# Centre Wellington Scoped Tier Three Water Budget Assessment Community Liaison Group Meeting #2

September 14, 2017; 6:30 p.m. Elora Community Centre







# Agenda

#### Meeting Purpose:

- Provide a refresh of the study process, scope and key participants;
- Review and receive feedback on the Physical Characterization Report; and
- Address any questions about the process overall.

6:30 pm	Welcome
6:40 pm	Agenda Review, Introductions and Roles
6:50 pm	Presentations
7:35 pm	Discussion #1 – Physical Characterization Report
8:35 pm	Discussion #2 – Tier 3 Water Budget Process Overall
9:00 pm	Adjourn

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# **Roles & Responsibilities**

#### • Tier 3 Water Budget Project Team:

- leads the Tier 3 Water Budget
- responsible for all decisions related to this project

#### • Provincial Peer Review Team:

 provides an external, independent, third party peer review of the technical findings at each major milestone

#### • Project Consultant Team:

 responsible for conducting the Tier 3 Water Budget with direction from the Project Team



# **Roles & Responsibilities**

- Community Liaison Group (CLG):
  - provides a forum for the community to be informed
  - provide feedback and observations within the scope of the Tier 3 Water Budget and its progress

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- Guided by Terms of Reference

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- Third Party Facilitator:
  - chairs the CLG meetings
  - provides facilitation and secretariat services
- CLG Observers:

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– Listen and learn about the Tier 3 Water Budget





## **Water Supply Master Plan**

The water quantity component of the Township Water Supply Master Plan (WSMP) is intended to identify and refine the additional sources of water to supplement the existing supply in the 24 year planning horizon (i.e. to 2041).

The study will be a Class Environmental Assessment



## Water Supply Master Plan

The project consists of :

- Public consultation and engagement;
- Population and water demand projections;
- Water supply capacity;



# **Water Supply Master Plan**

- Future water supply alternatives;
- Preferred water supply strategy with timelines; and
- Implementation recommendations.



#### Water Supply Master Plan, Tier 3 and Growth Objectives

- The scoped Tier 3 study will form a key component of the WSMP and the model will be an important tool in evaluating different water supply alternatives
- The County Official Plan growth targets are now approved until 2041 and form the approved targets that Centre Wellington must plan towards.



# **Tier 3 - Broad Study Objectives**

- Conduct a detailed study to identify if the Centre Wellington groundwater supply wells can meet current and future (2041) municipal water demands
- Estimate the potential impact of municipal groundwater pumping on other water uses (e.g., streams)

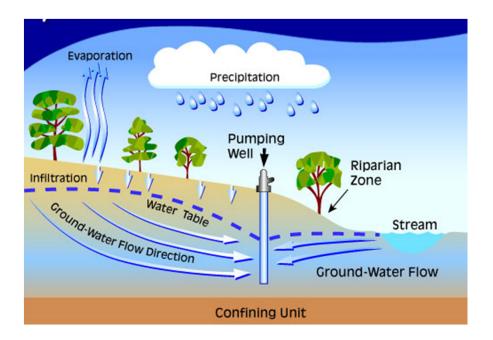
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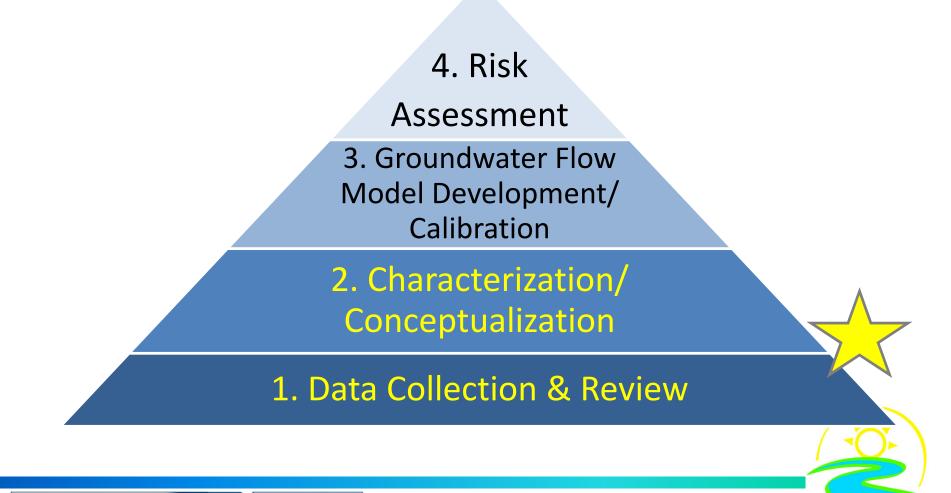




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#### **Four Key Project Components**









# **Physical Characterization Report**

EXECU	ITIVE SU	MMARY III	
1	INTRODUCTION		
	1.1	Scoped Tier Three Assessment1	
	1.2	Project Goals and Objectives	
	1.3	Study Team	
2	PHYSI	CAL SETTING	
	2.1	Study Area	
	2.2	Previous Water Resources Studies in the Centre Wellington Area	
	2.3	Ground Surface Topography and Drainage7	
	2.4	Geologic Setting	
	2.5	Hydrostratigraphic Setting	
	2.6	Regional Groundwater Flow	
	2.7	Summary of Advances Made to the Hydrostratigraphic Characterization	
3	WATE	R SUPPLY SYSTEMS AND ESTIMATED DEMANDS	
	3.1	Municipal Water Supply Systems	
	3.2	Municipal Water Demands	
	3.3	Non-Municipal Water Demands	
4	GROU	NDWATER TESTING AND MONITORING	
	4.1	Hydraulic Test Data	
	4.2	Municipal Water Quality Data	
	4.3	Municipal Groundwater Level Data55	
	4.4	Non-municipal Water Level Data	
5	SUMN	ARY AND CONCLUSIONS	
6	REFER	ENCES	

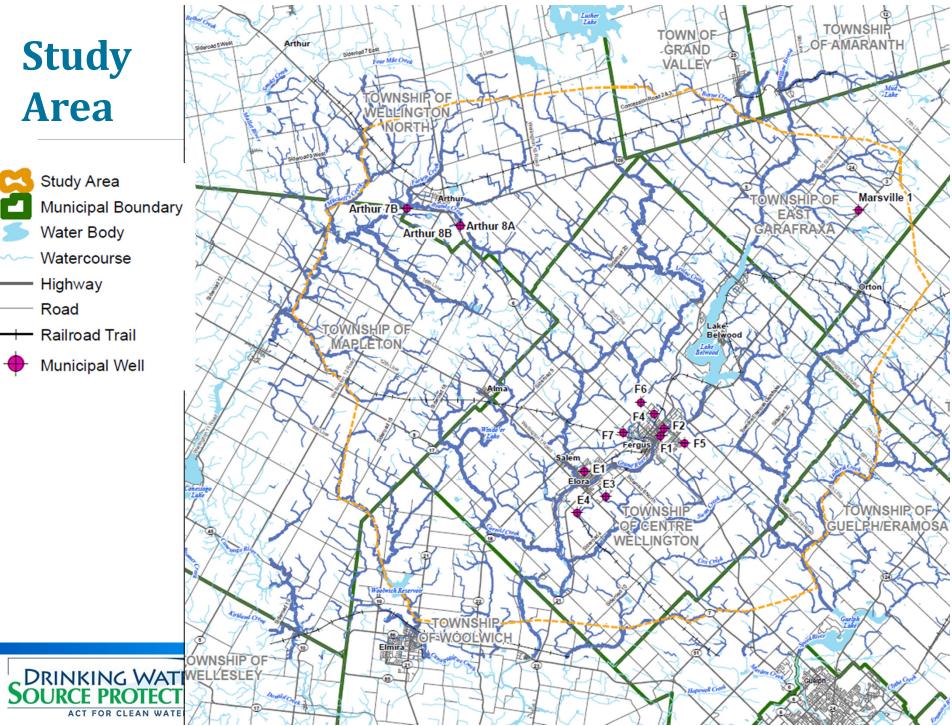


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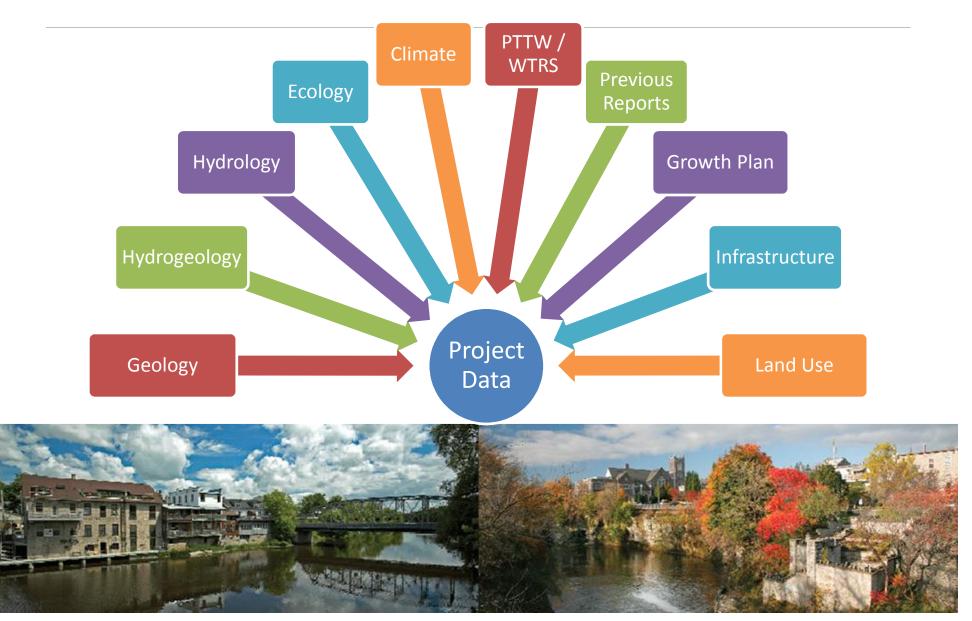


**Study** Area

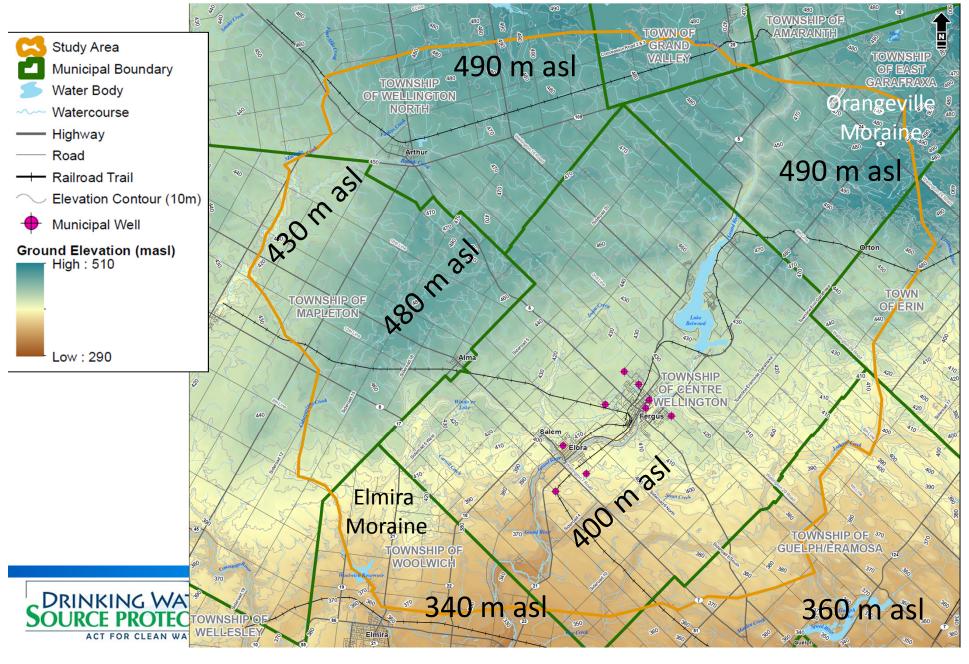




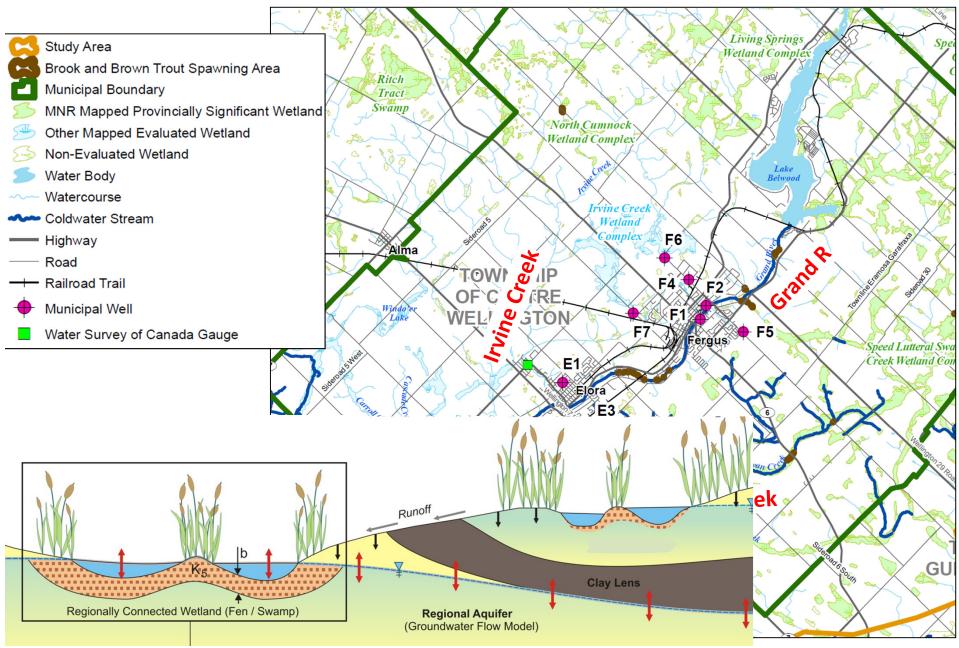
#### **Background Review and Data Collection**



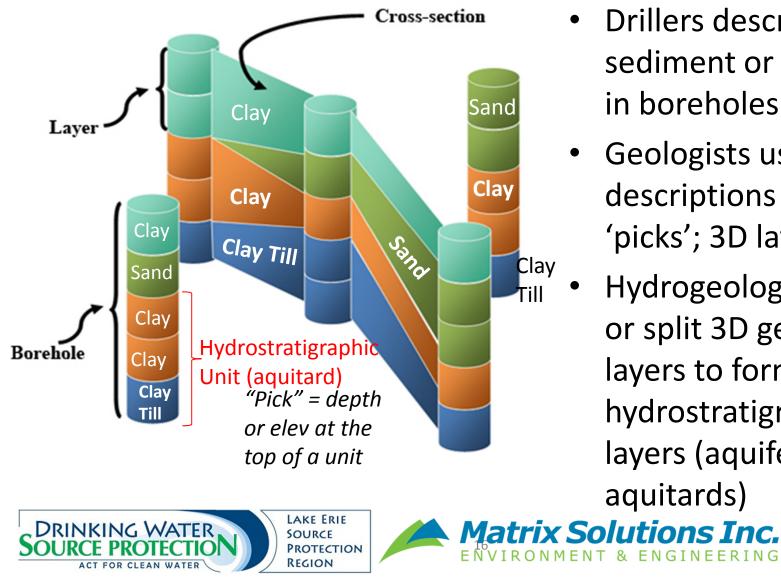
#### **Physical Setting: Ground Surface Topography**



## **Surface Water and Ecological Features**



# **Geology - Terminology**



- Drillers describe sediment or rock type in boreholes
- Geologists used descriptions to make 'picks'; 3D layers
- Hydrogeologists group or split 3D geologic layers to form hydrostratigraphic layers (aquifers, aquitards)

# **Geologic Setting: Overburden**

- **Burt and Dodge** (OGS)
- **Bajc and Shirota** • (OGS)
- Matrix

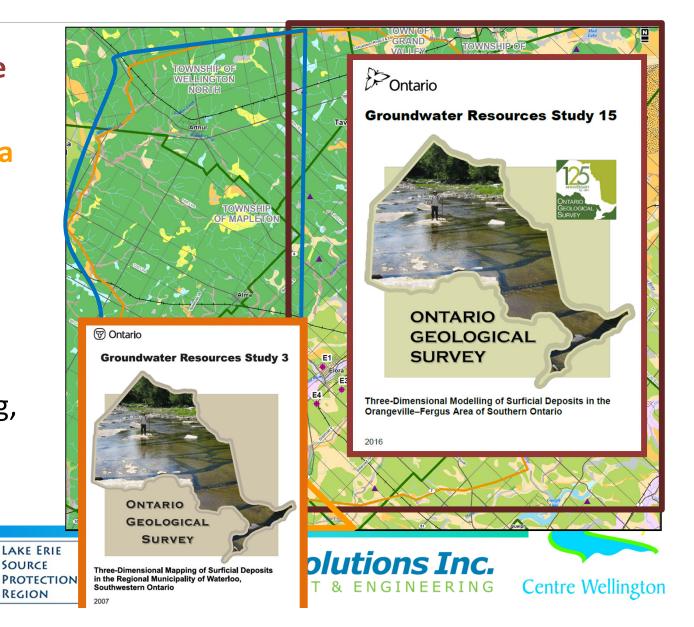
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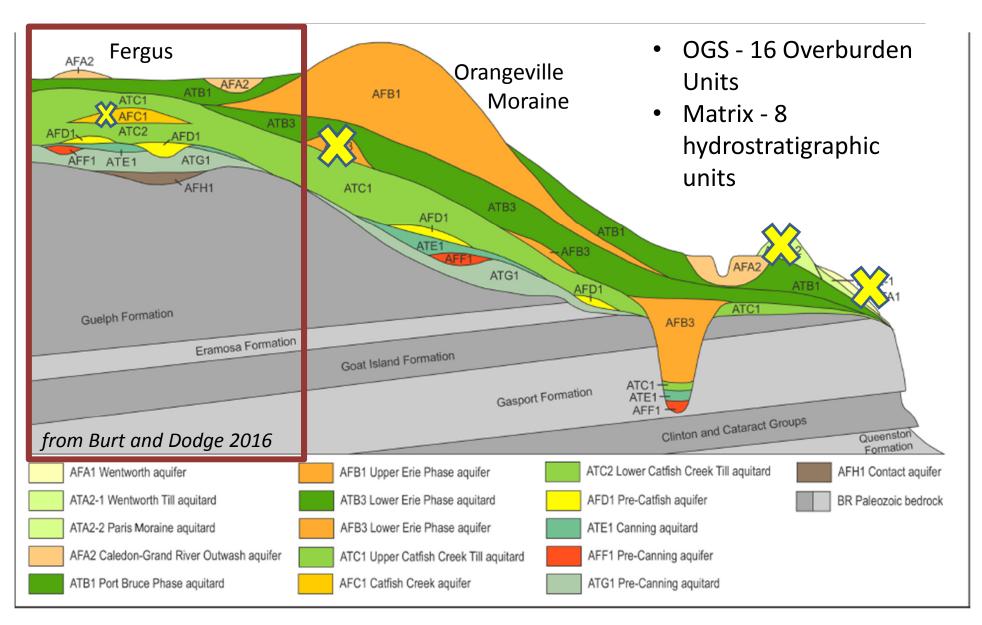
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 OGS studies included extensive coring, mapping, interpretation

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#### **Geologic Setting: Overburden**



# **Geologic Setting: Bedrock**

- Geologic interpretations of bedrock units have changed over past 20 years
- Frank Brunton, OGS has studied bedrock of this area for > 9 years
- Mr. Brunton reviewed local data and provided bedrock picks for units across study area at discrete well locations
  - Publication expected Fall 2017

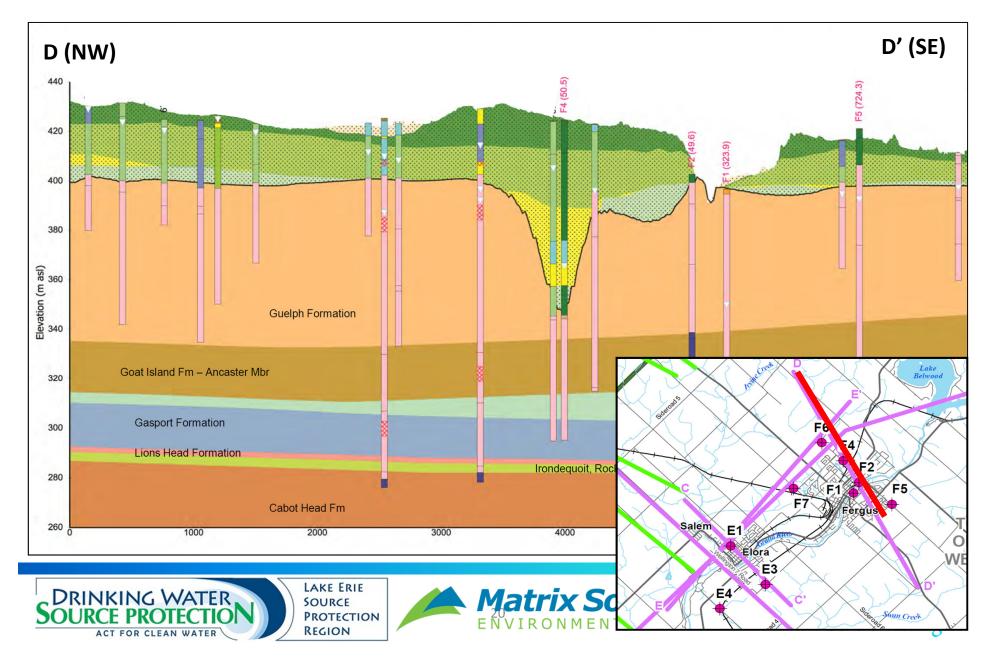
Lithology	Formation	Member
	Guelph	Hanlon
TAR BOOK	p	Wellington
	Eramosa	Stone Rd
		Reformatory Quarry
		Vinemount
	Goat Island	Ancaster
A A		Niagara Falls (=unsubdivided Amabel Fm)
	Gasport	Gothic Hill
		(Lions Head Mbr = Rochester Fm) (=previous unsubdivided Amabel Fm)
	Irondequoit	(=unsubdivided Amabel Fm)
	Rockway	
	Merritton	(= upper Fossil Hill Fm)
	Cabot Head	



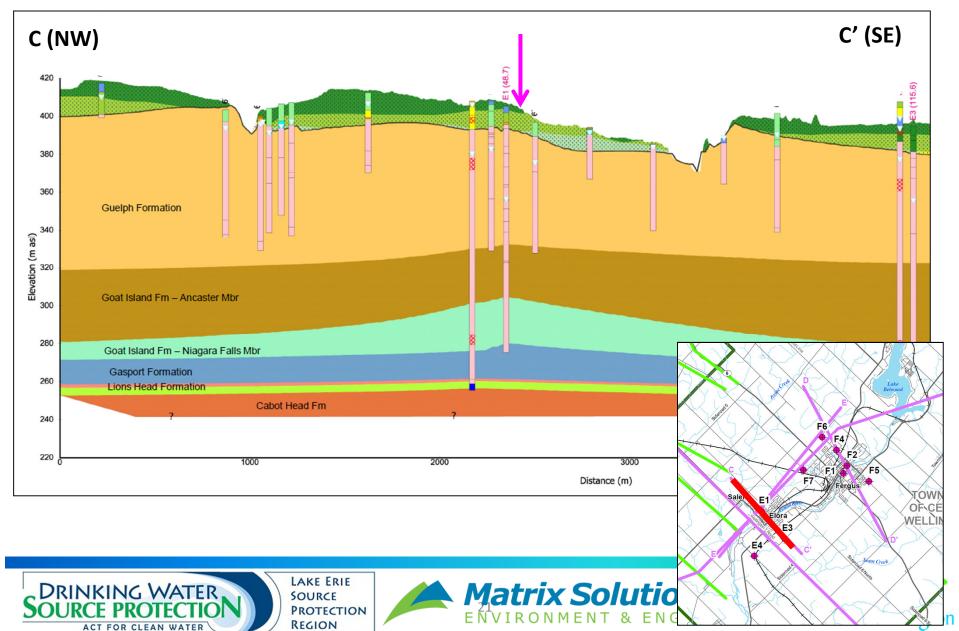
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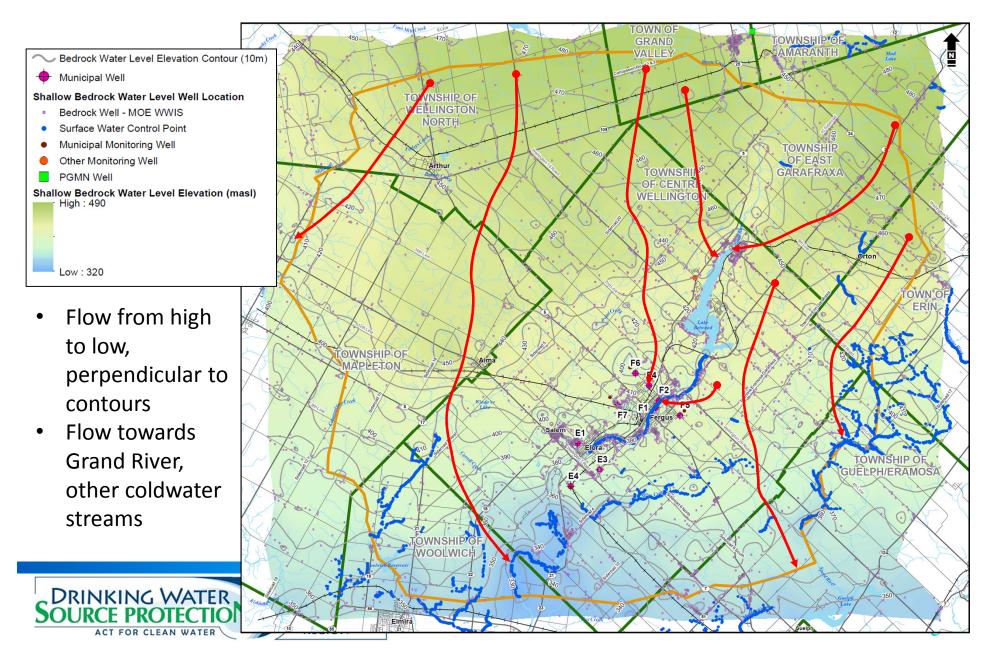
## **Fergus Cross Sections**



## **Elora Cross-Section**



# **Groundwater Flow (upper bedrock)**



#### **Water Demands - Technical Terms**

- Permitted Rates
  - rate that a well/ intake is permitted to pump
- Reported Rates

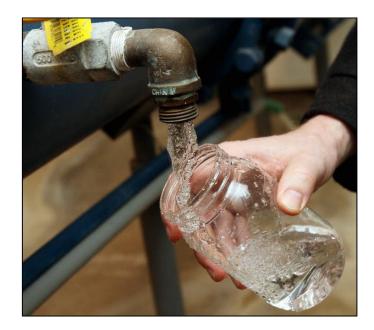
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- Permit holders report rates to the Ministry
- Consumptive Use Rates
  - Rate of water removed from a source that is not returned to the same source

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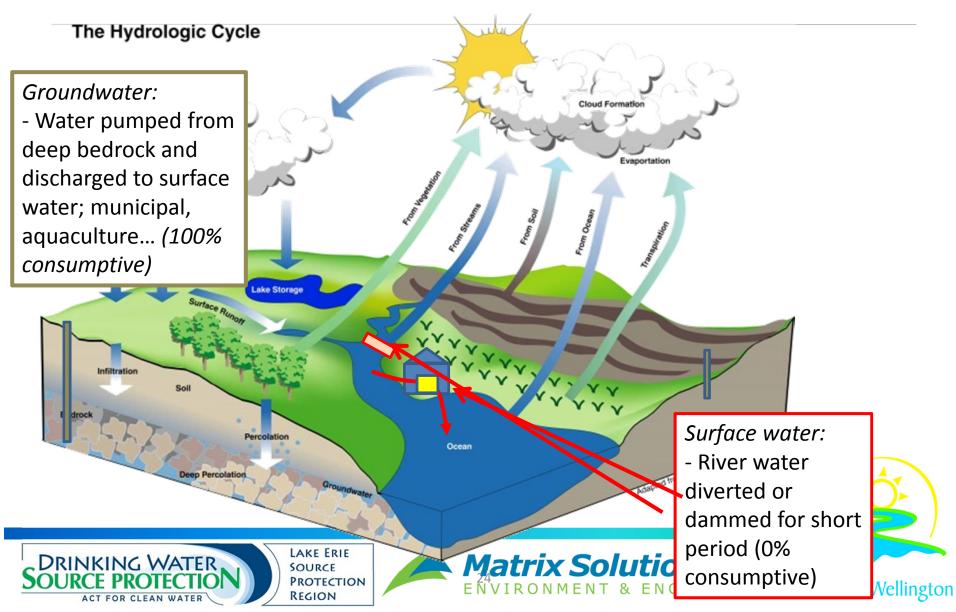


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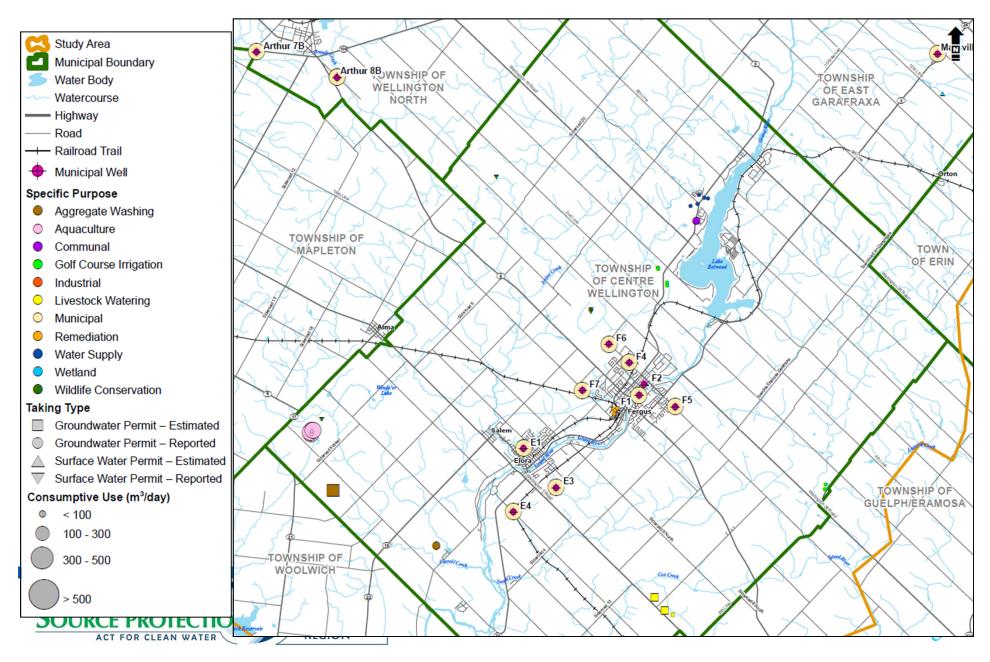




### **Consumptive Water Use Examples**



#### **Municipal and Non-Municipal Demands**



#### **Water Demands**

- Estimated current groundwater demands
- Municipal demand

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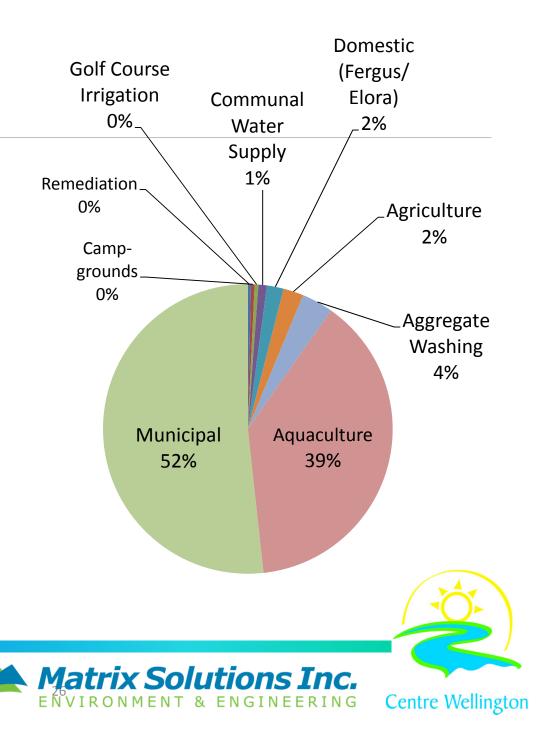
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- Centre Wellington
  (2016) = 5,422 m<sup>3</sup>/d
- Arthur and Marsville
  (2016) = 993 m<sup>3</sup>/d

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# **Agricultural Water Demands**

- Livestock operations do not require Permits to Take Water
- Township, Matrix and MOECC working together to identify and estimate the water demands for livestock operations within the study area



- GIS and air photo analysis used to identify properties
- Working with MOECC to confirm livestock densities and using OMAFRA data on
  - water usage









# **Water Demands - Municipal**

- Future population growth and future water demands
  - derived with Centre WellingtonTownship staff
  - documented in Risk Assessment
    Report

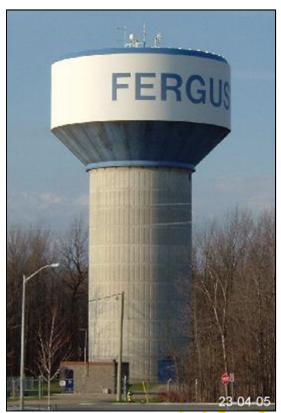
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## Water Level Data

- Municipal Data
  - Municipal pumping wells: 6 Fergus, 3 Elora
  - Monitoring wells: 9 wells (6 record levels at multiple depths)
- Non-Municipal Data
  - Highland Pines Campground (4 wells)

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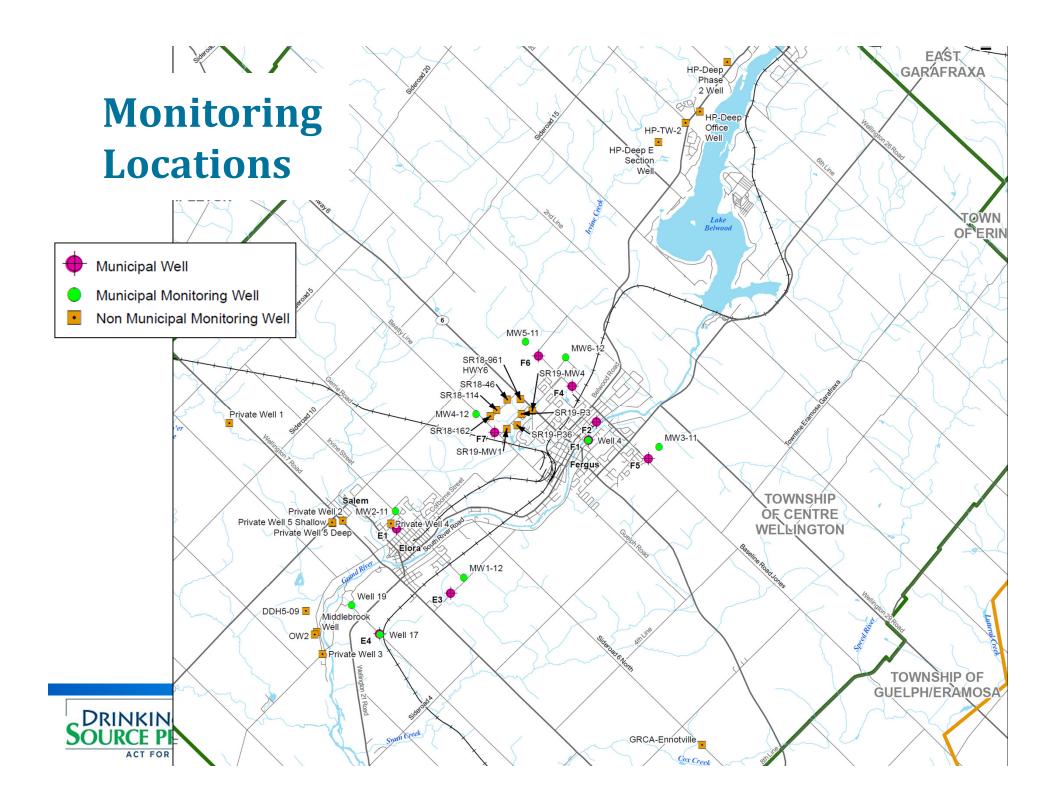
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- Nestle Canada (Middlebrook Well, 1 observation well, 5 private wells)
- Short term dewatering projects (Fergus; 8 wells on Side Roads 18 and 19).
- GRCA monitoring well

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- OGS bedrock well (DDH5-09)- (expected fall 2017)





# **Key Advances**

#### Overburden Characterization

Till or Fill					
MODEL LAYER	UNIT				
1	SHALLOW OVERBURDEN				
2	TILL AQUITARD				
3	BEDROCK CONTACT AQUIFER				
Golder 2013 Amabel Formation(Dolomite) Blackport Hydrogeology and WHI, 2002					

#### **Previous Studies**

#### **Scoped Tier 3 Study**







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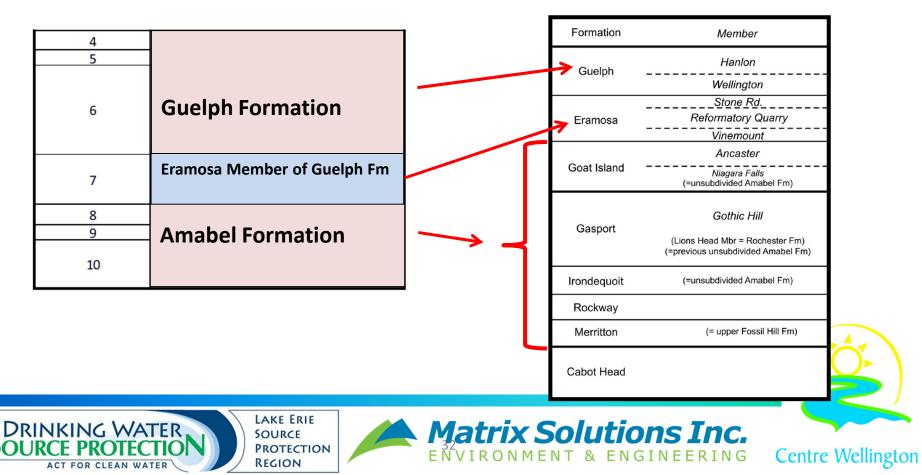
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# **Key Advances**

**Previous Studies** 

Bedrock Characterization

#### Scoped Tier 3 Study



# **Key Advances**

- Characterization of consumptive water use
- Hydrogeologic test data
  - OGS summary document
  - traditional data sources
- Water level data

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- GRCA, PTTW applicants and holders, OGS.
- Traditional data (i.e., Centre Wellington data)

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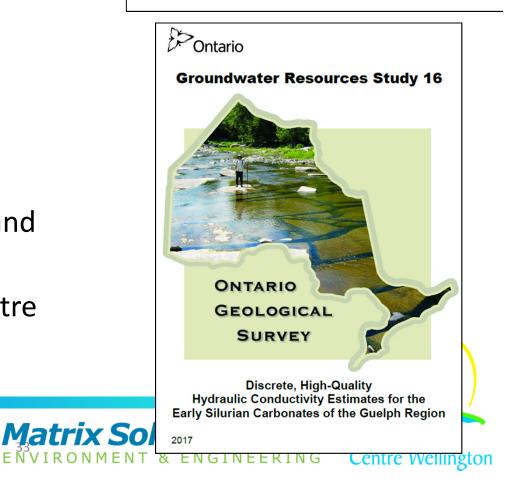
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Groundwater Hydrochemistry Data for Multi-Depth Well Sampling in the Early Silurian Carbonates of the Niagara Escarpment Cuesta: Support Document

E.H. Priebe<sup>1</sup> and V.L. Lee<sup>1</sup>



### **Discussion #1 - Physical Characterization Report**

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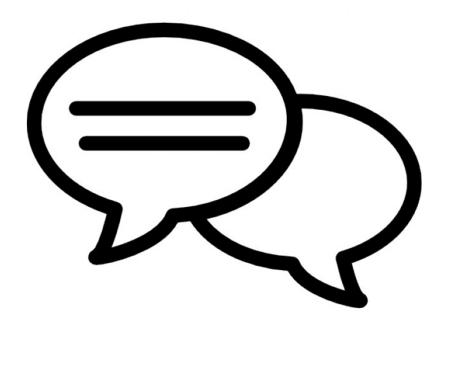


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#### **Discussion #2 – Tier 3 Water Budget Process Overall**

**Questions?** Comments?











# **Next Steps**

- Technical Work
  - -Send meeting minutes
    - CLG provide comments on minutes; finalize minutes with comments; post minutes and presentation on website
  - -Start to develop and then calibrate the groundwater flow model
  - -Document the model development and calibration



# **Next Steps**

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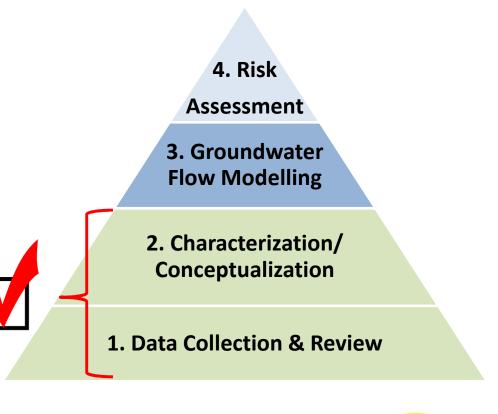
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- Next CLG meeting
  - -Aim for Q2 2018
  - Present the model development and calibration

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