 0.617
0.618 - 0.720
0.721 - 0.823
0.824 - 0.926
0.927 - 1.029
1:450,000
0 5,000 10,000 20,000 30,000 40,000
Meters





CANWET™ Canadian Nutrient and Water Evaluation Tool

Tel: 905•895•1281
1•800•465•0437
Fax: 905•853•5881
E-Mail: info@lsrca.on.ca
Web: www.lsrca.on.ca

120 Bayview Parkway
Box 282
Newmarket, Ontario
L3Y 4X1

February 26, 2010

R. Mark Palmer, P.Eng.
President
Greenland Consulting Engineers
120 Hume Street
Collingwood, ON L9Y 1V5

Dear Mr. Palmer:

Re: CANWET™ Model and Application

Please accept this letter as the Lake Simcoe Region Conservation Authority's endorsement of the CANWET™ (v.3) model. The Conservation Authority is extremely satisfied with the model's performance and accuracy and supports the continued use of this product in our watershed and others.

CANWET™ was initially developed and tested to deal with nutrient loading issues within the Lake Simcoe basin. Since this time the model has become an invaluable tool in the development of growth plans, as was demonstrated in the Lake Simcoe and Nottawassaga River Assimilative Capacity studies to support the Inter Governmental Action Plan (IGAP) process within Simcoe County. The model has also been extensively used and tested as part of the Lake Simcoe Basin's Source Water Protection program to develop Tier 1 water budgets and, most recently, the development and implementation of the provincial Lake Simcoe Protection Plan (LSPP). The tool has allowed the Authority to develop water quality and quantity targets at a sub-catchment level and is being evaluated for use under a Phosphorus Trading program being considered by the Ministry of the Environment.

Please do not hesitate to contact me should you require any further information or assistance.

A

Sincerely,

Watershed

Michael Walters, CMM III
General Manager, Watershed Management

MW/lmc

For

Life

County of Simcoe
Water and Wastewater Visioning Strategy (In-kind)

U.S. Government Pilot for the Chesapeake Bay Basin Program and Invitation for Canada / Mexico Governance Knowledge and Technology Transfer Partnerships (On-going)

- Primary Focus = **Chesapeake Bay** Basin (Conewago Creek Subwatershed) for the Development of New Information Technology and Modelling Tools and Governance System Review (Fed/State/Local).
- Canadian **Great Lakes** Companion "Primary" Subwatershed is Coldwater Creek (Simcoe County).
- 2nd Canadian **Great Lakes** Companion Subwatershed Proposed is Innisfil Creek With Support from OMAFRA.

(aka the Next Evolution of CANWET™ !)

ZedX INC®

GREENLAND® Group of Companies
"An Engineering and Technologies Enterprise"
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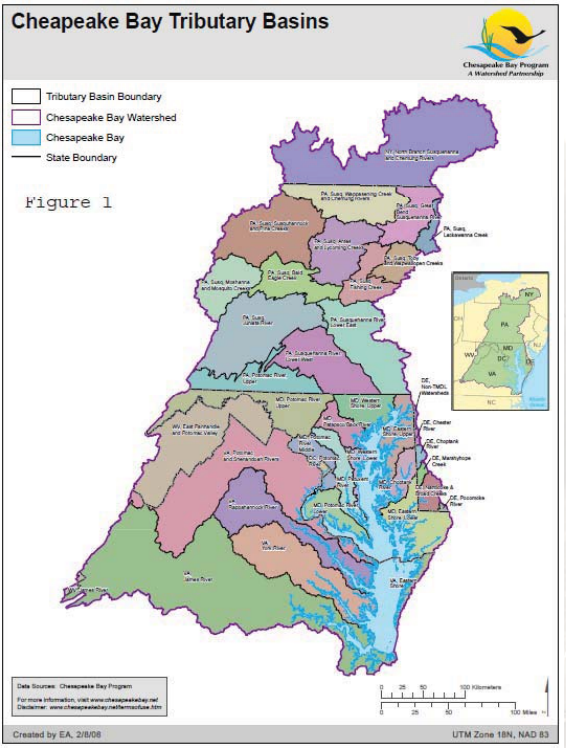
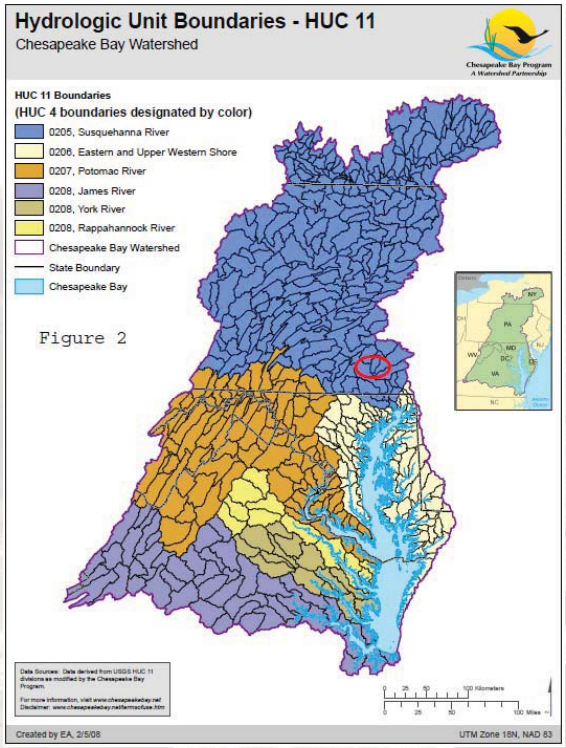

Cheapeake Bay Tributary Basins
Tributary Basin Boundary
Chesapeake Bay Watershed
Chesapeake Bay
State Boundary
Figure 1
Created by EA, 2/8/08
UTM Zone 18N, NAD 83


Hydrologic Unit Boundaries - HUC 11
Chesapeake Bay Watershed
HUC 11 Boundaries
(HUC 4 boundaries designated by color)
0205, Susquehanna River
0206, Eastern and Upper Western Shore
0207, Potomac River
0208, James River
0208, York River
0208, Rappahannock River
Chesapeake Bay Watershed
State Boundary
Chesapeake Bay
Figure 2
Created by EA, 2/5/08
UTM Zone 18N, NAD 83

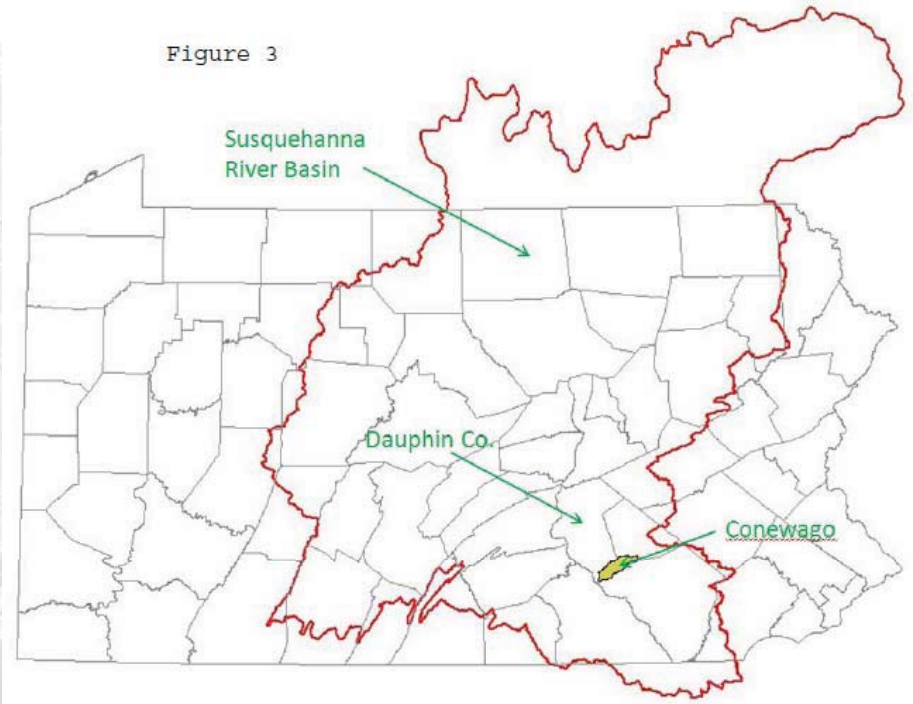
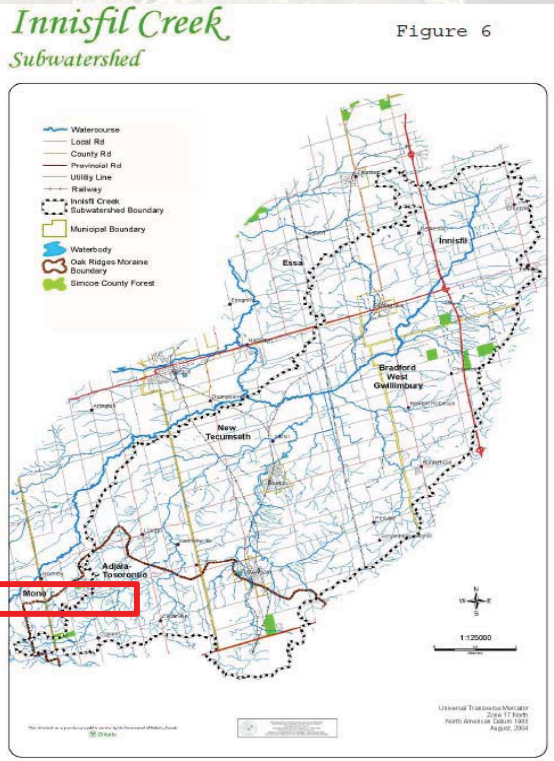
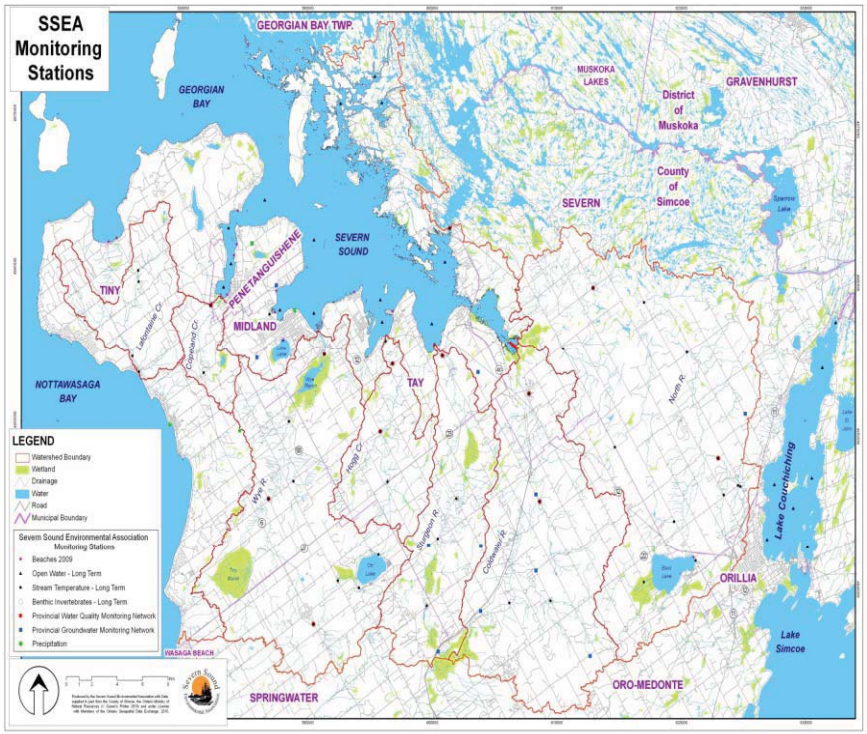


Figure 3
Susquehanna River Basin
Dauphin Co.
Conewago


DRINKING WATER SOURCE PROTECTION
ACT FOR CLEAN WATER
South Georgian Bay Lake Simcoe Source Protection Region
Figure 4
Muskoka
Haliburton
Black-Severn River
Severn Sound
Kawartha Lakes
Simcoe
Grey
Nottawasaga Valley
Lake Simcoe
Durham
Dufferin
York
Peel


Innisfil Creek
Subwatershed
Figure 6
Watercourse
Local Rd
County Rd
Provincial Rd
Utility Line
Railway
Innisfil Creek Subwatershed Boundary
Municipal Boundary
Waterbody
Oak Ridges Moraine Boundary
Simcoe County Forest
Innisfil
Essa
Bradford West Gwillimbury
New Tecumseth
Adjala-Tosorontio
Monv
1:125000


SSEA Monitoring Stations
GEORGIAN BAY TWP.
GEORGIAN BAY
MUSKOKA LAKES
GRAVENHURST
District of Muskoka
County of Simcoe
SEVERN
SEVERN SOUND
TINY
PENETANGUISHENE
MIDLAND
NOTTAWASAGA BAY
TAY
ORILLIA
Lake Couchiching
Lake Simcoe
WASAGA BEACH
SPRINGWATER
ORO-MEDONTE
LEGEND
Watershed Boundary
Wetland
Drainage
Water
Road
Municipal Boundary
Severn Sound Environmental Association Monitoring Stations
Beaches 2009
Open Water - Long Term
Stream Temperature - Long Term
Benthic Invertebrates - Long Term
Provincial Water Quality Monitoring Network
Provincial Groundwater Monitoring Network
Precipitation

PART 'B' – Opportunities and Constraints

1) Septage, Leachate Systems and Marinas

2) Level '1' Approach and Using CANWET™ Baseline Condition Data (NOTE: Adopted Methodology for the County's Visioning Strategy)

- *Example #1: Township of Clearview*

3) Level '2' Approach and Using CANWET™ for Master Servicing Plans (NOTE: For Consideration by the Member Municipalities)

- *Example: Town of Innisfil and Proposed OPA 1 and Campus Node*

Septage and Leachate Systems

Private Wastewater Systems

• Groundwater pollution from septic systems is a concern within more isolated, rural areas of Simcoe County were communities predominately rely on groundwater supply systems for their drinking water.

• There are approximately 130,000 people (over a third of the population) in the County of Simcoe that rely on private wastewater treatment systems for their wastewater servicing needs.

• There is a potential opportunity for a portion of the population currently using private wastewater treatment systems to connect to existing or future municipal infrastructure for wastewater servicing.

For example, in the Town of Innisfil, approximately 15,200 private wastewater treatment system users are included in the Class Environmental Assessment (EA) for the Lakeshore WPCP. Therefore, subject to further analysis, other County municipalities may have the same opportunity to connect existing private septic system users to a municipal wastewater treatment system through the extension, expansion and/or the construction of these facilities and also concurrently with any proposed growth areas.

Septage and Leachate Systems (cont'd)

Landfill Leachate

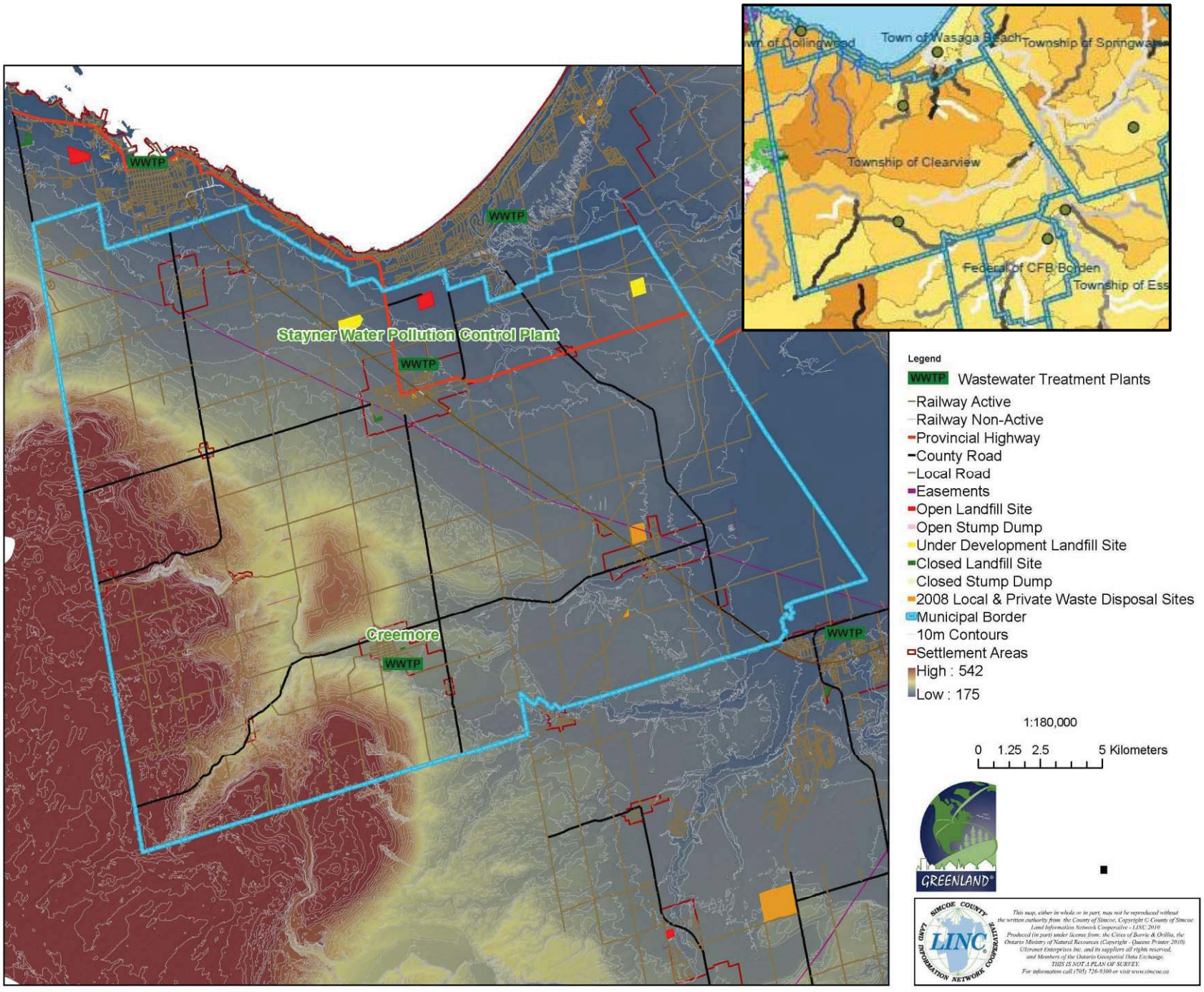
• Landfill leachate has been shown to be treatable on landfill sites, without either excessive costs, or the use of systems that require technical management and expertise. Leachate treatment technologies typically fall into two (2) basic system types - biological and physical/chemical. These system types can also be incorporated or combined for a more effective treatment process. The most common biological treatment is activated sludge, which is a suspended-growth process that uses aerobic microorganisms to degrade organic contaminants in leachate. With conventional activated sludge treatment, the leachate is aerated in an open tank with diffusers or mechanical aerators.

• At this time, the majority of leachate is being transported to the neighbouring municipalities of The Town of Blue Mountains and the City of Barrie.

• Since the majority of leachate generated within the five (5) active landfill sites located within Simcoe County is being transported to outside sources for the primary treatment and disposal, leachate transportation represents over 50% of the cost related to leachate disposal.

• There may be an opportunity to reduce leachate transportation and disposal costs by treating leachate on-site at landfills or at new, existing or improved wastewater treatment systems located closer to the subject landfills.

Level ‘1’ Approach for the County’s Visioning Strategy (e.g. Clearview)



Draft Conclusions (Wastewater):

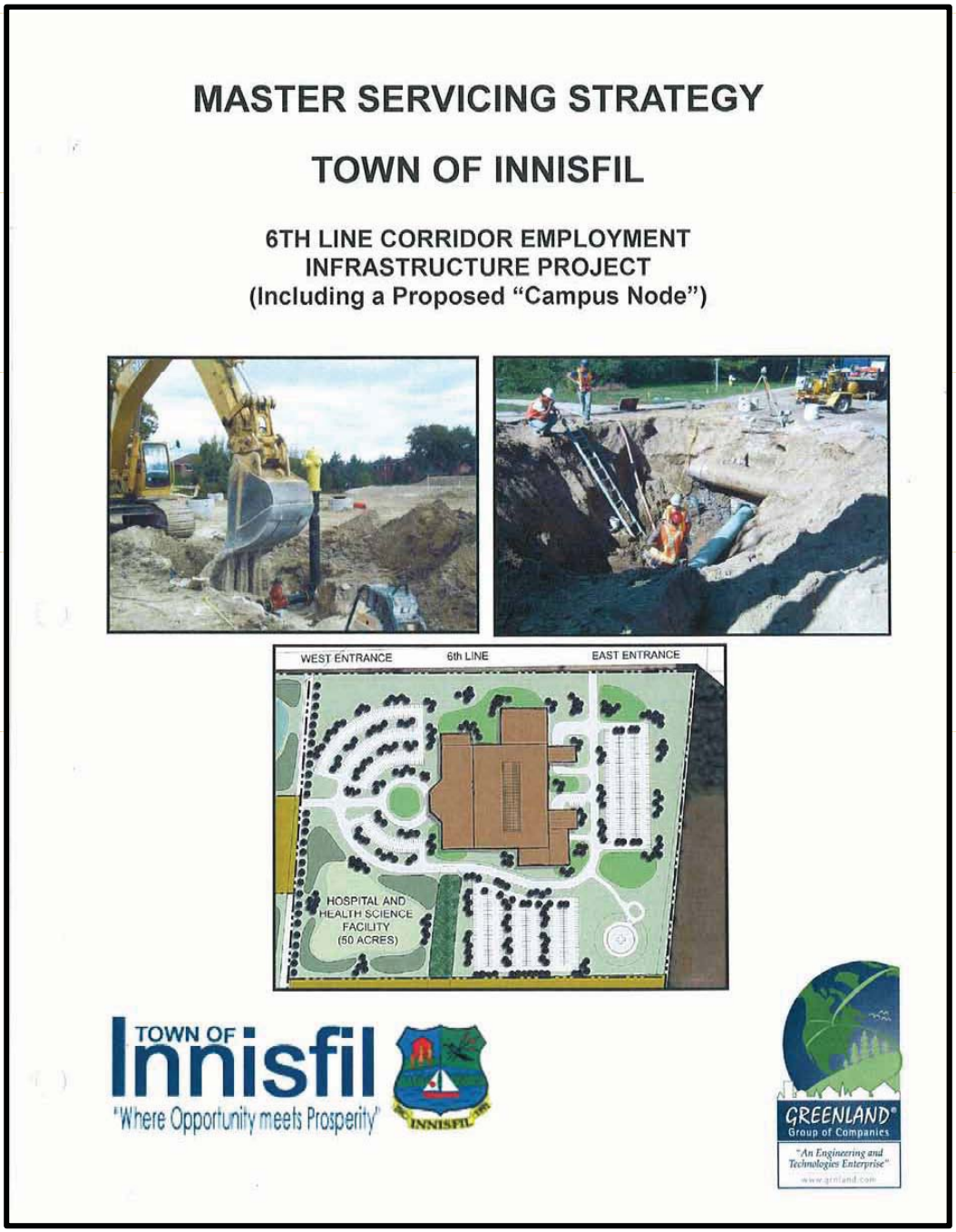
Township of Clearview has partially addressed its 2031 wastewater treatment servicing gap with the initiation of Class EAs to service the growth in the Communities of Nottawa and Stayner by the Collingwood and Wasaga Beach WPCPs, respectively.

- Presently, the Township and Town of Collingwood have discussed constructing a forcemain between the two municipalities to service the Village of Nottawa future population growth. A Class EA has already been conducted for this proposed connection.

- Presently, the Township and Town of Wasaga Beach have discussed constructing a forcemain between the two municipalities service the Village of Stayner future population growth. A Class EA has already been conducted for this proposed connection.

- *Village of New Lowell could potentially connect to the Community of Angus (Township of Essa) or CFB Borden via a forcemain to service this area of Clearview's future growth. Angus does have residual capacity that could potentially be utilized.*

PART 'B' – Opportunities and Constraints (cont'd)



Level '2' Approach and Using CANWET™ for Master Servicing Plans

(For Consideration by the Member Municipalities)

Example: ***Town of Innisfil and Proposed OPA 1 and Campus Node (Completed: October 2009)***

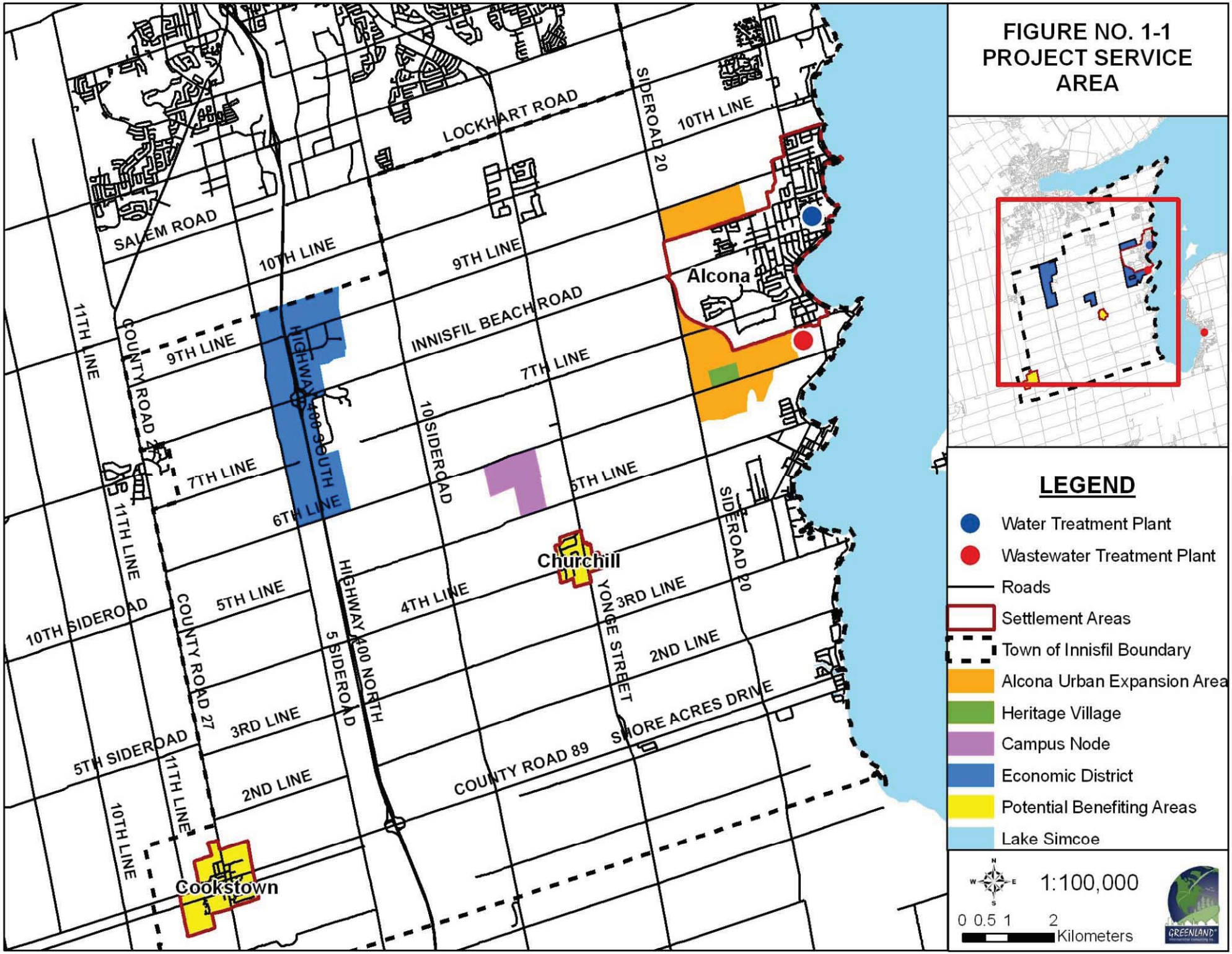


FIGURE NO. 1-1
PROJECT SERVICE AREA
LEGEND
Water Treatment Plant
Wastewater Treatment Plant
Roads
Settlement Areas
Town of Innisfil Boundary
Alcona Urban Expansion Area
Heritage Village
Campus Node
Economic District
Potential Benefiting Areas
Lake Simcoe
1:100,000
0 0.5 1 2
Kilometers
Alcona
Churchill
Cookstown
LOCKHART ROAD
SALEM ROAD
10TH LINE
9TH LINE
INNISFIL BEACH ROAD
7TH LINE
6TH LINE
5TH LINE
4TH LINE
3RD LINE
2ND LINE
10TH SIDEROAD
5TH SIDEROAD
SIDEROAD 20
10 SIDEROAD
5 SIDEROAD
11TH LINE
COUNTY ROAD 4
COUNTY ROAD 27
COUNTY ROAD 89
HIGHWAY 400 SOUTH
HIGHWAY 400 NORTH
YONGE STREET
SHORE ACRES DRIVE

Innisfil Employment Infrastructure Objectives

- **At the outset, conserve and protect all natural heritage features and other significant environmental lands;**
- Design a Master Servicing Strategy (MSS) that can also provide **net public benefits**, incl. local drainage systems, and which can implement **cost-effective technologies** to help protect Lake Simcoe;
- Comply with the **available science** from watershed management and stewardship initiatives involving the Public, Province, Town of Innisfil, County of Simcoe, and Conservation Authorities – while addressing any information deficiencies from these studies; and,
- Develop a **phased / flexible** Strategy that addresses current and future development needs of the Town and County, as well as new Provincial/Federal environmental compliance policies.

Outcome = An Integrated "Compliance / Science-Based" Strategy

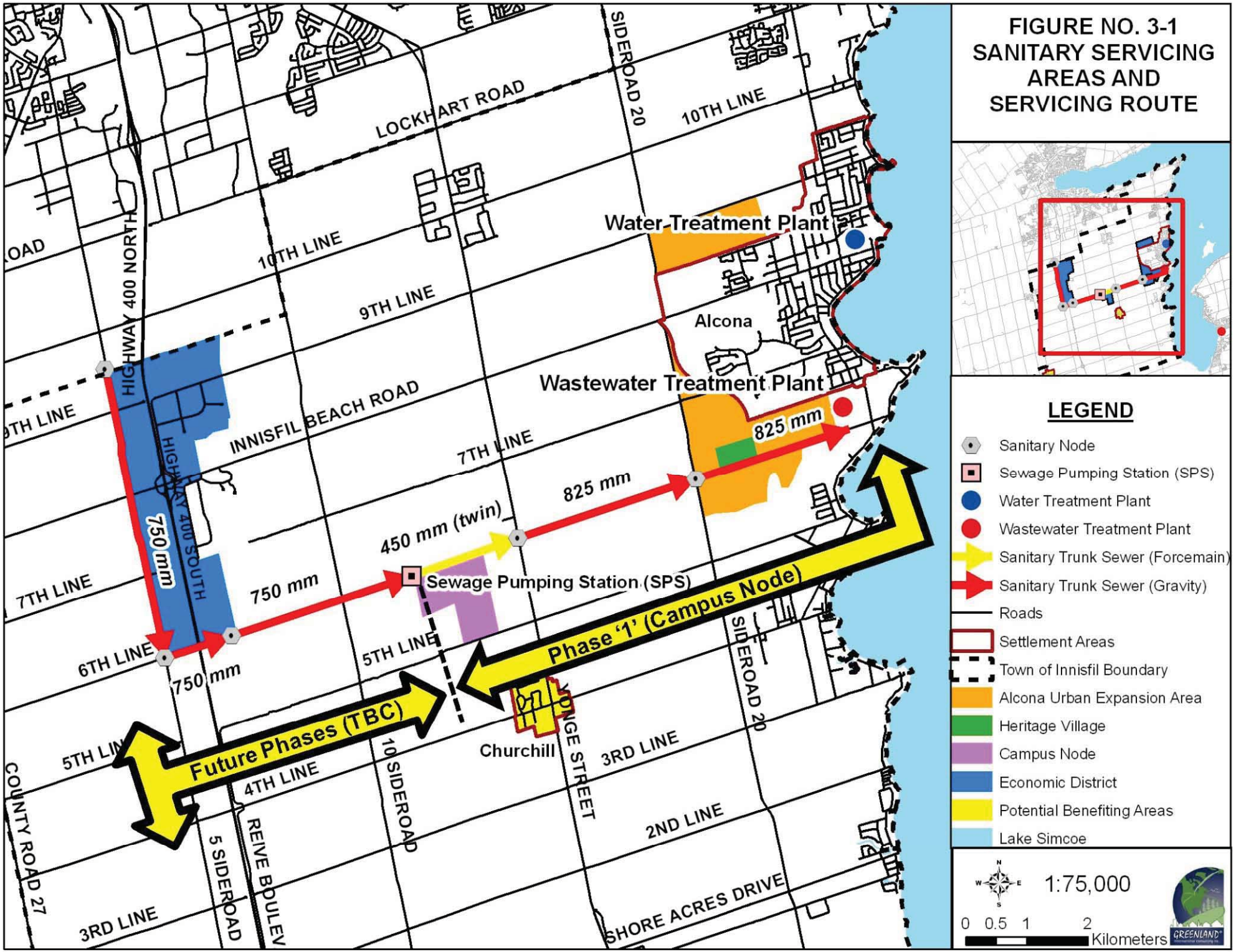
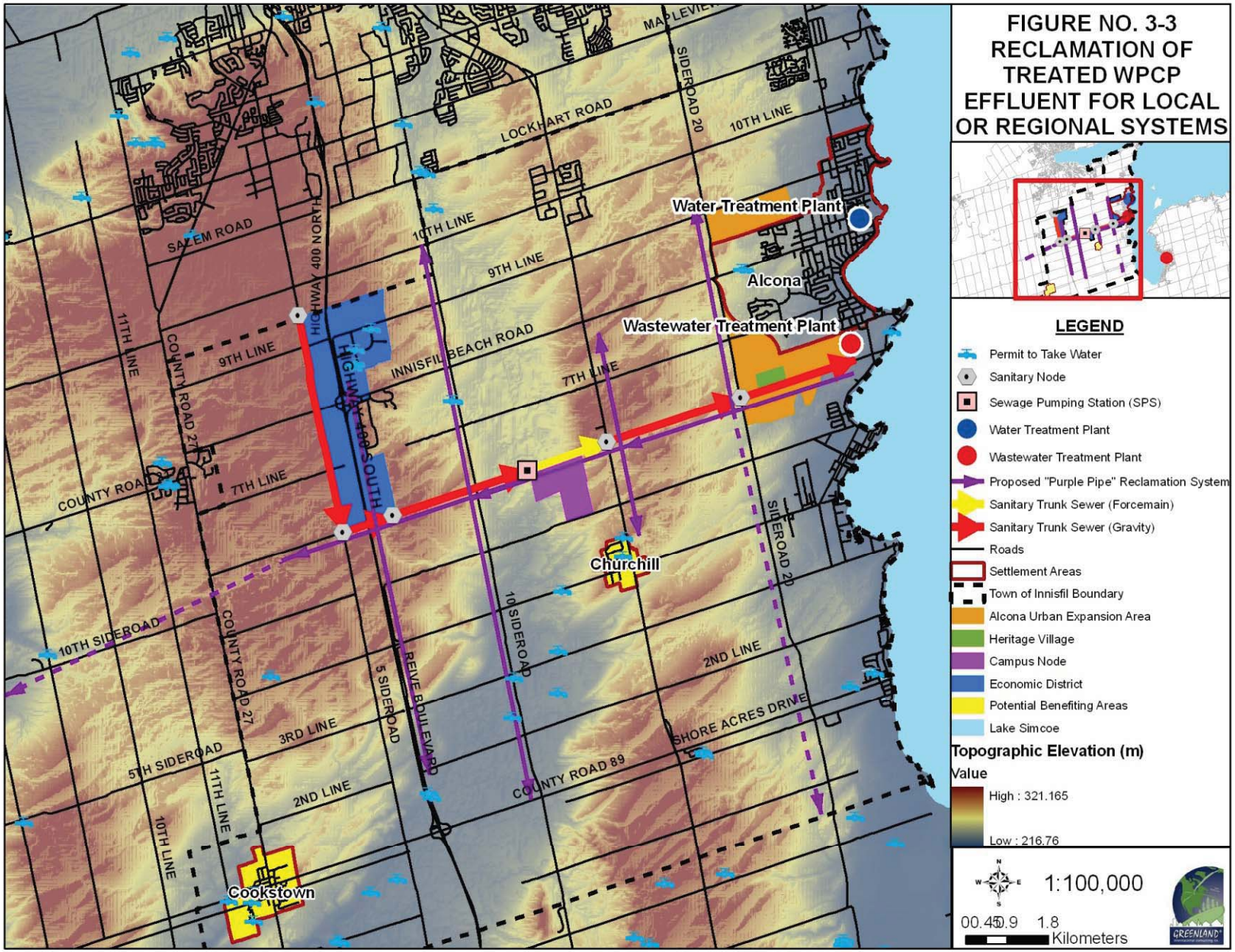


FIGURE NO. 3-1
SANITARY SERVICING AREAS AND SERVICING ROUTE
LEGEND
Sanitary Node
Sewage Pumping Station (SPS)
Water Treatment Plant
Wastewater Treatment Plant
Sanitary Trunk Sewer (Forcemain)
Sanitary Trunk Sewer (Gravity)
Roads
Settlement Areas
Town of Innisfil Boundary
Alcona Urban Expansion Area
Heritage Village
Campus Node
Economic District
Potential Benefiting Areas
Lake Simcoe
Water Treatment Plant
Wastewater Treatment Plant
Alcona
Sewage Pumping Station (SPS)
Churchill
Phase '1' (Campus Node)
Future Phases (TBC)
825 mm
825 mm
450 mm (twin)
750 mm
750 mm
750 mm
LOCKHART ROAD
10TH LINE
9TH LINE
7TH LINE
6TH LINE
5TH LINE
4TH LINE
3RD LINE
2ND LINE
INNISFIL BEACH ROAD
HIGHWAY 400 NORTH
HIGHWAY 400 SOUTH
SIDEROAD 20
10 SIDEROAD
5 SIDEROAD
REIVE BOULEV
YONGE STREET
SHORE ACRES DRIVE
COUNTY ROAD 27
1:75,000
0 0.5 1 2
Kilometers

Reclamation of Treated WPCP Effluent for Local or Other County Needs
(One of the Net Public Benefits from the Innisfil Employment Infrastructure Project)



Elements of the Innisfil Employment Infrastructure MSS

- Locations of the 1) Campus Node, 2) Economic District , 3) Proposed Alcona Development Areas , and 4) Lakeshore WPCP are not impaired by effluent receiver constraints within Lake Simcoe;

- Proposed developments and location/expansion of Lakeshore WPCP can be integrated cost-effectively into a water reclamation system for the Lake Simcoe and/or Nottawasaga River Basins, and potentially a "clean energy grid" resulting from heat exchange capabilities associated with the proposed water distribution and wastewater conveyance works;

- Master Servicing Strategy can address the interim lake phosphorus cap (imposed Feb. 2008) and the proposed 44 tonne total Lake Simcoe loading target from the *Lake Simcoe Protection Plan*.

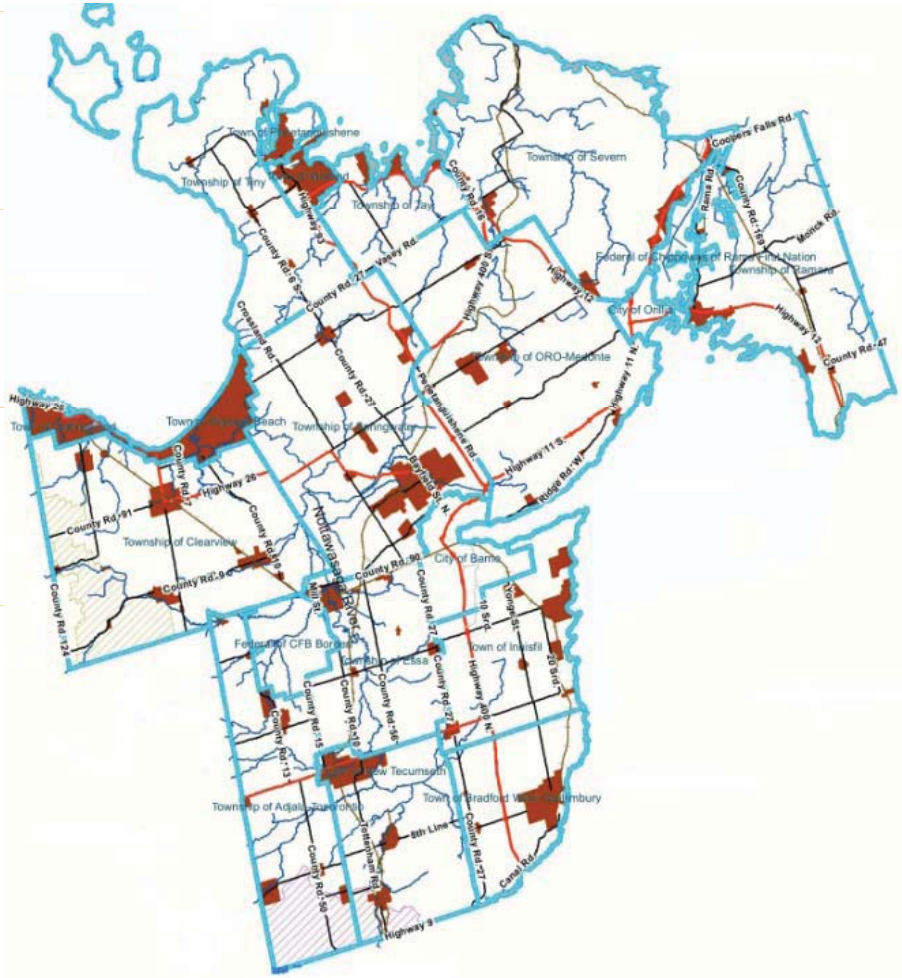
- Proposed development does not rely on other MSS alternatives for implementation, such as nutrient trading or emerging "P" reduction technologies (e.g. Phoslock) to achieve its sub-watershed loading target and based on current Provincial requirements for Lake Simcoe;

- Master Drainage Strategy addresses environmental and flooding concerns of the Town and Lake Simcoe Region Conservation Authority, while it also provides net public benefits.

- The Phase 'I' project supports ongoing R&D initiatives of Provincial interest and now involving the MOE, University of Guelph, Simcoe County District School Board and local Conservation Authorities (LSRCA and TRCA), and also the future operations of a "Centre of Excellence" to be located within the proposed Campus Node along the 6th Line corridor.

PART ‘C’ – Level 2 Opportunities - Details

1) **Identify and develop opportunities for municipalities with current servicing gaps.**



Identified Servicing Gaps

The Towns/Townships within Simcoe County with identified servicing gaps are:

- Township of Adjala – Tosorontio
- Town of Bradford West Gwillimbury
- Township of Clearview
- Town of Collingwood
- Town of Innisfil
- Township of Oro-Medonte
- Township of Ramara
- Township of Severn
- Township of Springwater
- Township of Tiny
- Town of Wasaga Beach
- City of Barrie

Muncipalities with Plans to Address Servicing Gaps

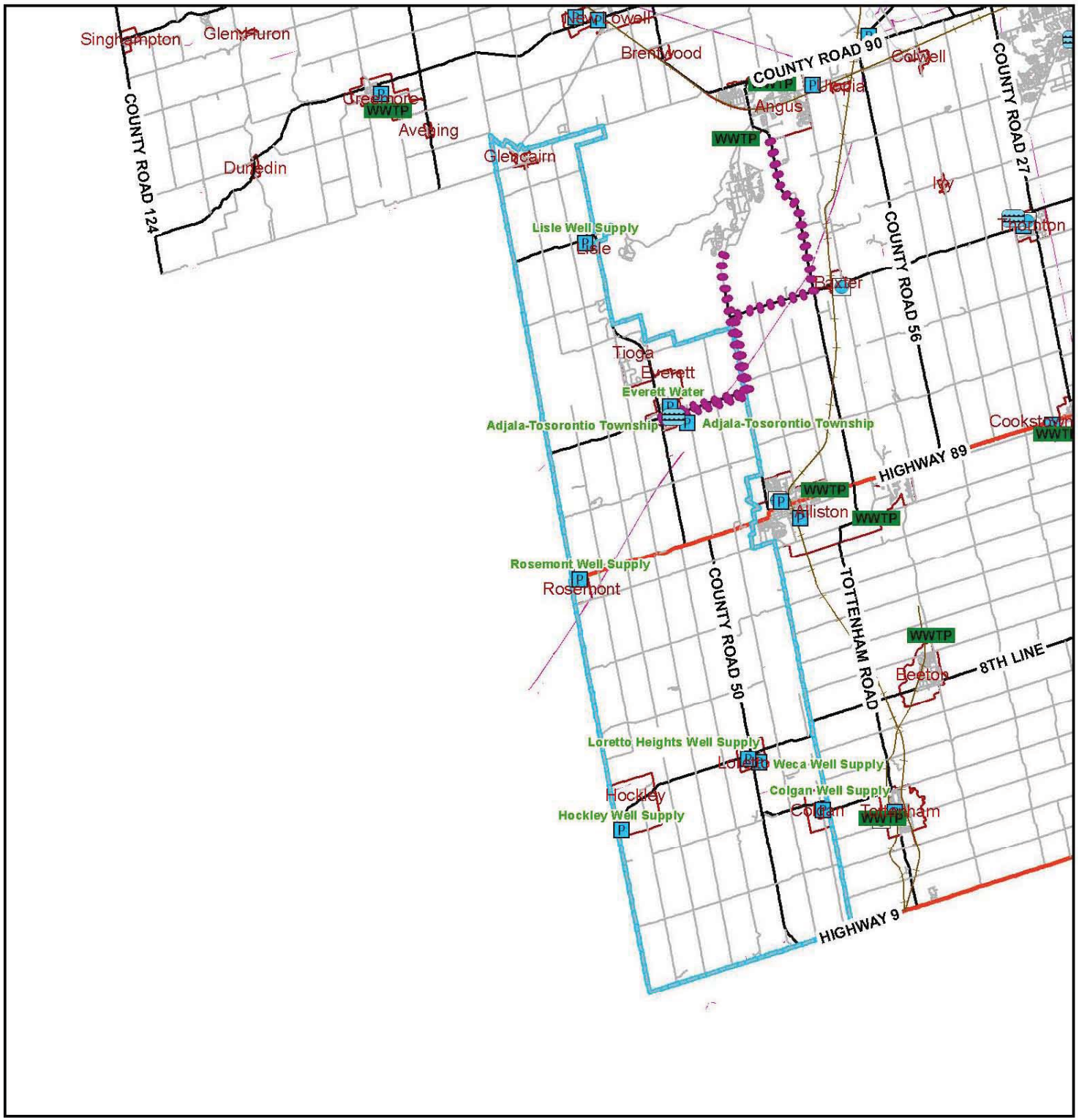
- The Town of Bradford West Gwillimbury has addressed their water and wastewater servicing gaps through the Lakeshore WTP agreement with Innisfil and expanding the Bradford WPCP (Class EA)
- The Town of Collingwood has addressed their water and wastewater servicing gaps with the ability to expandtheir WTP and initiating a Class EA to expand their WWTP
- The Town of Innisfil has addressed their water and wastewater servicing gaps by expanding the Alcona Lakeshore WTP and WWTP (Class Eas)
- The Township of Springwater has addressed their wastewater servicing gap by constructing a new WWTP (Class EA).
- The City of Barrie has addressed their wastewater servicing gap by undertaking an expansion of the Barrie WWTP.

Township of Adjala-Tosorontio

Proposed alternatives to address the wastewater servicing gap of 2,959 people within the Township are:

- Connect to either the CFB Borden WWTP (11 km) or the Angus WWTP (12 km) in the Township of Essa.
- Create a new WWTP with either subsurface or surface water disposal within the Township to accommodate the new 2031 growth.

Figure OPP1
Township of Adjala-Tosorontio
Level 2 Opportunities



Legend

- WWTP — Wastewater Treatment Plants
- WTP — Water Treatment Plant
- Surface Water Intake
- P — Well Site
- Resevoir
- Water Tower
- Standing Pipe
- Water monitoring production & observation
- Railway Active
- Railway Non-Active
- **Provincial Highway**
- **County Road**
- **Local Road**
- **Easements**

Proposed Level 2 Opportunities

- Wasterwater Servicing
- Water Servicing
- Settlement Areas
- Municipal Border

1:250,000

0 1.5 3 6 Kilometers

N W E S

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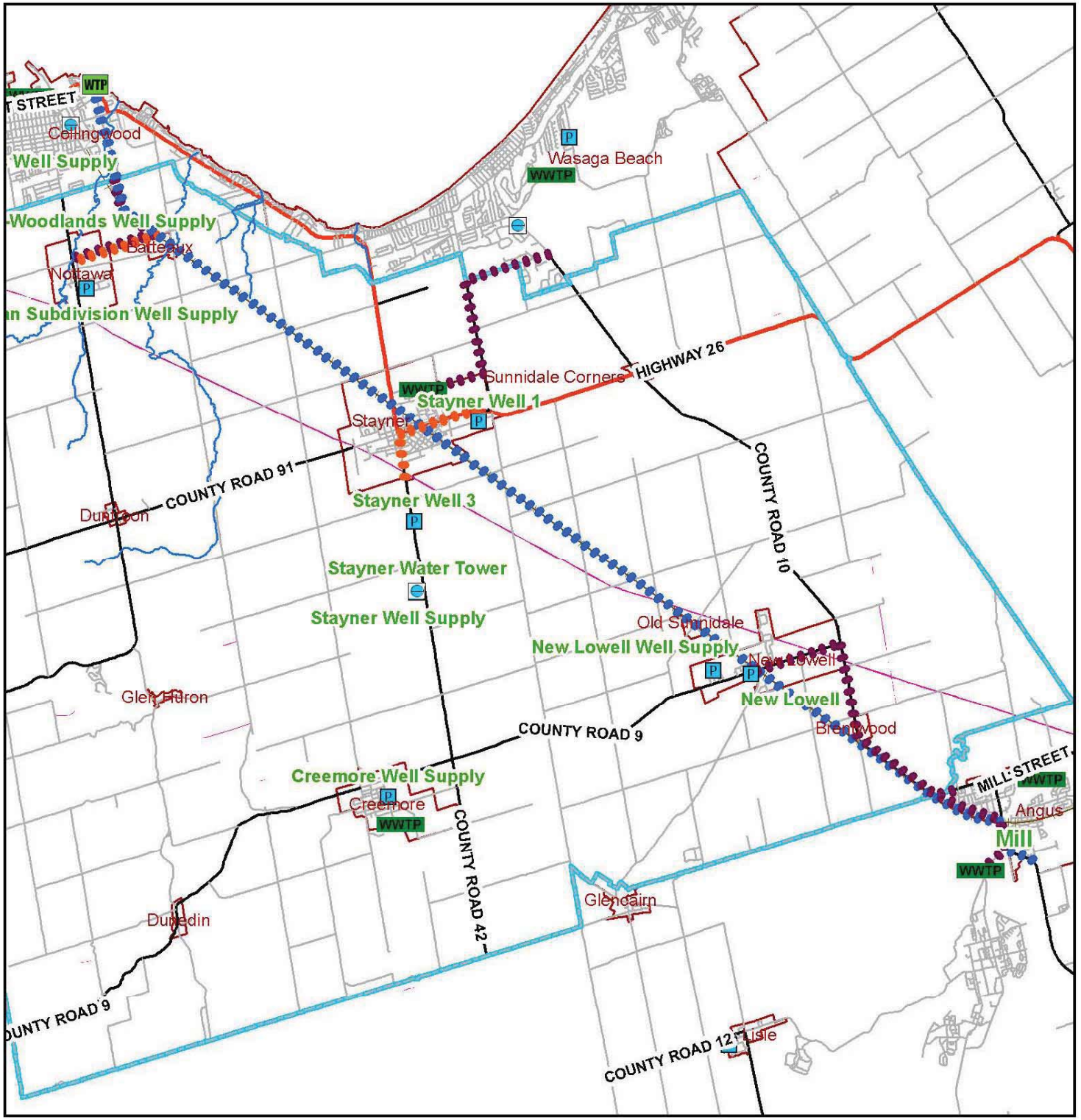
Township of Clearview

Proposed alternatives to address the water servicing gap or 5,722 people and the wastewater servicing gap of 8,893 people are:

- Connect to the CFB Borden WWTP (15.2 km) or the Angus WWTP (8.4 km) in the Township of Essa to service the Community of New Lowell.
- Utilize the existing Collingwood to Alliston pipeline to service Stayner's water servicing needs (3.9 km).
- Connect to the proposed expansion of the Collingwood WWTP to service the Town of Nottawa.
- Connect the proposed growth in Stayner to the Wasaga Beach WWTP (with existing residual capacity)

Figure OPP2
Township of Clearview
Level 2 Opportunities



Legend

- WWTP — Wastewater Treatment Plants
- WTP — Water Treatment Plant
- Surface Water Intake
- Well Site
- Resevoir
- Water Tower
- Standing Pipe
- Water monitoring production & observation
- Railway Active
- Railway Non-Active
- **Provincial Highway**
- **County Road**
- **Local Road**
- **Easements**

Proposed Level 2 Opportunities

- Collingwood to Alliston Pipeline
- Wasterwater Servicing
- Water Servicing
- Settlement Areas
- Municipal Border

1:150,000

0 1 2 4 Kilometers

N W E S

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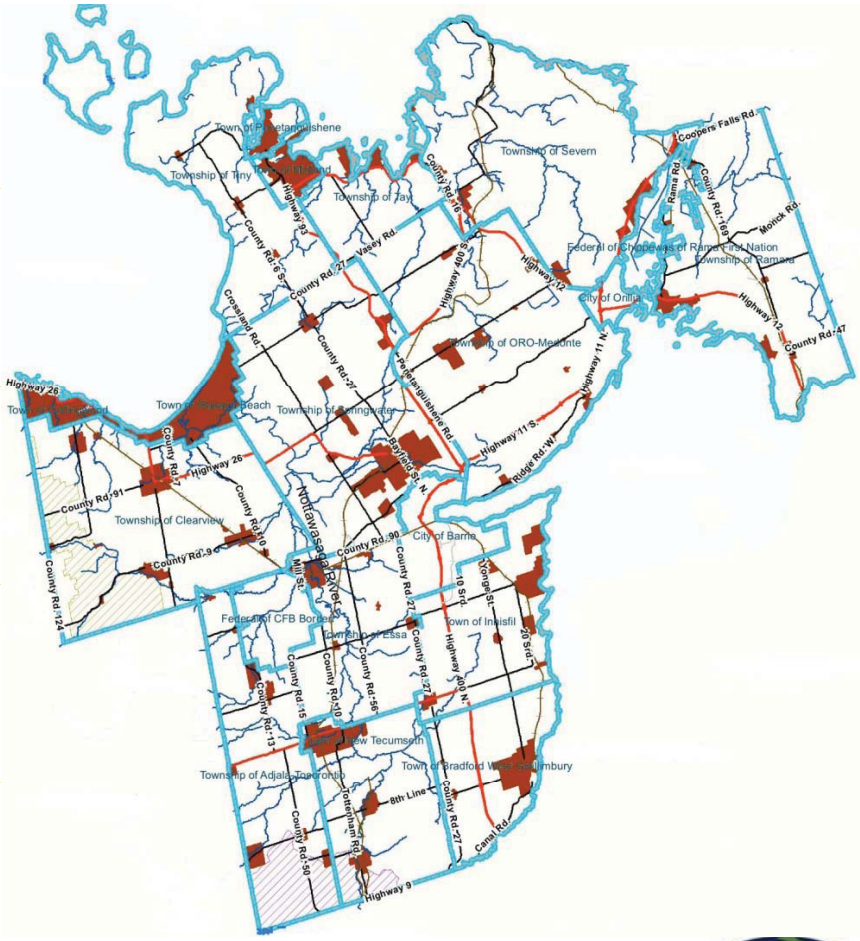
Closure and Next Steps

County of Simcoe Water and Wastewater Visioning Strategy

Overview of Background Information Brief and Servicing Gap Analysis



Presentation to Partners & Agencies (12 September 2011)

GREENLAND® Group of Companies
"An Engineering and Technologies Enterprise"
www.grnland.com

Presentation Outline

PART 'A' - Background

Introduction and Background

- County Council Resolution CCW-007-09 (Adopted December 2009)

- Project Goal, Objectives, and County - Greenland Staffs Responsibilities

- Study Area and Completed Data Collection / Background Information Process

Socio Economic Conditions

- Overview of County Official Plan Population and Employment

Natural Heritage Conditions

- Overview of Septage, Marina and Leachate Systems Summaries

Servicing Gap Analysis Examples

- Examples of Completed Servicing Gap Analyses (Township of Essa)

- In-kind Contributions (CANWET™-4 and Concurrent U.S. / Mexico Initiative)

Presentation Outline

PART 'B' – Opportunities and Constraints

- Septage and Leachate Systems
- Marinas
- Examples of Completed Level '1' Approach (Clearview)
- Level '2' Approach (Town of Innisfil)

PART 'C' – Level 2 Opportunities

- Identify and Develop Opportunities for Municipalities with Current Servicing Gaps.

•With the development of recent Provincial planning policies by the Ontario Government, the County of Simcoe is facing intense growth pressures.

• Forecasts from both the public and the private sectors identify Simcoe County as one of the key areas for planned employment and population growth opportunities.

• Demand for growth also presents opportunities for the County to enhance the area's future prosperity with long term sustainable employment and an opportunity for residents to live, work and play in well planned communities based on sound and sustainable solutions.

In response to this vision, County Council adopted **Resolution CCW-007-09** at the December 2009 general meeting in order to complete a County-wide water and wastewater visionary strategy:

THAT County staff, in consultation with the staff of the member municipalities, the separated cities, neighbouring municipalities, first nation partners and the development community, be required to prepare a report on the existing water and wastewater system requirements, agreements and plans (including septage and leachate), as well as analysis of the current and potential delivery matrix & options with respect to long term solutions regarding co-ordination of this service delivery;

AND THAT the Provincial and Federal governments and the assistance of an outside engineering consulting firm be utilized to accomplish this task.

To address Simcoe County Resolution CCW-007-09, and to provide current information that would assist potential/future infrastructure strategies to be initiated by the Province, the County retained the Greenland Group to complete the primary project goal, namely:

•To prepare a Servicing Gap Analysis that assesses existing water and wastewater system requirements for all County member municipalities, the separated cities, and federal lands within Simcoe County.

We interpreted that the **primary goal** could be achieved through the completion of the following document **objectives**:

1) Assess the existing water and wastewater system capacities with respect to servicing existing and proposed population growth identified in the County of Simcoe adopted 2008 Official Plan (No other land use changes were considered);

2) Compile a general review of existing environmental (natural, socio-economic) conditions for the County of Simcoe and utilizing available/local science; and,

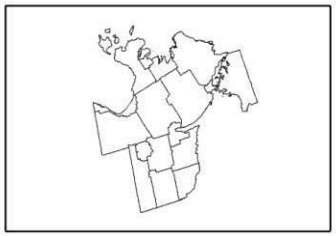
3) Based on Greenland's assessment and review of the above 2 objectives, prepare individual summaries of water and wastewater servicing opportunities and constraints and which should also consider baseline condition results from *Greenland's technology in-kind* (CANWET™) provided during the project.

4) Identify Level 2 Opportunities for each of the municipalities that are found to have a servicing gap.

Study Area

Project Study Area

Simcoe County Official Plan - Adopted 2008



Legend

- Water Courses
- Railway Active
- Railway Non-Active
- Provincial Highway
- County Road
- Niagara Escarpment Plan Boundary
- Oak Ridges Moraine Area
- Settlement Areas
- Municipal Border

1:400,000

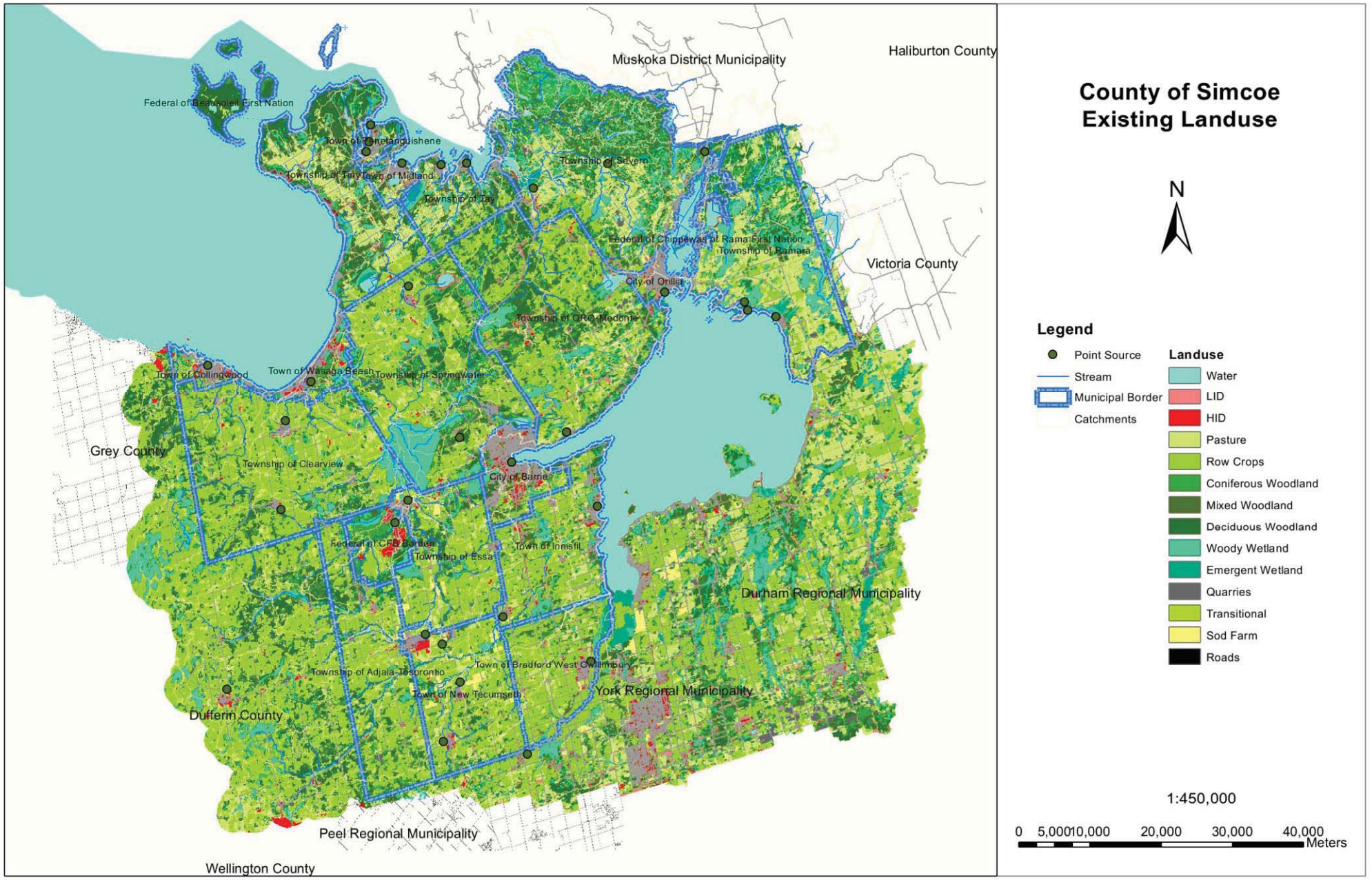
0 3.75 7.5 15 Kilometers

GREENLAND

N W E S

SIMCOE COUNTY LAND INFORMATION NETWORK COOPERATIVE — LINC

Study Area (cont'd)



Study Area (cont'd)

Natural Heritage Features
Simcoe County Official
Adopted 2008

Legend

- Water Courses
- Railway Active
- Railway Non-Active
- Provincial Highway
- County Road
- Niagara Escarpment Plan Boundary
- Oak Ridges Moraine Area
- Provincially Significant Wetland
- Locally Significant Wetland
- Marsh
- Provincial ANSI
- Regional ANSI
- Settlement Areas
- Municipal Border

1:400,000

0 3.75 7.5 15 Kilometers

GREENLAND

N W E S

Overview of County Official Plan Population and Employment

Simcoe County Official Plan (Revised Plan): Population Growth Rates in Simcoe County, Barrie and Orillia

Region	Town/Township	2006 Census Population (Persons)	Simcoe County Official Plan (Adopted) 2031 Population Allocation (Persons)	Population Growth 2006 - 2031 (Persons)	Percent Growth From 2006 - 2031 Population
SIMCOE COUNTY	Township of Adjala-Tosorontio	11,100	14,200	3,100	128%
	Town of Bradford West Gwillimbury	25,000	49,700	24,700	199%
	Township of Clearview	14,600	26,000	11,400	178%
	Township of Collingwood	18,000	30,200	12,200	168%
	Township of Essa	17,600	22,900	5,300	130%
	Town of Innisfil	32,400	65,000	32,600	201%
	Town of Midland	16,900	19,700	2,800	117%
	Town of New Tecumseth	28,800	49,000	20,200	170%
	Township of Oro-Medonte	20,800	28,100	7,300	135%
	Town of Penetanguishene	9,700	12,300	2,600	127%
	Township of Ramara	9,800	15,500	5,700	158%
	Township of Severn	12,500	20,200	7,700	162%
	Township of Springwater	18,100	26,500	8,400	146%
	Township of Tay	10,100	11,300	1,200	112%
	Township of Tiny	11,200	13,900	2,700	124%
	Town of Wasaga Beach	15,600	35,000	19,400	224%
	Total Population	**272,200**	**439,500**	**167,300**	**161%**
Other	City of Barrie	166,400	227,500	61,100	137%
	City of Orillia				
	Total Population	**438,600**	**667,000**	**228,400**	152%

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Overview of County Official Plan Population and Employment (cont'd)

Simcoe County Official Plan (Revised Plan): Employment Growth Rates in Simcoe County, Barrie and Orillia

Region	Town/Township	2006 Census Employment (Persons)	Simcoe County Official Plan (Adopted) 2031 Employment Allocation (Persons)	Employment Growth 2006 - 2031 (Persons)	Percent Growth From 2006 - 2031 Population
SIMCOE COUNTY	Township of Adjala-Tosorontio	1,600	2,100	500	131%
	Town of Bradford West Gwillimbury	8,000	16,200	8,200	203%
	Township of Clearview	4,400	5,800	1,400	132%
	Township of Collingwood	10,800	14,400	3,600	133%
	Township of Essa	7,700	10,300	2,600	134%
	Town of Innisfil	5,700	13,100	7,400	230%
	Town of Midland	12,000	16,000	4,000	133%
	Town of New Tecumseth	19,700	26,300	6,600	134%
	Township of Oro-Medonte	4,700	6,200	1,500	132%
	Town of Penetanguishene	5,300	7,000	1,700	132%
	Township of Ramara	1,900	2,500	600	132%
	Township of Severn	3,900	5,300	1,400	136%
	Township of Springwater	5,000	6,700	1,700	134%
	Township of Tay	1,500	2,000	500	133%
	Township of Tiny	1,400	1,900	500	136%
	Town of Wasaga Beach	3,100	4,100	1,000	132%
	Total Employment	**96,700**	**139,900**	**43,200**	**145%**
Other	City of Barrie	87,100	114,100	27,000	131%
	City of Orillia				
	Total Employment	**183,800**	**254,000**	**70,200**	**138%**

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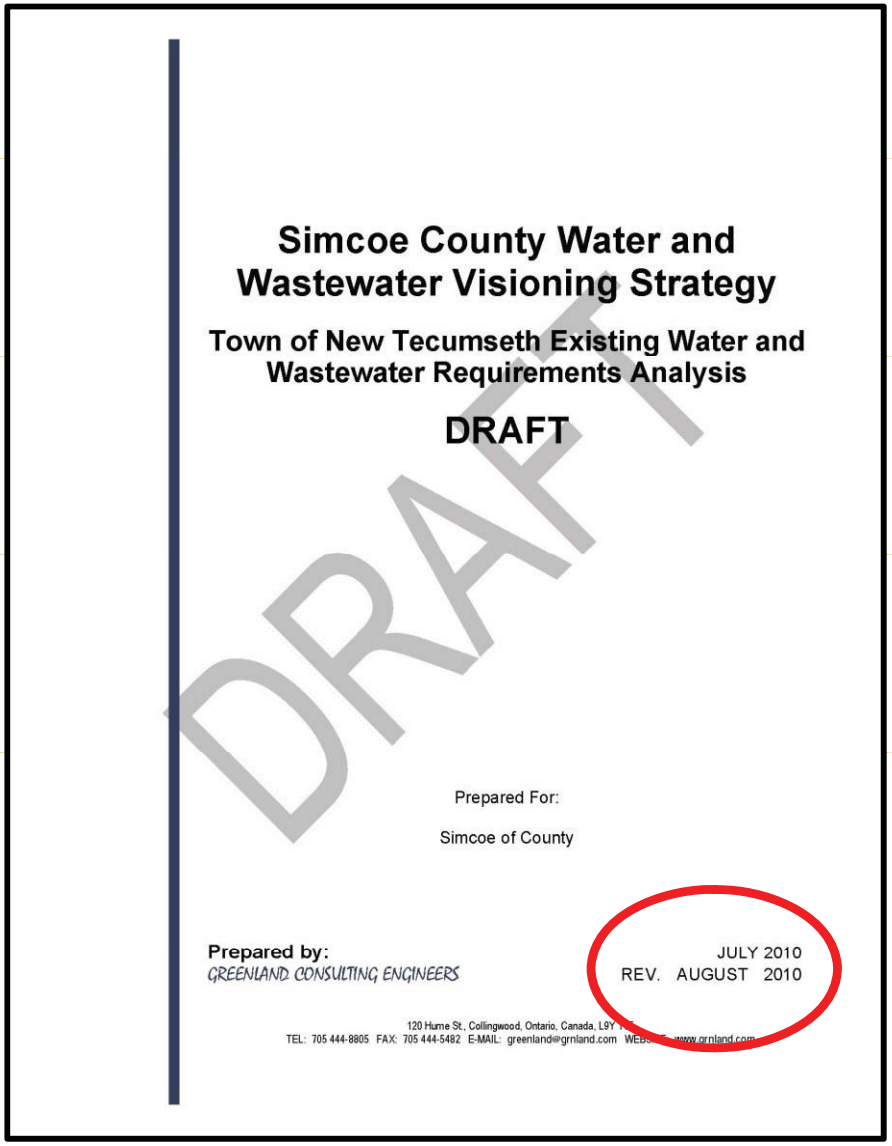
Data Collection / Background Information Process (e.g. New Tecumseth)



Simcoe County Water and Wastewater Visioning Strategy

Town of New Tecumseth Existing Water and Wastewater Requirements Analysis

DRAFT

DRAFT

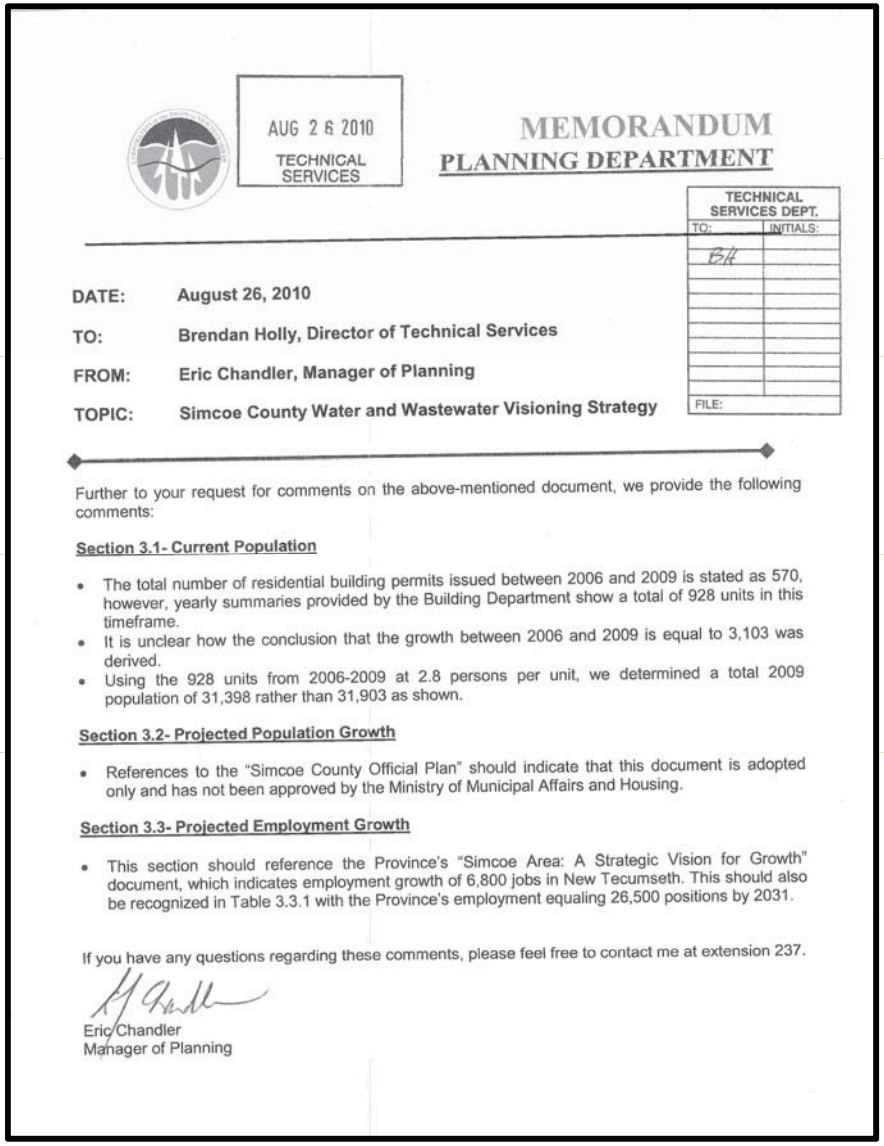
Prepared For:

Simcoe of County

Prepared by:
GREENLAND CONSULTING ENGINEERS

JULY 2010
REV. AUGUST 2010

120 Hume St., Collingwood, Ontario, Canada, L9Y
TEL: 705 444-8805 FAX: 705 444-5482 E-MAIL: greenland@grnland.com WEB: www.grnland.com



AUG 2 6 2010
TECHNICAL SERVICES

MEMORANDUM
PLANNING DEPARTMENT

TECHNICAL SERVICES DEPT.	
TO:	INITIALS:
BH	
FILE:	

DATE: August 26, 2010

TO: Brendan Holly, Director of Technical Services

FROM: Eric Chandler, Manager of Planning

TOPIC: Simcoe County Water and Wastewater Visioning Strategy

Further to your request for comments on the above-mentioned document, we provide the following comments:

Section 3.1- Current Population

- The total number of residential building permits issued between 2006 and 2009 is stated as 570, however, yearly summaries provided by the Building Department show a total of 928 units in this timeframe.
- It is unclear how the conclusion that the growth between 2006 and 2009 is equal to 3,103 was derived.
- Using the 928 units from 2006-2009 at 2.8 persons per unit, we determined a total 2009 population of 31,398 rather than 31,903 as shown.

Section 3.2- Projected Population Growth

- References to the "Simcoe County Official Plan" should indicate that this document is adopted only and has not been approved by the Ministry of Municipal Affairs and Housing.

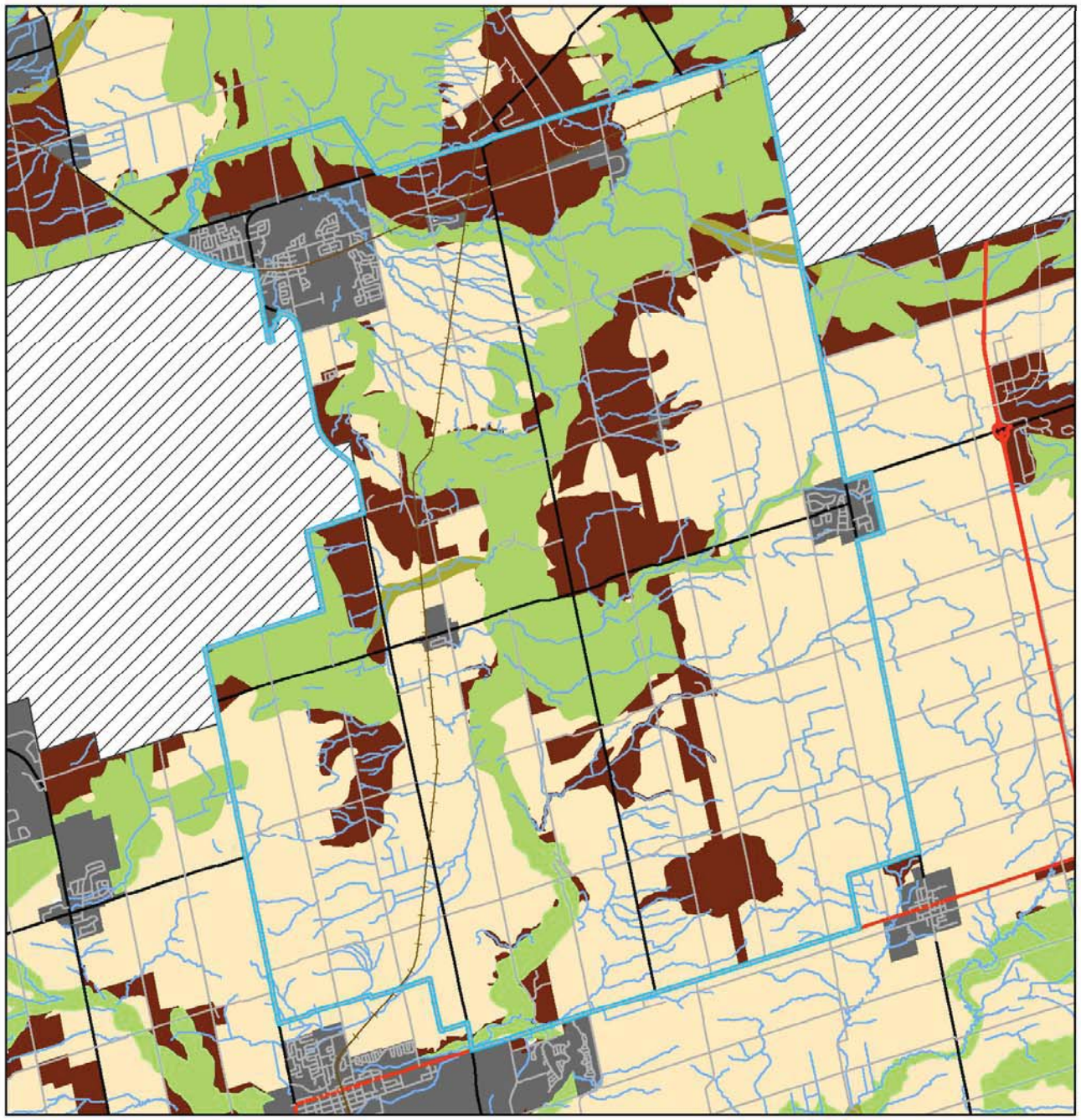
Section 3.3- Projected Employment Growth

- This section should reference the Province's "Simcoe Area: A Strategic Vision for Growth" document, which indicates employment growth of 6,800 jobs in New Tecumseth. This should also be recognized in Table 3.3.1 with the Province's employment equaling 26,500 positions by 2031.

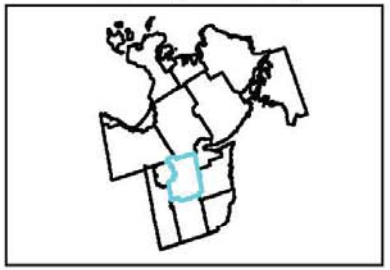
If you have any questions regarding these comments, please feel free to contact me at extension 237.

Eric Chandler
Manager of Planning

Example of Completed Servicing Gap Analysis (Township of Essa)



LU-9
Essa
Simcoe County Official Plan
Land Use Designations
2008 (DRAFT)



Legend

- Railway Active
- Railway Non-Active
- **Provincial Highway**
- **County Road**
- **Local Road**
- Major Rivers
- Niagara Escarpment Plan Boundary
- Oak Ridges Moraine Area
- Greenland
- Potential Greenland Linkages
- Settlement Areas
- Agricultural
- Rural
- Lands Not Subject to This Plan
- **Municipal Border**

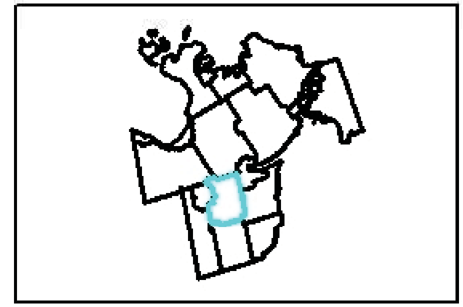
1:120,000

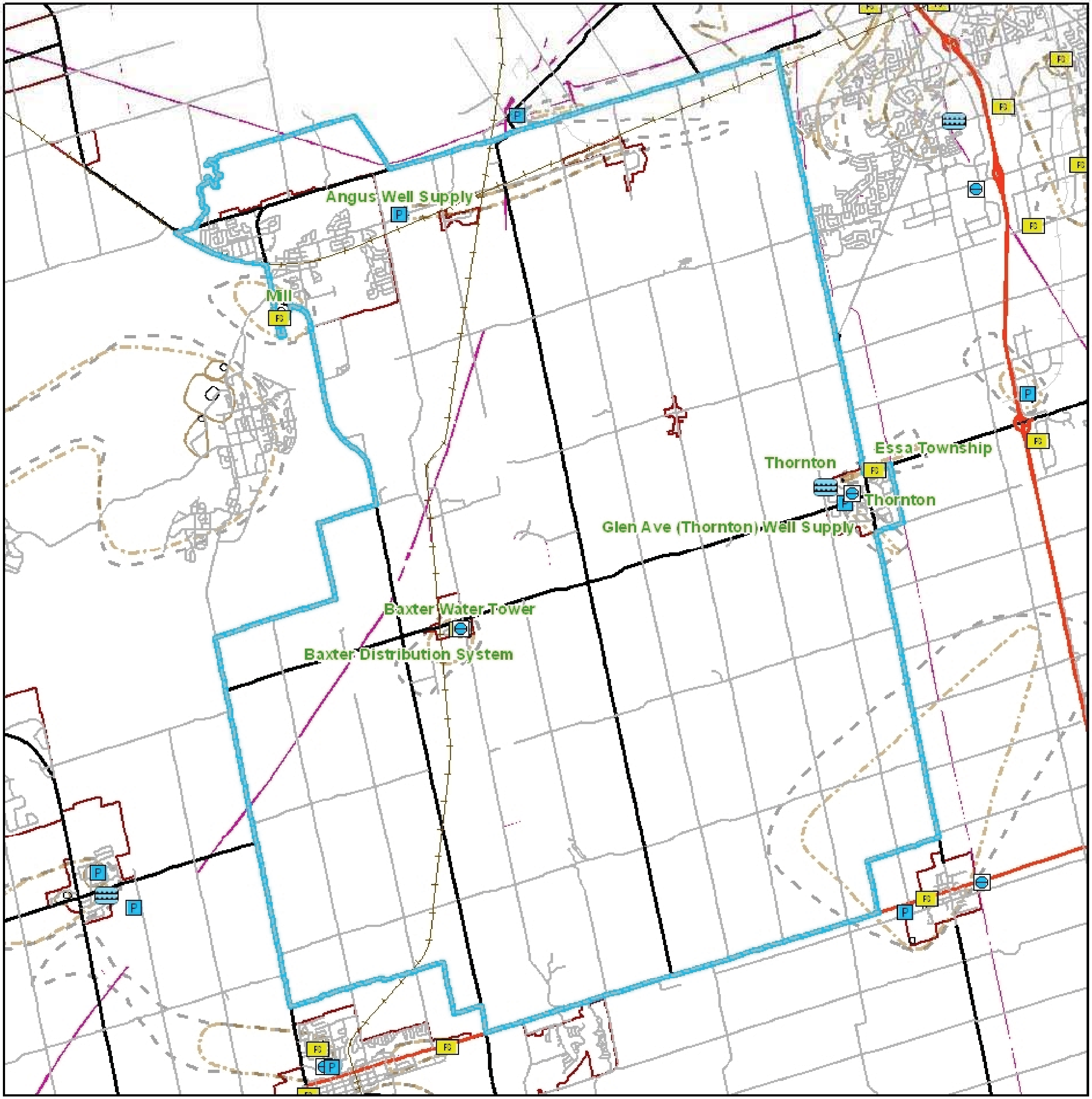
0 0.375 1.5 Kilometers

GREENLAND

SIMCOE COUNTY LAND INFORMATION NETWORK COOPERATIVE
LINC

WAT-9
Essa
Water Servicing Plan





Legend

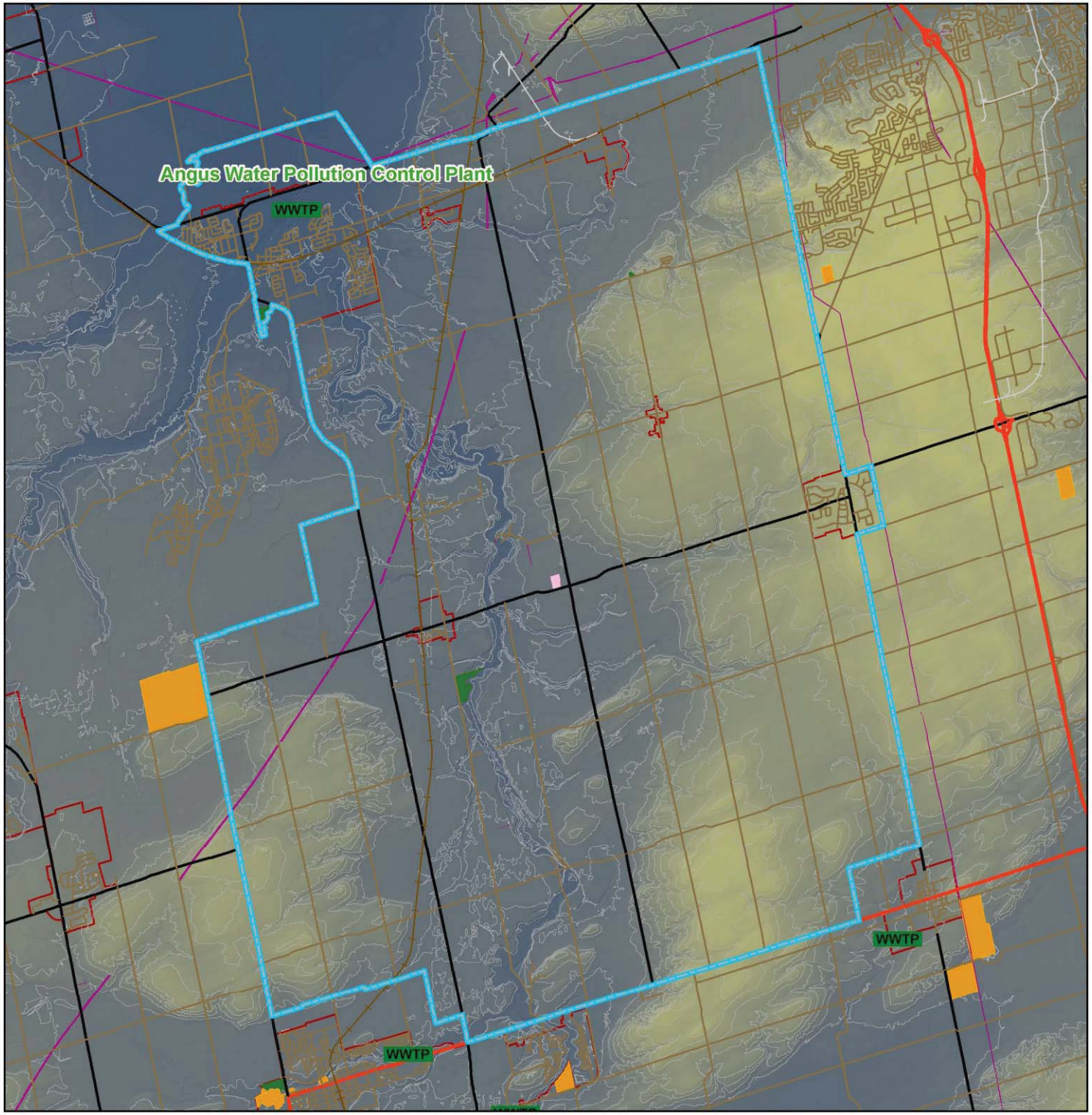
- WTP Water Treatment Plant
- Surface Water Intake
- Well Site
- Pumphouse
- Reservoir
- Water Tower
- Standing Pipe
- Water monitoring production & observation
- Railway Active
- Railway Non-Active
- Provincial Highway
- County Road
- Local Road
- Easements
- Intake Protection Zones
- Well Head Protection Capture Area
- 25Yr Certainty
- 25yr Uncertainty
- 10 Year
- 2 Year
- 50 Day
- Settlement Areas
- Municipal Border

1:120,000

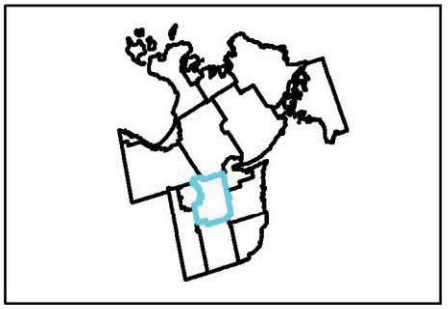
0 0.5 1 2 Kilometers

GREENLAND

SIMCOE COUNTY LAND INFORMATION NETWORK COOPERATIVE LINC



SAN-9
Essa
Wastewater Servicing Plan



Legend

- WWTP Wastewater Treatment Plants
- Railway Active
- Railway Non-Active
- Provincial Highway
- County Road
- Local Road
- Easements
- Open Landfill Site
- Open Stump Dump
- Under Development Landfill Site
- Closed Landfill Site
- Closed Stump Dump
- 2008 Local & Private Waste Disposal Sites
- Municipal Border
- 10m Contours
- Settlement Areas
- High : 542
- Low : 175

1:120,000

0 1 2 4 Kilometers

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SERVICING GAP ANALYSIS - TOWNSHIP ESSA

Water Supply System

	2006 Ainley Data					2009 Data					Servicing Gaps				
Water Supply System	Rated Capacity (m^3/day)	Equivalent Population (Persons)	MDD (m^3/day)	Serviced Population (Persons)	Existing Residual Capacity (Persons)	Rated Capacity (m^3/day)	Equivalent Population (Persons)	MDD (m^3/day)	Serviced Population (Persons)	Existing Residual Capacity (Persons)	Committed Capacity Increase (Persons)	Simcoe County Official Plan APP (Persons)	2031 Projected Employment Growth (Equivalent Persons)	Servicing Gap (Persons)	Servicing Gap (m^3/day)
Angus	6,554	11,958	3,094	6,210	5,450	10,805	22,882	3,422	7,247	15,635	0				
Thornton-Glen	1,540	1,596	658	750	850	1,540	1,531	1,304	1,296	235	0	**Data not available at this time**			
Baxter	225	242	132	156	100	100	177	84	149	28	0				
Total	**8,319**	**13,796**	**3,884**	**7,116**	**6,400**	**12,445**	**24,589**	**4,810**	**8,691**	**15,898**	**0**	**3,824**	**1,300**	**10,774**	**5,453**

Wastewater Treatment Systems

	2006 Ainley Data					2009 Data					Servicing Gaps				
Wastewater Treatment Systems	Rated Capacity (m^3/day)	Equivalent Population (Persons)	ADF (m^3/day)	Serviced Population (Persons)	Existing Residual Capacity (Persons)	Rated Capacity (m^3/day)	Equivalent Population (Persons)	ADF (m^3/day)	Serviced Population (Persons)	Existing Residual Capacity (Persons)	Committed Capacity Increase (Persons)	Simcoe County Official Plan APP (Persons)	2031 Projected Employment Growth (Equivalent Persons)	Servicing Gap (Persons)	Servicing Gap (m^3/day)
Angus	5,511	13,911	2,233	6,200	7,700	5,511	13,911	2,585	7,247	6,664	0	3,824	1,300	1,540	610
Total	**5,511**	**13,911**	**2,233**	**6,200**	**7,700**	**17,956**	**13,911**	**2,585**	**7,247**	**6,664**	**0**	**3,824**	**1,300**	**1,540**	**610**

GENERAL NOTES:

Maximum Daily Demand (MDD) per capita for 2009 data was obtained by the Township.

Average Daily Flow (ADF) per capita for 2009 Data was obtained by the Township.

Serviced Population for 2009 was based on 2009 Water Consumption Report

2009 Rated Capacity data was obtained through the Township of Essa.

100 m^3/day Water Supply for Baxter Water Supply System is supplied by the Town of Collingwood's RAB Water Treatment Facility

2009 Equivalent Population was based on 2009 Design per capita flows and demands.

GREENLAND®

Septage and Leachate Summaries

Estimated Quantity of Septic Systems within Simcoe County, Barrie and Orillia

	Town/Township	Estimated Septic Systems: Simcoe Area					
		2009 Population (Persons)	2009 Municipal Wastewater Servicing Population (Persons)	2009 Estimated Septic Servicing Population (Persons)	2009 Septic Service Population (Persons)	Persons Per Unit (PPU)	Estimated Number of Private Septic Systems (Units)
SIMCOE COUNTY	Township of Adjala-Tosorontio	11,085	300	10,785	10,785	3.00	3,595
	Town of Bradford West Gwillimbury	26,871	18,575	8,295	8,295	3.10	2,676
	Township of Clearview	15,111	5,971	9,140	9,140	2.80	3,264
	Township of Collingwood	19,078	18,048	1,030	1,030	2.60	396
	Township of Essa	19,076	7,247	11,829	11,829	2.70	4,381
	Town of Innisfil	34,932	24,148	10,784	10,784	3.00	3,595
	Town of Midland	17,329	14,429	2,900	2,900	2.70	1,074
	Town of New Tecumseth	31,398	23,050	8,348	8,348	2.80	2,982
	Township of Oro-Medonte	20,455	0	20,455	20,455	2.60	7,867
	Town of Penetanguishene	10,055	6,701	3,354	3,354	2.60	1,290
	Township of Ramara	9,968	3,179	6,789	6,789	2.49	2,727
	Township of Severn	12,997	4,000	8,997	8,997	2.70	3,332
	Township of Springwater	19,446	3,282	16,164	16,164	2.80	5,773
	Township of Tay	10,383	5,819	4,564	4,564	2.80	1,630
	Township of Tiny	11,454	0	11,454	11,454	2.80	4,091
	Town of Wasaga Beach	17,385	22,077	0	0	2.10	0
	Total	287,023	156,825	130,198	130,198	2.10	61,999
OTHER	City of Barrie	138,448	139,000	1560	1560	2.60	600
	City of Orillia	31,221	31,420	715	715	2.60	275
	First Nations	NA	NA	NA	NA	NA	NA

General Notes:

Assuming all residents have either a private/communal type septic system or is servicing serviced from a local municipal wastewater treatment system.

Persons Per Unit (PPU) was based on Servicing Gap Analysis.

.

GREENLAND®

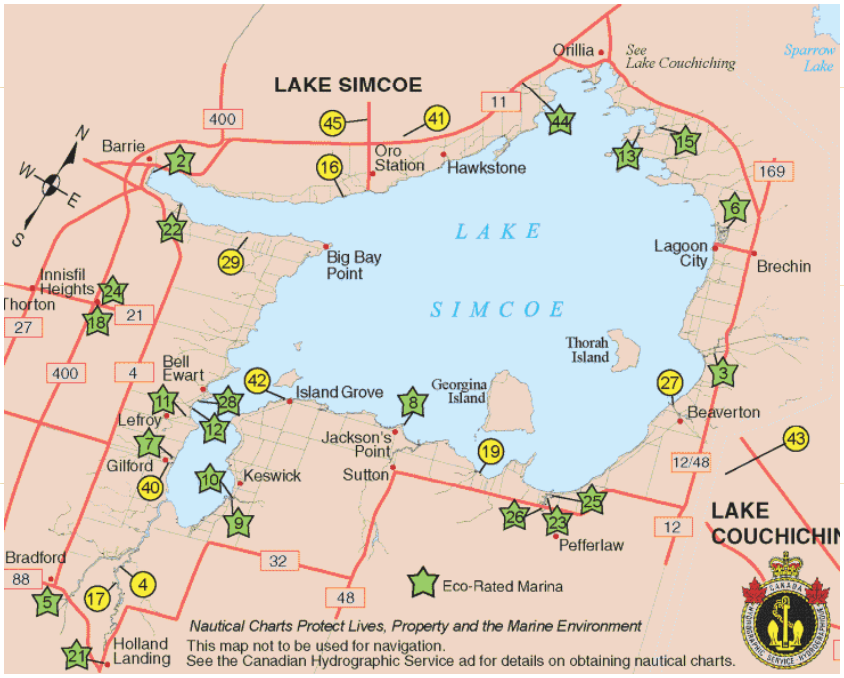
Septage and Leachate Summaries (cont'd)

2009 Leachate Production (m^3) within the County of Simcoe

2009 LEACHATE GENERATION														
		Leachate Volume Production (m^3)												
Landfill	Location	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec	Total
Site 4 (Essa)	Part Lot 13, Concession 5, Essa	363	642	535	466	258	387	86	129	129	43	165		3,203
Site 10 (Nottawasaga)	5715 30-31 Sideroad, Stayner		760	1,129	1,205	1,444	602	237	93	72	183	131	88	5,943
Site 11 (Oro)	610 Old Barrie Road West, Edgar	2,018	2,013	2,929	3,534	147	1,548	1,973	989	1,118	1,763	1,376	1,070	20,478
Site 13 (Adjala Tosorontio)	6815 Concession Road 4, Everett		936	703	1,161	1,039	704	676	581	406	636	287	705	7,834
Site 15 (Wasaga Beach)	Part Lot 21, Concession 9, Wasaga Beach	324	2,715	1,191	1,548	602	1,032	344	301	129	215	258	238	8,897
Site 16 (Bradford West Gwillimbury)	2960 Line 12, Bradford	211	334	344	172	215	346	430	172	215	215	172	167	2,993
Total		**2,916**	**7,401**	**6,830**	**8,085**	**3,704**	**4,618**	**3,746**	**2,265**	**2,069**	**3,055**	**2,389**	**2,268**	**49,347**

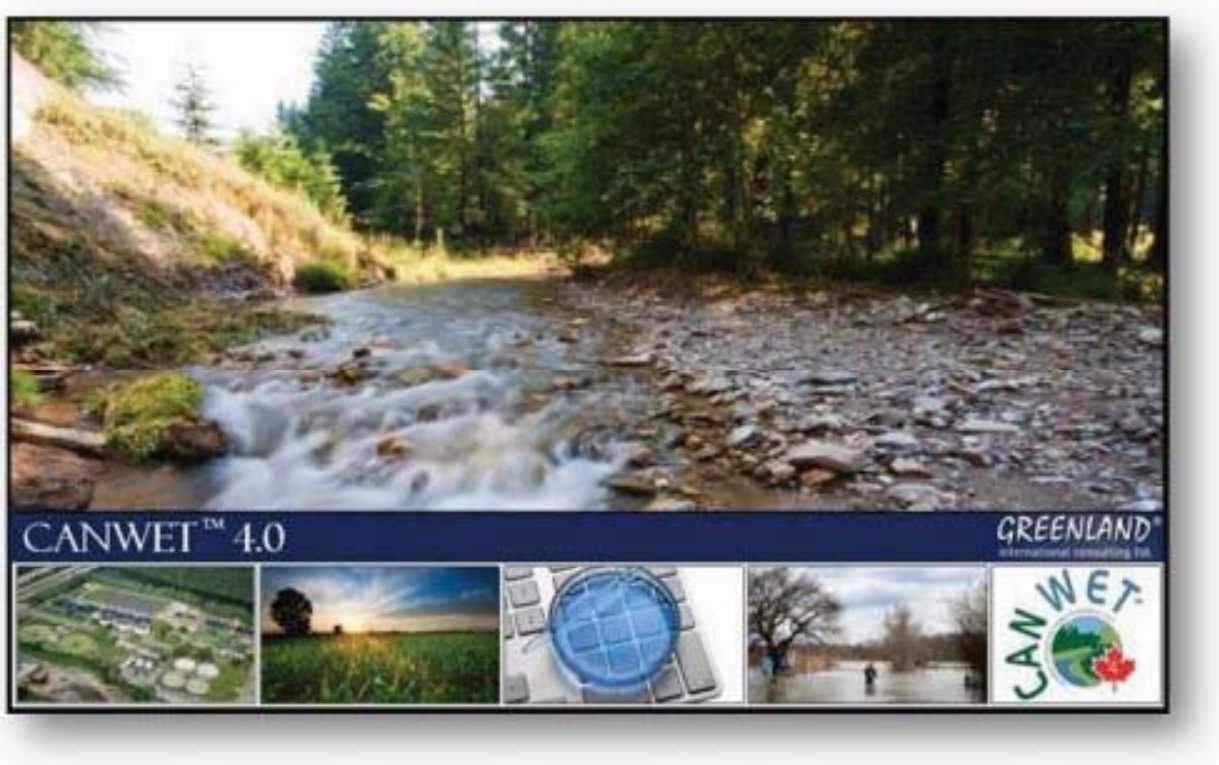
Simcoe County Marinas

- The 49 marinas in Simcoe County were contacted to determine if sewage pump-out services were provided
- 8 dispose the pump-out sewage waste into Town sewers, 18 have it pumped out via a trucking system, 9 marinas did not respond and 14 do not pump sewage at all.
- The sewage from private holding tanks is treated at the Town of Collingwood, City of Orillia, or the Town of Midland WWTPs.

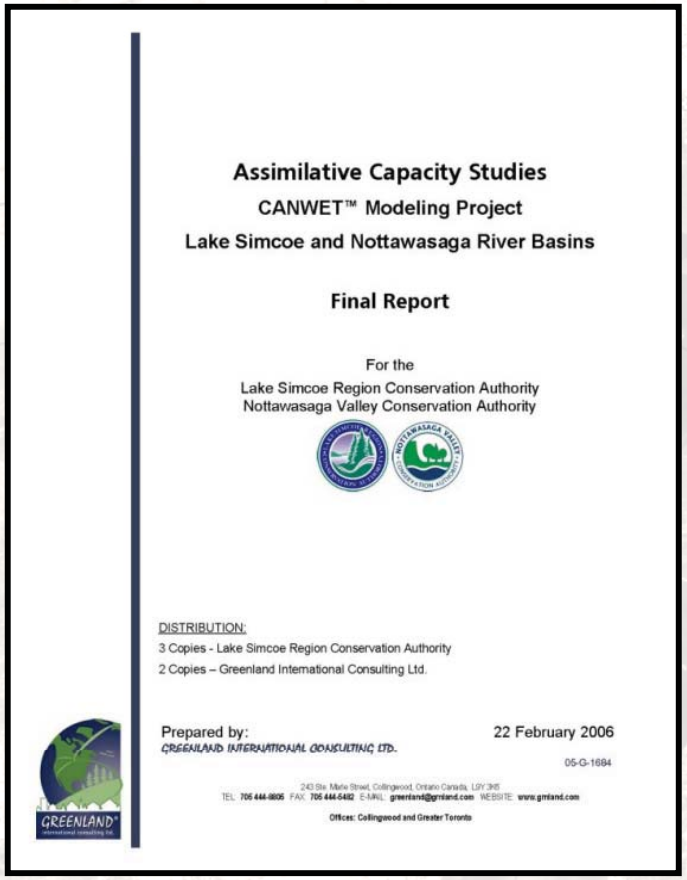


In-kind Project Contributions by the Greenland Group (CANWET™- 4 and Concurrent U.S. / Mexico Initiative)

CANWET™-4
(CANadian Watershed Evaluation Tool)



Ontario's Assimilative Capacity and IGAP Studies (2005-06) and the Use of CANWET™-2



Assimilative Capacity Studies

CANWET™ Modeling Project

Lake Simcoe and Nottawasaga River Basins

Final Report

For the
Lake Simcoe Region Conservation Authority
Nottawasaga Valley Conservation Authority

DISTRIBUTION:
3 Copies - Lake Simcoe Region Conservation Authority
2 Copies – Greenland International Consulting Ltd.

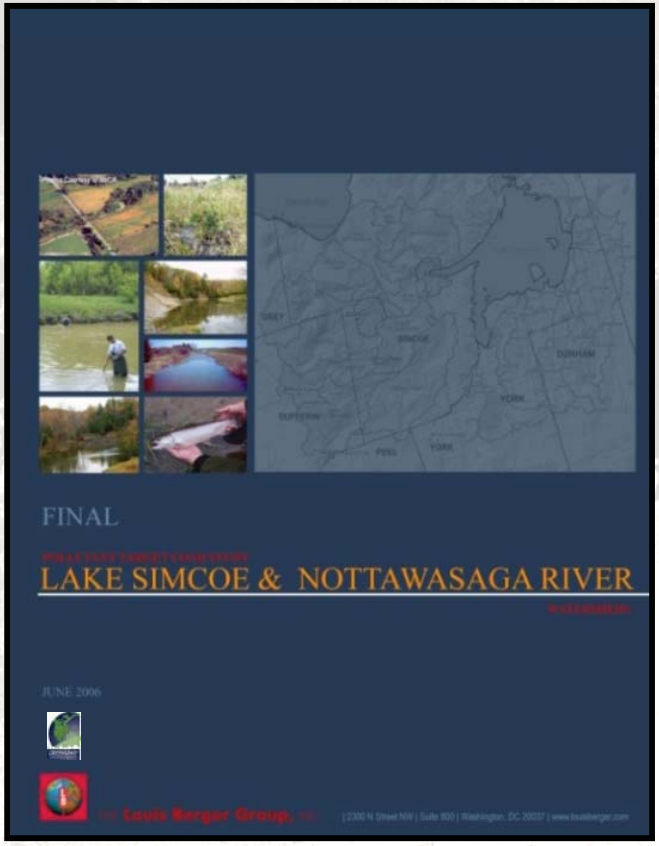
Prepared by:
GREENLAND INTERNATIONAL CONSULTING LTD.

22 February 2006

05-G-1684

243 Ste. Marie Street, Collingwood, Ontario Canada, L9Y 3K6
TEL: 705 444-8805 FAX: 705 444-5482 E-MAIL: greenland@grnland.com WEBSITE: www.grnland.com

Offices: Collingwood and Greater Toronto

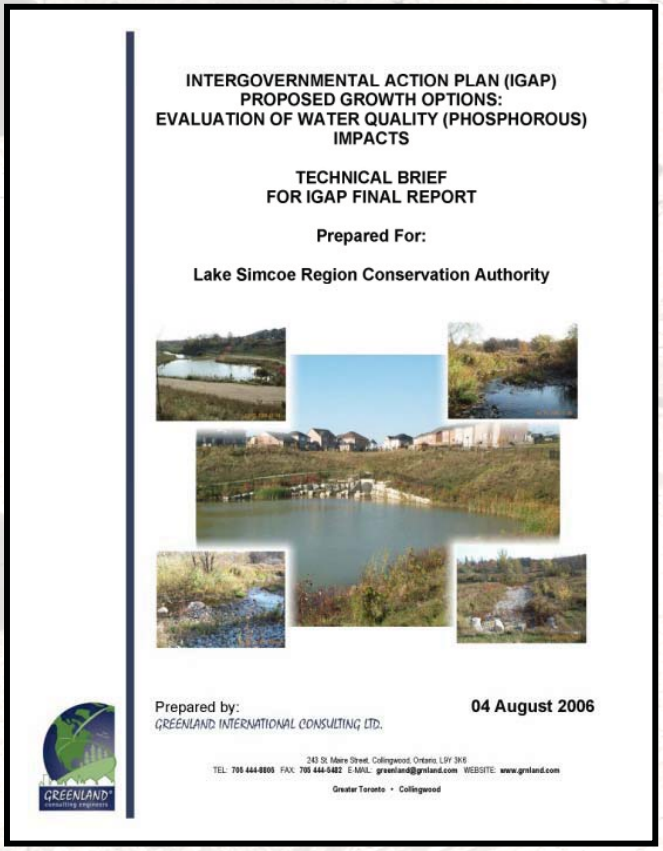


FINAL

LAKE SIMCOE & NOTTAWASAGA RIVER

JUNE 2006

Louis Berger Group, Inc.



**INTERGOVERNMENTAL ACTION PLAN (IGAP)
PROPOSED GROWTH OPTIONS:
EVALUATION OF WATER QUALITY (PHOSPHOROUS) IMPACTS**

**TECHNICAL BRIEF
FOR IGAP FINAL REPORT**

Prepared For:

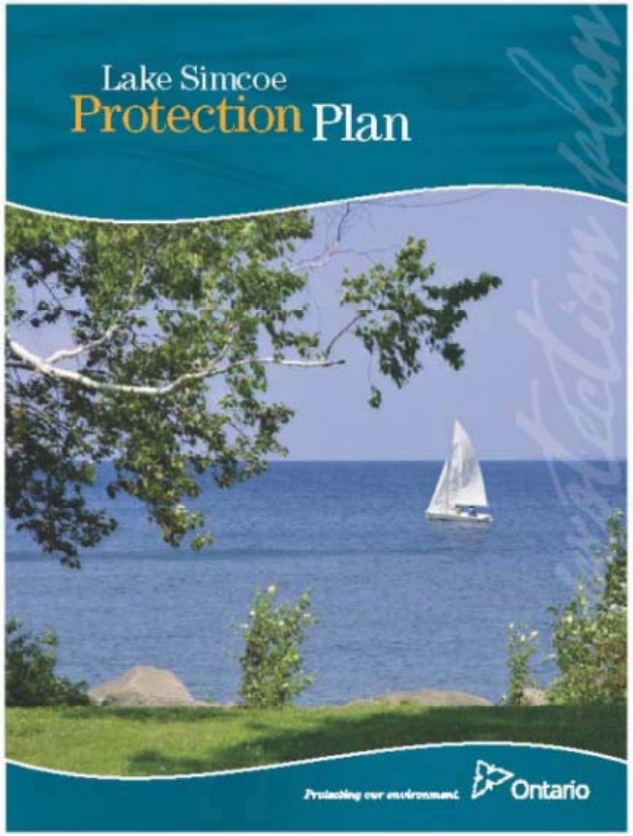
Lake Simcoe Region Conservation Authority

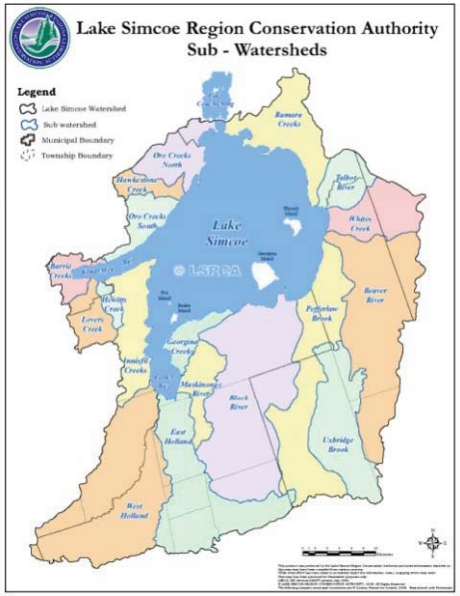
Prepared by:
GREENLAND INTERNATIONAL CONSULTING LTD.

04 August 2006

243 St. Marie Street, Collingwood, Ontario, L9Y 3K6
TEL: 705 444-8805 FAX: 705 444-5482 E-MAIL: greenland@grnland.com WEBSITE: www.grnland.com

Greater Toronto • Collingwood





Tel: 905•895•1281
1•800•465•0437
Fax: 905•853•5881
E-Mail: info@lsrca.on.ca
Web: www.lsrca.on.ca

120 Bayview Parkway
Box 282
Newmarket, Ontario
L3Y 4X1

A Watershed For Life

February 26, 2010

CANWET™-3

R. Mark Palmer, P.Eng.
President
Greenland Consulting Engineers
120 Hume Street
Collingwood, ON L9Y 1V5

Dear Mr. Palmer:

Re: CANWET™ Model and Application

Please accept this letter as the Lake Simcoe Region Conservation Authority's endorsement of the CANWET™ (v.3) model. The Conservation Authority is extremely satisfied with the model's performance and accuracy and supports the continued use of this product in our watershed and others.

CANWET™ was initially developed and tested to deal with nutrient loading issues within the Lake Simcoe basin. Since this time the model has become an invaluable tool in the development of growth plans, as was demonstrated in the Lake Simcoe and Nottawassaga River Assimilative Capacity studies to support the Inter Governmental Action Plan (IGAP) process within Simcoe County. The model has also been extensively used and tested as part of the Lake Simcoe Basin's Source Water Protection program to develop Tier 1 water budgets and, most recently, the development and implementation of the provincial Lake Simcoe Protection Plan (LSPP). The tool has allowed the Authority to develop water quality and quantity targets at a sub-catchment level and is being evaluated for use under a Phosphorus Trading program being considered by the Ministry of the Environment.

Please do not hesitate to contact me should you require any further information or assistance.

Sincerely,

Michael Walters, CMM III
General Manager, Watershed Management

MW/lmc

CANWET™-4 Acknowledgements

- Canada's National Research Council – I.R.A.P.

- Michael Walters (Lake Simcoe Region Conservation Authority)

- Dr. Ramesh Rudra (University of Guelph)
- Dr. Bahram Gharabaghi (University of Guelph)
- Dr. Aaron Berg (University of Guelph)

- Dr. Barry Evans (Penn State University)

- Environment Canada
- Agriculture and Agri-Food Canada

- County of Simcoe
- Town of Innisfil
- City of Barrie

CANWET™-4

National Research Council Canada | Conseil national de recherches Canada

Industrial Research Assistance Program | Programme d'aide à la recherche industrielle

NRC·CNRC

July 8, 2011

Mr. R. Mark Palmer
Greenland International Consulting Ltd.
120 Hume Street
Collingwood, ON
L9Y 1V5

Re: Acknowledgement of Successful NRC-IRAP Funded Project

Dear Mark,

I am writing to acknowledge the completion of a successful R&D project funded by the National Research Council's Industrial Research Assistance Program (NRC-IRAP).

Your firm completed the project titled "Web Based GIS Driven Watershed Management Tool" in January, 2011. NRC-IRAP contributed $300,000 towards the cost of the project, as well as technical advice from our team of Industrial Technology Advisors. Your firm's performance on the project was excellent, and your team was a pleasure to work with. In particular, Trevor Boston demonstrated a strong ability to manage the project to completion.

The CANWET product that you have commercialized since the end of the project represents a strong step forward in your field, and you should be proud.

We wish you well in the successful commercialization of the technology, and the continued growth of your firm which will contribute to the Canadian economy.

Sincerely,

Doug Reed
Industrial Technology Advisor
NRC-IRAP
c/o Seneca College
8 The Seneca Way
Suite 911
Markham, ON
L3R 5Y1

Canada

Lake Simcoe Region Conservation Authority

July 27, 2011

Mr. R. Mark Palmer
President and CEO
Greenland Consulting Engineers
120 Hume Street
Collingwood, ON L9Y 1V5

Dear Mr. Palmer:

Re: CANWET™ v.4

Thank you for demonstrating the new interface and MapWindow GIS for CANWET™ v.4 to our staff on June 21, 2011. The latest technological advancements to the new tool were remarkable.

LSRCA will be employing the new model to undertake a number of projects in order to increase our understanding of the Lake Simcoe watershed. I believe this model will enable staff to make better informed management and land use decisions.

I look forward to working with Greenland Consulting Engineers in the future and utilizing CANWET™ v.4 in our watershed.

Sincerely,

Michael Walters
General Manager, Watershed Management

/tb

120 Bayview Parkway
Box 282, Newmarket, Ontario L3Y 4X1
Tel: 905.895.1281 1.800.465.0437 Fax: 905.853.5881
E-Mail: Info@lsrca.on.ca Web: www.lsrca.on.ca

1951•2011
Proud Past • Focused Future

CANWET™-4 Applications

- Nutrient loading quantification and target setting (TMDL – type analysis)
- Nutrient offsetting (trading) programs
- In-stream assimilative capacity studies
- Urban land development, infrastructure planning and design evaluations (pre- to post- development scenarios)
- Evaluate BMP benefit-cost scenarios
- Climate change impact analyses
- Water budget, water stress and in-stream temperature analyses
- Food security strategies

CANWET™-4 Key Features

- Daily water balance and hydrology
- Daily time step water quality (loadings and concentrations for nutrients, sediments, bacteria and pathogens)
- Hydraulic model with in-stream temperature simulator and concentration computed daily
- GIS driven input and output
- Climate change analysis tools
- Project results to Google Earth
- Import observation data for calibration
- Watershed delineation tools
- Consider point and non-point sources
- Consider impacts of multiple BMPs based on available science and cost-benefits

CANWET™-4 Architecture

- **Microsoft .NET Framework**
  - R.A.D.
  - Language-Independent
  - Rich Code Libraries
  - Extensibility

Desktop

Web

Mobile

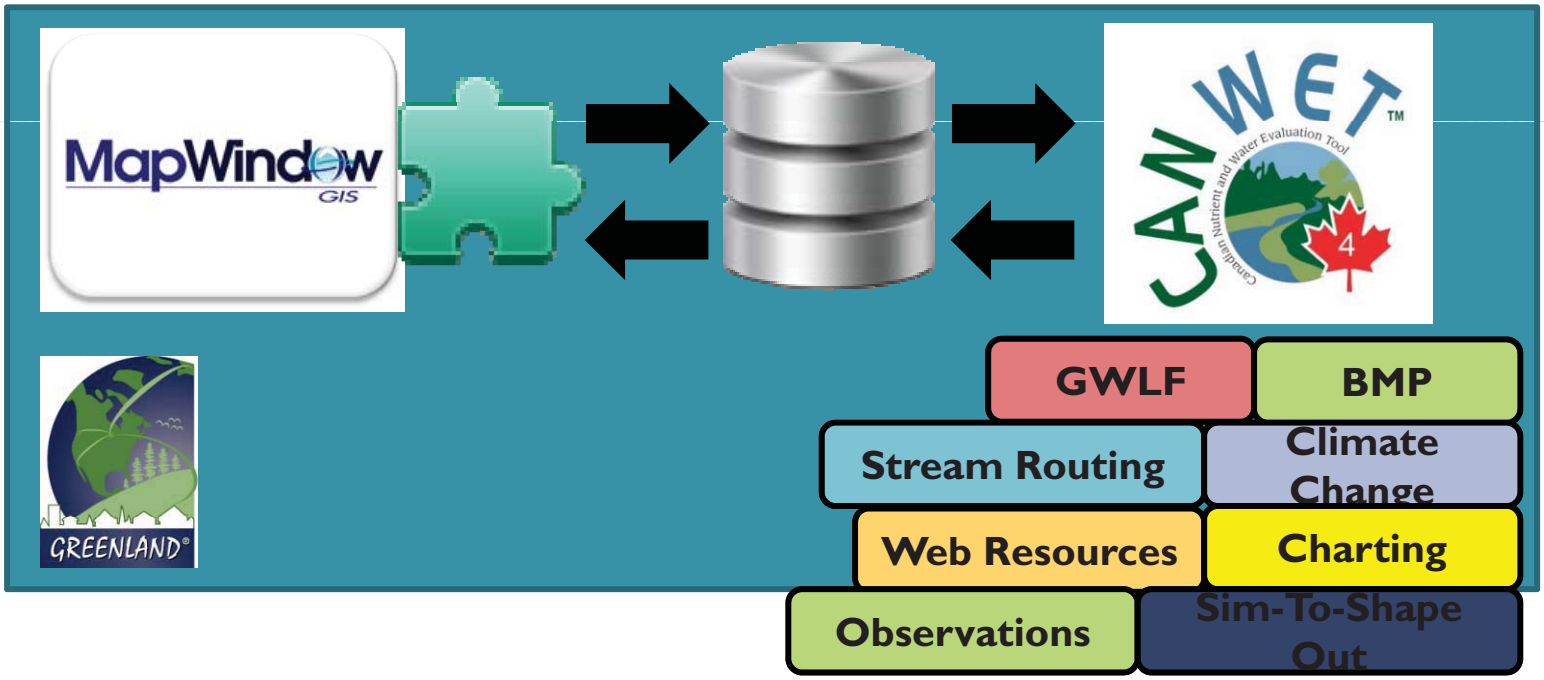
CANWET™ -4 Architecture

- **Microsoft .NET Framework**
  - Languages are Object-Oriented
  - Class design (real-world modeling)
  - Scalable
  - Modular

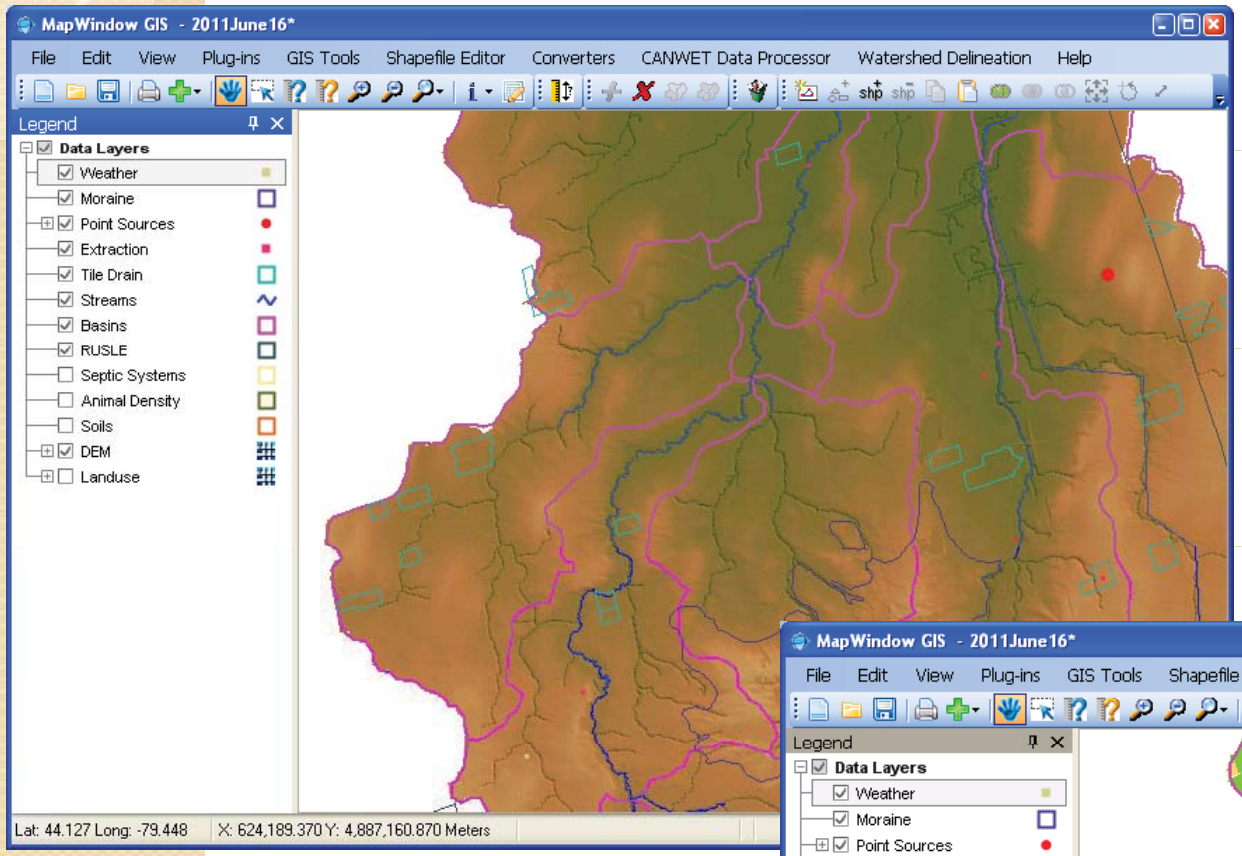
CANWET™ -4 Architecture

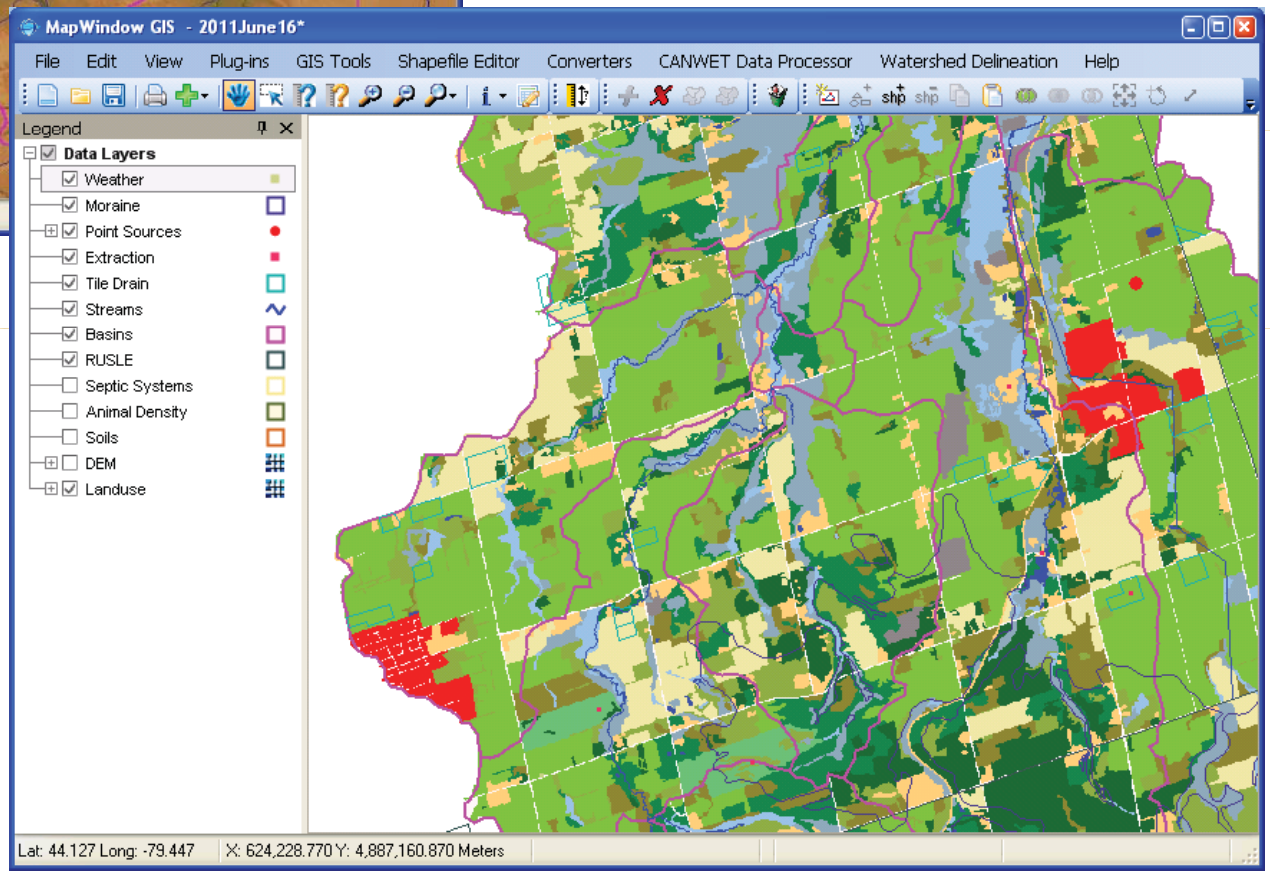
CANWET: Current Version

- Database Storage (SQL Server)
- Daily Time Step
- GIS Processing Integrated

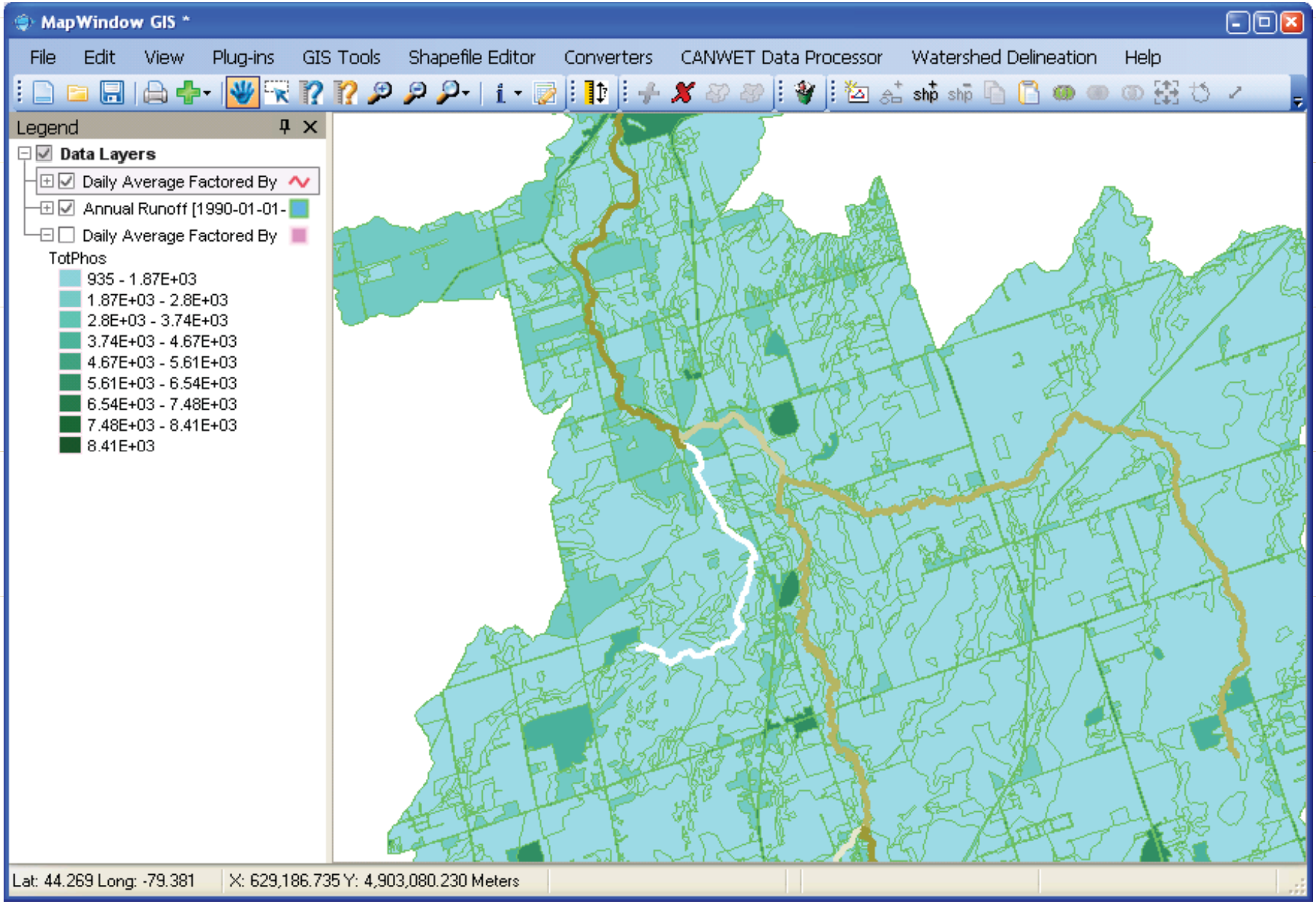


GIS Interface for Calculating Input Parameters

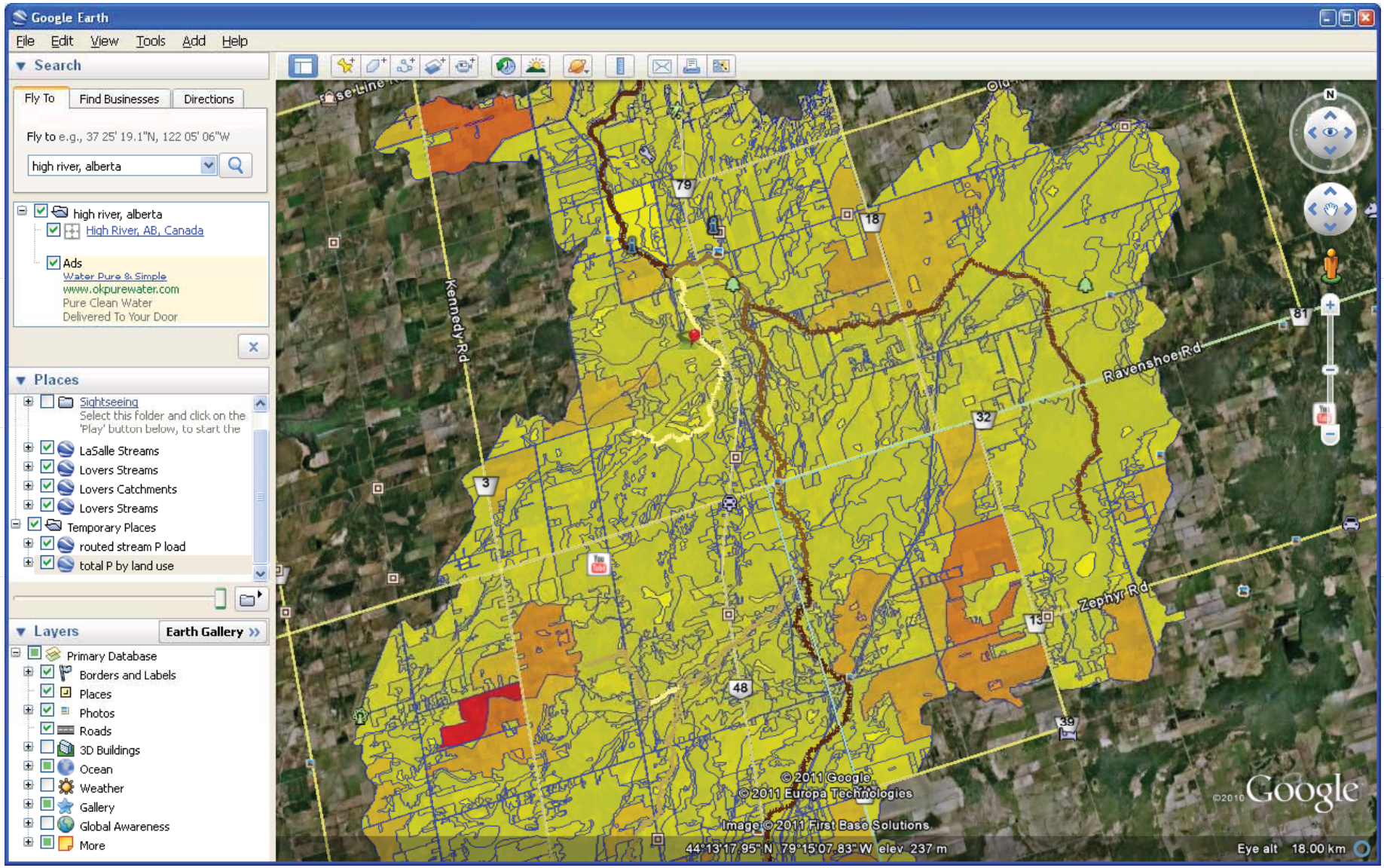




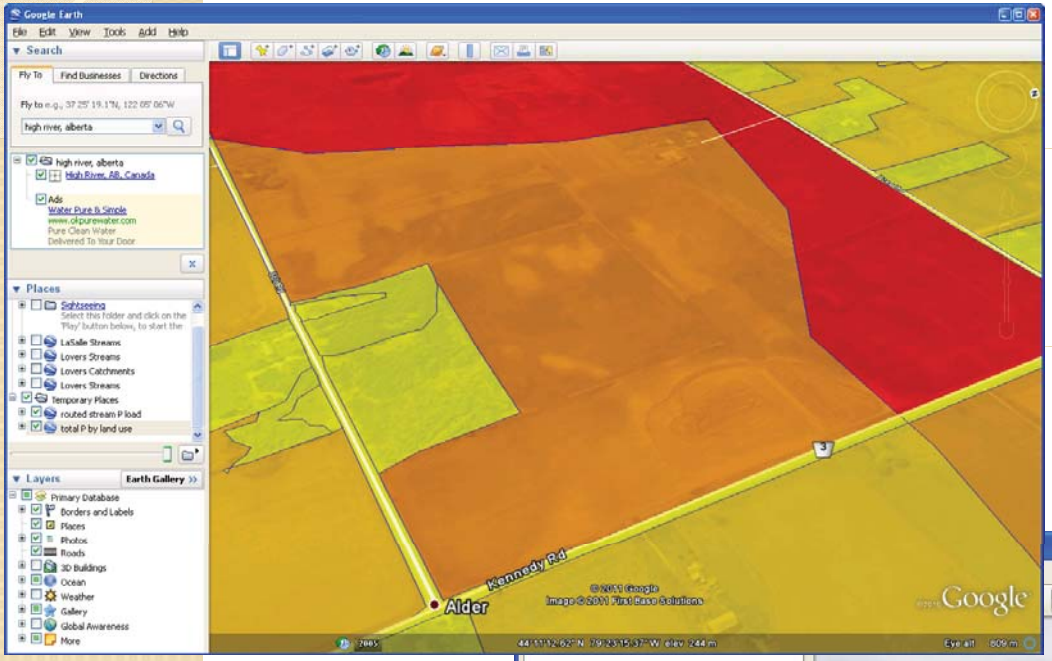
GIS Interface: Representation of Simulated Results

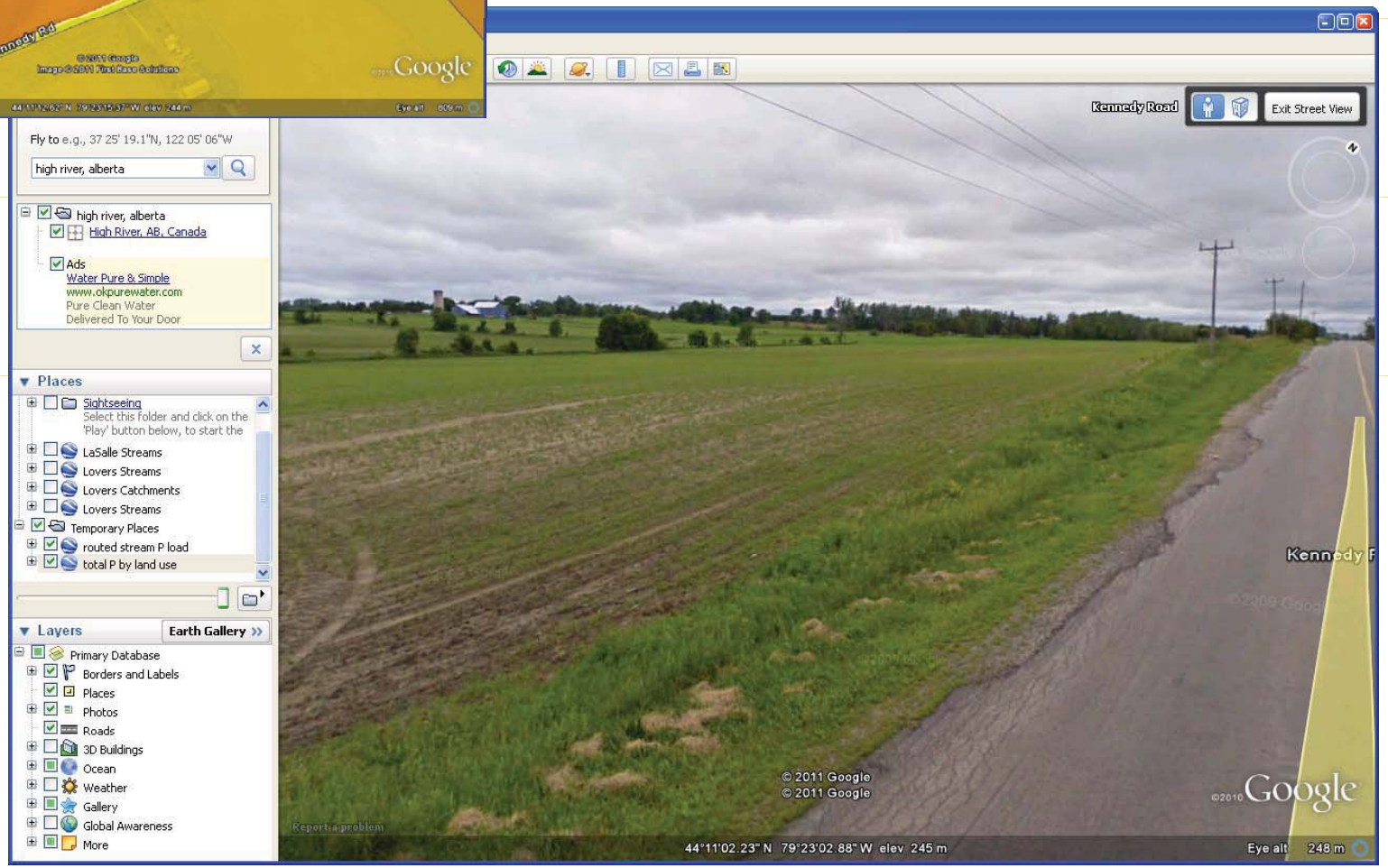


Simulation Results to Google Earth



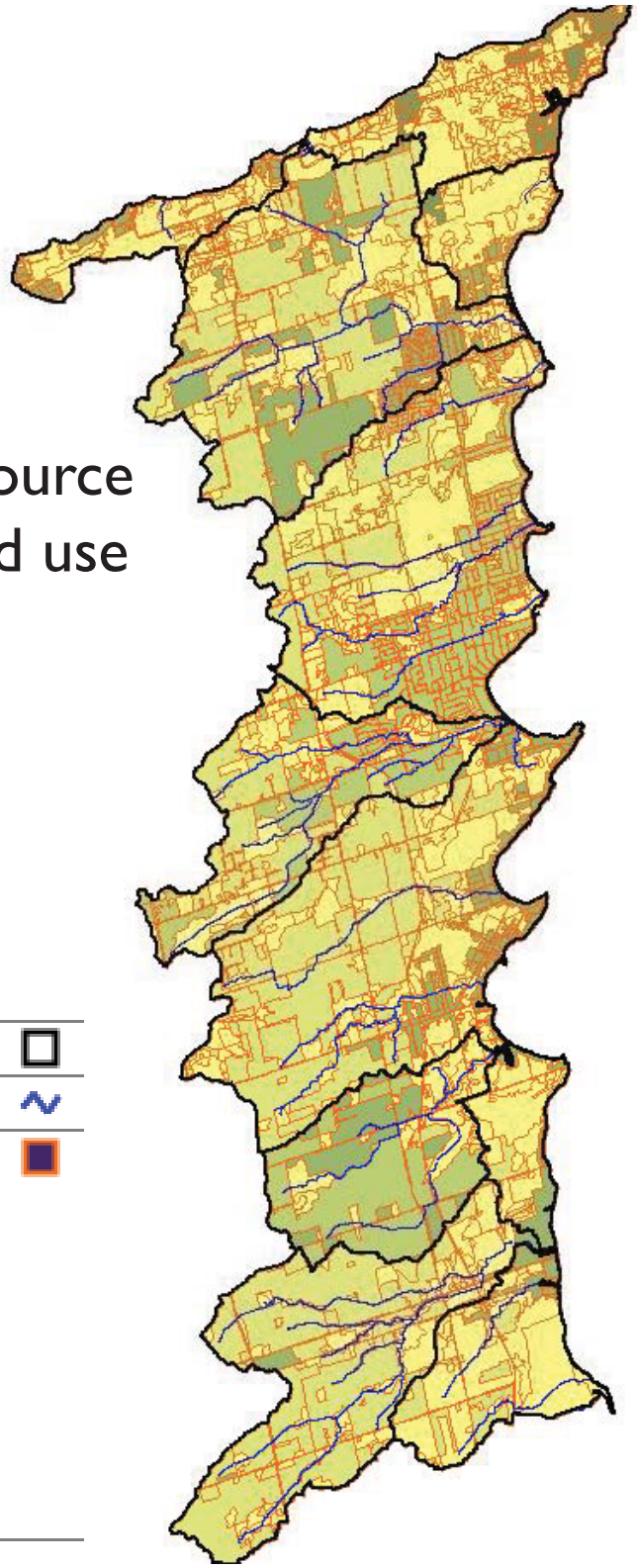
Analysis of "Hot Spots"



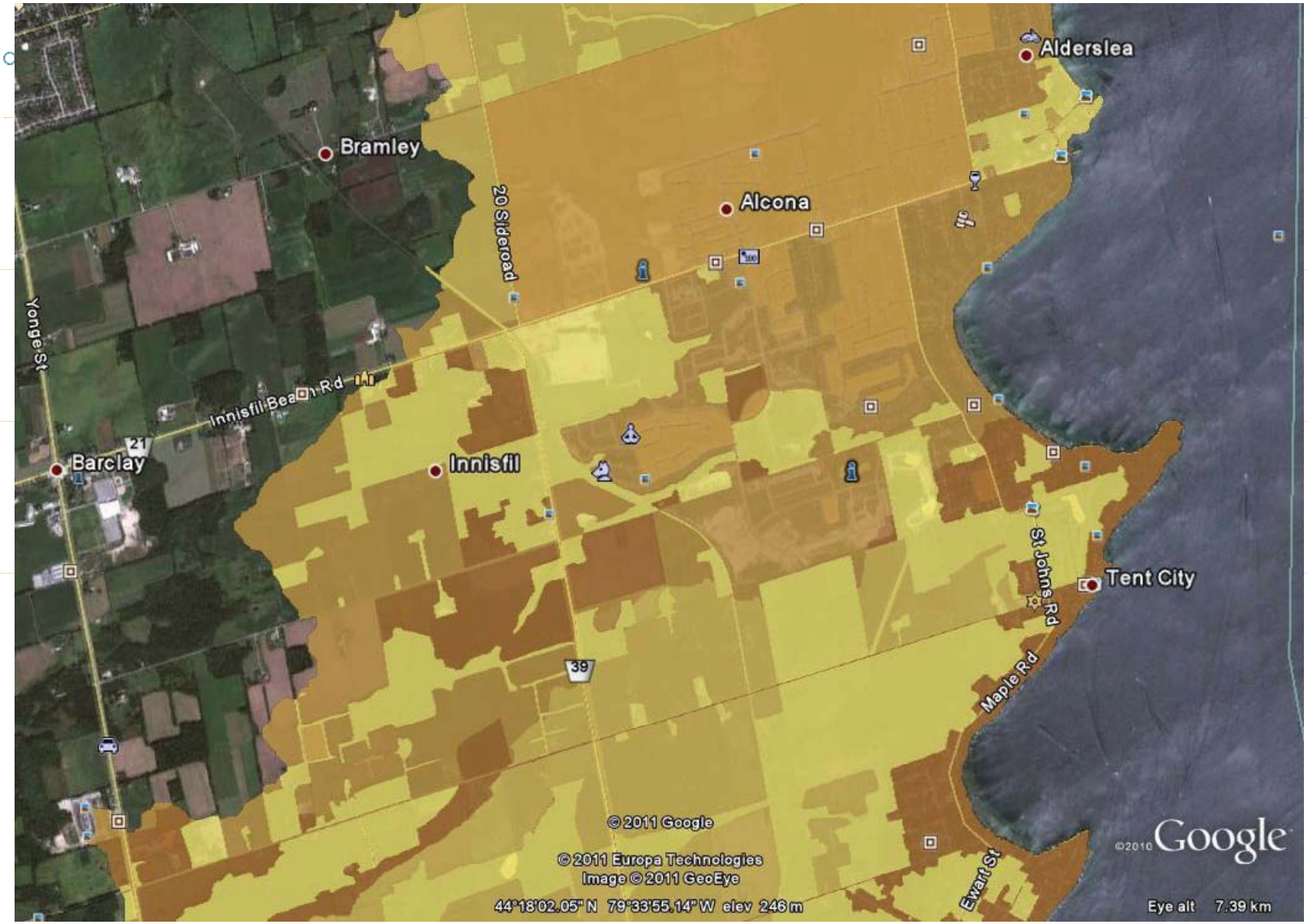


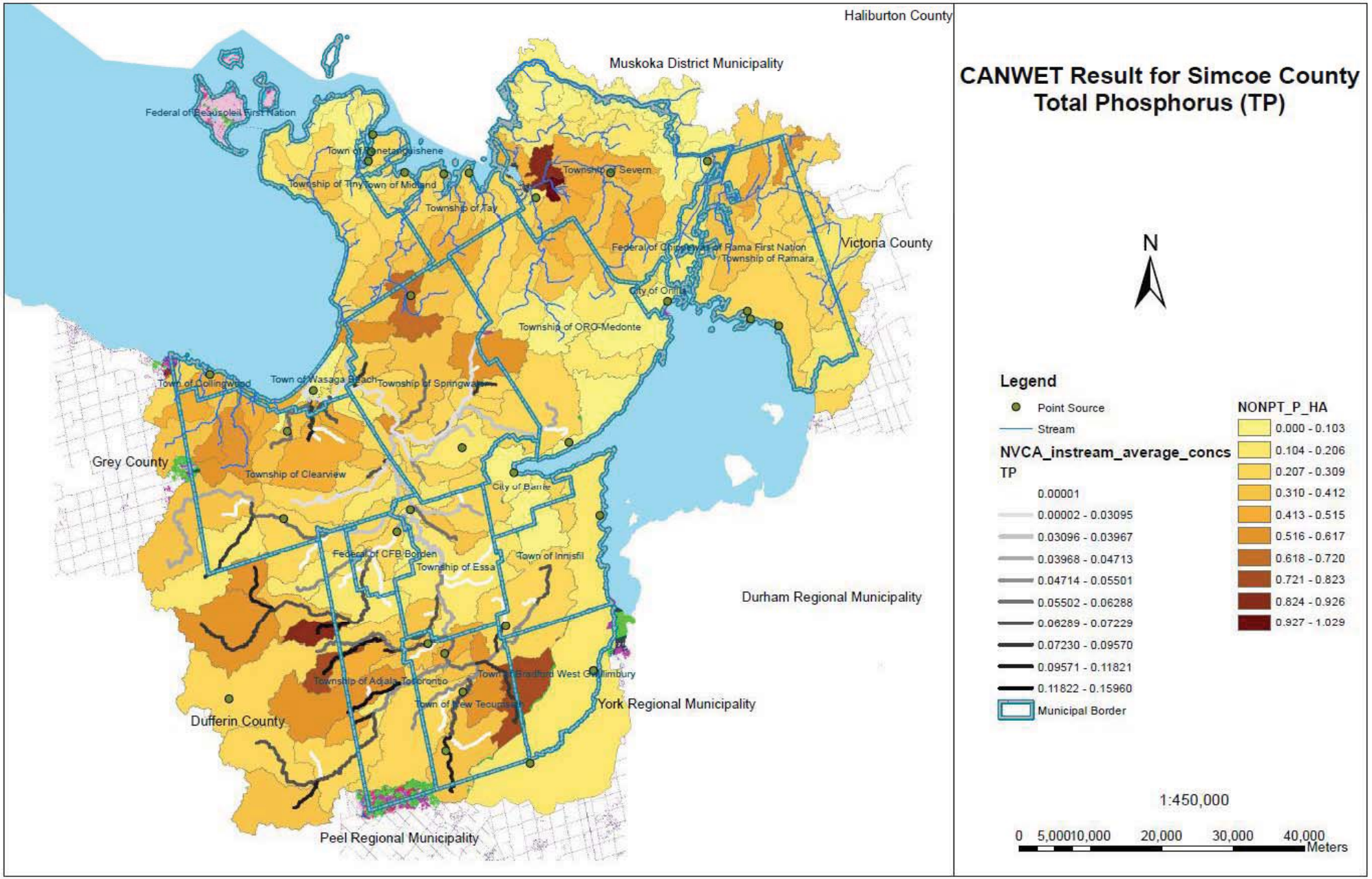
CANWET™-4 Model Output From Innisfil Creeks Subwatershed (Lake Simcoe Basin)

- Mapping shows mean annual non-point source loading of total phosphorus based on land use and catchment combinations.
- Subwatershed results consistent with Berger 2010 model calibration against "synthesized " monitoring data from LSRCA.

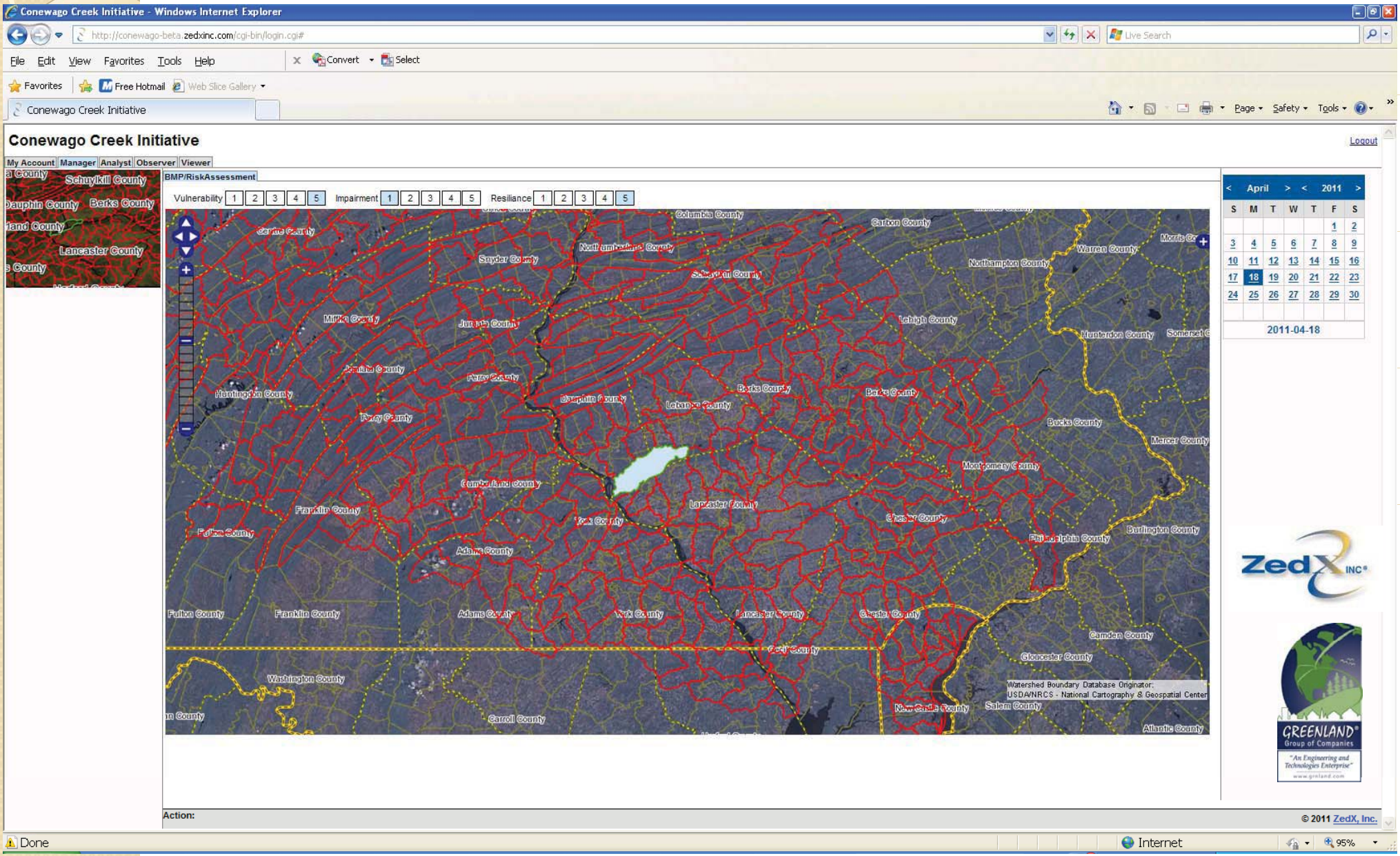


Projection of CANWET™-4 Results to Google Earth




Haliburton County
Muskoka District Municipality
Federal of Beausoleil First Nation
Town of Penetanguishene
Township of Tiny
Town of Midland
Township of Tay
Township of Severn
Federal of Chippewas of Rama First Nation
Township of Ramara
Victoria County
City of Orillia
Township of ORO-Medonte
Town of Collingwood
Town of Wasaga Beach
Township of Springwater
Grey County
Township of Clearview
City of Barrie
Federal of CFB Borden
Township of Essa
Town of Innisfil
Durham Regional Municipality
Township of Adjala-Tosorontio
Town of Bradford West Gwillimbury
Town of New Tecumseth
York Regional Municipality
Dufferin County
Peel Regional Municipality
CANWET Result for Simcoe County
Total Phosphorus (TP)
N
Legend
Point Source
Stream
NVCA_instream_average_concs
TP
0.00001
0.00002 - 0.03095
0.03096 - 0.03967
0.03968 - 0.04713
0.04714 - 0.05501
0.05502 - 0.06288
0.06289 - 0.07229
0.07230 - 0.09570
0.09571 - 0.11821
0.11822 - 0.15960
Municipal Border
NONPT_P_HA
0.000 - 0.103
0.104 - 0.206
0.207 - 0.309
0.310 - 0.412
0.413 - 0.515
0.516 - 0.617
0.618 - 0.720
0.721 - 0.823
0.824 - 0.926
0.927 - 1.029
1:450,000
0 5,000 10,000 20,000 30,000 40,000
Meters

In-kind Project Contributions by the Greenland Group (CANWET™- 4 and Concurrent U.S. / Mexico Initiative)

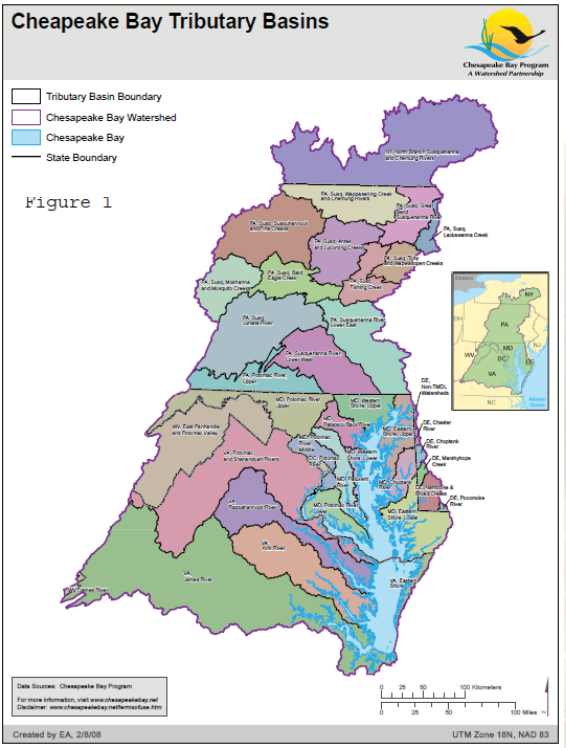


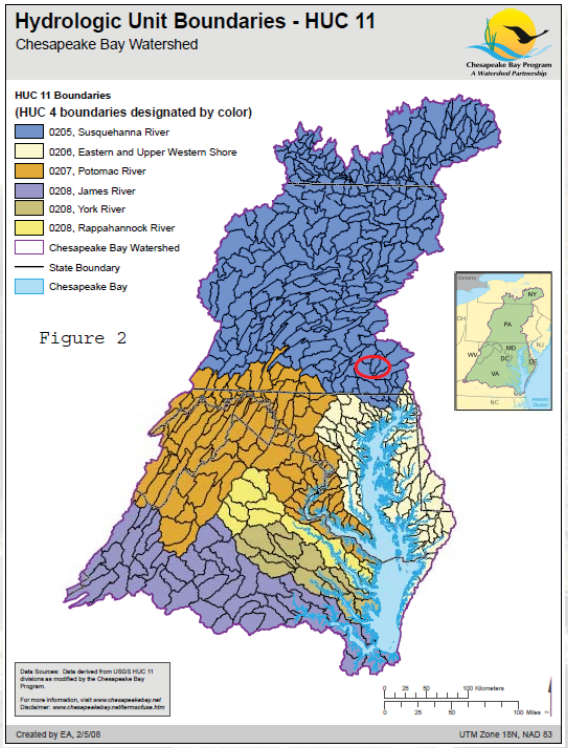
County of Simcoe
Water and Wastewater Visioning Strategy (In-kind)

U.S. Government Pilot for the Chesapeake Bay Basin Program and Invitation for Canada / Mexico Governance Knowledge and Technology Transfer Partnerships (On-going)

- Primary Focus = **Chesapeake Bay** Basin (Conewago Creek Subwatershed) for the Development of New Information Technology and Modelling Tools and Governance System Review (Fed/State/Local).
- Canadian **Great Lakes** Companion "Primary" Subwatershed is Coldwater Creek Subwatershed (Simcoe County).
- 2nd Canadian **Great Lakes** Companion Subwatershed Proposed is Innisfil Creek (To Be Confirmed with OMAFRA).

(aka the Next Evolution of CANWET™ !)


Cheapeake Bay Tributary Basins
Chesapeake Bay Program
A Watershed Partnership
Tributary Basin Boundary
Chesapeake Bay Watershed
Chesapeake Bay
State Boundary
Figure 1
Created by EA, 2/8/08
UTM Zone 18N, NAD 83


Hydrologic Unit Boundaries - HUC 11
Chesapeake Bay Watershed
Chesapeake Bay Program
A Watershed Partnership
HUC 11 Boundaries
(HUC 4 boundaries designated by color)
0205, Susquehanna River
0206, Eastern and Upper Western Shore
0207, Potomac River
0208, James River
0208, York River
0208, Rappahannock River
Chesapeake Bay Watershed
State Boundary
Chesapeake Bay
Figure 2
Created by EA, 2/5/08
UTM Zone 18N, NAD 83

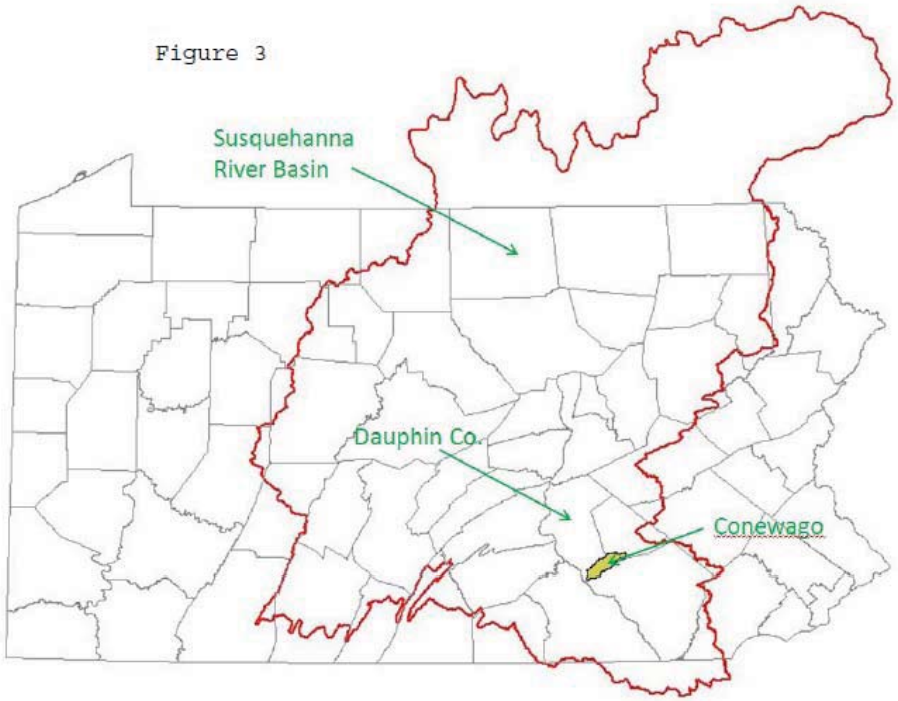
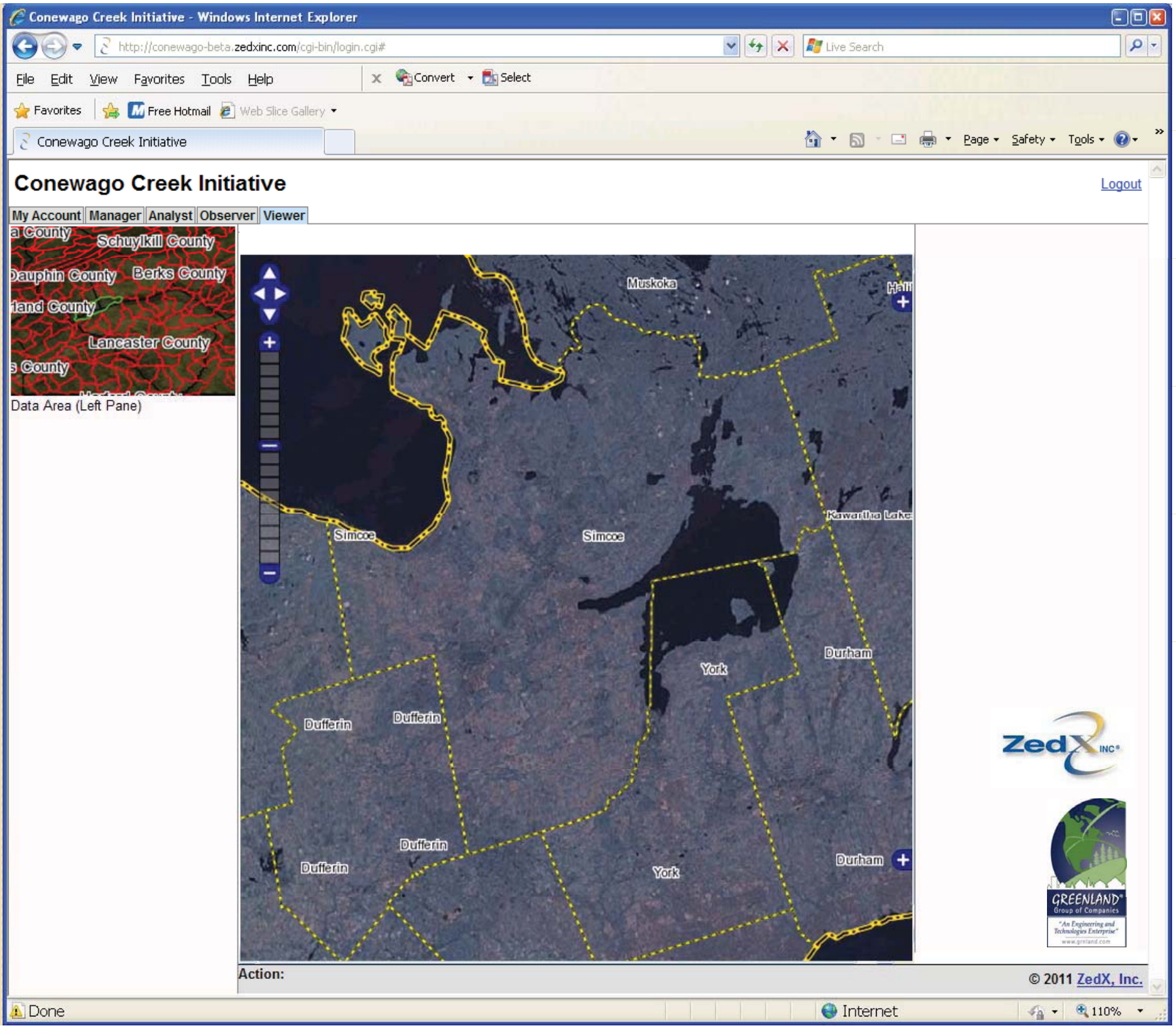


Figure 3
Susquehanna
River Basin
Dauphin Co.
Conewago


DRINKING WATER
SOURCE PROTECTION
ACT FOR CLEAN WATER
South Georgian Bay
Lake Simcoe
Source Protection Region
1:160,000
Figure 4
Muskoka
Haliburto
Black-Severn River
Severn Sound
Kawartha
Lakes
Simcoe
Grey
Nottawasaga Valley
Lake Simcoe
Durham
Dufferin
York
Peel
Georgian Bay
Lake Simcoe
Lake Ontario
Huntsville
Lake of Bays
Muskoka Lakes
Gravenhurst
Bracebridge
Minden Hills
Penetanguishene
Midland
Severn
Tay
Tiny
Orillia
Ramara
Collingwood
Wasaga Beach
Springwater
Clearview
Barrie
Innisfil
Essa
Bradford
West Gwillimbury
Georgina
Brock
Uxbridge
Scugog
Mulmur
Melancthon
Shelburne
Adjala-
Tosorontio
New Tecumseth
Newmarket
Whitchurch-
Stouffville
Clarington
Mono
Amaranth
King
Aurora
Pickering
Whitby
Oshawa
Ajax
Markham
Richmond Hill
Vaughan
Caledon
Orangeville
East Luther
Grand Valley
East Garafraxa


Conewago Creek Initiative - Windows Internet Explorer
http://conewago-beta.zedxinc.com/cgi-bin/login.cgi#
Live Search
File Edit View Favorites Tools Help
Convert Select
Favorites Free Hotmail Web Slice Gallery
Conewago Creek Initiative
Page Safety Tools
Conewago Creek Initiative
Logout
My Account Manager Analyst Observer Viewer
Schuylkill County
Berks County
Lancaster County
Data Area (Left Pane)
Muskoka
Simcoe
Simcoe
York
Durham
Dufferin
Dufferin
Dufferin
Dufferin
York
Durham
Action:
© 2011 ZedX, Inc.
Done
Internet
110%

PART 'B' – Opportunities and Constraints

1) Septage, Leachate Systems and Marinas

2) Level '1' Approach and Using CANWET™ Baseline Condition Data (NOTE: Adopted Methodology for the County's Visioning Strategy)

- *Example #1: Township of Clearview*

3) Level '2' Approach and Using CANWET™ for Master Servicing Plans (NOTE: For Consideration by the Member Municipalities)

- *Example: Town of Innisfil and Proposed OPA 1 and Campus Node*

Septage and Leachate Systems

Private Wastewater Systems

• Groundwater pollution from septic systems is a concern within more isolated, rural areas of Simcoe County were communities predominately rely on groundwater supply systems for their drinking water.

• There are approximately 130,000 people (over a third of the population) in the County of Simcoe that rely on private wastewater treatment systems for their wastewater servicing needs.

• There is a potential opportunity for a portion of the population currently using private wastewater treatment systems to connect to existing or future municipal infrastructure for wastewater servicing.

For example, in the Town of Innisfil, approximately 15,200 private wastewater treatment system users are included in the Class Environmental Assessment (EA) for the Lakeshore WPCP. Therefore, subject to further analysis, other County municipalities may have the same opportunity to connect existing private septic system users to a municipal wastewater treatment system through the extension, expansion and/or the construction of these facilities and also concurrently with any proposed growth areas.

Septage and Leachate Systems (cont'd)

Landfill Leachate

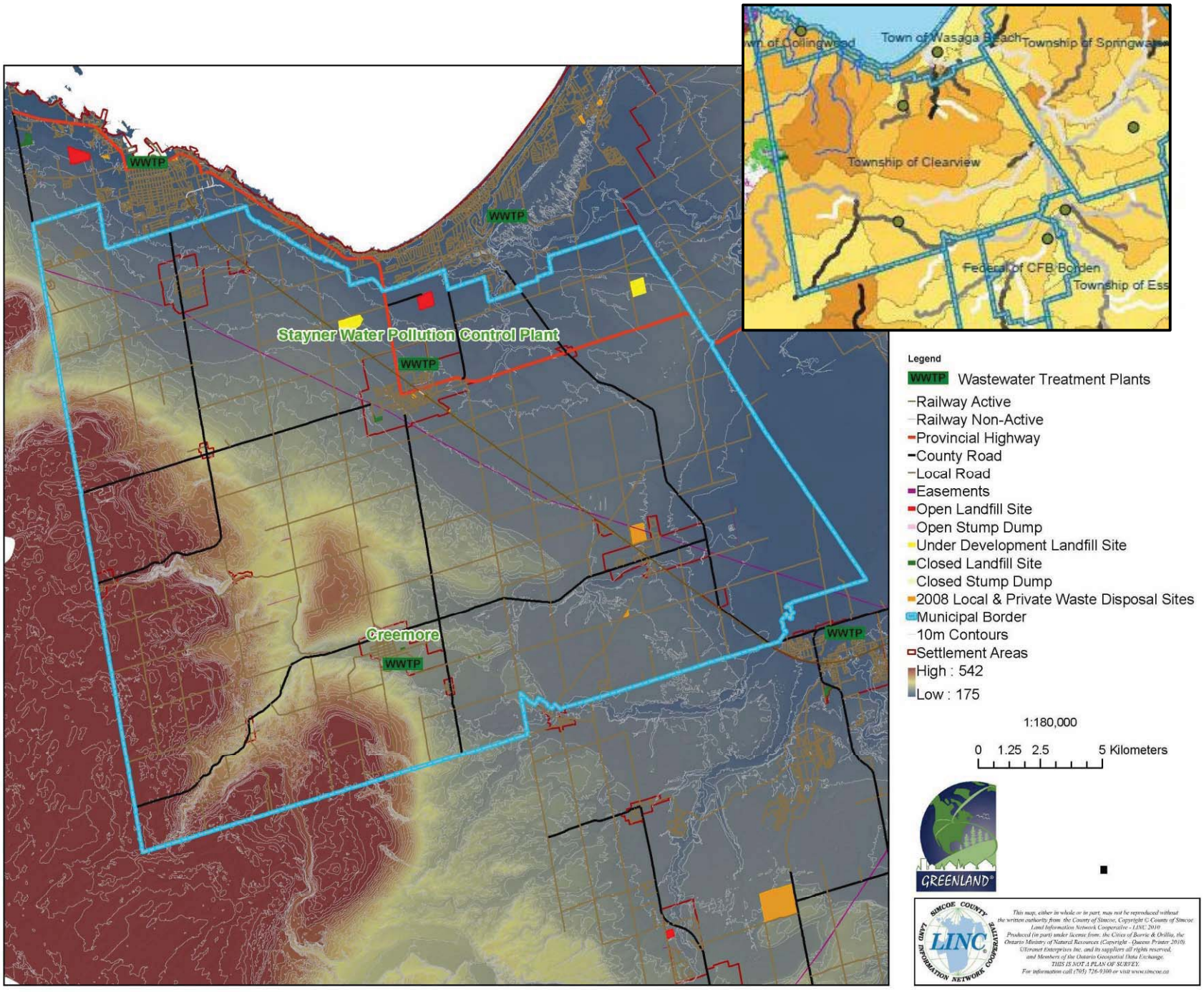
• Landfill leachate has been shown to be treatable on landfill sites, without either excessive costs, or the use of systems that require technical management and expertise. Leachate treatment technologies typically fall into two (2) basic system types - biological and physical/chemical. These system types can also be incorporated or combined for a more effective treatment process. The most common biological treatment is activated sludge, which is a suspended-growth process that uses aerobic microorganisms to degrade organic contaminants in leachate. With conventional activated sludge treatment, the leachate is aerated in an open tank with diffusers or mechanical aerators.

• At this time, the majority of leachate is being transported to the neighbouring municipalities of The Town of Blue Mountains and the City of Barrie.

• Since the majority of leachate generated within the five (5) active landfill sites located within Simcoe County is being transported to outside sources for the primary treatment and disposal, leachate transportation represents over 50% of the cost related to leachate disposal.

• There may be an opportunity to reduce leachate transportation and disposal costs by treating leachate on-site at landfills or at new, existing or improved wastewater treatment systems located closer to the subject landfills.

Level ‘1’ Approach for the County’s Visioning Strategy (e.g. Clearview)



Draft Conclusions (Wastewater):

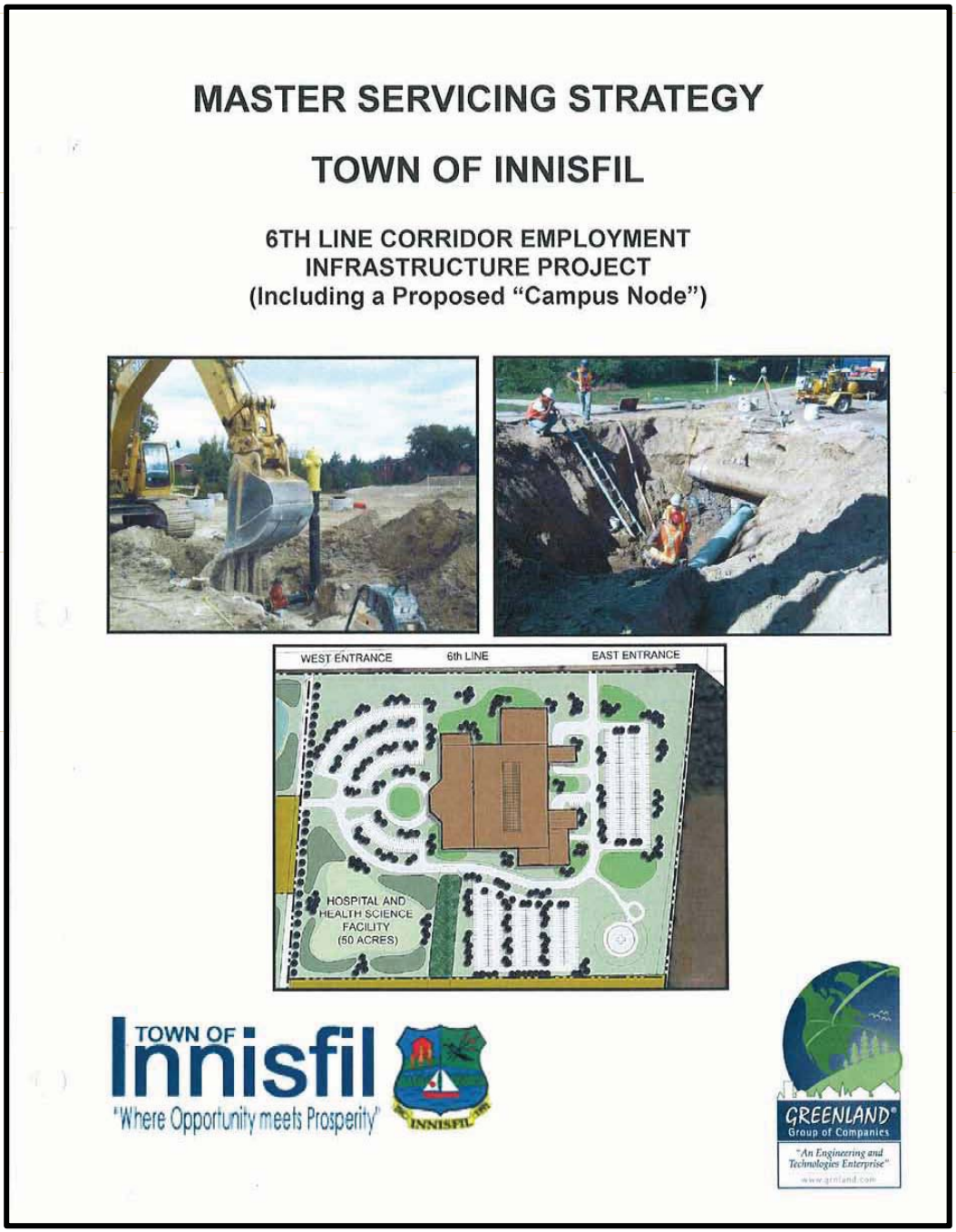
Township of Clearview has partially addressed its 2031 wastewater treatment servicing gap with the initiation of Class EAs to service the growth in the Communities of Nottawa and Stayner by the Collingwood and Wasaga Beach WPCPs, respectively.

- Presently, the Township and Town of Collingwood have discussed constructing a forcemain between the two municipalities to service the Village of Nottawa future population growth. A Class EA has already been conducted for this proposed connection.

- Presently, the Township and Town of Wasaga Beach have discussed constructing a forcemain between the two municipalities service the Village of Stayner future population growth. A Class EA has already been conducted for this proposed connection.

- *Village of New Lowell could potentially connect to the Community of Angus (Township of Essa) or CFB Borden via a forcemain to service this area of Clearview's future growth. Angus does have residual capacity that could potentially be utilized.*

PART 'B' – Opportunities and Constraints (cont'd)



Level '2' Approach and Using CANWET™ for Master Servicing Plans

(For Consideration by the Member Municipalities)

Example: ***Town of Innisfil and Proposed OPA 1 and Campus Node (Completed: October 2009)***

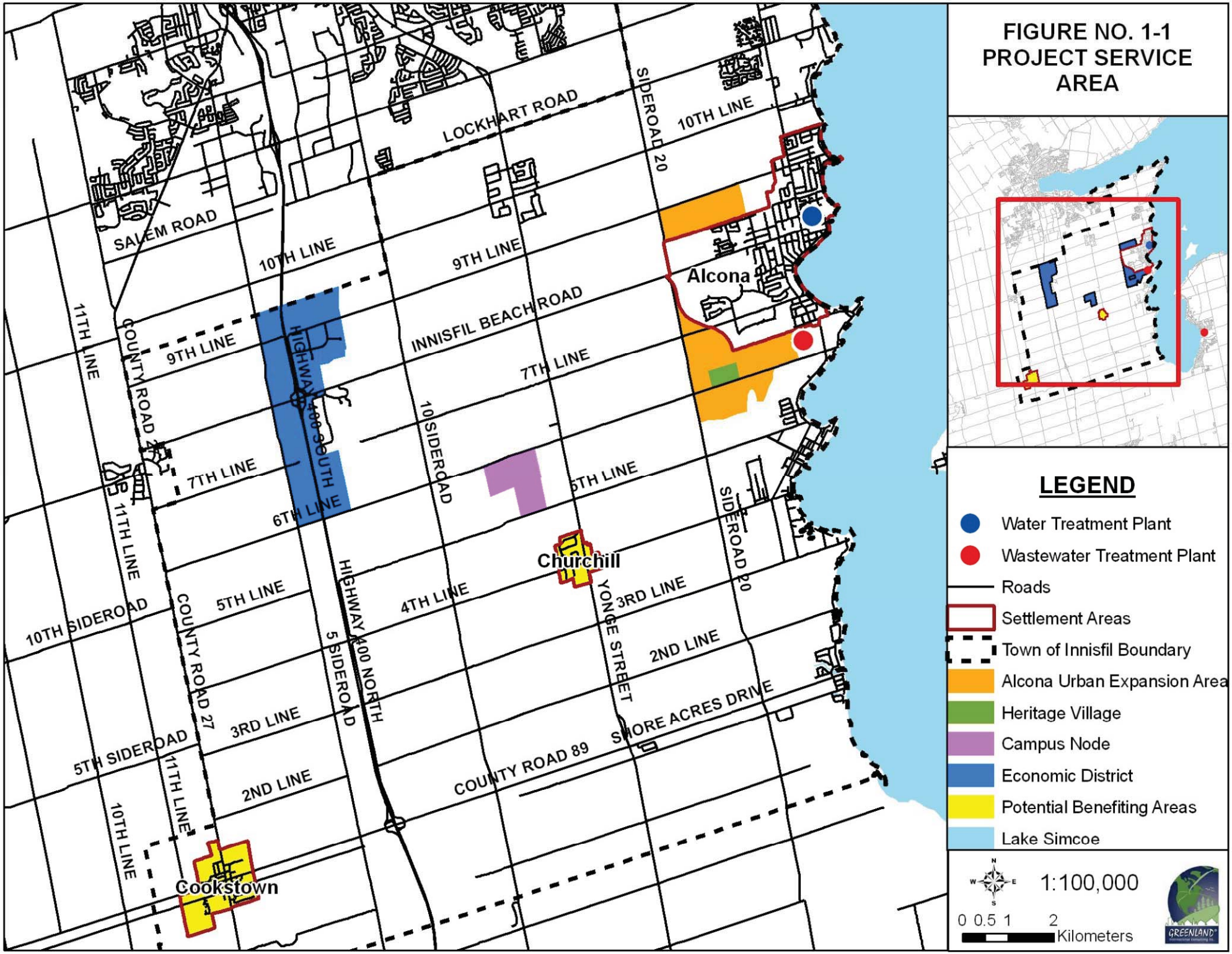


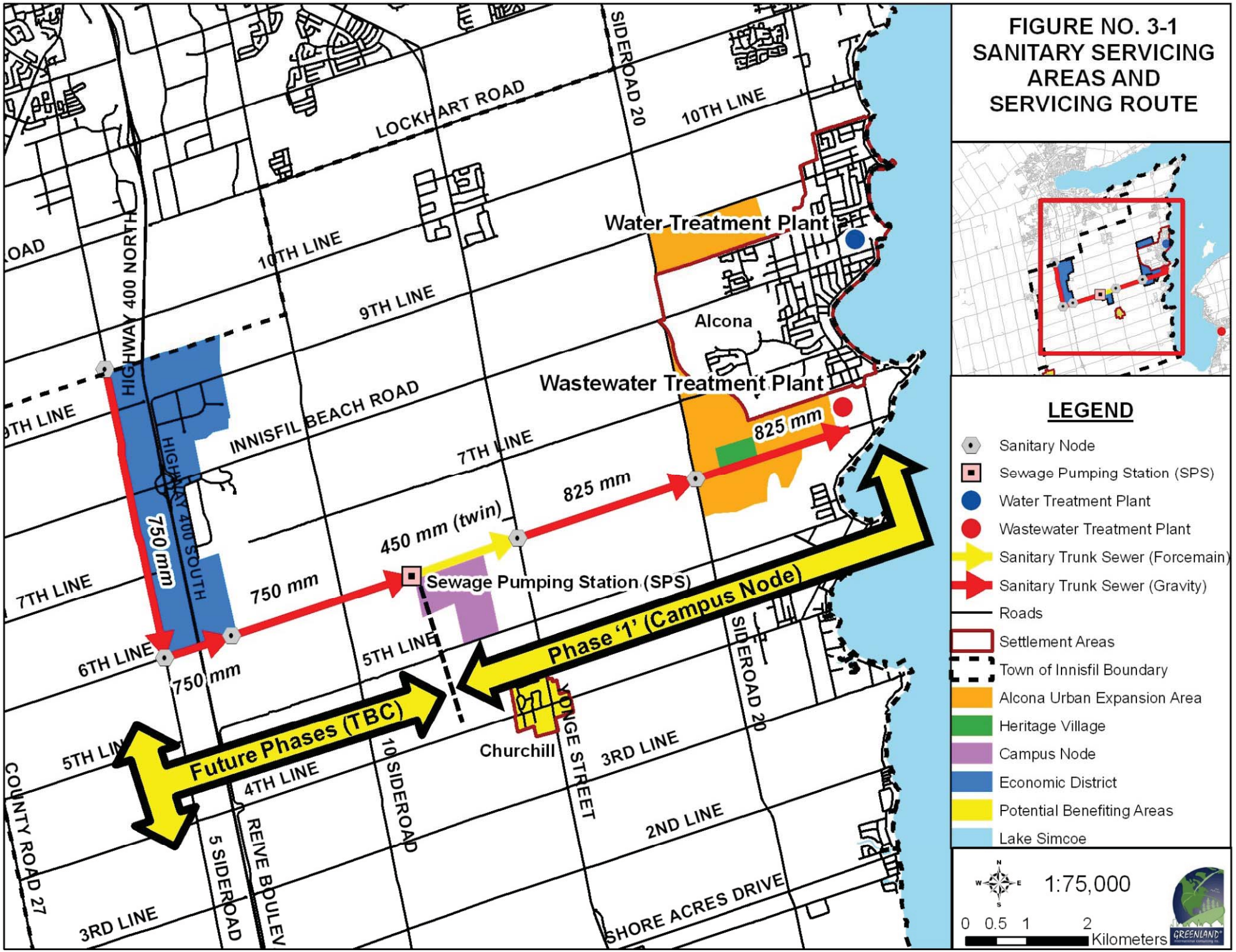
FIGURE NO. 1-1
PROJECT SERVICE AREA
LEGEND
Water Treatment Plant
Wastewater Treatment Plant
Roads
Settlement Areas
Town of Innisfil Boundary
Alcona Urban Expansion Area
Heritage Village
Campus Node
Economic District
Potential Benefiting Areas
Lake Simcoe
1:100,000
0 0.5 1 2
Kilometers
GREENLAND
Alcona
Churchill
Cookstown
LOCKHART ROAD
SALEM ROAD
10TH LINE
9TH LINE
INNISFIL BEACH ROAD
7TH LINE
6TH LINE
5TH LINE
4TH LINE
3RD LINE
2ND LINE
10TH SIDEROAD
5TH SIDEROAD
SIDEROAD 20
10 SIDEROAD
5 SIDEROAD
11TH LINE
COUNTY ROAD 4
COUNTY ROAD 27
COUNTY ROAD 89
HIGHWAY 400 SOUTH
HIGHWAY 400 NORTH
YONGE STREET
SHORE ACRES DRIVE

Innisfil Employment Infrastructure Objectives

- **At the outset, conserve and protect all natural heritage features and other significant environmental lands;**
- Design a Master Servicing Strategy (MSS) that can also provide **net public benefits**, incl. local drainage systems, and which can implement **cost-effective technologies** to help protect Lake Simcoe;
- Comply with the **available science** from watershed management and stewardship initiatives involving the Public, Province, Town of Innisfil, County of Simcoe, and Conservation Authorities – while addressing any information deficiencies from these studies; and,
- Develop a **phased / flexible** Strategy that addresses current and future development needs of the Town and County, as well as new Provincial/Federal environmental compliance policies.

Outcome = An Integrated "Compliance / Science-Based" Strategy

FIGURE NO. 3-1
SANITARY SERVICING AREAS AND SERVICING ROUTE



LEGEND

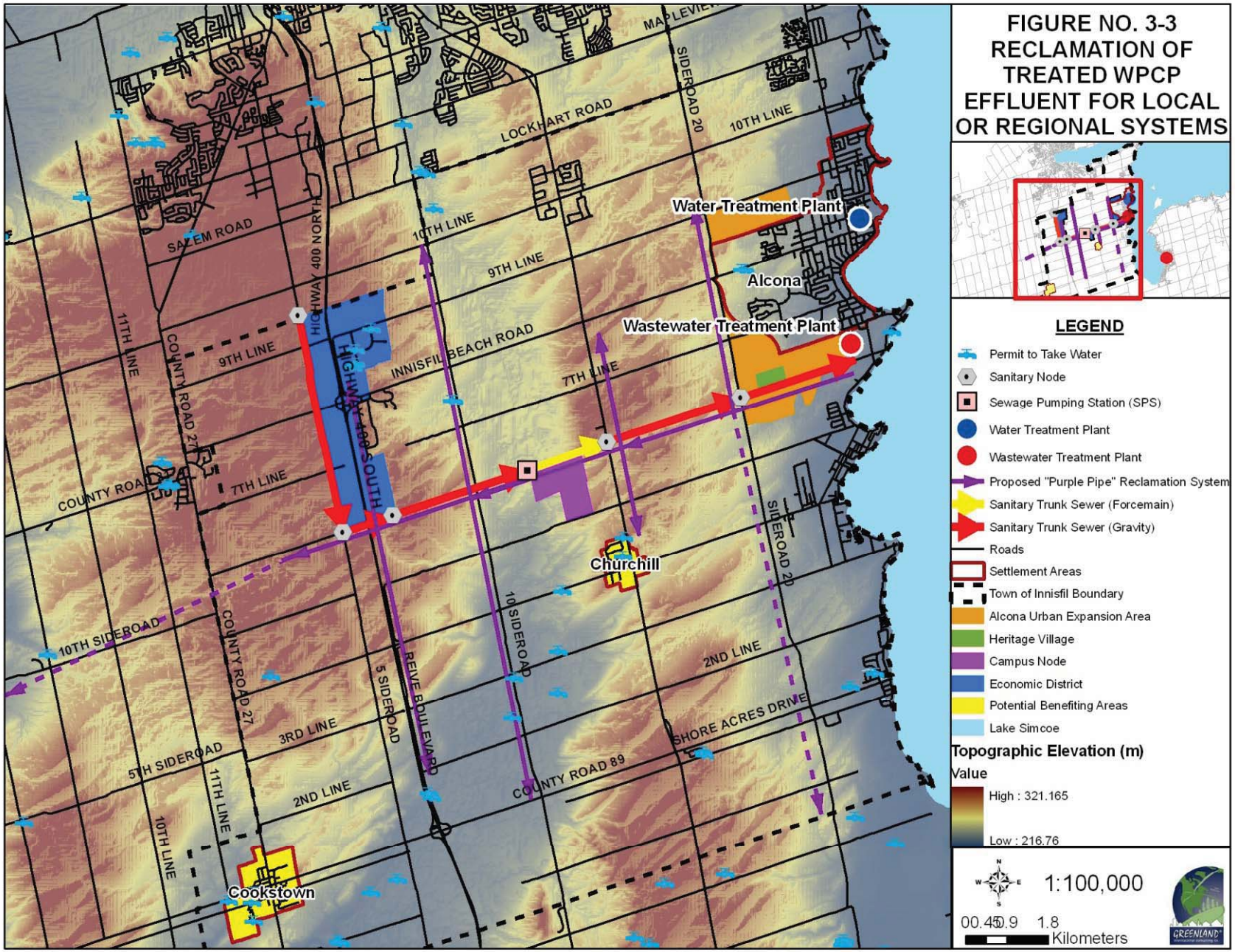
- Sanitary Node
- Sewage Pumping Station (SPS)
- Water Treatment Plant
- Wastewater Treatment Plant
- Sanitary Trunk Sewer (Forcemain)
- Sanitary Trunk Sewer (Gravity)
- Roads
- Settlement Areas
- Town of Innisfil Boundary
- Alcona Urban Expansion Area
- Heritage Village
- Campus Node
- Economic District
- Potential Benefiting Areas
- Lake Simcoe

1:75,000

0 0.5 1 2 Kilometers

GREENLAND

Reclamation of Treated WPCP Effluent for Local or Other County Needs
(One of the Net Public Benefits from the Innisfil Employment Infrastructure Project)



Elements of the Innisfil Employment Infrastructure MSS

- Locations of the 1) Campus Node, 2) Economic District , 3) Proposed Alcona Development Areas , and 4) Lakeshore WPCP are not impaired by effluent receiver constraints within Lake Simcoe;

- Proposed developments and location/expansion of Lakeshore WPCP can be integrated cost-effectively into a water reclamation system for the Lake Simcoe and/or Nottawasaga River Basins, and potentially a "clean energy grid" resulting from heat exchange capabilities associated with the proposed water distribution and wastewater conveyance works;

- Master Servicing Strategy can address the interim lake phosphorus cap (imposed Feb. 2008) and the proposed 44 tonne total Lake Simcoe loading target from the *Lake Simcoe Protection Plan*.

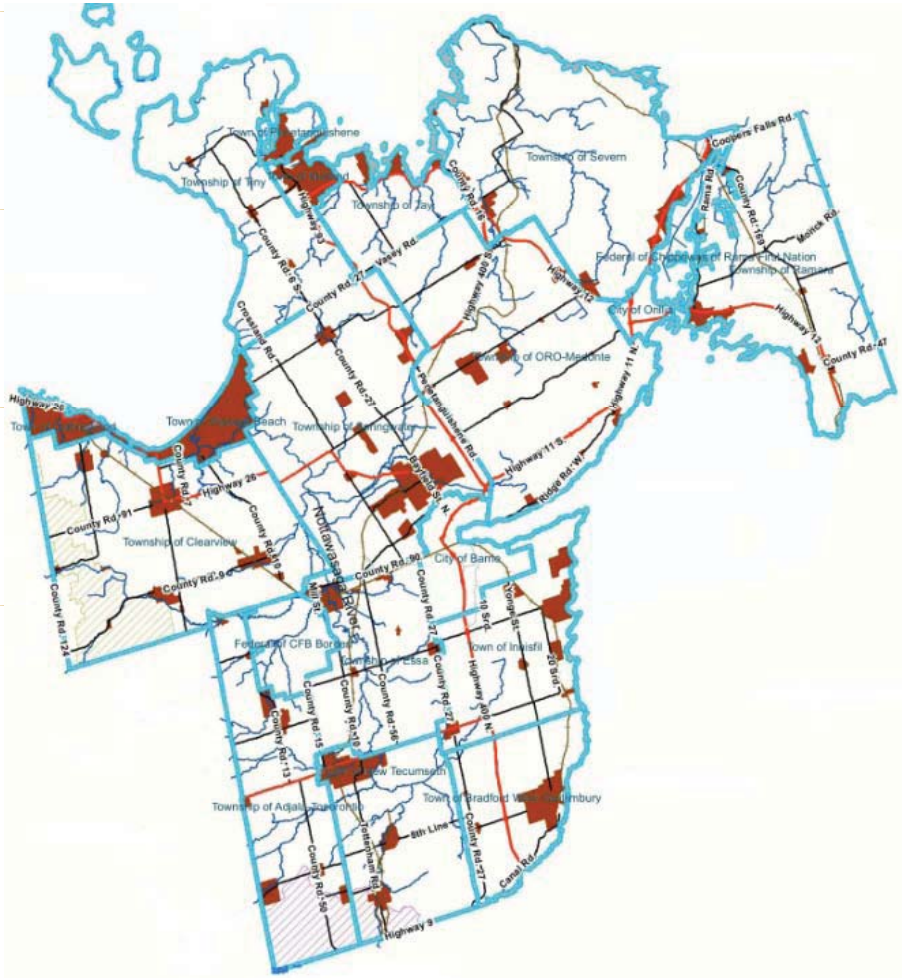
- Proposed development does not rely on other MSS alternatives for implementation, such as nutrient trading or emerging "P" reduction technologies (e.g. Phoslock) to achieve its sub-watershed loading target and based on current Provincial requirements for Lake Simcoe;

- Master Drainage Strategy addresses environmental and flooding concerns of the Town and Lake Simcoe Region Conservation Authority, while it also provides net public benefits.

- The Phase 'I' project supports ongoing R&D initiatives of Provincial interest and now involving the MOE, University of Guelph, Simcoe County District School Board and local Conservation Authorities (LSRCA and TRCA), and also the future operations of a "Centre of Excellence" to be located within the proposed Campus Node along the 6th Line corridor.

PART ‘C’ – Level 2 Opportunities - Details

1) **Identify and develop opportunities for municipalities with current servicing gaps.**



Identified Servicing Gaps

The Towns/Townships within Simcoe County with identified servicing gaps are:

- Township of Adjala – Tosorontio
- Town of Bradford West Gwillimbury
- Township of Clearview
- Town of Collingwood
- Town of Innisfil
- Township of Oro-Medonte
- Township of Ramara
- Township of Severn
- Township of Springwater
- Township of Tiny
- Town of Wasaga Beach

Muncipalities with Plans to Address Servicing Gaps

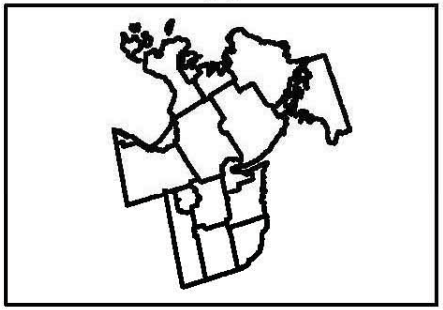
- The Town of Bradford West Gwillimbury has addressed their water and wastewater servicing gaps through the Lakeshore WTP agreement with Innisfil and expanding the Bradford WPCP (Class EA)
- The Town of Collingwood has addressed their water and wastewater servicing gaps with the ability to expandtheir WTP and initiating a Class EA to expand their WWTP
- The Town of Innisfil has addressed their water and wastewater servicing gaps by expanding the Alcona Lakeshore WTP and WWTP (Class Eas)
- The Township of Springwater has addressed their wastewater servicing gap by constructing a new WWTP (Class EA).

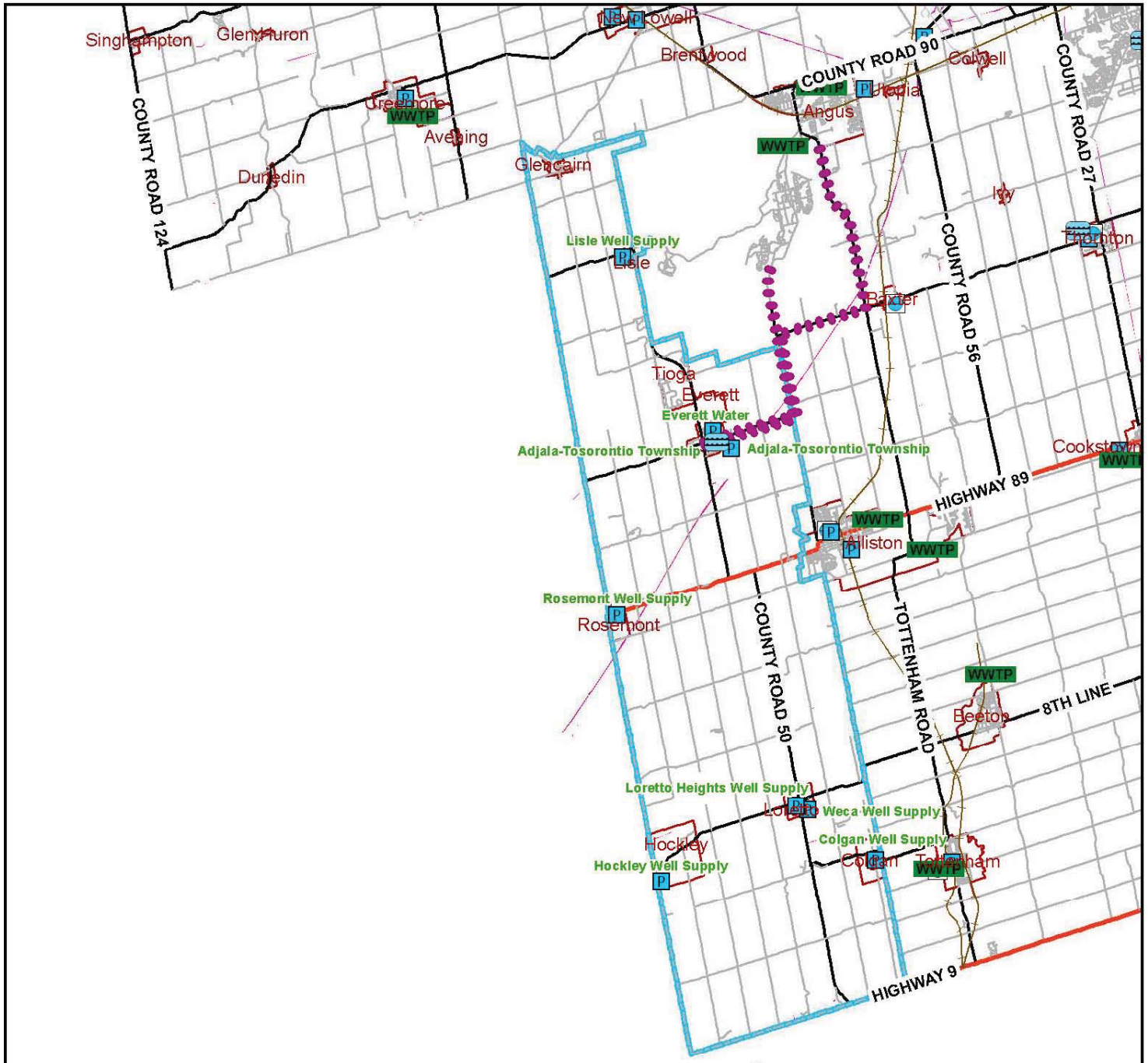
Township of Adjala-Tosorontio

Proposed alternatives to address the wastewater servicing gap of 2,959 people within the Township are:

- Connect to either the CFB Borden WWTP (11 km) or the Angus WWTP (12 km) in the Township of Essa.
- Create a new WWTP with either subsurface or surface water disposal within the Township to accommodate the new 2031 growth.

Figure OPP1
Township of Adjala-Tosorontio
Level 2 Opportunities





Legend

- WWTP — Wastewater Treatment Plants
- WTP — Water Treatment Plant
- Surface Water Intake
- P — Well Site
- Resevoir
- Water Tower
- Standing Pipe
- Water monitoring production & observation
- Railway Active
- Railway Non-Active
- **Provincial Highway**
- **County Road**
- **Local Road**
- **Easements**

Proposed Level 2 Opportunities

- Wasterwater Servicing
- Water Servicing
- Settlement Areas
- Municipal Border

1:250,000

0 1.5 3 6 Kilometers

N W E S

GREENLAND®

Township of Clearview

Proposed alternatives to address the water servicing gap or 5,722 people and the wastewater servicing gap of 8,893 people are:

- Connect to the CFB Borden WWTP (15.2 km) or the Angus WWTP (8.4 km) in the Township of Essa to service the Community of New Lowell.
- Utilize the existing Collingwood to Alliston pipeline to service Stayner's water servicing needs (3.9 km).
- Connect to the proposed expansion of the Collingwood WWTP to service the Town of Nottawa.
- Connect the proposed growth in Stayner to the Wasaga Beach WWTP (with existing residual capacity)

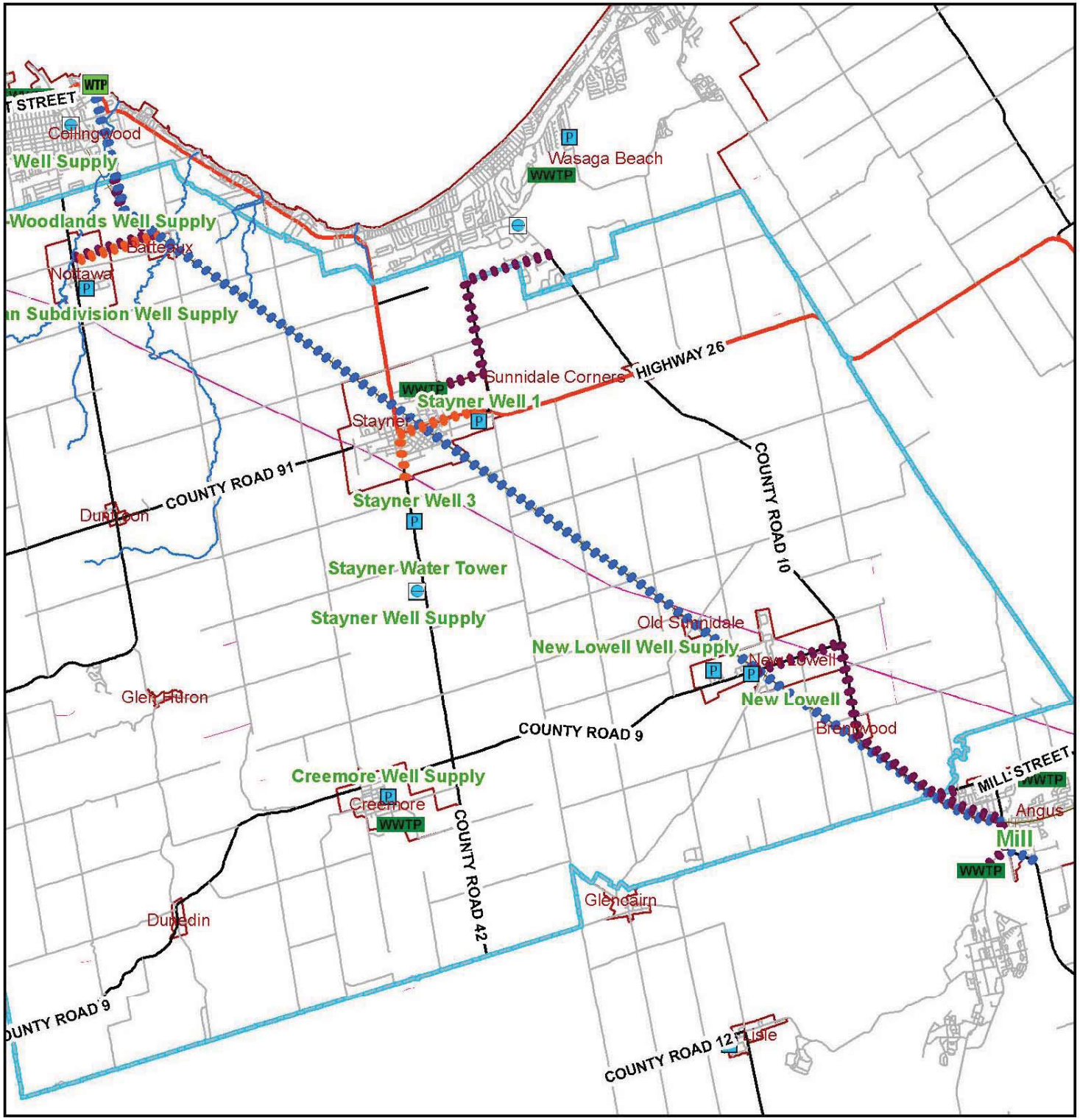
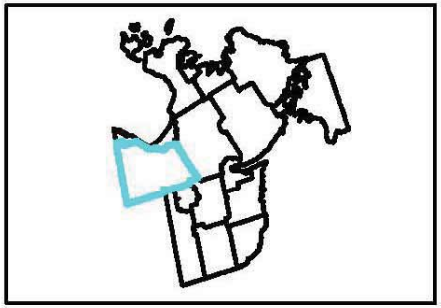


Figure OPP2
Township of Clearview
Level 2 Opportunities



Legend

- WWTP — Wastewater Treatment Plants
- WTP — Water Treatment Plant
- Surface Water Intake
- Well Site
- Resevoir
- Water Tower
- Standing Pipe
- Water monitoring production & observation
- Railway Active
- Railway Non-Active
- **Provincial Highway**
- **County Road**
- **Local Road**
- **Easements**

Proposed Level 2 Opportunities

- Collingwood to Alliston Pipeline
- Wasterwater Servicing
- Water Servicing
- Settlement Areas
- Municipal Border

1:150,000

0 1 2 4 Kilometers

GREENLAND®

N W E S

Closure and Next Steps

Table A-1-1: Simcoe County Marina Holding Tank Waste Handling Details

Number	Marina	Slips	Amenities	Sewage Info.
1.	**Cranberry Resort and Yacht Club** 15 Harbour Street, Collingwood, ON Phone: 705-444-1251	130	Full service Marina	• Accepts marine holding tank waste • Town sewer
2.	**Town of Collingwood Dock** 1 Heritage Dr, Collingwood, ON L9Y-3Z7 Phone: 705-444-2500	80	Full Service Marina	• Does not accept marine holding tank waste
3.	**Wasaga Marine** 1237 Mosley St Wasaga Beach, ON Phone: - -	36	Full Service Marina	
4.	**Sturgeon Point Marina** 350 River Road East Wasaga Beach, ON Phone: 705-429-2934	150	Full Service Marina	• Does not accept marine holding tank waste
5.	**A.C. Marina** 15 Sunrise Court, R.R. #3 Penetanguishene, ON L9M 1R3 Phone: 705-533-2024	90	Full Service Marina	
6.	**Northwest Basin Marina** R.R. #2, 579 Champlain Road Penetanguishene, ON L9M 1R2 Phone: 705-549-2655	100	Full Service Marina	
7.	**Harbour West Marina** 319 Champlain Road, Penetanguishene, ON L9M 1S3 Phone: 705-549-9378	160	All amenities other than fuel dock	• Accepts marine holding tank waste • Holding tank • Georgian Bay Sanitation •
8.	**Hindson Marina** Box 5025, 79 Champlain Road Penetanguishene, ON L9M 2G2 Phone: 705-549-2991	470	Full Service Marina	• Accepts marine holding tank waste • Holding tank

Table A-1-1: Simcoe County Marina Holding Tank Waste Handling Details

				• Regional Sanitation • Midland or Collingwood(winter) • Land applied (summer)
9.	**Beacon Bay Marina** 1-37 Champlain Road Penetanguishene, ON L9M 1S1 Phone: 705-549-2075	321	Full Service Marina	• Accepts marine holding tank waste • Holding tank • Regional Sanitation • Midland or Collingwood(winter) • Land applied (summer)
10.	**Historic Port of Penetanguishene** 2 Main St Penetanguishene, ON L9M 1T1 Phone: 705-549-7777	90	Dockage only	• Does not accept marine holding tank waste
11.	**Bay Moorings Marina** 1-200 Fox Street Penetanguishene, ON L9M 1E7 Phone: 705-549-6958	340	Full Service Marina	• Accepts marine holding tank waste • Town sewers
12.	**Dutchman's Cove Marina** 222 Fox Street Penetanguishene, ON L9M 1E7 Phone: 705-549-2641	145	Full Service Marina	• Accepts marine holding tank waste • Holding tank • Goes to Midland
13.	**Discovery Harbour Docks** 93 Jury Drive Penetanguishene, ON Phone: - -	10*	Seasonal Dockage only 1-2-	
14.	**Bay Port Yachting Center** Box 644, 165 Marina Park Avenue Midland, ON	668	Full Service Marina	• Accepts marine holding tank

Table A-1-1: Simcoe County Marina Holding Tank Waste Handling Details

	L4R 4P4 Phone: 705-527-7678			waste • Town sewers
15.	**Midland Bay Sailing Club** P.O. Box 63 Midland, ON L4R 4K6 Email (Primary contact method): mbsc1@csolve.net	125	Dockage only	• Accepts marine holding tank waste • Holding tank • Goes to Midland
16.	**Town of Midland Dock/Slips** 527 Len Self Blvd. Midland, ON L4R 5N6 Phone: 705-526-9395 (Midland Parks and Recreation Department)	150	Dockage only	• Does not accept marine holding tank waste
17.	**Central Marine** 171 Midland Ave Midland, ON L4R 4L1 Tel:705-526-4251	150	Full Service Marina	• Accepts marine holding tank waste • Town sewer
18.	**Wye Heritage Marina** Box 40, 3282 Ogden's Beach Rd Midland, ON L4R 4K6 Phone: 705-526-0155	800	Full Service Marina	• Accepts marine holding tank waste • Holding tank • Pepi's Sewage
19.	**Paradise Point** 249 Patterson Blvd. Port McNicoll, ON Phone: 647-274-3847	20	Dockage and Washroom only	• Does not accept marine holding tank waste
20.	**Queen's Cove Marina** Box 333, 67 Juneau Road Victoria Harbour, ON L0K 2A0 Phone: 705-534-4100	310	Full Service Marina	• Accepts marine holding tank waste • Town sewers
21.	**Bridgeview Marina** 55 Coldwater Rd Waubaushene, ON Phone: 705-737-7584	50	Dockage and Washrooms only	• Accepts marine holding tank waste • Holding tank • Pepi's Sewage
22.	**Twin Bridge Marina**	20	Bathrooms and	• Does not

Table A-1-1: Simcoe County Marina Holding Tank Waste Handling Details

	35 Duck Bay Rd Waubaushene, ON Phone: 705-538-2295		Fuel only	accept marine holding tank waste
23.	**Marsh's Waubaushene Marina** Box 158, 5 Duck Bay Road Waubaushene, ON L0K 2C0 Phone: 705-538-2285	100*	Dockage and maintenance only	• Does not accept marine holding tank waste
24.	**Jim Earl Marine** 2754 Marine Dr Port Severn, ON L0K-2C0 Phone: 705-538-1515	11*	Maintenance and Engine Service Only	• Does not accept marine holding tank waste
25.	**Bushes Marine** 3279 Port Severn Rd Port Severn, ON L1K 1C0 Phone: 705-538-2378	24*	Dockage Only	• Does not accept marine holding tank waste
26.	**Severn Boat Haven** 2658 Kelly's Rd Port Severn, ON - -	100	Full Service Marina	• Accepts marine holding tank waste • Holding tank • Pepi's Sewage
27.	**Gloucester Pool Resort Marina** 3720 Narrows Rd Port Severn, ON -	14	Dockage, Fuel and Washrooms	
28.	**Severn Township Docs** 1730 Earl Haid Ave Severn, ON Contact at Township Office Phone: (705) 325-2315	10*	Dockage Only	• Does not accept marine holding tank waste
29.	**Lauderdale Point Resort Inc** 3500 Lauderdale Point Cres Severn Bridge, ON P0E 1N0 Phone: 705-689-2104	85	Full Service Marina	• Accepts marine holding tank waste • Holding tank • Don't know
30.	**McGregor On The Water** 3331 McClelland Rd Washago, ON L0K2B0	56	Full Service Marina	• Accepts marine holding tank waste

Table A-1-1: Simcoe County Marina Holding Tank Waste Handling Details

	Phone: 705-689-9935			• Holding tank • Northern Sanitation
31.	**Port of Orillia** 150 Front Street South Orillia, ON L3V 4S7 Phone: 705-326-6314	222*	Dockage, washrooms and hydro only	•
32.	**Ojibway Bay Marina** Box 121 Rama Road Rama, ON L0K 1T0 Phone: 705-326-5855	150	Full Service Marina	•
33.	**Bridge Port Marina** 434 Couchiching Point Road Orillia, ON L3V 6P8 Phone: 705-326-7898	102	Full Service Marina	• Accepts marine holding tank waste • Holding tank • Town
34.	**Mariposa Landing** 430 Couchiching Point Road Orillia, ON - -	170	Full Service Marina	• Accepts marine holding tank waste • Town sewers
35.	**Crate's Lake Country Boats** 674 Atherley Road Orillia, ON - -	22	Full Service Marina	• Does not accept marine holding tank waste
36.	**Crothers Twin Lake Marina** 5 Queen St. Orillia, ON - -	99	Full Service Marina	• Does not accept marine holding tank waste
37.	**Blue Beacon Marina** 693 Atherley St Orillia, ON L3V 1P4 Phone: 705-325-2526	85	Full Service Marina	• Accepts marine holding tank waste • Holding tank • Northern Sanitation
38.	**Starport Landing** 3952 McRae Park Road Orillia, ON L3V 6H7 Phone: 705-325-3775	207	Full Service Marina	• Accepts marine holding tank waste • Holding tank

Table A-1-1: Simcoe County Marina Holding Tank Waste Handling Details

				• Northern Sanitation
39.	**Marina Del Ray** R.R. #7, Box 21, 4130 Bayview Avenue, Orillia, ON L3V 6H7 Phone: 705-325-3051	160	Full Service Marina	• Accepts marine holding tank waste • Holding tank • Bullock's Septic
40.	**Lagoon City Marina** 150 Laguna Parkway Brechin, ON L0K 1B0 Phone: 705-484-5063	277	Full Service Marina	• Accepts marine holding tank waste • Town sewers
41.	**City of Barrie Marina** P.O. Box 400, 55 Lakeshore Drive Barrie, ON L4M 4T5 Phone: 705-739-4218	398	Full Service Marina Transient dockage available at government docks next to marina.	• Accepts marine holding tank waste • Town sewers
42.	**Brentwood Marine** 342 Tollendale Mill Road Barrie, ON L4N 4S6 Phone: 705-722-8344	130	Full Service Marina	• Accepts marine holding tank waste • Holding tank • City of Barrie
43.	**Town of Innisfil Dock (Big Bay Point)** North End of 30th Sideroad – Innisfil Phone: N/A – Town office: 705-436-3710	5*	Dockage Only	• Does not accept marine holding tank waste
44.	**Town of Innisfil Dock (Innisfil Beach Road)** West End of Innisfil Beach Road Phone: N/A – Town office: 705-436-3710	5*	Dockage Only	• Does not accept marine holding tank waste
45.	**Lake Simcoe Marine** P.O. Box 55, 977 Isabella Street, Bell Ewart, ON L0L 1C0 Phone: 705-456-3131	92	Full Service Marine	•

Table A-1-1: Simcoe County Marina Holding Tank Waste Handling Details

46.	**Monto Reno Marina** 1111 Killarney Beach Rd Box 33 Lefroy, ON L0L 1W0 Phone: 705-456-2122	110	Full Service Marina	• Accepts marine holding tank waste • Holding tank • Lotto Sanitation
47.	**Lefroy Harbour Resorts** P.O. Box 1, 727 Harbour Road Lefroy, ON L0L 1W0 Phone: 705-456-2120	300	Full Service Marina	• Accepts marine holding tank waste • Holding tanks • Lotto Sanitation
48.	**Kon Tiki Marina** Box 58 Gilford, ON L0L 1R0 Phone: 705-456-2339	200	Full Service Marina	•
49.	**Cooks Bay Marina** P.O. Box 3, 1155 Gilford Road Gilford, ON L0L 1R0, Phone: 705-456-6212	155	Full Service Marina	• Accepts marine holding tank waste • Holding tanks • Don’t know

* = Transient slips
Full Service Marina = Marina has basic amenities such as fuel, bathrooms, dockage, parking, maintenance/service and more.

Table 4.1 Evaluation of effluent targets for Severn Sound area sewage plants

Plant	Present Pop'n Serviced	Present Design Flow (m3/d)	Present Effluent [TP]* (mg/L)	Present Phosphorus Load** (kg/y)	Target Effluent [TP] (mg/L)	Forecast Design Flow (m3/d)	P.Load with Upgrade (kg/y)	Reduction in P. Supply (%)(6)
Penetanguishene Bay								
Main St.	4,300	3,000	0.58	552	0.10	4546 (1)	166	70
Fox St.	1,000	1,500	0.47	215	0.10	1515 (1)	55	74
Open Severn Sound								
Penetang MHC	950	568	0.19	39	0.19	568 (2)	39	0
Midland	12,000	13,638	0.72	2,944	0.30	18,180 (3)	1,992	32
Port McNicoll	1,800	1,045	0.32	88	0.30	2000 (3)	219	0(-150)
Wye River								
Elmvale	1,200	750	3.5	1,750	0.10	1512 (4)	55	97
Sturgeon Bay								
Victoria Harbour	1,669	2,363	0.12	27	0.15	2363 (5)	129	-378
Port Severn Area/Matchedash Bay								
Coldwater	796	545	3.55	526	0.30	1000 (3)	110	79
Totals	23,715	23,409		6,121		28,504	2,398	61

Possible new service area includes Port Severn (to serve pop. 3669; 1650 m^3/d; 0.3 mg/L; 181 kg/yr; Paragon Engineering Ltd., 1992)
* 1989-90 Effluent Quality, reported to the MOE, (XCG, 1991b)
** 1989-90 (XCG, 1991b)

Notes on forecast design flows:
(1) Reid and Associates on behalf of Town of Penetanguishene (1992).
(2) Penetanguishene Mental Health Centre flow and quality assumed to remain the same.
(3) Assumed increase in design flow capacity
(4) Ainley and Associates on behalf of the Village of Elmvale (Class EA Design brief, 1991)
(5) Growth assumed to take up existing design flow capacity
(6) Compares existing load with P.Load after upgrade at forecast design flow