

COMMITTEE AGENDA



TO **Planning & Building, Engineering and Environment
Committee**

DATE July 7, 2014

LOCATION Council Chambers, Guelph City Hall, 1 Carden Street

TIME 2:00 p.m.

Please turn off or place on non-audible all cell phones, PDAs, Blackberrys and pagers during the meeting.

DISCLOSURE OF PECUNIARY INTEREST AND GENERAL NATURE THEREOF

CONFIRMATION OF MINUTES – June 10, 2014 open meeting minutes

PRESENTATIONS (Items with no accompanying report)

a) None

CONSENT AGENDA

The following resolutions have been prepared to facilitate the Committee's consideration of the various matters and are suggested for consideration. If the Committee wishes to address a specific report in isolation of the Consent Agenda, please identify the item. The item will be extracted and dealt with separately. The balance of the Planning & Building, Engineering and Environment Committee Consent Agenda will be approved in one resolution.

ITEM	CITY PRESENTATION	DELEGATIONS	TO BE EXTRACTED
PBEE-2014.19 Water Supply Master Plan Update	<ul style="list-style-type: none"> Peter Busatto, General Manager, Guelph Water Services Department 		✓
PBEE-2014.20 Great Lakes Nuclear Dump (Correspondence Only)			✓
PBEE-2014.21 Sign By-law Variance for 40 Wellington St. W.			

PBEE-2014.22 Sign By-law Variance for 765 Woodlawn Road West			
PBEE-2014.23 Outstanding Motions of the Planning & Building, Engineering and Environment Committee			

Resolution to adopt the balance of the Planning & Building, Engineering & Environment Committee Consent Agenda.

ITEMS EXTRACTED FROM CONSENT AGENDA

Once extracted items are identified, they will be dealt with in the following order:

- 1) delegations (may include presentations)
- 2) staff presentations only
- 3) all others.

STAFF UPDATES AND ANNOUNCEMENTS

ADJOURNMENT

NEXT MEETING: AUGUST 5, 2014

**Planning & Building, Engineering and Environment Committee
Held in the Council Chambers, Guelph City Hall
Tuesday, June 10, 2014 at 2:00 p.m.**

Attendance

Members: Chair Bell
Mayor Farbridge
Councillor Guthrie
Councillor Wettstein

Absent: Councillor Piper

Councillors: Councillor Furfaro
Councillor Hofland
Councillor Van Hellemond

Staff: Dr. J. Laird, Executive Director of Planning & Building, Engineering and Environment
Mr. T. Salter, General Manager, Planning Services
Mr. D. Wyman, General Manager, Solid Waste Resources
Ms. K. Suresh, General Manager, Wastewater Services
Ms. J. Sweeney, Council Committee Coordinator
Ms. D. Black, Council Committee Coordinator

Call to Order (2:00 p.m.)

Chair Bell called the meeting to order.

Disclosure of Pecuniary Interest and General Nature Thereof

There were no disclosures.

Confirmation of Minutes

1. Moved by Councillor Guthrie
Seconded by Mayor Farbridge

That the open meeting minutes of the Planning & Building, Engineering and Environment Committee held on May 5, 2014 be confirmed as recorded.

VOTING IN FAVOUR: Mayor Farbridge, Councillors Bell, Guthrie, and Wettstein (4)

VOTING AGAINST: (0)

CARRIED

Consent Agenda

The following items were extracted from the June 10, 2014 Consent Agenda to be voted on separately:

- PBEE-2014.16 Draft Grand River Watershed Water Management Plan**
PBEE-2014.17 2014 Solid Waste Management Master Plan
PBEE-2014.18 Rental Housing Licensing Recommended Approach Council Referral (follow up memo)

Extracted Consent Items

PBEE-2014.16 Draft Grand River Watershed Water Management Plan

Dr. Laird, Executive Director, Planning, Building, Engineering and Environment, provided an overview of the City's involvement with the draft Grand River Watershed Water Management Plan.

Mr. Joe Farwell, Chief Administrative Officer, Grand River Conservation Authority (GRCA), summarized the role and scope of the GRCA, summarized the critical issues and explained the goals of the plan.

Ms. Kiran Suresh, General Manager, Wastewater Services, provided an overview of the integrated action plan emphasizing the City's role. She highlighted the purpose and goals of the management plan and explained the next steps.

Discussion ensued regarding potential legal or financial issues, risk abatement tools regarding flood damages, insurance issues, funding sources and stakeholder participation.

2. Moved by Councillor Wettstein
Seconded by Councillor Guthrie
 1. That Council endorse, in principle, the Grand River Watershed Water Management Plan.
 2. That the City continue to collaborate with other Plan partners to develop and voluntarily implement the best value solutions to water management issues in the Grand River Watershed.

VOTING IN FAVOUR: Mayor Farbridge, Councillors Bell, Guthrie, and Wettstein (4)

VOTING AGAINST: (0)

CARRIED

PBEE-2014.17 2014 Solid Waste Management Master Plan

Mr. Dean Wyman, General Manager, Solid Waste Resources provided an overview of the process of the Solid Waste Management Master Plan and advised there are no financial implications at this time.

Dr. Brajesh Dubey, Vice-Chair, Solid Waste Management Master Plan Review Steering Committee, provided a summary of the process to date, the current status, growth trends and hindrances of the plan and next steps. He noted that Guelph has achieved the highest diversion rate in Ontario at 68% and outlined the recommendations that will address multi-residential properties.

Discussion ensued regarding addressing behavioral issues, best practices, educational programs, AODA requirements and budget.

Mr. Ted Pritchard supports the plan and the recommendations that pertain to multi-residential units. He suggested that a Condominium Advisory Committee would be beneficial to address education, development of a database, and outreach for multi-residential units. He believes the City needs to be more proactive to ensure proper waste separation occurs with multi-

residential developments. He appreciates the timeline for expanding the type of collection services provided and suggested some of the current fleet be retained to provide bagged garbage pickup where dumpsters and carts are not viable. He thanked the City for providing a process that was an excellent example of a transparent and open government.

Mr. Cavan Acheson, Fair Taxes Campaign in Guelph, stated concerns about the level of taxes paid by condominium owners and services provided in comparison to single family dwellings. He believes the creation of a multi-residential waste diversion committee will cause further delays to multi-residential waste collection. He questioned the waste diversion rate because it does not include any private collection services. He believes waste collection needs to be addressed at the planning stages of new developments and a database for condominiums online is needed.

Discussion ensued regarding the timing of addressing the multi-residential properties, the determination of the diversion rate goal; the timing of exploring privatization of waste collection, and reducing waste collection costs.

3. Moved by Councillor Guthrie
Seconded by Councillor Wettstein

1. That Council endorse in principle the recommendations contained in the 2014 Solid Waste Management Master Plan (SWMMP).
2. That Council extend their appreciation to the members of the SWMMP Steering Committee for their efforts and dedication over the past year.

VOTING IN FAVOUR: Mayor Farbridge, Councillors Bell, Guthrie, and Wettstein (4)

VOTING AGAINST: (0)

CARRIED

PBEE-2014.18 Rental Housing Licensing Recommended Approach Council Referral (follow up memo)

Dr. Laird, Executive Director, Planning, Building, Engineering and Environment provided a synopsis of the rental housing licensing recommended approach Council referral follow up memo.

Discussion arose regarding the financing options and feasibility of hiring an additional staff person or training existing staff to initialize the program in 2014. The question of receiving a report on the rationale for the change in recommendations from one report to another, an explanation of why licensing would not address the issues, the benefits of the proposed program, a summary of costs for the two alternatives and funding sources was also raised.

5. Moved by Councillor Guthrie
Seconded by Mayor Farbridge

1. That the memo regarding the matter of the Rental Housing Licensing Recommended Approach be received.

VOTING IN FAVOUR: Mayor Farbridge, Councillors Bell, Guthrie, and Wettstein (4)

VOTING AGAINST: (0)

CARRIED

Staff Updates and Announcements

There were no updates or announcements.

Adjournment (3:38 p.m.)

6. Moved by Councillor Guthrie
Seconded by Mayor Farbridge

That the meeting be adjourned.

CARRIED

Joyce Sweeney - Designated Clerk

**PLANNING & BUILDING, ENGINEERING and ENVIRONMENT COMMITTEE
CONSENT AGENDA**

July 7, 2014

Members of the Planning & Building, Engineering and Environment Committee.

SUMMARY OF REPORTS:

The following resolutions have been prepared to facilitate the Committee's consideration of the various matters and are suggested for consideration. If the Committee wishes to address a specific report in isolation of the Consent Agenda, please identify the item. The item will be extracted and dealt with immediately. The balance of the Planning & Building, Engineering & Environment Committee Consent Agenda will be approved in one resolution.

Reports from Administrative Staff

REPORT	DIRECTION
<p>PBEE-2014.19 WATER SUPPLY MASTER PLAN UPDATE</p> <ol style="list-style-type: none"> 1. That Council receive the Water Supply Master Plan Update Report (final draft); and 2. That the Water Supply Master Plan Update be approved in principle; and 3. That staff be directed to implement the recommendations, subject to budget approval. 	Approve
<p>PBEE-2014.20 GREAT LAKES NUCLEAR DUMP</p> <p>Note: Correspondence extracted from March 7, 2014 Information Sheets at Councillor Piper's request. Councillor Piper will speak to this item.</p>	Receive
<p>PBEE-2014.21 SIGN BY-LAW VARIANCE FOR 40 WELLINGTON STREET WEST</p> <ol style="list-style-type: none"> 1. That the report from Planning, Building, Engineering and Environment dated July 7, 2014, regarding sign by-law variances for 40 Wellington Street West, be received; and 2. That the request for variances from the sign by-law for 40 Wellington Street West to permit a sign perpendicular to the building face to project 1.02 metres from the building face and contain internal lighting, be approved. 	Approve

PBEE-2014.22 SIGN BY-LAW VARIANCE FOR 765 WOODLAWN ROAD WEST

Approve

1. That the report from Planning, Building, Engineering and Environment dated July 7, 2014, regarding two (2) Sign By-law variances for 765 Woodlawn Road West, be received; and
2. That the requested variances from the Sign By-law for 765 Woodlawn Road West for a freestanding sign to be a height of 8.05 metres and within 27 metres of a freestanding sign on an adjacent property, be approved.

PBEE-2014.23 OUTSTANDING MOTIONS OF THE PLANNING & BUILDING, ENGINEERING AND ENVIRONMENT COMMITTEE

Approve

That the report dated July 7, 2014 regarding outstanding motions of the Planning & Building, Engineering and Environment Committee, be received.

Attach.

City of Guelph Water Supply Master Plan Update: PBEE Committee Presentation

July 7, 2014





WATER SUPPLY MASTER PLAN UPDATE

PROBLEM / OPPORTUNITY STATEMENT



- Responsible for supplying clean, safe drinking water;
- Provide a reliable and sustainable supply to meet current and future needs of all customers over the next 25 years;
- Best manage vital supply to provide the high level of service our residents expect?
- Updated Master Plan will identify and prioritize individual projects required to implement the master plan.

CONSULTATION PROCESS



Class EA Phase 1

Class EA Phase 2

Additional groundwater & alternative municipal supplies are identified

Constraints / opportunities identified. Evaluation methodology / criteria defined

Evaluate alternatives & Develop plan for Implementation

Preferred alternatives determined / Draft Plan submitted

Getting Started

Scoping the Project

Review of Alternatives

Implementation Plan

Confirmation & Approval

Notice of Project Initiation

Pre-consultation Discussions

Water Conservation & Efficiency (WCE) PAC Meeting

Community Liaison Committee (CLC) Meeting #1

Agency / Municipal Forum #1

Community Open House #1

Township Council Meetings

WCE PAC Meeting

CLC Meeting #2

Agency / Municipal Forum #2

Community Open House #2

Township Council Meetings

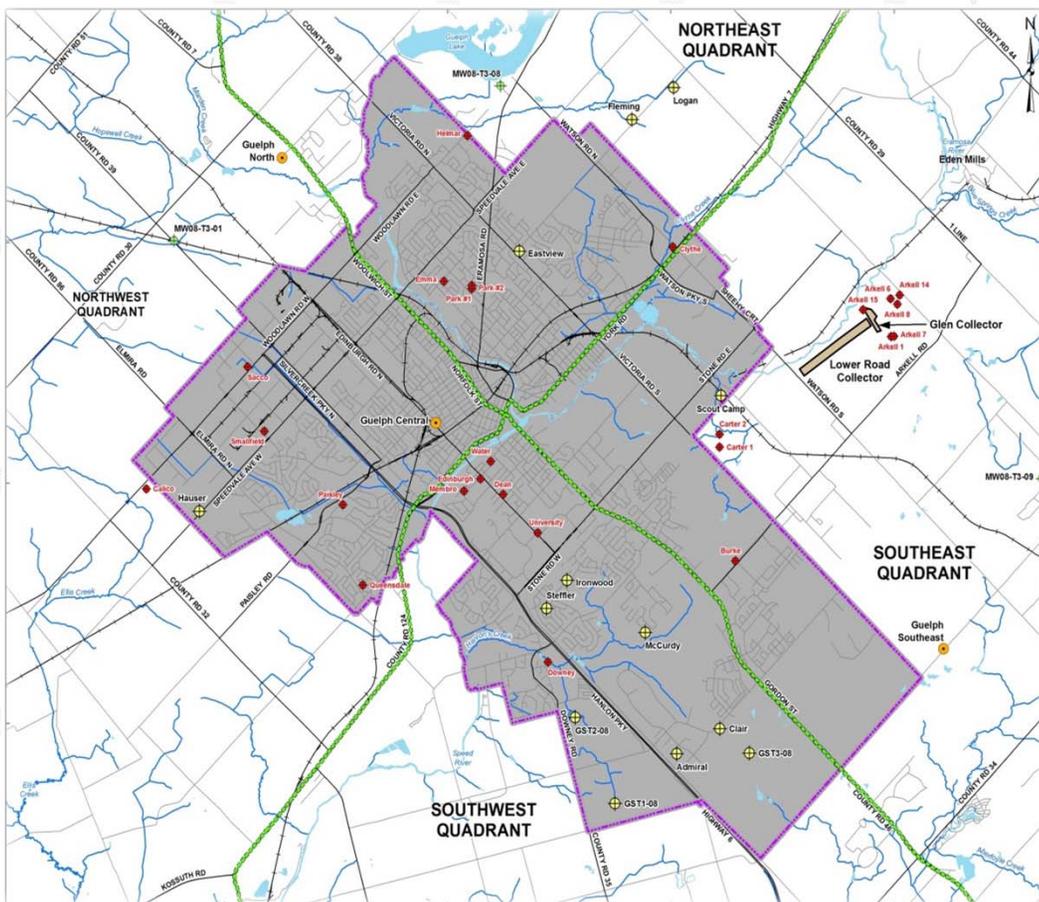
Notice of Completion

We are here

Issue Management, Tracking, and Reporting



WHERE DO WE GET OUR WATER?



- Have relied on groundwater to meet water demands since 1879;
- Water supply comes from wells in the **Gasport Formation** deep bedrock aquifer and the **Arkell Spring Grounds** collector system;
- Municipal supply system includes 25 production wells:
 - 21 wells are in continuous operation;
 - 4 wells are offline due to water quality concerns.



HOW MUCH WATER DO WE HAVE NOW?

SUMMARY BY QUADRANT

- Potential supply capacity determined for each well, based on concurrent operation;
- Summary table compares 2014 capacity to 2007 well capacities;
- Two new wells in Arkell (2007);
- Existing potential water supply capacity is **83,836 m³/day**.

Quadrant	WSMP (2007)	WSMP Update (2014)
	(m ³ /day)	(m ³ /day)
Southeast	40,400	49,700
Southwest	17,800	17,936
Northeast	12,300	12,300
Northwest	4,500	3,900
Total	75,000	83,836



HOW MUCH WATER DO WE PLAN FOR?



- **Security of supply:**
Additional 10 - 15% above actual maximum day demand;
- **Design maximum day factor (MDF) = 1.5:** Calculates required supply capacity;
- We build to the Design Maximum Day Factor to ensure security of supply.

Demand/Capacity	2013	2038
Average Daily Demand (m ³ /day)	48,300	69,900
Maximum Daily Demand (m ³ /day) (actual MDF of 1.35)	64,100	94,300
Total Existing System Capacity (m³/day)	83,836	
Surplus/Deficit (m³/day)	19,736	-10,464

Existing Capacity under Drought Condition – short term (m ³ /day) *	71,128	
Surplus/Deficit (m³/day)	7,028	-23,172

Existing Capacity with Loss of Supply (m ³ /day) **	75,800	
Surplus/Deficit (m³/day)	11,700	-18,500

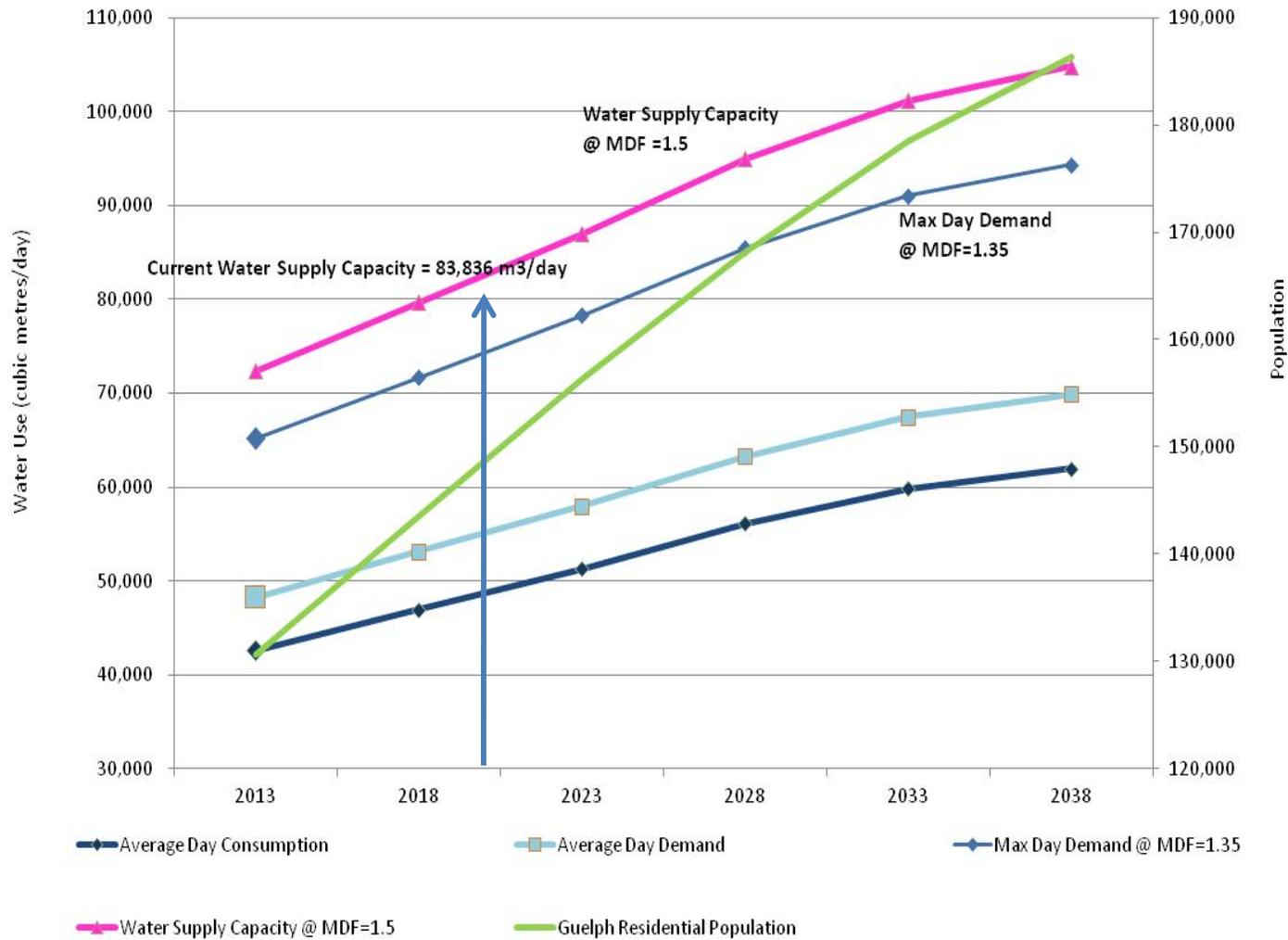
* represents reduction in supply capacity of 15%

* represents reduction in supply capacity of 10%

HOW MUCH WATER DO WE NEED?



Projected Population and Water Supply Requirements



DEVELOPMENT OF ALTERNATIVES



- **1A: Water Conservation and Demand Management**
- **1B: Re-use**
- **2: Expand Existing Groundwater System**
 - 2A - Optimize existing operating municipal wells
 - 2B - Restore existing off-line municipal wells
 - 2C - Develop existing municipal test wells
 - 2D - Install new wells inside City boundaries
 - 2E - Install new wells outside City boundaries
 - 2F - Install new Aquifer Storage and Recovery wells inside City;
- **3: Establish New Surface Water Supply**
 - Guelph Lake/Speed River
 - 3A - Surface Water Treatment Plant (WTP)
 - 3B - Surface WTP plus Aquifer Storage and Recovery (ASR) Wells
 - Eramosa River
- **4: Limit Growth**
- **5: Do Nothing**



ALTERNATIVE #1 – WATER CONSERVATION AND DEMAND MANAGEMENT POTENTIAL SAVINGS BY SCENARIO

Scenario	Total Potential Savings (m ³ /day)	Implementation Period	Direct Program Costs	Total O&M Costs	Total Program Cost for Period	Capital Cost per m ³ /day	LCC - Cost per m ³ avoided
Scenario 1	5,556	2014 to 2025	\$5,685,930	\$10,217,564	\$15,903,494	\$1,023	\$0.65
Scenario 2	9,842	2014 to 2038	\$43,767,600	\$23,880,972	\$67,648,572	\$4,447	\$0.75
Scenario 3	9,690	2014 to 2038	\$24,597,600	\$23,880,972	\$48,478,572	\$2,539	\$0.55
Scenario 4	8,448	2014 to 2038	\$23,097,600	\$23,880,972	\$46,978,572	\$2,734	\$0.61
Scenario 5	7,419	2014 to 2038	\$22,553,100	\$23,880,972	\$46,434,072	\$3,040	\$0.69

Alt. #1: Water Conservation and Demand Management/Reuse

Water Conservation Scenarios

Program Alternatives	Sector	1	2	3	4	5
Current Retrofits Incentive Program Model - Single Family Toilets	RES	x	x	x	x	x
Current Retrofits Incentive Program Model - Multi Family Toilets	RES	x	x	x	x	x
Current Retrofits Incentive Program Model - Clothes Washers	RES	x	x	x	x	x
New Retrofit Incentive Program - Hot Water Recirculation	RES		x	x	x	x
New Retrofit Incentive Program - Water Softener	RES		x	x	x	x
New Retrofit Wholesale Program Model- Multi-res Toilets	RES		x	x	x	x
New Retrofit Wholesale Program Model- Multi-res Toilet Flapper	RES		x	x	x	x
New Retrofit LIC Program Model - Toilets	RES		x	x	x	
New Retrofit LIC Program Model - Hot Water Recirculation	RES		x	x	x	
New Retrofit LIC Program Model - Water Softener	RES		x	x	x	
Water Conservation Rates - Planning Rate Increase Response Guelph 2014 LRFP	RES	x				
Water Conservation Rates - Increasing Block Rate Implementation	RES		x	x		
Building Code Improvements	RES	x	x	x	x	x
Active Water Loss Management - DMAs	NRW	x	x	x	x	x
Advanced Water Loss Management - Pressure Management	NRW		x			
ICI Audits and Capital Retrofit Incentives	ICI	x	x	x	x	x
ICI Peak Demand Management - Cooling Tower/Chiller Retrofit Incentives	ICI		x	x	x	x
Home Audit and Retrofit Program	RES		x	x	x	x
Private Side Leak Reduction: Res Sector AMI Implementation	RES		x	x	x	x
Blue Built Home - New Home Water Efficiency Certification	RES	x	x	x	x	x

WATER SUPPLY ALTERNATIVES



Expand existing groundwater supply system:

- Restoration of existing off-line municipal wells:
8,000 to 14,000 m³/day at \$1,400 to \$6,000 per m³/day;
- Develop existing municipal test wells:
Up to 14,800 m³/day at \$500 to \$4,100 per m³/day;
- Install new wells inside City boundaries:
1,000 to 1,500 m³/day at \$3,015 per m³/day;
- Install new wells outside City boundaries
Up to 11,500 m³/day at \$840 to \$990 per m³/day;
- Optimize excess Arkell Collector system volumes using ASR:
3,300 m³/day at \$2,700 per m³/day.

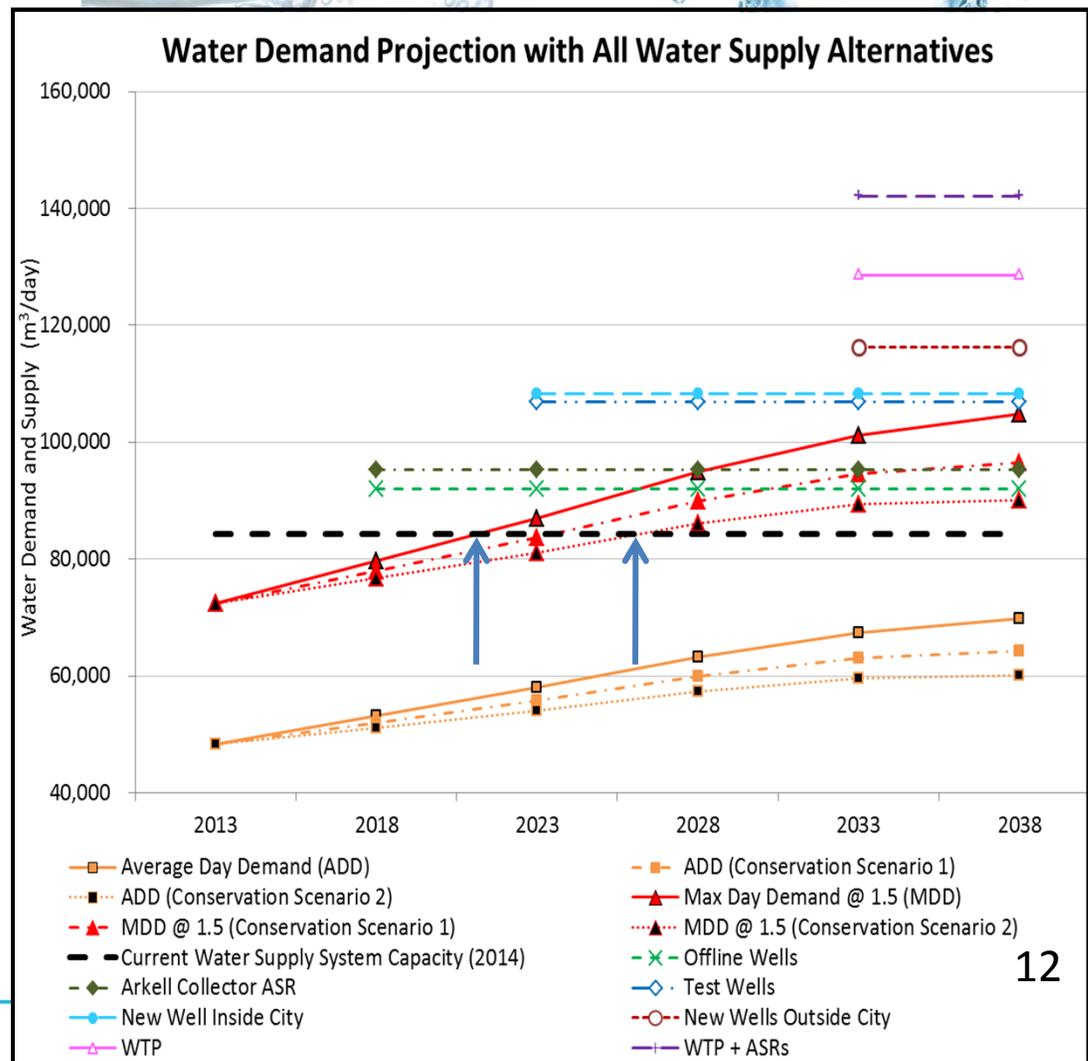
Establish new local surface water supply:

- Guelph Lake water treatment plant: 12,312 m³/day at \$3,471 per m³/day;
- Guelph Lake water treatment plant with Aquifer Storage Recovery (ASR):
25,825 m³/day at \$3,055 per m³/day.



WATER DEMAND PROJECTION WITH ALL WATER SUPPLY ALTERNATIVES

- Each water supply alternatives is shown cumulative, to indicate total water capacity available;
- Implementation strategy: based on selection and prioritization of preferred water supply alternatives to meet future needs.



EVALUATION OF ALTERNATIVES - CRITERIA



Financial Considerations

- Estimated capital costs; capital cost per capacity
- Estimated operation and maintenance costs
- Life cycle cost (per volume produced)

Legal and Jurisdictional Considerations

- Location inside vs. outside of City boundaries

Technological Considerations

- Constructability
- Potential productivity and reliability
- Water treatment requirements
- Approval requirements

Built Environment

- Effect on existing and/or planned residences, businesses, community, institutional or recreational facilities
- Effect on private and municipal wells

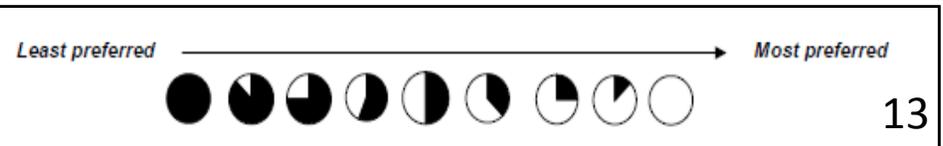
Natural Environment

- Effect of construction and operation on aquatic and terrestrial species & habitat
- Effect on surface water quantity and quality

Social and Cultural Environment

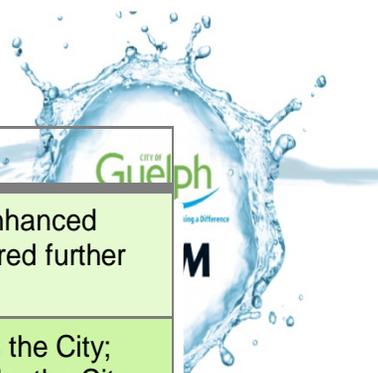
- Ability to meet municipal and provincial growth targets
- Public acceptance
- Effect of noise/vibration on sensitive receptors
- Effect on cultural heritage landscapes and built heritage resources
- Effect on potential archaeological resources

• Alternatives were evaluated using qualitative comparisons and trade-offs



IDENTIFIED PREFERRED ALTERNATIVE

Alternative	Ranking	Comments
1A – Conservation & Demand Management	1	Strong public support for continued and enhanced water conservation; target reduction explored further through financial analysis
2B – Groundwater: Existing Municipal Off-line Wells	1	Support for optimizing water takings within the City; order of implementation to be determined by the City with consideration for regulatory, treatment, financial constraints
2C – Groundwater: Municipal Test Wells	1	
2D – Groundwater: New Well inside City	1	
2F – Arkell Collectors & ASR Wells	2	ASR alternative requires additional feasibility investigation with respect to Eramosa River PTTW optimization; water volumes available via collector systems; need to install ASR wells vs. changing existing well permits to allow for flexible takings
2E – Groundwater: New Wells outside City	2	Incorporates Townships' staff and public response to maximize water takings inside the City before pursuing wells in the Townships
3A – Surface water: Guelph Lake Water Treatment Plant	3	While this alternative is not required to provide water supply within the 25 year study period, the City will track timeline to determine 10 year lead-in required prior to implementation; Speed River/Guelph Lake water taking requires GRCA policy approvals
3B – Surface water: Guelph Lake Water Treatment Plant & ASR Wells	3	
1B – Re-Use – Centralized	3	Potential of this alternative to be explored further; highly dependent on end use customer demand; integration and alignment with future WWTP treatment requirements
Limit Growth	4	This alternative does not meet the Study Problem Statement and contravenes the Official Plan
Do Nothing	4	This alternative does not meet the Study Problem Statement and contravenes the Official Plan



IMPLEMENTATION - PREFERRED ALTERNATIVE



- Capital Cost Forecast
- Individual Project Implementation Planning
- Water Planning Recommendations:
 - Review of applications from new large volume users;
 - Supply capacity allocation for both new and existing customers;
 - Tracking system to closely monitor conservation successes;
 - Time limits on development commitments;
 - Process for existing customers to request large increases;
 - Synchronize capacity increases with the timing of new supplies;
 - Flexibility in funding.
- Supply Capacity Management Recommendations:
 - Annual reviews of supply capacity;
 - Implement maintenance & upgrades to water supply system;
 - Municipal by-law to restrict new private groundwater supply.



ENHANCED CONSERVATION SCENARIO – CAPITAL COST FORECAST (\$000s)

Year	New Supply		Conservation		TOTAL (New Supply + Conservation)	
	2014 Budget	WSMP 2014	2014 Budget	WSMP 2014	2014 Budget	WSMP 2014
2015-2019	\$ 13,950	\$ 10,569	\$ 3,924	\$ 7,670	\$ 17,874	\$ 18,239
2020-2025	\$ 14,550	\$ 6,182	\$ 763	\$ 6,170	\$ 15,313	\$ 12,352
Total	\$ 28,500	\$ 16,751	\$ 4,687	\$ 13,840	\$ 33,187	\$ 30,591

Budgets to be developed:

- Non-Tax Supported Capital Budget and Forecast for Water Services for 2015 to 2024
- Annual Non-Tax Supported Operating and Development Charge Funded Budgets



THANK YOU!



To find out more about the project, visit guelph.ca/water and follow the Water Supply Master Plan link, or contact:

Dave Belanger
Water Supply Program Manager
City of Guelph
519-822-1260 ext. 2186
Dave.Belanger@guelph.ca

Patty Quackenbush
Senior Project Manager
AECOM
519-650-8691
Patty.Quackenbush@aecom.com

As per the *Accessibility for Ontarians with Disabilities Act*, this content is available in an alternate format by contacting 519-650-8691.

STAFF REPORT



TO Planning & Building, Engineering and Environment Committee

SERVICE AREA Planning, Building, Engineering and Environment

DATE July 7, 2014

SUBJECT Water Supply Master Plan Update (Draft Final Report)

REPORT NUMBER

EXECUTIVE SUMMARY

PURPOSE OF REPORT

- Outline the process used to update the City's Water Supply Master Plan;
- Summarize the results, the recommendations and the proposed implementation plan;
- Obtain approval to implement the Water Supply Master Plan, subject to budget approval.

KEY FINDINGS

In 2007, the City of Guelph (City) completed the Water Supply Master Plan (WSMP) project to ensure that our water supply continues to meet current and future demands. The purpose of the WSMP Update Project is to review and revise the 2007 WSMP to make it consistent with the current needs of the City, covering a 25 year period from 2013 to 2038.

The project has been completed according to the work plan and has included: an extensive public consultation process as per the City community engagement framework; reviews of population growth to aid in defining future water supply demand; an assessment of the current capacity of the City's existing water supply system; comparisons between the existing supply capacity and the future demand to identify supply requirements to 2038; and the development of supply alternatives to meet the future demand.

The results of the project have been developed into an implementation strategy and a preferred water supply alternative. The preferred alternative, consistent with the previous WSMP, uses conservation and demand management as the cornerstone of the strategy and develops additional new groundwater supplies from existing offline municipal wells, municipal test wells and new wells inside the City. The Plan provides recommendations for optimizing the schedule for water supply capacity planning through appropriate supply planning policies that ensure the City has suitable lead-time and budgets in place for required supplies. The Plan also provides recommendations for the management of the existing supply system to ensure an optimal supply capacity including a new,

proposed by-law to restrict new private groundwater supply wells in the City.

FINANCIAL IMPLICATIONS

- The WSMP Update project has provided updated capital costs for the short-term, intermediate-term and long-term water supply options for the next 25-years;
- Related capital projects, which will be funded through development charges, will be brought forward during the 2015 capital budget process;
- As with the 2007 WSMP, the plan considers both the requirement for new supply, as well as ensuring efficient use of our current supply and built infrastructure (i.e. water conservation);
- The 10-year capital budget forecast for new water supply projects will be lower than estimated in the approved 2014 capital budget forecast;
- The overall budget for water conservation will decrease, although there will be a slight increase for water conservation during the initial 5 years;
- In total, the combined 10-year capital forecast for new supply and conservation is expected to be lower by approximately \$2.6 million;
- Continued emphasis on water conservation will result in deferment of capital costs for new water supply.

ACTION REQUIRED

To approve, in principle, the WSMP Update report and direct staff to implement the recommendations, subject to budget approval.

RECOMMENDATION

1. That Council receive the Water Supply Master Plan Update Report (final draft).
2. That the Water Supply Master Plan Update be approved in principle.
3. That staff be directed to implement the recommendations, subject to budget approval.

BACKGROUND

In 2007, the City of Guelph (City) completed the Water Supply Master Plan (WSMP) project to ensure that the City's water supply continues to meet current and future demands. The purpose of this WSMP update is to review and revise the 2007 WSMP to ensure consistency with the current and future needs of the City, covering a 25-year period from 2013 to 2038. The WSMP update builds upon the work previously completed, taking into account more recent studies and the work activities completed over the past six years. This update reviews the 2007 WSMP recommendations as well as examines new water supply alternatives in accordance with the Class Environmental Assessment (EA) process for Municipal Water projects.

STAFF REPORT



REPORT

The project has followed the Municipal Class Environmental Assessment (EA) planning and design process for the development of master water supply plans. Council approval of the Master Plan allows the plan to be used as justification for specific Class EA projects. The WSMP Update report was prepared by the consulting firms of AECOM and Golder Associates Ltd. The Executive Summary of the Update Report is attached and the full report (945 pages) is available on the City web site - <http://guelph.ca/plans-and-strategies/water-supply-master-plan/>.

The first phase of the WSMP Update was to prepare clear statements on the identified problems and the deficiencies or opportunities to be investigated. The Update defined how the City will provide a reliable and sustainable supply of water to meet the needs of all residents. The updated analysis has shown that the existing water supply capacity will meet future demands until 2021. When investigating water supply options, including water conservation strategies, the Update considered water quality and quantity, economic factors, environmental concerns and relevant regulations.

Population projections are required to determine future water supply requirements. Population growth projections to 2031 were per the Official Plan, with details provided in the 2014 Development Charges Growth Forecast and extrapolated by Planning Services to 2038. The residential population was assumed to range from 130,670 in 2013 to 186,299 in 2038 with total equivalent population, accounting for employment population, from 197,400 to 285,779 over the same period. These population projections translate into average water demands of 48,253 m³/day in 2013 to 69,872 m³/day in 2038. The maximum day requirements (with contingency for security of supply and risk management) ranged from 72,379 m³/day in 2013 to 104,808 m³/day in 2038.

A detailed assessment of the maximum capacity of the existing water supply system was completed, which included determination of the maximum capacity of each individual well/system and to identify constraints to operating at the maximum. An assessment of the sustainable capacity of the existing water supply system (recognizing interference effects amongst the municipal wells) was also completed. The groundwater supply capacity was determined to be 83,836 m³/day in 2014. Comparisons between the maximum day supply requirements and the existing supply capacity demonstrate the need for additional supply capacity over the 25-year planning period.

The review of water supply alternatives considered in the WSMP Update included the following viable options with related new supply capacity and unit costs:

- Water conservation and demand management (demand reductions to average day demand of 5,556 to 9,842 m³/day at \$1,023 to \$3,040 per m³/day);
- Expand existing groundwater supply system:
 - Optimize existing operating municipal wells;

STAFF REPORT

- Restoration of existing off-line municipal wells (8,000 to 14,000 m³/day at \$1,400 to \$6,000 per m³/day);
- Develop existing municipal test wells (up to 14,800 m³/day at \$500 to \$4,100 per m³/day);
- Install new wells inside City boundaries (1,000 to 1,500 m³/day at \$3,015 per m³/day);
- Install new wells outside City boundaries (up to 11,500 m³/day at \$840 to \$990 per m³/day);
- Install new ASR wells inside City to optimize excess Arkell Collector system volumes (3,300 m³/day at \$2,700 per m³/day);
- Establish new local surface water supply:
 - Guelph Lake water treatment plant (12,312 m³/day at \$3,471 per m³/day);
 - Guelph Lake water treatment plant with Aquifer Storage Recovery (ASR) (25,825 m³/day at \$3,055 per m³/day).

Alternatives were evaluated based on the following criteria components:

- Built Environment
- Natural environment
- Social/cultural environment
- Financial considerations
- Legal/jurisdictional considerations
- Technical considerations

Each potential alternative was assessed using a consistent approach and evaluation criteria along with specific indicators for each. The evaluation is qualitative and considered the suitability of alternative solutions and strategies based on significant advantages and disadvantages.

Communications and consultation activities formed a key component of the process to develop the Guelph Water Supply Master Plan Update project and were completed in accordance with the City's community engagement framework. Community input and public consultation consisted of the following components:

- Pre-consultation Interviews;
- Community Liaison Committee Meetings;
- Municipal / Agency Workshops;
- Public Open Houses;
- Presentations and discussion to the Water Conservation and Efficiency Public Advisory Committee;
- Presentations to Puslinch Township and the Guelph-Eramosa Township Councils; Guelph Water User Survey.

Based on the public input and the evaluation outputs for each of the alternatives, the highest ranked (preferred) alternatives were:

STAFF REPORT

- conservation and demand management;
- groundwater: existing municipal off-line wells;
- groundwater: municipal test wells; and
- groundwater: new wells inside the City.

A timeline and budget was established for implementing the preferred alternatives, including a financial analysis to determine the optimum conservation scenario when considered with the need for new supply sources as well as the relative timing.

The optimal water conservation scenario has a demand reduction of 9,147 m³/day at a capital program cost of \$13,864,780. This enhanced water conservation scenario results in the deferral of capital costs for new supply infrastructure totaling \$18.3 million. The specific conservation programs to achieve this demand reduction are being established through the 2014 Water Conservation and Efficiency Strategy update.

Recommendations have been developed for review of our water capacity planning and approvals processes to manage the allocation of future water supply in light of unknowns with respect to commitments on existing supply capacity and the timing of needed new supply capacity. These processes may include:

- Review of applications from new large volume users for balance in employment, community value, and water use;
- Equitable policies for supply capacity allocation for both new and existing customers;
- Enhanced tracking system to closely monitor conservation successes against forecasted demand;
- Time limits on reservation of capacity for development commitments;
- Consultation processes for existing customers to request large increases;
- Mechanisms to synchronize approvals of significant demand requirements from development applications or proposed industrial increases with the proposed timing of new supplies in accordance with the master planning schedule.

Recommendations have also been provided to manage the City water supply capacity including annual reviews of our supply systems and implementation of maintenance and upgrade programs to maintain optimal performance. A new by-law to restrict new private groundwater supply wells in the City is proposed to manage groundwater quantity in the City.

CORPORATE STRATEGIC PLAN:

- 3.1 Ensure a well designed, safe, inclusive, appealing and sustainable City
- 3.3 Strengthen citizen and stakeholder engagement and communications

STAFF REPORT

FINANCIAL IMPLICATIONS:

The WSMP Update will be used as the basis for revisions to the Non-Tax Supported Capital Budget and Forecast for Water Services for 2015 to 2024. The capital budget forecast for new supply will be lower than estimated in the approved 2014 capital forecast budget due to the deferral of capital costs. The overall budget for water conservation will decrease, although there will be a slight increase for water conservation during the initial 5 years. The combined budget for new supply and conservation are expected to be lower over the 10-year capital forecast by approximately \$2.6M.

DEPARTMENTAL CONSULTATION:

A Technical Steering Committee consisting of representatives from Planning, Engineering, Wastewater, Water and Financial Services provided direction on the project. Staff from various departments provided input and reviews on the report.

COMMUNICATIONS:

The Project was implemented with an extensive community engagement program and public input has been used throughout the project consistent with the corporate community engagement framework. The draft Final Water Supply Master Plan Update Report was posted for the 30-day public review period as part of the Class Environmental Assessment process. Public comments from the review period have been incorporated into the report.

ATTACHMENTS

- ATT-1 Draft FINAL Water Supply Master Plan Update Report (Executive Summary)
- ATT-2 Draft FINAL Water Supply Master Plan Update Report (Full Report, 50 Mb, 945 pages) is available on the City web site - <http://guelph.ca/plans-and-strategies/water-supply-master-plan/>

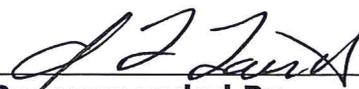
Prepared By:

Dave Belanger, M.Sc., P.Geo.
Water Supply Program Manager



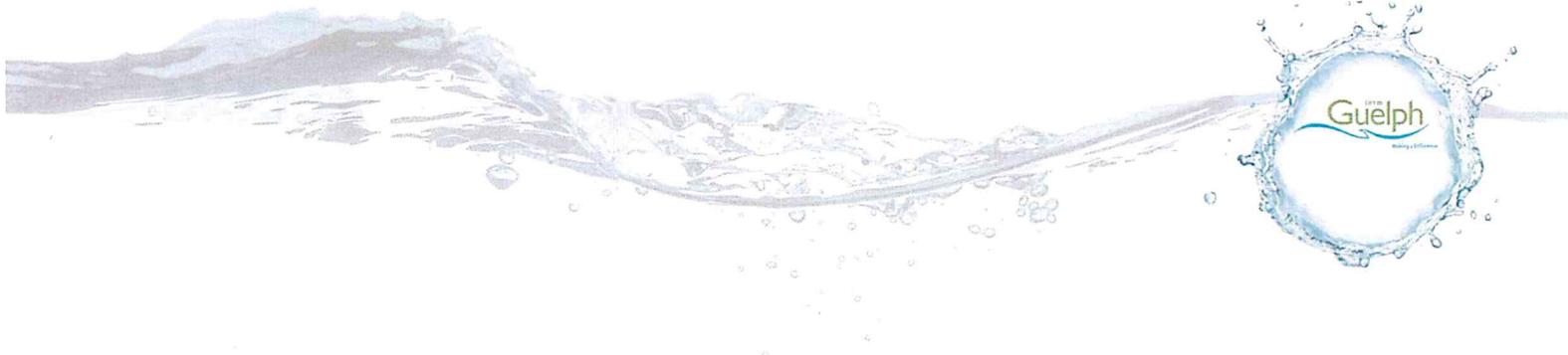
Approved By

Peter Busatto
General Manager
Water Services
519-822-1260, ext. 2165
peter.busatto@guelph.ca



Recommended By

Janet L. Laird, Ph.D.
Executive Director
Planning, Building, Engineering
and Environment
519-822-1260, ext. 2237
janet.laird@guelph.ca

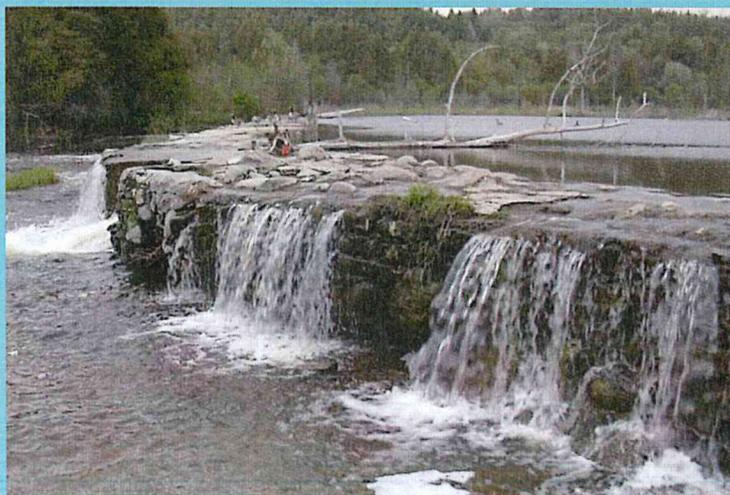
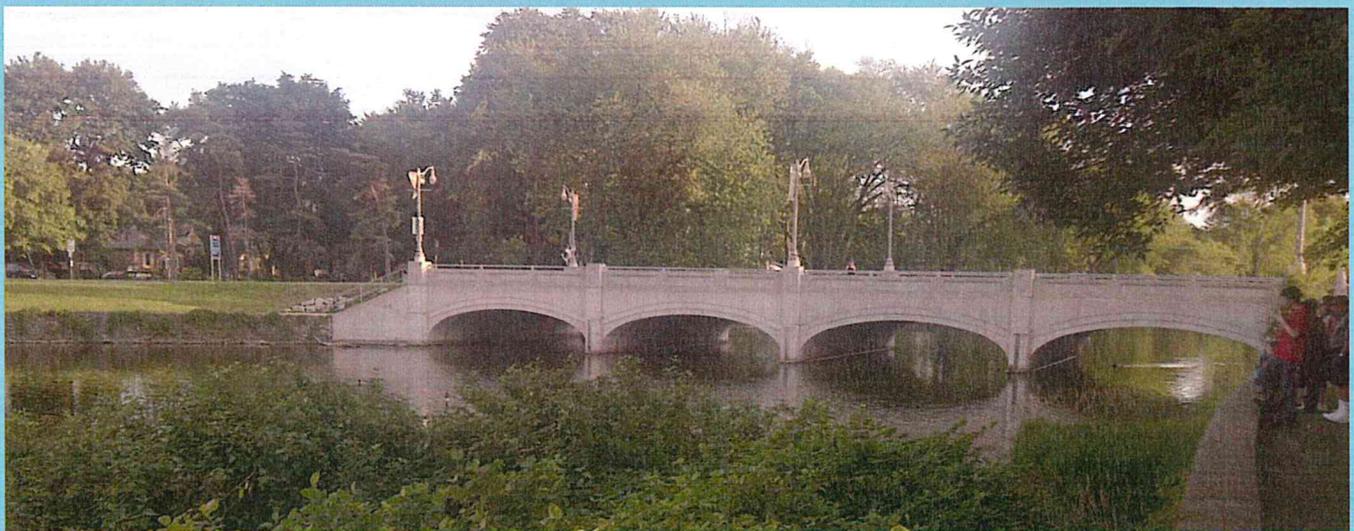


The Corporation of the City of Guelph

Water Supply Master Plan Update

(Draft Final Report) Executive Summary

May 2014



Prepared by:

AECOM



City of Guelph
**Water Supply Master Plan Update
Draft Final Report**

Prepared by:

AECOM

50 Sportsworld Crossing Road, Suite 290, Kitchener, ON, Canada N2P 0A4

Tel: 519.650.5313 Fax: 519.650.3424

www.aecom.com

Golder Associates Ltd.

6925 Century Avenue, Suite 100, Mississauga, ON, Canada L5N 7K2

Tel: 905.567.4444 Fax: 905.567.6561

www.golder.com

Project Number:

60287843

Date:

May, 2014

Executive Summary

ES-1 Background

In 2007, the City of Guelph (City) completed the Water Supply Master Plan (WSMP) project to ensure that the City's water supply continues to meet current and future demands. The purpose of this WSMP update is to review and revise the 2007 WSMP to make it consistent with the current needs of the City, covering a 25 year period from 2013 to 2038. The WSMP update builds upon the work previously completed taking into account more recent studies and the work activities completed over the past six years. This update reviews the 2007 WSMP recommendations as well as examines new water supply alternatives in accordance with the Class Environmental Assessment (EA) process for Municipal Water projects, resulting in the listing of recommended water supply projects, including phased implementation schedules and recommended Class EA Schedules. Class EA approvals for Schedule "B" and "C" projects can then be conducted by using the Master Plan as a starting point.

ES-2 Purpose Statement

Phase 1 of the Class EA planning process requires the proponent of an undertaking to first document factors leading to the conclusion that the improvement or change is needed, and ultimately, develop a clear statement of the identified problems, deficiencies or opportunities to be investigated. The Purpose Statement for the WSMP update was developed through communication with the public and stakeholders in the first round of consultation.

The City of Guelph is responsible for supplying clean, safe drinking water to its customers. The City has initiated an update to its Water Supply Master Plan (WSMP, 2007) that will define how we will continue to provide a reliable and sustainable supply of water to meet the current and future needs of all residents, industrial, commercial and institutional customers over the next 25 years. The updated Master Plan will identify individual projects required to implement the master plan and prioritize these projects based on need.

Today, our existing water supply fulfills the City's commitment to provide a safe and reliable supply of water. However, recent analysis confirms that the existing water supply system capacity will not meet future demands. Updating the WSMP is an opportunity to discuss with the community how best to manage this vital supply so that we continue to provide the high level of service Guelph residents have come to expect.

When investigating existing and new water supply options, including water conservation strategies, we will consider water quality and quantity, economic factors, environmental concerns and relevant regulations. Regardless of source, our water supply will continue to meet the service requirements of the Guelph community and the high regulatory standards of the Ontario Ministry of the Environment.

ES-3 Population/Water Demand Projections

ES-3.1 Population Projections

Population projections are required to determine future water supply requirements. The population projections presented herein combine non-residential and residential populations to develop a total 'equivalent' population. The equivalent population represents the projected residential population plus the additional population representative of

industrial, commercial and institutional (ICI) land use. This equivalent population forms the basis for developing existing and future water demands. Population growth projections to 2031 for the City are per the Official Plan, with details provided in the 2014 Development Charges Growth Forecast. In order to extend population projections beyond the current Official Plan planning period of 2031, City Planning staff provided forecasts of the Growth Plan from 2031 out to 2041. The population projections from 2013 to 2038 in five-year increments are presented in **Table ES-1**.

Table ES-1 Guelph Population Projections

Year	Residential Population (Including Census Undercount)*	Equivalent Employment Population (Excluding work at home and no fixed place of work)	Total Equivalent Population**
2013	130,670	66,730	197,400
2018	143,480	73,874	217,354
2023	156,290	81,017	237,307
2028	168,190	90,340	258,530
2033	178,464	96,947	275,411
2038	186,299	99,480	285,779

* Census undercount is estimated at approximately 3.5%.

** Projection excludes lands designated Reserve Lands, and Open Space/Park within Clair-Maltby Secondary Plan Area; Projection also excludes students which would not be captured within the permanent population base.

2013 to 2031 Source: (Watson & Associates Economists Ltd., 2013) –1.6% to 2% growth per year
2032 to 2038 Source: (Ontario Ministry of Infrastructure, 2012), (City of Guelph - Planning, Building, Engineering and Environment - Todd Salter, 2013) – 0.7% to 0.9% growth per year

ES-3.2 Water Demand Projections

Design Basis for Average Day Demands

The basis for projecting demands from the residential and employment sectors, as well as non-revenue water, is to assume the status quo applied to population projections, i.e. representative of per capita demands without influence of future conservation or non-revenue water reduction efforts. This baseline was used to measure the effect of potential future programs and their associated costs against the costs and efforts to provide new water supply.

Residential and Employment (ICI) consumption

The baseline demand for each of the residential and ICI sectors considered historical customer demand and analysis of recent trends over the past six years with consideration for whether the recent declines in per capita demands are sustainable for the purposes of projections. It was determined that the decrease in demand per capita in the residential sector is likely sustainable; whereas the decrease in the ICI sector may be partially attributed to economic factors. Therefore, the design rates in litres per capita per day (lcd) to apply to the future population were developed incorporating some contingency in the ICI unit rate:

- Residential – 180 litres per capita per day (lcd)
- Employment (ICI) – 286 lcd

These design values were applied to the projected populations from 2013 to 2038 to determine the future water demands for each sector assuming status quo in terms of water conservation efforts to date.

Non-Revenue Water (NRW)

The difference in water consumed by customers that is measured directly through utility billings and that which is pumped at water facilities to the water distribution system is classified as Non-Revenue Water (NRW). There are

three main categories of Non-Revenue Water (NRW): unbilled authorized consumption, apparent losses, and real losses. These all represent volumes of treated water for which the City does not receive revenue.

The average of the annual NRW volume for the period of 2006 to 2012 (5,550 m³/d) was used as the basis for projecting future losses along with additional anticipated losses as a function of new watermains and connections for servicing future growth.

Projected Average Water Demands by Sector

Table ES-2 presents the projected average day water demand in 5-year increments from 2013 to 2038, based on the design per capita demands.

Table ES-2 Projected Average Day Water Demand (2013-2038)

Year	Population			Demand by Sector			NRW (m ³ /d)	Average Water Demand (m ³ /d)
	Resid.	Employ.	Total Equiv.	Resid.	Employ.	Total		
2013	130,670	66,730	197,400	23,536	19,059	42,595	5,658	48,253
2018	143,480	73,874	217,354	25,843	21,100	46,943	6,175	53,117
2023	156,290	81,017	237,307	28,150	23,140	51,290	6,691	57,982
2028	168,190	90,340	258,530	30,293	25,803	56,096	7,208	63,305
2033	178,464	96,947	275,411	32,144	27,690	59,834	7,628	67,462
2038	186,299	99,480	285,779	33,555	28,413	61,969	7,903	69,872

Design Basis for Maximum Day Demand

The Ministry of the Environment (MOE) Guidelines for the Design of Water Distribution Systems dictate that water supply systems be designed to satisfy the greater of the maximum day plus fire flow or peak rate (maximum hourly demand). Fire flows and peak flows are typically provided in storage within a distribution system; and therefore, the pumping capacity of the water supply system is designed to meet maximum day demands. Through review of historical average demands by sector, reasonable estimates can be developed for projecting future demands. Similarly, historical information regarding peak demands in recent years can be evaluated to determine a design maximum day factor (MDF) for projecting future maximum demands. The maximum day factor is calculated as the maximum day demand divided by average day demand during a given year.

With the success of water efficiency measures and the implementation of outside water use restrictions in Guelph, the actual maximum day factors for the period of 2008 to 2012 ranged between 1.19 and 1.41, with an average of 1.26. Based on a review of historical data through the previous WSMP and more recent years, it is reasonable to continue to use a maximum day factor of 1.35 for projecting future maximum water demands.

Another consideration in determining future water supply requirements is to provide an allowance for events which could impact the existing supply capacity. A review of potential risks to the City's existing water supply system was completed to consider possible scenarios which could result in supply reductions such as a period of drought, and contamination or mechanical issues resulting in a large supply well being off-line. It was determined that under these two scenarios, the total existing water supply capacity is reduced by approximately 10 to 15%. Therefore, it is suggested that the City adopt a maximum day factor of 1.5 for the purposes of projecting future water supply requirements, with the difference from the actual maximum day demand (at a MDF of 1.5) to provide additional contingency in the supply system.

Projected Total Water Supply Requirements

The design basis developed for each component making up the total water demand and supply requirement was applied to the 25 year period of this study in 5 year increments to develop future water demand projections and water supply requirements, as indicated in Table ES-3 and Figure ES-1.

Table ES-3 Projected Total Water Supply Requirements (2013-2038)

Year	Total Average Day Demand (m ³ /d)	Max Day Demand @ 1.35 MDF (m ³ /d)	Water Supply Requirement @ 1.5 MDF (m ³ /d)
2013	48,253	65,141	72,379
2018	53,117	71,708	79,676
2023	57,982	78,275	86,972
2028	63,305	85,461	94,957
2033	67,462	91,074	101,193
2038	69,872	94,327	104,808

Note: MDF = maximum day factor

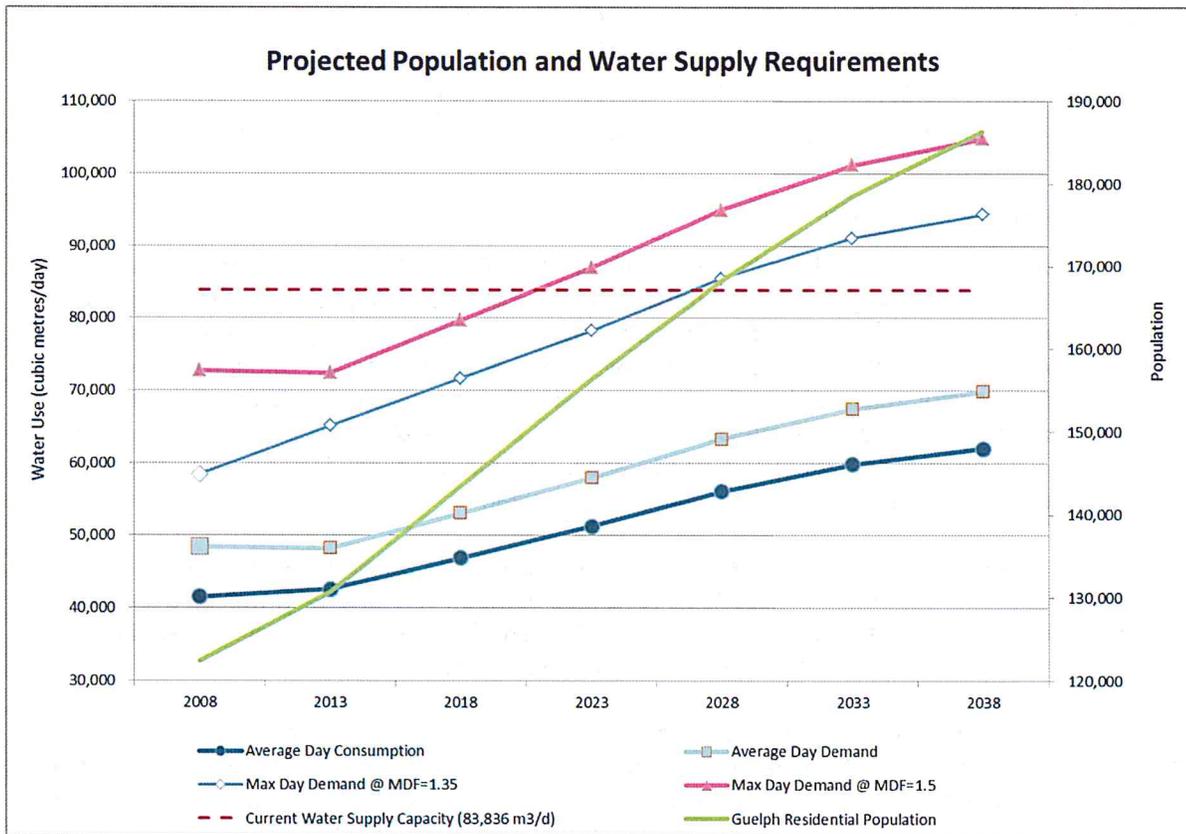


Figure ES-1 Projected Population and Water Supply Requirements

ES-4 Existing Water Supply System Capacity Assessment

The City of Guelph relies exclusively on groundwater to meet the City's residential and industrial, commercial and institutional (ICI) water demands. The City's groundwater supply system consists of 21 active wells constructed within overburden, shallow and deep bedrock aquifers and one active groundwater collection system (Arkell Infiltration Galleries - Glen Collector).

A detailed assessment of the existing maximum capacity of the existing water supply system was completed, which included determination of the maximum capacity of each individual well and to identify constraints to operating at the maximum; and assessment of the sustainable capacity of the existing water supply system (recognizing interference effects amongst the municipal wells). This review referenced the City of Guelph draft Tier Three Water Budget and Risk Assessment (Matrix Solutions Inc., 2013), herein referred to as the 'Tier Three Risk Assessment'. The objective of the Tier Three Risk Assessment is to evaluate the sustainability of the City's groundwater supply system from a quantity perspective, and to identify potential threats to that sustainability.

Evaluation of the existing system is completed with reference to the four quadrants of the City: Southeast, Southwest, Northeast and Northwest. Historical records (from 1997 through 2013) for each groundwater supply source and quadrant provided the daily pumping total, the monthly average of the daily production total, observed groundwater elevation and the permitted rate and maximum pumping elevations. Based on the review of groundwater pumping rate and groundwater elevation data, the capacity of each municipal groundwater supply source has been re-evaluated relative to the 2007 WSMP.

The total groundwater supply system capacity of the City's groundwater supply system was determined to be 83,836 m³/day. This represents an increase of 8,836 m³/day, relative to the available well capacity reported within the 2007 WSMP. The increase reflects additional permitted pumping from the new Arkell pumping wells (Arkell 14 and Arkell 15). It is noted that this estimate reflects normal operating conditions (i.e., non-drought conditions), and recognizes interference effects amongst the groundwater supply sources as well as other interferences such as that from continued pumping at the Dolime Quarry. Also taken into consideration are other physical constraints which potential limit the long term sustainable pumping rates of these supplies. A summary of the total water supply system capacity is indicated in the following table with comparison to the 2007 WSMP assessment.

Table ES-4 Existing Groundwater Supply System Capacity

Well Field	Well Name	Year Constructed	Permitted Rate (m ³ /d)	2007 WSMP Well Capacity (m ³ /d)	2014 WSMP Update Well Capacity (m ³ /d)
SWQ	Arkell 1	1966	3,273	2,000	2,000
	Arkell 6	1963	28,800	6,500	28,800
	Arkell 7	1963		6,500	
	Arkell 8	1963		6,500	
	Arkell 14	2000		n/a	
	Arkell 15	2000		n/a	
	Burke	1966		6,546	
	Carter 1	1962	7,855	5,500	5,500
	Carter 2	1962			
SEQ	Membro	1953	6,050	6,000	6,000
	Water Street	1953	3,400	2,700	2,700
	Dean	1958	2,300	1,500	1,500

Well Field	Well Name	Year	Permitted Rate	2007 WSMP Well	2014 WSMP Update Well
	University	1965	3,300	2,500	2,500
	Downey	1968	5,237	5,100	5,236
NEQ	Park 1	1937	10,300	8,000	8,000
	Park 2	1947			
	Emma	1931	3,100	2,800	2,800
	Helmar	1966	3,273	1,500	1,500
NWQ	Paisley	1952	3,200	1,400	1,400
	Calico	1976	5,237	1,100	1,400
	Queensdale	1970	5,237	2,000	1,100
Arkell Infiltration Galleries - Glen Collector			25,000	6,900	6,900
Total			122,108	75,000	83,836

ES-5 Water Supply Alternatives

The 2007 WSMP implementation plan set out a strategy for the City to investigate and execute the necessary steps to optimize existing and develop new water supplies, with a focus on local sustainability. City Council provided direction in 2003 “That the focus of the Water Supply Master Plan establish a sustainable water supply to regulate future growth”. This direction emphasizes the need for water supply to be sustainable. Public response to the 2007 WSMP helped shape that definition of sustainable to refer to available local water supplies, which included local groundwater and surface water sources.

The utmost importance was placed on water conservation and as a result, the City of Guelph has become a renowned leader in water conservation and demand management in Canada. Council has made this a priority by setting a goal “to use less energy and water per capita than any comparable Canadian city” through its 2007 Strategic Plan and Community Energy Initiative. It is the aim of this update to establish success achieved to date, and to determine reduction strategies and goals moving forward for comparison to other water supply alternatives.

Public feedback in 2007 indicated that the City first examine groundwater supply opportunities within the City’s boundaries in order to minimize potential impacts on its neighbours. Although groundwater flow does not respect geographic borders, impacts from pumping from aquifers may result in local impacts on the natural environment and also on private and municipal wells in close proximity. As a result, the City has since implemented a number of programs and studies to maintain and optimize existing supply facilities within the City and in areas of existing municipal well supply infrastructure, including:

- Completed construction of new well facilities (Arkell 14 and 15) and commencement of the Arkell Adaptive Management Plan and Operational Testing Program;
- Completed Class Environmental Assessment (EA) for the existing Burke Well facility;
- Commenced Class EA for the Guelph Southwest Quadrant Water Supply (on-going) which includes evaluation of existing supplies in that quadrant as well as new test wells; and,
- Completed treatability assessments of municipal wells which were previously taken off line due to water quality issues: Clythe, Smallfield and Sacco Wells.

Also included in the short to mid-term implementation strategy was the initiation of various hydrogeological investigations inside the City and just outside the City’s boundaries to explore the potential for new water supplies in these areas, including the Guelph South Groundwater Supply Investigation.

The City also initiated the following regional studies and plans to ensure the protection and long term sustainability of the existing water supply system:

- The Guelph Tier Three Water Budget and Local Area Risk Assessment is being completed to evaluate the sustainability of the City's water supply system from a quantity perspective and to identify potential threats to that sustainability. This study and the Tier Three computer model of Guelph's municipal aquifer system (in and outside the City) provide invaluable insights into reviewing the current water supply system and its reliability now and into the future.
- The Guelph Drinking Water Source Protection Plan was developed within a watershed context to identify and evaluate potential quality threats to the municipal supply system. The City, through the Lake Erie Source Protection Authority and with other municipalities within the Grand River Watershed, have developed policies to protect existing and future drinking water sources from unwanted impacts and harmful contaminants.

The objective of the WSMP Update is to continue to ensure that the City can provide an adequate and sustainable supply of water to meet the current and future needs of all customers over the next 25 years. The water supply demand forecast indicates that under a "do nothing" scenario with continued growth, the City would require an additional capacity of 20,000 m³/day to satisfy maximum day demand including an allowance for security of supply (approximately 10 to 15% of the total system capacity).

The following alternatives were developed and evaluated with respect to their capability to contribute to the total water supply solution. It is acknowledged each does not address the problem statement as a stand-alone alternative. Therefore, each alternative is discussed and evaluated on its own merit as part of the total solution.

ES-5.1 Water Conservation and Demand Management/Re-Use

The City of Guelph is known as one of the most proactive communities in Canada with respect to water conservation having implemented a wide variety of water conservation programs across all sectors since 1999. The City continues to implement water conservation programs to reduce demands within a Council approved cost-benefit framework that compares the cost to implement water reduction programs to the cost for developing new municipal water supplies, with consideration for the added benefits of also deferring wastewater treatment infrastructure and incurring energy savings.

Water Conservation Scenarios

In investigating future reduction scenarios and their associated costs, the City's water conservation staff reviewed the maximum potential of current programs, as well as potential for future additional programs. Five scenarios were developed; each consisting of a combination of possible water conservation and efficiency programs. Scenarios ranged from continuing with the current approved Water Conservation and Efficiency Strategy Update (WCESU) plan, to an aggressive scenario which considered all possibilities. The development of scenarios based on a number of possible initiatives was completed solely for the purpose of evaluating the cost and feasibility of various target reductions. The actual programs would be established through the next WCESU.

A summary of potential savings for each scenario is indicated in **Table ES-5**.

Table ES-5 Summary of Potential Savings for Each Scenario

Scenario	Total Potential Reduction in Average Day Demand (m ³ /day)	Implementation Period	Direct Program Costs	Total O&M Costs	Total Program Cost for Period
Scenario 1	5,556	2014 to 2025	\$5,685,930	\$10,217,564	\$15,903,500
Scenario 2	9,842	2014 to 2038	\$43,767,600	\$23,880,972	\$67,648,600
Scenario 3	9,690	2014 to 2038	\$24,597,600	\$23,880,972	\$48,478,600
Scenario 4	8,448	2014 to 2038	\$23,097,600	\$23,880,972	\$46,978,600
Scenario 5	7,419	2014 to 2038	\$22,553,100	\$23,880,972	\$46,434,100

The above water conservation scenarios were developed and reviewed to demonstrate the range of potential savings and associated costs of various combinations of programs, for discussion through public consultation. Further iterations of these scenarios were developed during the financial evaluation completed in developing the implementation plan.

Centralized Re-Use Alternative

The above scenarios do not include any programs related to Wastewater Reuse and Reclamation. Although pilot studies have been implemented for individual systems for grey water within the City, it is generally accepted that significant reductions from reclaim and re-use options will only be achieved through centralized facilities. Wastewater reclamation involves the treatment or processing of wastewater to make it suitable for reuse, with water reuse being the beneficial use of the treated water. Water reclamation and re-use has great potential to be an effective, efficient, sustainable way to meet water demands.

There are two options for centralized re-use or reclaimed water:

- Treatment to non-potable standards for landscaping irrigation and other non-potable uses through a dual plumbing system,
- Treatment to potable standards for use in the existing distribution system

Generally, due to the considerable challenges currently associated with the centralized re-use alternatives, these options are not implemented where there are alternative sources of fresh water as the costs of re-use options are prohibitive. However, as increasingly advanced treatment is required for wastewater to meet discharge requirements in future, these alternatives will become more attractive. In addition, it is expected that this eventuality will correspond to decreasing availability of local groundwater and surface water. While not considered as part of the conservation option in the 25 year study period, opportunities to incorporate reuse into future developments (e.g. purple pipe; dual plumbing systems) should be reviewed with a long term view to ensure its feasibility. It is recommended that this be considered when reviewing future expansion and treatment upgrades at the wastewater treatment facility.

ES-5.2 Expand Existing Groundwater Supply System

The approach undertaken in investigating opportunities for optimizing existing wells and developing new groundwater sources followed the direction provided through the consultation process in the 2007 WSMP. Public response indicated that the City should consider groundwater opportunities within the City boundaries prior to exploring outside the City. As noted in the 2007 WSMP, the development of new water supply sources in the Townships would require the concurrence of the Townships and the County of Wellington.

Furthermore, with use of the updated Tier Three computer model, the feasibility of higher pumping within the City is studied with respect to impacts on other supplies as well as potential environmental effects. The Tier Three Water Budget and Local Area Risk Assessment Study are referenced when seeking additional sources outside the City with consideration for available takings, and also known and anticipated impacts on the watersheds in close proximity. In general, although the Tier Three project is not yet completed, model-predicted impacts were found to be moderate for the south branch of Blue Springs Creek, Chilligo/Ellis Creek, and Hanlon Creek. Therefore, for the purposes of this WSMP Update, future groundwater supply sources investigated herein focussed preferentially on catchment areas along the Speed River and Mill Creek.

Each quadrant of the City has been studied extensively, with the City having completed monitoring and exploration programs in support of the existing operating wells and in reviewing feasibility of possible future sources. Of note is that the possible supply sources outside of the City boundaries considered in this WSMP update are limited to

approximately 5 km from the City's limits. This parameter was determined with consideration to limiting impacts on surrounding municipalities, as well as the practicality of connecting to the existing water distribution system. A general summary of potential new water supplies within each quadrant is provided as follows:

Southwest Quadrant (SWQ)

Following the recommendation in the 2007 WSMP, the City initiated a Class Environmental Assessment (EA) study to optimize existing and to develop new water supplies in the SWQ. This quadrant consists of the following existing operational wells: Downey, Membro, Water St., Dean and University Wells. It also includes the Edinburgh Well which was taken off-line due to water quality issues, and the Admiral Well which was initially developed for industrial use but not brought on line due to natural water quality issues. Through the Class EA study, two large diameter test wells (named 'Ironwood' and 'Steffler') were installed and tested over an extended period to determine potential capacity and to monitor the effects on other municipal and private wells, and surface water. Preliminary findings suggest that when the SWQ is considered as a whole, i.e. one wellfield, an additional taking of 4,500 m³/day can be achieved. This rate is in addition to that established as a maximum day sustainable pump rate for the SWQ of 17,800 m³/day. Therefore, a total objective for additional water supply from the SWQ of 4,500 m³/day is available whether through one or two new municipal wells, or through a combination of new wells plus optimizing existing including reactivating existing wells off-line requiring treatment.

Southeast Quadrant (SEQ)

The SEQ consists primarily of the Arkell wellfield which includes Arkell 1, 6, 7, 8, 14 and 15 Wells, as well as the Glen Collector System, and the Carter Wells. The City is currently demonstrating the sustainability of operating the Arkell bedrock wellfield with extensive monitoring for three years through an Operational Testing Program; results to date have confirmed the existing capacity of the Arkell bedrock wellfield of 28,800 m³/day and indicate no measureable impacts on the Blue Springs Creek watershed. A possible new source in the Arkell area is to reinstate the Lower Road Collection system which was taken off line due to regulated water quality concerns. It is anticipated that, although work is required to repair and construct the collector infrastructure, it would be acceptable to direct this water along with other wells and the Glen Collector to the aqueduct for ultraviolet irradiation (UV) disinfection at the Woods Pumping Station.

The City completed a Class EA study in 1994 investigating a new well supply near the Barber Scout Camp on Stone Road ('Scout Camp' Well) which was found to have naturally poor water quality.

Lastly, new potential water supply outside the City was reviewed using the Tier Three model. The hydrogeological conditions in the general area of Victoria and Maltby Roads suggest the possibility of a well with capacity of 4,000 to 6,000 m³/day in this area, with consideration given to preventing potential impacts to Mill Creek.

Northeast Quadrant (NEQ)

Existing operating wells in the NEQ include the Park and Emma Wells, and the Helmar Well. The Clythe Well is a municipal supply that was taken offline due to natural water quality issues. A Class EA is currently underway which will consider treatment options for reconnecting this well to the distribution system.

The City has previously installed and tested wells in the area of Eastview Road and Watson Road, referred to as 'Logan' and 'Fleming' test wells, located outside the City in the Township of Guelph-Eramosa. The results suggest the potential for a new municipal supply in this area of 4,500 to 6,100 m³/day.

Northwest Quadrant (NWQ)

Existing operational wells in the NWQ include the Paisley, Calico and Queensdale Wells. The City also has a test well referred to as the Hauser well with a proposed taking of 900 m³/day.

Two municipal groundwater supply sources (Sacco and Smallfield Wells) are currently permitted for operation, however, remain inactive and off-line since the mid-1990s due to groundwater quality concerns. Smallfield Well groundwater consistently contained Trichloroethylene (TCE) concentrations that exceeded the Ontario Drinking Water Quality Standards (ODWQS) maximum acceptable concentration (MAC) of 5 µg/L. Sacco groundwater quality comprised of detectable levels of both TCE and Tetrachloroethylene (PCE), but consistently below the ODWQS MAC. The potential well capacities for Smallfield and Sacco Wells are 1,408 and 1,150 m³/day respectively as concluded in the rehabilitation and performance assessment in 2008.

The Tier Three report suggested that the Ellis Creek Watershed may be under moderate stress, and therefore any new potential takings in the NWQ beyond the existing municipal active, off-line and test wells previously mentioned should be located preferentially to avoid potential impacts to Ellis Creek. In modeling scenarios, a possible new well source was located closer to the Speed River at Sunny Acres Park where it was determined that an estimated 1,500 m³/day may be available.

Beyond the City boundary, a potential new supply was considered in the general area of Conservation Road west of Highway 6. Through Tier Three modeling, a long term average pumping rate of 4,600 m³/day could be supported which suggests the possibility of a well with a maximum day capacity of 6,200 m³/day. It is anticipated that a well in this area would have good water quality.

Groundwater Alternatives

After reviewing existing and future well supplies on a quadrant basis and understanding operational and environmental constraints, the potential groundwater opportunities for expansion of the existing supply system are grouped into the following alternatives:

- Optimize existing operating municipal wells
- Restoration of existing off-line municipal wells
- Develop existing municipal test wells
- Install new wells inside City boundaries
- Install new wells outside City boundaries
- Install new ASR wells inside City to optimize excess Arkell Collector system volumes

Optimize Existing Operating Municipal Wells

An extensive assessment of existing municipal production wells was undertaken to determine sustainable concurrent water takings from all supplies, and to identify wells where upgrades and/or modifications to the well itself or the well system could be considered to improve the well performance, water quality and general security of the source. In general, 'optimizing' existing wells requires a review of operational and maintenance activities for the current facilities to ensure that the potential hydrogeological capacity can be achieved as required to meet peak demands.

The only well identified as possibly having more capacity available as compared to its current Permit to Take Water (PTTW) is the Downey Well which could potentially pump at a rate 6,000 m³/day. The potential for increasing the capacity of the Downey well will be reviewed within the SWQ Class EA.

Restoration of Existing Off-line Municipal Wells

This alternative includes wells which have existing Permits to Take Water (PTTW) but the City has discontinued use due to concerns over existing issues with water quality, either elevated at present or a noted increasing trend. In general, these wells require upgrades for water quality treatment and to provide the required disinfection contact time. Most of these facilities will require completion of Class Environmental Assessment (EA) studies to establish

recommended treatment systems. The total increase in potential quantity available from these wells ranges from 8,000 to 14,000 m³/d. **Table ES-6** summarizes the capital cost estimates for implementation.

Table ES-6 Cost Estimate to Restore Existing Off-line Municipal Wells

	Clythe	Smallfield	Sacco	Edinburgh	Lower Road Collector	Admiral
Potential Capacity (m³/d)	3,395	1,408	1,150	3,000	2,000	500
Total Cost	\$4,809,000	\$3,820,000	\$4,135,000	\$6,029,000	\$9,161,000	\$2,998,000
Cost per m³/d	\$1,400	\$2,700	\$3,600	\$2,000	\$4,600	\$6,000

Develop Existing Municipal Test Wells

An extensive review and assessment of existing municipal test wells was undertaken to determine potential well yields and treatment requirements. Due to the information available from previous studies including pumping tests and water quality testing, there is more certainty regarding these alternatives in regards to location, potential yields and treatment requirements. The City can move more readily to the next steps including Class EA and treatability studies, should these be part of the recommended solution. The total increase in a potential quantity available from these wells is from 14,800 m³/d (includes only 4,500 m³/d from SWQ wells). **Table ES-7** summarizes the cost estimate for implementation.

Table ES-7 Cost Estimate to Develop Existing Municipal Test Wells

	NEQ Fleming/Logan	SEQ Scout Camp	SWQ Steffler	SWQ Ironwood	NWQ Hauser
Potential Capacity (m³/d)	4,714	5,789	3,600	8,000	900
Total Cost	\$4,735,000	\$4,702,000	\$3,252,000	\$4,036,000	\$3,691,000
Cost per m³/d	\$1,000	\$800	\$900	\$500	\$4,100

Develop New Wells Inside Existing City Boundary

Using the Tier Three groundwater flow model, analyses was completed to identify new potential groundwater supply source locations within the City. Due to interference effects amongst existing groundwater supply sources as well as new proposed supply sources (off-line wells and test wells), it is advised that additional new supplies within the remainder of the City are limited. For example, less than 10 metres of further groundwater level drawdown is available within the Gasport Formation in the northeast end of the City. In the northwest portion of the City, potential concerns are related to lower aquifer hydraulic conductivity and further stress of the Chilligo/Ellis Creek catchment area. Recognizing these constraints, only one new well inside the City is proposed located in or near Sunny Acres Park, located along Edinburgh Road approximately 600 metres north of the Speed River. The rationale for this location is its proximity to an area with high transmissivity within the Gasport aquifer. Due to the limited available drawdown at this location (approximately 7 m), the estimated capacity of a well in this area ranges from 1,000 m³/day on an average basis to 1,500 m³/day to meet maximum day demands. The cost estimate for implementation is \$4,522,000, resulting in a cost per capacity of \$3,015/m³/day.

Install New Wells Outside City Boundaries

The Tier Three groundwater flow model was used to review potential for new water supply outside the City. Areas with potential for future groundwater supply sources were focused within Mill Creek (southeast of the City), Marsden Creek (north of the City) and Speed River (northeast of city) catchment areas. Groundwater modelling analysis concluded that additional groundwater supplies (ranging from 3,500 to 5,000 m³/day on an average basis) can potentially be established within each of these respective areas, without significantly changing base flow rates encountered at the nearby watercourses. Two areas were evaluated including Guelph South (Victoria Road and

Maltby Road) and Guelph North (Conservation Road). The total increase in a potential quantity available from these wells is 11,500 m³/d. **Table ES-8** summarizes the cost estimate for implementation of these two well supplies.

Table ES-8 Cost Estimate for Guelph South well and Guelph North well

	Guelph South	Guelph North
Potential Capacity (m ³ /d)	5,281	6,291
Total Cost	\$5,185,000	\$5,289,000
Cost per m ³ /day	\$990	\$840

Arkell Collector System ASR Wells

Review of the current Glen Collector system and off-line Lower Road Collector system flows indicates high seasonal variability, with elevated flows in the spring which do not correspond to a period of corresponding demand. As a result, these flows cannot be considered as part of the maximum daily supply capacity. For the purposes of reviewing feasibility of an alternative that captures some of the excess flow available from these collector systems, it was assumed that an excess of 10,000 m³/day would be available continuously for a period of 4 months. It is also assumed that the Lower Road Collector system is repaired and placed back online.

The advantage of this alternative is that a surface water treatment plant would not be required as it would be if water was taken directly from the Eramosa River. The additional seasonal volumes from the collector systems would be discharged to the aqueduct to combine with other Arkell wellfield supplies for disinfection at the Woods Pumping Station (PS). However, rather than shutting off the other Arkell wells while these high seasonal volumes are available, all will continue to be pumped and subsequently stored to recover as required to meet demands. The additional volume would be pumped into the distribution system and obtained similar to a large customer demand at two ASR wells for injection and storage in the aquifer. It is anticipated that the ASR wells would be located in the area of the Park and Emma wells where the high transmissivity would allow for optimization. It is assumed that two wells would be required, each capable of injection at 5,000 m³/day. Based on the above assumption of 10,000 m³/day over a four month period, this results in a potential supply capable of 3,300 m³/day. The cost estimate for implementation is \$9,954,000, resulting in a cost per capacity of \$2,700/m³/day.

ES-5.3 Establish New Local Surface Water Supply

Two possible local surface waters for assessment of volume available for taking water on a continuous or seasonal basis include the Speed River (at Guelph Lake) and the Eramosa River. Surface water must either be treated to provide a continuous flow into the distribution system, or alternatively, volumes of water can be taken from the surface water when available, treated and stored underground in aquifers. This option is referred to as an aquifer storage recovery (ASR) system. The supply capacity available from this source on a continuous basis is equal to the volume taken from surface water when available and treated and injected, and then removed over the period of a full year.

For both continuous flow and ASR approaches, construction of a water treatment plant (WTP) is required to fully treat the surface water to meet Ontario Drinking Water Quality Standards (ODWQS). In the first option, the WTP is sized to treat a continuous input to the plant with direct discharge to the City's distribution system. In the second option, the WTP would be required to treat varying flows ranging from the continuous flow requirement to the maximum design capacity based on high seasonal flows.

To evaluate potential quantity available through this alternative, the Grand River Conservation Authority (GRCA) was contacted for their expert opinion on this managed watershed. The GRCA undertook an evaluation of the Speed River (at Guelph Lake) and the Eramosa River (at Arkell) to determine the water volumes available throughout the

year, utilizing historical flow information and modeling tools. It was determined that only the Guelph Lake option provided a reasonable surface water alternative for continuous and seasonal flows. Through this evaluation, a base level water taking was established which would be available year-round, while maintaining minimum river flows in the rivers and minimizing potential environmental impacts of reducing total river flows. The GRCA also reviewed historical records to establish reliability of taking additional volumes during times of higher river flows.

Historical water quality information for the Speed River was referenced to determine treatment processes required to achieve drinking water quality. Conventional treatment is required with treatment for taste and odour on a seasonal basis, as necessary. The proposed WTP has been sized to accommodate the following alternatives at Guelph Lake:

- continuous taking of 150 L/s – Municipal Base Taking
- maximum taking of 300 L/s – ASR option

The total increase in a potential quantity available from a surface water treatment and ASR system based on after-treatment flows is 25,825 m³/d. This can be viewed as two alternatives, the first being a continuous surface WTP, and the second an expansion to the WTP and development of the ASR well system. The costs and capacities shown are for two independent alternatives. **Table ES-9** summarizes the cost estimate for implementation of the surface water alternatives.

Table ES-9 Estimated Capital Costs to Develop Surface Water Alternatives

	Guelph Lake WTP	Guelph Lake WTP + ASR
Potential Capacity (m ³ /d)	12,312	25,825
Total Cost	\$36,708,000	\$78,905,000
Cost per m ³ /day	\$3,471	\$3,055

ES-6 Environmental Assessment Process

Evaluation criteria were developed based on the environmental components that address the broad definition of the environment described in the Environmental Assessment Act, as summarized in **Table ES-10**.

Table ES-10 Evaluation Criteria Components Summary

Component	Criteria
Built Environment	<ul style="list-style-type: none"> • Effect on existing and/or planned residences, businesses, community, institutional or recreational facilities • Effect on private and municipal wells
Natural Environmental	<ul style="list-style-type: none"> • Effect of construction and operation on aquatic and terrestrial species & habitat • Effect on surface water quantity and quality
Social/Cultural Environment	<ul style="list-style-type: none"> • Ability to meet municipal and provincial growth targets • Public acceptance • Effect of noise/vibration on sensitive receptors • Effect on cultural heritage landscapes and built heritage resources • Effect on potential archaeological resources
Financial Considerations	<ul style="list-style-type: none"> • Estimated capital costs; capital cost per capacity • Estimated operation and maintenance costs • Life cycle cost (per volume produced)
Legal/Jurisdictional Considerations	<ul style="list-style-type: none"> • Location inside vs. outside of City boundaries
Technical Considerations	<ul style="list-style-type: none"> • Constructability

Component	Criteria
	<ul style="list-style-type: none"> Potential productivity and reliability Water treatment requirements Approval requirements

Each potential alternative was assessed using a consistent approach and evaluation criteria along with specific indicators for each. The evaluation was qualitative – not a numerical ranking system – and considered the suitability of alternative solutions and strategies based on significant advantages and disadvantages. The summary evaluation tables (in the full report) provide an overall recommendation for each of the alternatives which can be compared to the other alternatives. This provides a means to rank the alternatives to allow for incorporation into an implementation plan in order to meet the water supply requirement to 2038. The alternatives are listed in **ES-11** in order of the priority as determined by the summary outputs:

Table ES-11 Summary of Evaluation Outputs

Alternative	Ranking	Comments
1A – Conservation & Demand Management	1	Strong public support for continued and enhanced water conservation; target reduction explored further through financial analysis
2B – Groundwater: Existing Municipal Off-line Wells	1	Support for optimizing water takings within the City; order of implementation to be determined by the City with consideration for regulatory, treatment, financial constraints
2C – Groundwater: Municipal Test Wells	1	
2D – Groundwater: New Well inside City	1	
2F – Arkell Collectors & ASR Wells	2	ASR alternative requires additional feasibility investigation with respect to Eramosa River PTTW optimization; water volumes available via collector systems; need to install ASR wells vs. changing existing well permits to allow for flexible takings
2E – Groundwater: New Wells outside City	2	Incorporates Townships' staff and public response to maximize water takings inside the City before pursuing wells in the Townships
3A – Surface water: Guelph Lake Water Treatment Plant	3	While this alternative is not required to provide water supply within the 25 year study period, the City will track timeline to determine 10 year lead-in required prior to implementation; Speed River/Guelph Lake water taking requires GRCA policy approvals
3B – Surface water: Guelph Lake Water Treatment Plant & ASR Wells	3	
1B – Re-Use – Centralized	3	Potential of this alternative to be explored further; highly dependent on end use customer demand; integration and alignment with future WWTP treatment requirements
Limit Growth	4	This alternative does not meet the Study Problem Statement and contravenes the Official Plan
Do Nothing	4	This alternative does not meet the Study Problem Statement and contravenes the Official Plan

Figure ES-2 compares the implementation of all of the water supply alternatives to the water demand curve with and without conservation to 2038. It can be seen that with conservation, the groundwater options ranked first ('1') are sufficient to satisfy the demand in the study period.

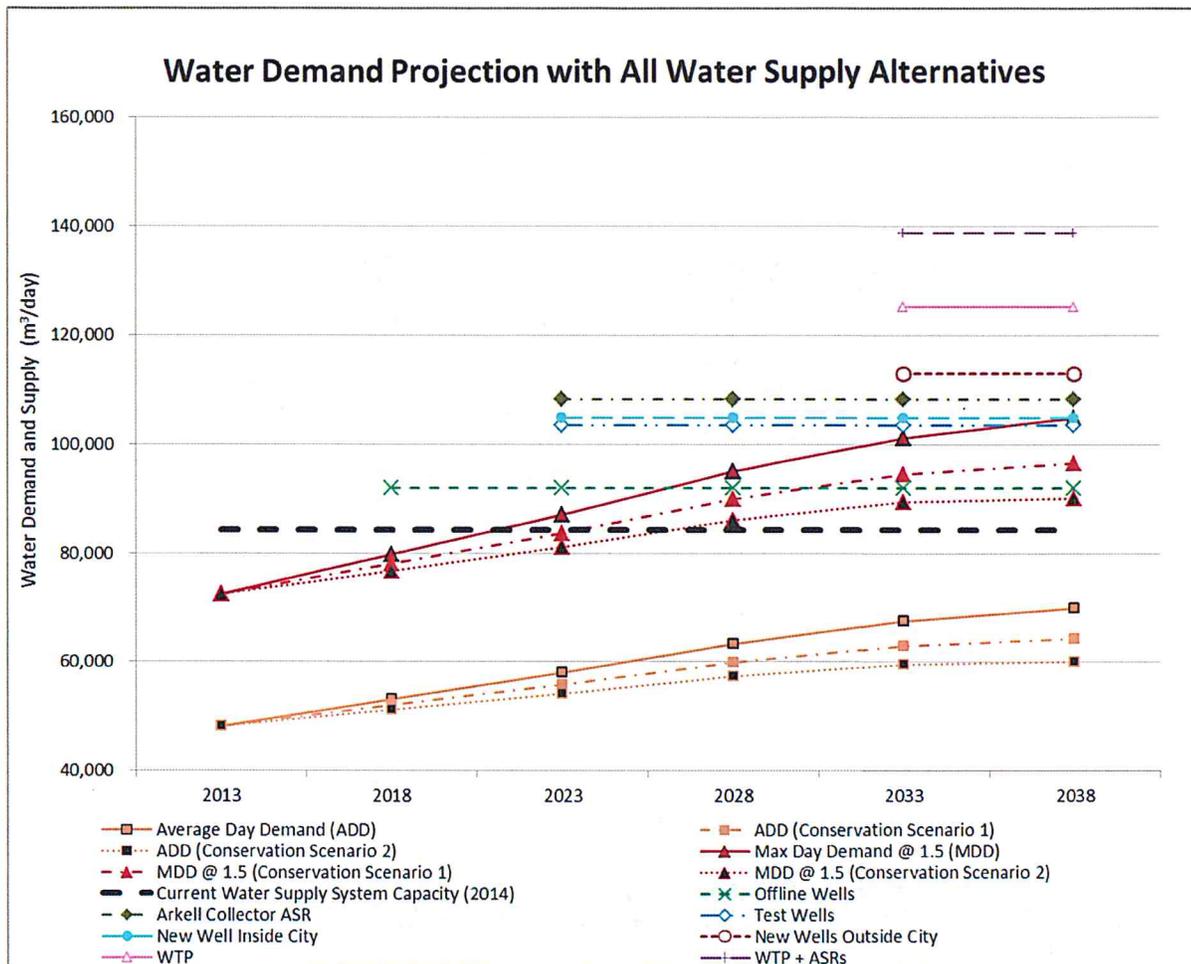


Figure ES-2 Water Demand Projection with All Water Supply Alternatives

ES-7 Public Consultation Plan/Outputs

Communications and consultation activities formed a key component of the process to develop the Guelph Water Supply Master Plan (WSMP). Community input is an essential part of the Water Supply Master Plan update process. People care about where their water comes from, and they want to see a safe and sustainable supply maintained for present and future generations. With this in mind:

- **Pre-consultation Interviews** were held with select community members and prospective Community Liaison Committee members to understand perspectives related to water supply and to confirm community engagement needs.
- A **Community Liaison Committee (CLC)** was established to advise and provide feedback to the project team throughout the process;
- A **Municipal / Agency Workshop** provided crucial inputs from a government and approval agency perspective;

- Two public **Open Houses** were held during the course of the study, giving community members an opportunity to discuss the project with the Study Team and provide comments;
- Presentations and discussion related to the WSMP update were included at four meetings of the Water Conservation and Efficiency Public Advisory Committee;
- Presentations were made at the Puslinch Township and the Guelph Eramosa Township Councils' meetings at their request; and,
- **Guelph Water User Survey:** Expectations of Service was completed in early 2014.

Figure ES-3 illustrates the communications and consultation activities undertaken as part of the EA process for the Guelph WSMP.

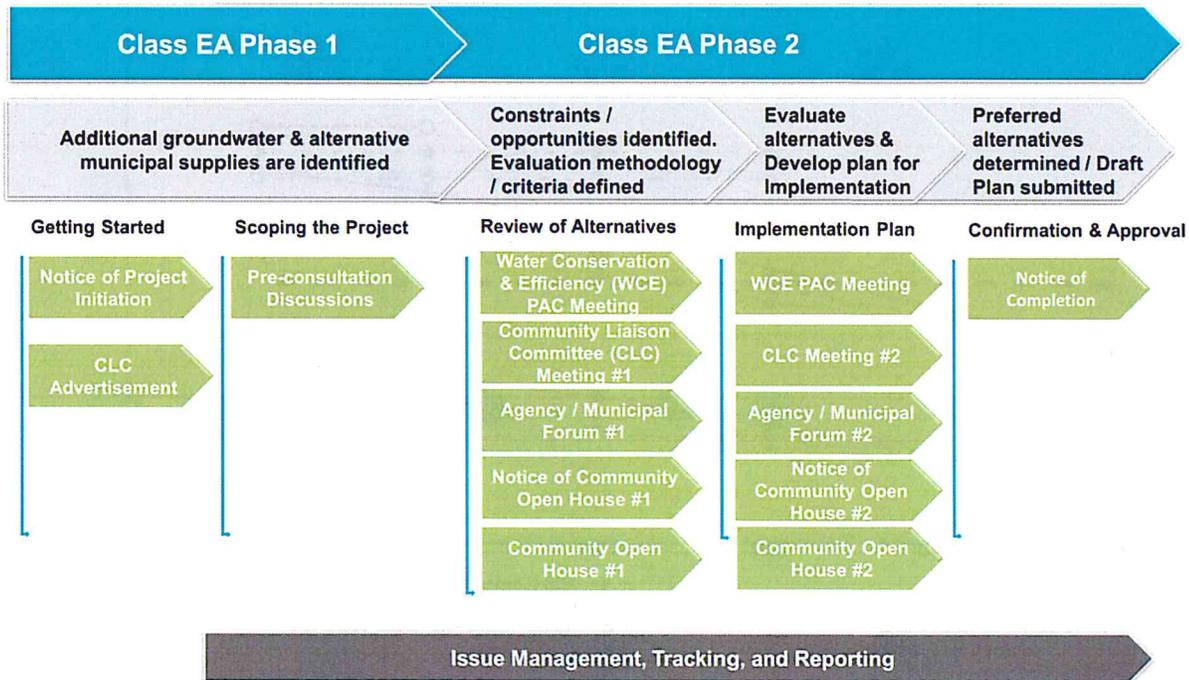


Figure ES-3 Consultation Process

Overall the public was pleased to be informed and to participate in this study. The main points of discussion at the Community Open Houses were water conservation programming, the impact of major water users on the water system, source water protection and water quality. The quality of questions and the engagement of those present at the Community Open Houses was a positive indicator of the interest in water supply issues within the City of Guelph and the surrounding area.

The additional consultation offered and provided to the Townships at their request was also well received and provides a good starting point for future discussions around the potential for new wells to be located just outside the City's boundaries in the neighbouring Townships. Township representatives raised concerns regarding source protection issues and potential constraints on land uses resulting from new water supplies.

ES-8 Implementation Recommendations

ES-8.1 Implementation Approach

Based on the evaluation outputs for each of the alternatives, a timeline and budget was to be established for implementation of the preferred alternative. This strategy included a financial analysis for determining the optimum conservation scenario when considered with the need for new water supply sources. This analysis takes into consideration the following:

- Timeline and costs associated with each alternative – including technical investigations, water quality analysis, environmental impact studies, land acquisition, preliminary and detailed design, and construction and commissioning. The timeline allowed in advance of water supply availability is as follows:
 - Groundwater - 5 year timeline
 - Arkell Collector ASR wells – 8 year timeline
 - Surface Water/ Surface Water + ASR wells – 10 year timeline
- The exception to the above is that the investigative phase for all of the test wells and inside-City groundwater options is scheduled to occur earlier so that the City has sufficient information to determine whether the alternative is feasible, to identify any constraints, and to confirm capacity and treatment requirements prior to the next WSMP update.
- An assumed order of groundwater projects based on the following priorities:
 - water supply sources currently included in on-going Class EAs pursuant to recommendations from the 2007 WSMP: Southwest Quadrant (e.g. Ironwood test well); and Clythe Well
 - test well with high potential for large volume production and low anticipated treatment requirements (i.e. lower costs) – Logan test well
 - off-line wells - Sacco Well; Smallfield Well
 - upgrades to Lower Road Collector System – although at a higher per capacity cost, this must be done in advance of the Collector System/ASR well project
 - new well in City
 - test wells with lower certainties – Scout Camp test well; Hauser test well
 - Collector Systems & ASR wells – longer lead-in time to allow for feasibility review; also Lower Road Collector System would require upgrades prior to implementation.

It is important to note that the assumptions made to the above prioritization were for the purpose of determining the requirement for new supplies against the demand curve in comparison to varying conservation scenarios. Most of these projects would be in investigation and design phases concurrently and the schedule for each would be a function of constraints and ease of implementation.

- Provide a schedule for implementation such that supply is always greater than 90% to ensure sufficient capacity for proposed development commitment, and industrial/commercial applications, as well as to respond to large increases in demand by current customers. This flexibility is important to address growth needs or demands that do not follow the planned demand projection. This 90% trigger is not to be compared to the redundancy and security of supply allowance which is included in the design maximum day factor of 1.5.

ES-8.2 Recommended Water Conservation Strategy

A number of conservation scenarios were explored in order to establish the cost associated with varying combinations of possible programs. As discussed, five original scenarios were developed to represent a range of possible target reductions and associated costs. With reference to these five scenarios, three were included in the financial evaluation as shown in **Table ES-12**. Current WCESR Approved Programming represents Scenario 1; Maximum Water Conservation represents Scenario 2; and Enhanced Water Conservation is a variation on Scenarios 3 to 5 developed through a closer review of the overall costs and reductions. Under the Base Case without any spending on water conservation, natural savings in water demand are forecasted due to improving building standards (changes in 2014 Ontario Building Code), and consumer reaction to real increases in the price of

water. Each of the water conservation scenarios explored will delay the need to implement proposed projects for increasing the water supply, assuming that the conservation is successfully implemented to achieve the desired targets.

Table ES-12 Water Conservation Scenarios

	Timing	Reduction in Average Day Demand (m ³ /d)	Total Program Cost (Non-Discounted)
Base Case	NA	990	–
Current WCESU Approved Programming	2014 to 2025	5,556	\$5,685,930
Enhanced Water Conservation	2014 to 2038	9,147	\$13,864,780
Maximum Water Conservation	2014 to 2038	9,842	\$42,267,600

This analysis compares the forecasted impacts of different water conservation scenarios on the demand for potable water, the timing of the City's proposed water supply projects, and the City's capital spending and operating expenditure on water supply projects and water conservation. Water conservation allows water supply projects to be delayed and/or avoided within the 25 year study period. This is because as increased water conservation is achieved, per capita demand is reduced, lowering overall water demand. If overall demand is lowered, the City's current water sources will meet demand for a longer period of time before more sources are needed to meet an increased overall demand.

The forecasted timing of proposed water supply projects under the different scenarios is presented in **Table ES-13**. The indicated year is when the new source is required to be on-line; as indicated earlier, there is a timeline for implementation including investigation, Class EA studies, design and construction prior to the year that the new supply is required.

Table ES-13 Timing of Proposed Water Supply Projects under Different Conservation Scenarios

Project No./ Order of Implementation	Project Name	Timing			
	Base Forecast	Base Case	Current WCESU Approved Programming	Enhanced Conservation	Maximum Conservation
Project 1	SWQ (Ironwood test well)	2015	2017	2019	2019
Project 2	Clythe Well	2018	2022	2024	2024
Project 3	Logan test well	2020	2025	2027	2027
Project 4	Sacco Well	2022	2026	2029	2029
Project 5	Smallfield Well	2023	2027	2030	2030
Project 6	Lower Road Collector System	2023	2028	2031	2032
Project 7	Sunny Acre (new well inside City)	2025	2029	2033	2035
Project 8	Scout Camp test well	2026	2030	2036	2038
Project 9	Hauser test well	2027	2033	Post 2038	Post 2038
Project 10	Arnell Collector ASR wells	2028	2034	Post 2038	Post 2038
Project 11	Guelph South (new well outside City)	2030	2038	Post 2038	Post 2038
Project 12	Guelph North (new well outside City)	2034	Post 2038	Post 2038	Post 2038

Project No./ Order of Implementation	Project Name	Timing			
	Base Forecast	Base Case	Current WCESU Approved Programming	Enhanced Conservation	Maximum Conservation
Project 13	Guelph Lake WTP	2038	Post 2038	Post 2038	Post 2038
Project 14	Guelph Lake WTP and ASR wells in Northeast Quadrant	Post 2038	Post 2038	Post 2038	Post 2038

The timing of new water supply projects is dependent on the City's overall demand for water and is different under each of the four water conservation scenarios. This in turn impacts capital and operational spending. The capital spending on water supply projects is combined with the spending on water conservation to result in a net present value of cost for each of the four different water conservation scenarios, presented in **Table ES-14**.

Table ES-14 Present Value and Reduction in Average Day Demand for Conservation Scenarios

	Reduction in Average Day Demand (m ³ /d)	Present Value (PV) Cost of System
Base Case	990	\$78,260,000
Current WCESU Approved Programming	5,556	\$58,696,000
Enhanced Water Conservation	9,147	\$59,959,000
Maximum Water Conservation	9,842	\$75,467,000

Based on the completed financial analysis, the Enhanced Water Conservation Scenario is recommended for implementation. This scenario will result in a target for reduction in average day demand of 9,150 m³/d by 2038. Although the water conservation programs included in the Enhanced Water Conservation Scenario are not fully specified to allow for flexibility in subsequently determining the best strategy for achieving the water conservation target, it is important to note that rate reform is a key driver of water conservation in the enhanced scenario. If the City does not proceed with rate reform, it will likely be difficult to hit the specified water conservation target, which would consequently necessitate additional water supply projects within the study period to meet the required system capacity.

ES-8.3 Preferred Water Supply Alternative

The preferred water supply alternative consists of the Enhanced Water Conservation Scenario as well as Projects 1 through 8 listed as identified in **Table ES-15**. These are all groundwater projects included in the first ranked alternatives in the evaluation process, consisting of existing municipal off-line wells, existing municipal test wells, and a new well inside the City. A recommended implementation strategy for all required projects is provided in detail in the full report.

Table ES-15 Preferred Water Supply Alternatives

Alternative	Evaluation Ranking	Projects
1A – Conservation & Demand Management	1	Enhanced Water Conservation Scenario
2B – Groundwater: Existing Municipal Off-line Wells	1	1. Southwest Quadrant well (e.g. Ironwood test well) 2. Clythe Well 3. Logan test well 4. Sacco Well 5. Smallfield Well 6. Lower Road Collector System 7. Sunny Acre (new well inside City) 8. Scout Camp test well
2C – Groundwater: Municipal Test Wells	1	
2D – Groundwater: New Well inside City	1	

It will be important for the City to closely track the success of the water conservation program to ensure that the predicted reductions are being achieved, and to be able to trigger the initial phases of supply projects noting the lengthy lead-in time to complete all of the necessary investigations, approvals and design such that the water is available when needed. The City may decide to take a more conservative approach to complete more of the preliminary steps in advance to allow for a shorter final implementation time required for final construction and commissioning once triggered. This would also assist in identifying project issues early, and also securing land requirements.

ES-8.4 Recommendations

Planning Recommendations

The estimated water supply demand in any given future year is based on the projected residential population and employment numbers for that year multiplied by design values for unit consumption. Actual demand averaged over time generally follows a similar linear trend. In reality, however, required water supply capacity is subject to planning applications for developments which require commitment of a large volume at one time regardless of the timeline for construction or when the demand will be realized, and proposals from industries which may require a large volume in a short period of time. These planning obligations present challenges for infrastructure planning as they can result in expediting water supply projects and the associated budgets to bring water supply on-line prior to when it is actually needed, or conversely use up available capacity on an accelerated schedule that was intended for future growth. This can be partially addressed by including a conservative trigger for bringing on-line new supply capacity (e.g. at demand/supply of 90%). However, optimizing the schedule for water supply capacity planning may also be addressed through appropriate planning policies that ensure the City has suitable lead-time and budgets in place for required supplies. As such, it is recommended that the City review its planning and approvals process for managing allocation of water supply capacity.

Future City policies addressing water supply may address these challenges as follows:

- Build on the current process and guidelines for review of applications from new large volume users (e.g. industry), which considers a balance of employment and water use.
- Investigate more robust policies for supply capacity allocation for both new and existing customers that take into account the relatively large capital expenses and lengthy timelines required to fully commission new water supply facilities. These policies would ensure maximum value to the City for supply capacity allocated to both new and existing customers.
- Develop a tracking system to closely monitor conservation successes and whether results are in-line with the forecasted demand for the preferred scenario.
- Consider time limits on development commitments such that water capacity is not ‘held’ for long periods of time.

- Determine a consultation and approval process for existing customers to request additional large volumes of water takings, to avoid sudden and unexpected increases in demand.
- Review possible mechanisms to synchronize approvals of significant capacity increases with the proposed timing of new supplies in accordance with the master planning schedule.
- Assess the Development Charges planning process for the ability to provide flexibility in funding.

Supply Capacity Management Recommendations

The supply capacity in any given year is dependent on the existing water supply system to deliver the optimal capacity from each of the municipal wells or collector system. Maintaining the system for optimal capacity requires regular reviews of system capacity and consideration of potential threats in quantity and quality. The City's Source Protection Program under the Clean Water Act is expected to protect and improve the quality aspects of the existing water supply system. The following are recommendations to manage the maintenance of water supply capacity:

- Water Services should conduct annual reviews of each component of the water supply system to determine the supply capacity and to identify any changes in the capacity from previous years or any constraints in delivering the optimal supply capacity;
- Based on the annual reviews of water supply capacity, Water Services should develop programs and implement maintenance and upgrades to the water supply system so that the system can deliver its optimal supply capacity;
- To protect water quantity and to mitigate potential impacts on quantity from other water takings, the City should consider implementing a municipal by-law to restrict new private groundwater supply wells in the City as well as other areas where municipal water services are present.

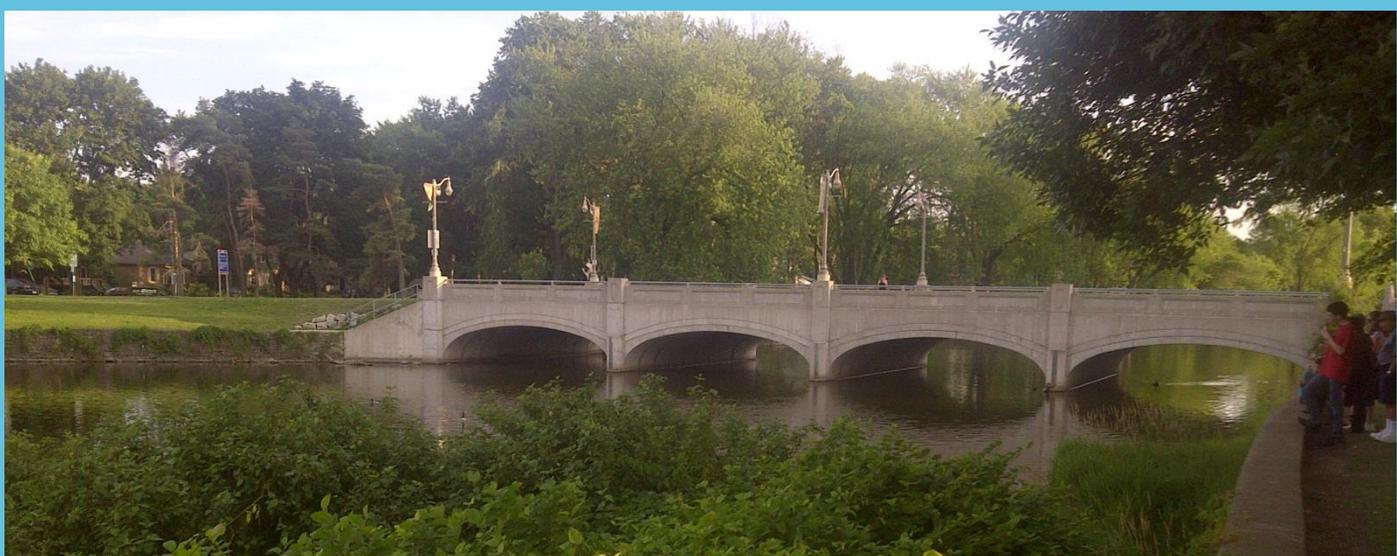


The Corporation of the City of Guelph

Water Supply Master Plan Update

(Draft Final Report) Executive Summary

May 2014



Prepared by:

AECOM



City of Guelph
**Water Supply Master Plan Update
Draft Final Report**

Prepared by:

AECOM
50 Sportsworld Crossing Road, Suite 290, Kitchener, ON, Canada N2P 0A4
Tel: 519.650.5313 Fax: 519.650.3424
www.aecom.com

Golder Associates Ltd.
6925 Century Avenue, Suite 100, Mississauga, ON, Canada L5N 7K2
Tel: 905.567.4444 Fax: 905.567.6561
www.golder.com

Project Number:

60287843

Date:

May, 2014

Executive Summary

ES-1 Background

In 2007, the City of Guelph (City) completed the Water Supply Master Plan (WSMP) project to ensure that the City's water supply continues to meet current and future demands. The purpose of this WSMP update is to review and revise the 2007 WSMP to make it consistent with the current needs of the City, covering a 25 year period from 2013 to 2038. The WSMP update builds upon the work previously completed taking into account more recent studies and the work activities completed over the past six years. This update reviews the 2007 WSMP recommendations as well as examines new water supply alternatives in accordance with the Class Environmental Assessment (EA) process for Municipal Water projects, resulting in the listing of recommended water supply projects, including phased implementation schedules and recommended Class EA Schedules. Class EA approvals for Schedule "B" and "C" projects can then be conducted by using the Master Plan as a starting point.

ES-2 Purpose Statement

Phase 1 of the Class EA planning process requires the proponent of an undertaking to first document factors leading to the conclusion that the improvement or change is needed, and ultimately, develop a clear statement of the identified problems, deficiencies or opportunities to be investigated. The Purpose Statement for the WSMP update was developed through communication with the public and stakeholders in the first round of consultation.

The City of Guelph is responsible for supplying clean, safe drinking water to its customers. The City has initiated an update to its Water Supply Master Plan (WSMP, 2007) that will define how we will continue to provide a reliable and sustainable supply of water to meet the current and future needs of all residents, industrial, commercial and institutional customers over the next 25 years. The updated Master Plan will identify individual projects required to implement the master plan and prioritize these projects based on need.

Today, our existing water supply fulfills the City's commitment to provide a safe and reliable supply of water. However, recent analysis confirms that the existing water supply system capacity will not meet future demands. Updating the WSMP is an opportunity to discuss with the community how best to manage this vital supply so that we continue to provide the high level of service Guelph residents have come to expect.

When investigating existing and new water supply options, including water conservation strategies, we will consider water quality and quantity, economic factors, environmental concerns and relevant regulations. Regardless of source, our water supply will continue to meet the service requirements of the Guelph community and the high regulatory standards of the Ontario Ministry of the Environment.

ES-3 Population/Water Demand Projections

ES-3.1 Population Projections

Population projections are required to determine future water supply requirements. The population projections presented herein combine non-residential and residential populations to develop a total 'equivalent' population. The equivalent population represents the projected residential population plus the additional population representative of

industrial, commercial and institutional (ICI) land use. This equivalent population forms the basis for developing existing and future water demands. Population growth projections to 2031 for the City are per the Official Plan, with details provided in the 2014 Development Charges Growth Forecast. In order to extend population projections beyond the current Official Plan planning period of 2031, City Planning staff provided forecasts of the Growth Plan from 2031 out to 2041. The population projections from 2013 to 2038 in five-year increments are presented in **Table ES-1**.

Table ES-1 Guelph Population Projections

Year	Residential Population (Including Census Undercount)*	Equivalent Employment Population (Excluding work at home and no fixed place of work)	Total Equivalent Population**
2013	130,670	66,730	197,400
2018	143,480	73,874	217,354
2023	156,290	81,017	237,307
2028	168,190	90,340	258,530
2033	178,464	96,947	275,411
2038	186,299	99,480	285,779

* Census undercount is estimated at approximately 3.5%.

** Projection excludes lands designated Reserve Lands, and Open Space/Park within Clair-Maltby Secondary Plan Area; Projection also excludes students which would not be captured within the permanent population base.

2013 to 2031 Source: (Watson & Associates Economists Ltd., 2013) –1.6% to 2% growth per year

2032 to 2038 Source: (Ontario Ministry of Infrastructure, 2012), (City of Guelph - Planning, Building, Engineering and Environment - Todd Salter, 2013) – 0.7% to 0.9% growth per year

ES-3.2 Water Demand Projections

Design Basis for Average Day Demands

The basis for projecting demands from the residential and employment sectors, as well as non-revenue water, is to assume the status quo applied to population projections, i.e. representative of per capita demands without influence of future conservation or non-revenue water reduction efforts. This baseline was used to measure the effect of potential future programs and their associated costs against the costs and efforts to provide new water supply.

Residential and Employment (ICI) consumption

The baseline demand for each of the residential and ICI sectors considered historical customer demand and analysis of recent trends over the past six years with consideration for whether the recent declines in per capita demands are sustainable for the purposes of projections. It was determined that the decrease in demand per capita in the residential sector is likely sustainable; whereas the decrease in the ICI sector may be partially attributed to economic factors. Therefore, the design rates in litres per capita per day (lcd) to apply to the future population were developed incorporating some contingency in the ICI unit rate:

- Residential – 180 litres per capita per day (lcd)
- Employment (ICI) – 286 lcd

These design values were applied to the projected populations from 2013 to 2038 to determine the future water demands for each sector assuming status quo in terms of water conservation efforts to date.

Non-Revenue Water (NRW)

The difference in water consumed by customers that is measured directly through utility billings and that which is pumped at water facilities to the water distribution system is classified as Non-Revenue Water (NRW). There are

three main categories of Non-Revenue Water (NRW): unbilled authorized consumption, apparent losses, and real losses. These all represent volumes of treated water for which the City does not receive revenue.

The average of the annual NRW volume for the period of 2006 to 2012 (5,550 m³/d) was used as the basis for projecting future losses along with additional anticipated losses as a function of new watermains and connections for servicing future growth.

Projected Average Water Demands by Sector

Table ES-2 presents the projected average day water demand in 5-year increments from 2013 to 2038, based on the design per capita demands.

Table ES-2 Projected Average Day Water Demand (2013-2038)

Year	Population			Demand by Sector			NRW (m ³ /d)	Average Water Demand (m ³ /d)
	Resid.	Employ.	Total Equiv.	Resid.	Employ.	Total		
2013	130,670	66,730	197,400	23,536	19,059	42,595	5,658	48,253
2018	143,480	73,874	217,354	25,843	21,100	46,943	6,175	53,117
2023	156,290	81,017	237,307	28,150	23,140	51,290	6,691	57,982
2028	168,190	90,340	258,530	30,293	25,803	56,096	7,208	63,305
2033	178,464	96,947	275,411	32,144	27,690	59,834	7,628	67,462
2038	186,299	99,480	285,779	33,555	28,413	61,969	7,903	69,872

Design Basis for Maximum Day Demand

The Ministry of the Environment (MOE) Guidelines for the Design of Water Distribution Systems dictate that water supply systems be designed to satisfy the greater of the maximum day plus fire flow or peak rate (maximum hourly demand). Fire flows and peak flows are typically provided in storage within a distribution system; and therefore, the pumping capacity of the water supply system is designed to meet maximum day demands. Through review of historical average demands by sector, reasonable estimates can be developed for projecting future demands. Similarly, historical information regarding peak demands in recent years can be evaluated to determine a design maximum day factor (MDF) for projecting future maximum demands. The maximum day factor is calculated as the maximum day demand divided by average day demand during a given year.

With the success of water efficiency measures and the implementation of outside water use restrictions in Guelph, the actual maximum day factors for the period of 2008 to 2012 ranged between 1.19 and 1.41, with an average of 1.26. Based on a review of historical data through the previous WSMP and more recent years, it is reasonable to continue to use a maximum day factor of 1.35 for projecting future maximum water demands.

Another consideration in determining future water supply requirements is to provide an allowance for events which could impact the existing supply capacity. A review of potential risks to the City's existing water supply system was completed to consider possible scenarios which could result in supply reductions such as a period of drought, and contamination or mechanical issues resulting in a large supply well being off-line. It was determined that under these two scenarios, the total existing water supply capacity is reduced by approximately 10 to 15%. Therefore, it is suggested that the City adopt a maximum day factor of 1.5 for the purposes of projecting future water supply requirements, with the difference from the actual maximum day demand (at a MDF of 1.5) to provide additional contingency in the supply system.

Projected Total Water Supply Requirements

The design basis developed for each component making up the total water demand and supply requirement was applied to the 25 year period of this study in 5 year increments to develop future water demand projections and water supply requirements, as indicated in **Table ES-3** and **Figure ES-1**.

Table ES-3 Projected Total Water Supply Requirements (2013-2038)

Year	Total Average Day Demand (m ³ /d)	Max Day Demand @ 1.35 MDF (m ³ /d)	Water Supply Requirement @ 1.5 MDF (m ³ /d)
2013	48,253	65,141	72,379
2018	53,117	71,708	79,676
2023	57,982	78,275	86,972
2028	63,305	85,461	94,957
2033	67,462	91,074	101,193
2038	69,872	94,327	104,808

Note: MDF = maximum day factor

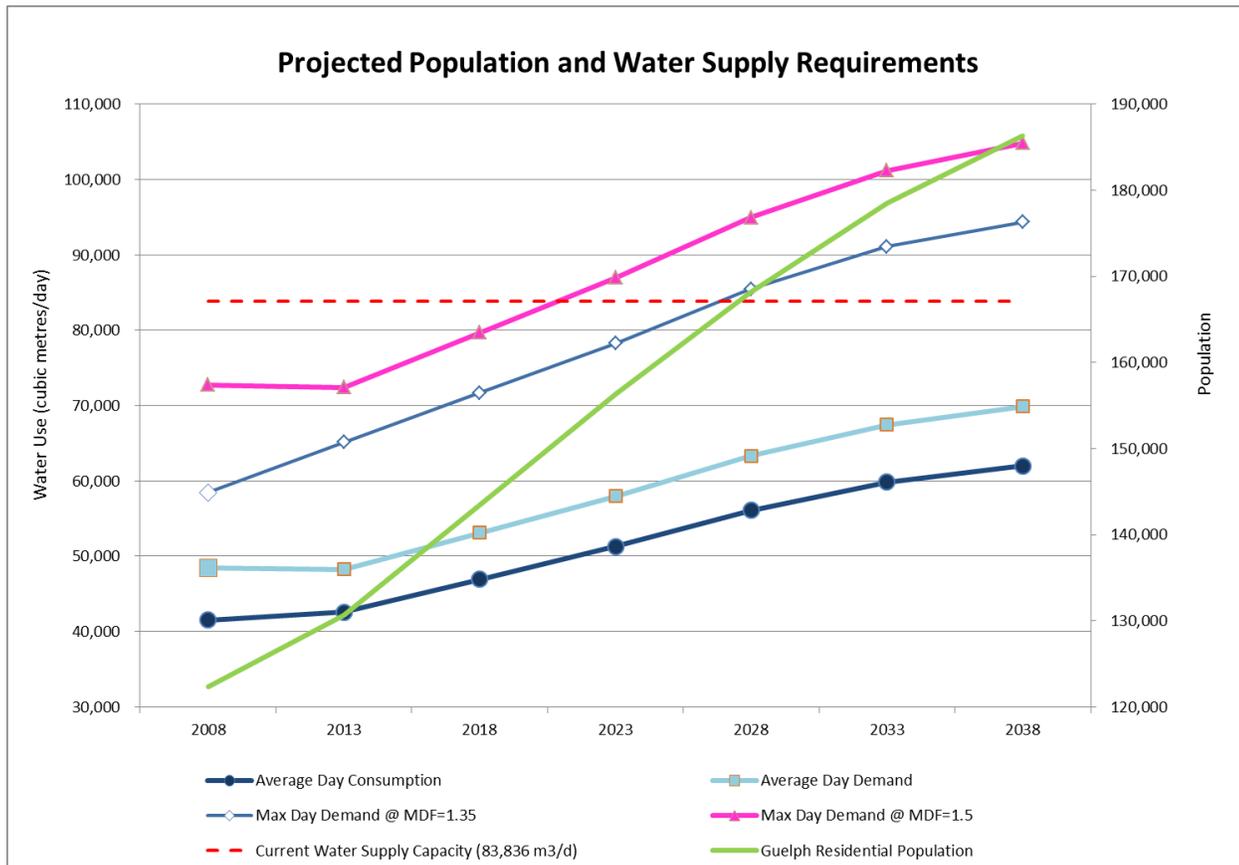


Figure ES-1 Projected Population and Water Supply Requirements

ES-4 Existing Water Supply System Capacity Assessment

The City of Guelph relies exclusively on groundwater to meet the City's residential and industrial, commercial and institutional (ICI) water demands. The City's groundwater supply system consists of 21 active wells constructed within overburden, shallow and deep bedrock aquifers and one active groundwater collection system (Arkell Infiltration Galleries - Glen Collector).

A detailed assessment of the existing maximum capacity of the existing water supply system was completed, which included determination of the maximum capacity of each individual well and to identify constraints to operating at the maximum; and assessment of the sustainable capacity of the existing water supply system (recognizing interference effects amongst the municipal wells). This review referenced the City of Guelph draft Tier Three Water Budget and Risk Assessment (Matrix Solutions Inc., 2013), herein referred to as the 'Tier Three Risk Assessment'. The objective of the Tier Three Risk Assessment is to evaluate the sustainability of the City's groundwater supply system from a quantity perspective, and to identify potential threats to that sustainability.

Evaluation of the existing system is completed with reference to the four quadrants of the City: Southeast, Southwest, Northeast and Northwest. Historical records (from 1997 through 2013) for each groundwater supply source and quadrant provided the daily pumping total, the monthly average of the daily production total, observed groundwater elevation and the permitted rate and maximum pumping elevations. Based on the review of groundwater pumping rate and groundwater elevation data, the capacity of each municipal groundwater supply source has been re-evaluated relative to the 2007 WSMP.

The total groundwater supply system capacity of the City's groundwater supply system was determined to be 83,836 m³/day. This represents an increase of 8,836 m³/day, relative to the available well capacity reported within the 2007 WSMP. The increase reflects additional permitted pumping from the new Arkell pumping wells (Arkell 14 and Arkell 15). It is noted that this estimate reflects normal operating conditions (i.e., non-drought conditions), and recognizes interference effects amongst the groundwater supply sources as well as other interferences such as that from continued pumping at the Dolime Quarry. Also taken into consideration are other physical constraints which potential limit the long term sustainable pumping rates of these supplies. A summary of the total water supply system capacity is indicated in the following table with comparison to the 2007 WSMP assessment.

Table ES-4 Existing Groundwater Supply System Capacity

Well Field	Well Name	Year Constructed	Permitted Rate (m ³ /d)	2007 WSMP Well Capacity (m ³ /d)	2014 WSMP Update Well Capacity (m ³ /d)
SWQ	Arkell 1	1966	3,273	2,000	2,000
	Arkell 6	1963	28,800	6,500	28,800
	Arkell 7	1963		6,500	
	Arkell 8	1963		6,500	
	Arkell 14	2000		n/a	
	Arkell 15	2000		n/a	
	Burke	1966		6,546	
	Carter 1	1962	7,855	5,500	5,500
	Carter 2	1962			
SEQ	Membro	1953	6,050	6,000	6,000
	Water Street	1953	3,400	2,700	2,700
	Dean	1958	2,300	1,500	1,500

Well Field	Well Name	Year	Permitted Rate	2007 WSMP Well	2014 WSMP Update Well
	University	1965	3,300	2,500	2,500
	Downey	1968	5,237	5,100	5,236
NEQ	Park 1	1937	10,300	8,000	8,000
	Park 2	1947			
	Emma	1931	3,100	2,800	2,800
	Helmar	1966	3,273	1,500	1,500
NWQ	Paisley	1952	3,200	1,400	1,400
	Calico	1976	5,237	1,100	1,400
	Queensdale	1970	5,237	2,000	1,100
Arkeff Infiltration Galleries - Glen Collector			25,000	6,900	6,900
Total			122,108	75,000	83,836

ES-5 Water Supply Alternatives

The 2007 WSMP implementation plan set out a strategy for the City to investigate and execute the necessary steps to optimize existing and develop new water supplies, with a focus on local sustainability. City Council provided direction in 2003 “That the focus of the Water Supply Master Plan establish a sustainable water supply to regulate future growth”. This direction emphasizes the need for water supply to be sustainable. Public response to the 2007 WSMP helped shape that definition of sustainable to refer to available local water supplies, which included local groundwater and surface water sources.

The utmost importance was placed on water conservation and as a result, the City of Guelph has become a renowned leader in water conservation and demand management in Canada. Council has made this a priority by setting a goal “to use less energy and water per capita than any comparable Canadian city” through its 2007 Strategic Plan and Community Energy Initiative. It is the aim of this update to establish success achieved to date, and to determine reduction strategies and goals moving forward for comparison to other water supply alternatives.

Public feedback in 2007 indicated that the City first examine groundwater supply opportunities within the City’s boundaries in order to minimize potential impacts on its neighbours. Although groundwater flow does not respect geographic borders, impacts from pumping from aquifers may result in local impacts on the natural environment and also on private and municipal wells in close proximity. As a result, the City has since implemented a number of programs and studies to maintain and optimize existing supply facilities within the City and in areas of existing municipal well supply infrastructure, including:

- Completed construction of new well facilities (Arkeff 14 and 15) and commencement of the Arkeff Adaptive Management Plan and Operational Testing Program;
- Completed Class Environmental Assessment (EA) for the existing Burke Well facility;
- Commenced Class EA for the Guelph Southwest Quadrant Water Supply (on-going) which includes evaluation of existing supplies in that quadrant as well as new test wells; and,
- Completed treatability assessments of municipal wells which were previously taken off line due to water quality issues: Clythe, Smallfield and Sacco Wells.

Also included in the short to mid-term implementation strategy was the initiation of various hydrogeological investigations inside the City and just outside the City’s boundaries to explore the potential for new water supplies in these areas, including the Guelph South Groundwater Supply Investigation.

The City also initiated the following regional studies and plans to ensure the protection and long term sustainability of the existing water supply system:

- The Guelph Tier Three Water Budget and Local Area Risk Assessment is being completed to evaluate the sustainability of the City's water supply system from a quantity perspective and to identify potential threats to that sustainability. This study and the Tier Three computer model of Guelph's municipal aquifer system (in and outside the City) provide invaluable insights into reviewing the current water supply system and its reliability now and into the future.
- The Guelph Drinking Water Source Protection Plan was developed within a watershed context to identify and evaluate potential quality threats to the municipal supply system. The City, through the Lake Erie Source Protection Authority and with other municipalities within the Grand River Watershed, have developed policies to protect existing and future drinking water sources from unwanted impacts and harmful contaminants.

The objective of the WSMP Update is to continue to ensure that the City can provide an adequate and sustainable supply of water to meet the current and future needs of all customers over the next 25 years. The water supply demand forecast indicates that under a "do nothing" scenario with continued growth, the City would require an additional capacity of 20,000 m³/day to satisfy maximum day demand including an allowance for security of supply (approximately 10 to 15% of the total system capacity).

The following alternatives were developed and evaluated with respect to their capability to contribute to the total water supply solution. It is acknowledged each does not address the problem statement as a stand-alone alternative. Therefore, each alternative is discussed and evaluated on its own merit as part of the total solution.

ES-5.1 Water Conservation and Demand Management/Re-Use

The City of Guelph is known as one of the most proactive communities in Canada with respect to water conservation having implemented a wide variety of water conservation programs across all sectors since 1999. The City continues to implement water conservation programs to reduce demands within a Council approved cost-benefit framework that compares the cost to implement water reduction programs to the cost for developing new municipal water supplies, with consideration for the added benefits of also deferring wastewater treatment infrastructure and incurring energy savings.

Water Conservation Scenarios

In investigating future reduction scenarios and their associated costs, the City's water conservation staff reviewed the maximum potential of current programs, as well as potential for future additional programs. Five scenarios were developed; each consisting of a combination of possible water conservation and efficiency programs. Scenarios ranged from continuing with the current approved Water Conservation and Efficiency Strategy Update (WCESU) plan, to an aggressive scenario which considered all possibilities. The development of scenarios based on a number of possible initiatives was completed solely for the purpose of evaluating the cost and feasibility of various target reductions. The actual programs would be established through the next WCESU.

A summary of potential savings for each scenario is indicated in **Table ES-5**.

Table ES-5 Summary of Potential Savings for Each Scenario

Scenario	Total Potential Reduction in Average Day Demand (m ³ /day)	Implementation Period	Direct Program Costs	Total O&M Costs	Total Program Cost for Period
Scenario 1	5,556	2014 to 2025	\$5,685,930	\$10,217,564	\$15,903,500
Scenario 2	9,842	2014 to 2038	\$43,767,600	\$23,880,972	\$67,648,600
Scenario 3	9,690	2014 to 2038	\$24,597,600	\$23,880,972	\$48,478,600
Scenario 4	8,448	2014 to 2038	\$23,097,600	\$23,880,972	\$46,978,600
Scenario 5	7,419	2014 to 2038	\$22,553,100	\$23,880,972	\$46,434,100

The above water conservation scenarios were developed and reviewed to demonstrate the range of potential savings and associated costs of various combinations of programs, for discussion through public consultation. Further iterations of these scenarios were developed during the financial evaluation completed in developing the implementation plan.

Centralized Re-Use Alternative

The above scenarios do not include any programs related to Wastewater Reuse and Reclamation. Although pilot studies have been implemented for individual systems for grey water within the City, it is generally accepted that significant reductions from reclaim and re-use options will only be achieved through centralized facilities. Wastewater reclamation involves the treatment or processing of wastewater to make it suitable for reuse, with water reuse being the beneficial use of the treated water. Water reclamation and re-use has great potential to be an effective, efficient, sustainable way to meet water demands.

There are two options for centralized re-use or reclaimed water:

- Treatment to non-potable standards for landscaping irrigation and other non-potable uses through a dual plumbing system,
- Treatment to potable standards for use in the existing distribution system

Generally, due to the considerable challenges currently associated with the centralized re-use alternatives, these options are not implemented where there are alternative sources of fresh water as the costs of re-use options are prohibitive. However, as increasingly advanced treatment is required for wastewater to meet discharge requirements in future, these alternatives will become more attractive. In addition, it is expected that this eventuality will correspond to decreasing availability of local groundwater and surface water. While not considered as part of the conservation option in the 25 year study period, opportunities to incorporate reuse into future developments (e.g. purple pipe; dual plumbing systems) should be reviewed with a long term view to ensure its feasibility. It is recommended that this be considered when reviewing future expansion and treatment upgrades at the wastewater treatment facility.

ES-5.2 Expand Existing Groundwater Supply System

The approach undertaken in investigating opportunities for optimizing existing wells and developing new groundwater sources followed the direction provided through the consultation process in the 2007 WSMP. Public response indicated that the City should consider groundwater opportunities within the City boundaries prior to exploring outside the City. As noted in the 2007 WSMP, the development of new water supply sources in the Townships would require the concurrence of the Townships and the County of Wellington.

Furthermore, with use of the updated Tier Three computer model, the feasibility of higher pumping within the City is studied with respect to impacts on other supplies as well as potential environmental effects. The Tier Three Water Budget and Local Area Risk Assessment Study are referenced when seeking additional sources outside the City with consideration for available takings, and also known and anticipated impacts on the watersheds in close proximity. In general, although the Tier Three project is not yet completed, model-predicted impacts were found to be moderate for the south branch of Blue Springs Creek, Chilligo/Ellis Creek, and Hanlon Creek. Therefore, for the purposes of this WSMP Update, future groundwater supply sources investigated herein focussed preferentially on catchment areas along the Speed River and Mill Creek.

Each quadrant of the City has been studied extensively, with the City having completed monitoring and exploration programs in support of the existing operating wells and in reviewing feasibility of possible future sources. Of note is that the possible supply sources outside of the City boundaries considered in this WSMP update are limited to

approximately 5 km from the City's limits. This parameter was determined with consideration to limiting impacts on surrounding municipalities, as well as the practicality of connecting to the existing water distribution system. A general summary of potential new water supplies within each quadrant is provided as follows:

Southwest Quadrant (SWQ)

Following the recommendation in the 2007 WSMP, the City initiated a Class Environmental Assessment (EA) study to optimize existing and to develop new water supplies in the SWQ. This quadrant consists of the following existing operational wells: Downey, Membro, Water St., Dean and University Wells. It also includes the Edinburgh Well which was taken off-line due to water quality issues, and the Admiral Well which was initially developed for industrial use but not brought on line due to natural water quality issues. Through the Class EA study, two large diameter test wells (named 'Ironwood' and 'Steffler') were installed and tested over an extended period to determine potential capacity and to monitor the effects on other municipal and private wells, and surface water. Preliminary findings suggest that when the SWQ is considered as a whole, i.e. one wellfield, an additional taking of 4,500 m³/day can be achieved. This rate is in addition to that established as a maximum day sustainable pump rate for the SWQ of 17,800 m³/day. Therefore, a total objective for additional water supply from the SWQ of 4,500 m³/day is available whether through one or two new municipal wells, or through a combination of new wells plus optimizing existing including reactivating existing wells off-line requiring treatment.

Southeast Quadrant (SEQ)

The SEQ consists primarily of the Arkell wellfield which includes Arkell 1, 6, 7, 8, 14 and 15 Wells, as well as the Glen Collector System, and the Carter Wells. The City is currently demonstrating the sustainability of operating the Arkell bedrock wellfield with extensive monitoring for three years through an Operational Testing Program; results to date have confirmed the existing capacity of the Arkell bedrock wellfield of 28,800 m³/day and indicate no measureable impacts on the Blue Springs Creek watershed. A possible new source in the Arkell area is to reinstate the Lower Road Collection system which was taken off line due to regulated water quality concerns. It is anticipated that, although work is required to repair and construct the collector infrastructure, it would be acceptable to direct this water along with other wells and the Glen Collector to the aqueduct for ultraviolet irradiation (UV) disinfection at the Woods Pumping Station.

The City completed a Class EA study in 1994 investigating a new well supply near the Barber Scout Camp on Stone Road ('Scout Camp' Well) which was found to have naturally poor water quality.

Lastly, new potential water supply outside the City was reviewed using the Tier Three model. The hydrogeological conditions in the general area of Victoria and Maltby Roads suggest the possibility of a well with capacity of 4,000 to 6,000 m³/day in this area, with consideration given to preventing potential impacts to Mill Creek.

Northeast Quadrant (NEQ)

Existing operating wells in the NEQ include the Park and Emma Wells, and the Helmar Well. The Clythe Well is a municipal supply that was taken offline due to natural water quality issues. A Class EA is currently underway which will consider treatment options for reconnecting this well to the distribution system.

The City has previously installed and tested wells in the area of Eastview Road and Watson Road, referred to as 'Logan' and 'Fleming' test wells, located outside the City in the Township of Guelph-Eramosa. The results suggest the potential for a new municipal supply in this area of 4,500 to 6,100 m³/day.

Northwest Quadrant (NWQ)

Existing operational wells in the NWQ include the Paisley, Calico and Queensdale Wells. The City also has a test well referred to as the Hauser well with a proposed taking of 900 m³/day.

Two municipal groundwater supply sources (Sacco and Smallfield Wells) are currently permitted for operation, however, remain inactive and off-line since the mid-1990s due to groundwater quality concerns. Smallfield Well groundwater consistently contained Trichloroethylene (TCE) concentrations that exceeded the Ontario Drinking Water Quality Standards (ODWQS) maximum acceptable concentration (MAC) of 5 µg/L. Sacco groundwater quality comprised of detectable levels of both TCE and Tetrachloroethylene (PCE), but consistently below the ODWQS MAC. The potential well capacities for Smallfield and Sacco Wells are 1,408 and 1,150 m³/day respectively as concluded in the rehabilitation and performance assessment in 2008.

The Tier Three report suggested that the Ellis Creek Watershed may be under moderate stress, and therefore any new potential takings in the NWQ beyond the existing municipal active, off-line and test wells previously mentioned should to be located preferentially to avoid potential impacts to Ellis Creek. In modeling scenarios, a possible new well source was located closer to the Speed River at Sunny Acres Park where it was determined that an estimated 1,500 m³/day may be available.

Beyond the City boundary, a potential new supply was considered in the general area of Conservation Road west of Highway 6. Through Tier Three modeling, a long term average pumping rate of 4,600 m³/day could be supported which suggests the possibility of a well with a maximum day capacity of 6,200 m³/day. It is anticipated that a well in this area would have good water quality.

Groundwater Alternatives

After reviewing existing and future well supplies on a quadrant basis and understanding operational and environmental constraints, the potential groundwater opportunities for expansion of the existing supply system are grouped into the following alternatives:

- Optimize existing operating municipal wells
- Restoration of existing off-line municipal wells
- Develop existing municipal test wells
- Install new wells inside City boundaries
- Install new wells outside City boundaries
- Install new ASR wells inside City to optimize excess Arkell Collector system volumes

Optimize Existing Operating Municipal Wells

An extensive assessment of existing municipal production wells was undertaken to determine sustainable concurrent water takings from all supplies, and to identify wells where upgrades and/or modifications to the well itself or the well system could be considered to improve the well performance, water quality and general security of the source. In general, 'optimizing' existing wells requires a review of operational and maintenance activities for the current facilities to ensure that the potential hydrogeological capacity can be achieved as required to meet peak demands.

The only well identified as possibly having more capacity available as compared to its current Permit to Take Water (PTTW) is the Downey Well which could potentially pump at a rate 6,000 m³/day. The potential for increasing the capacity of the Downey well will be reviewed within the SWQ Class EA.

Restoration of Existing Off-line Municipal Wells

This alternative includes wells which have existing Permits to Take Water (PTTW) but the City has discontinued use due to concerns over existing issues with water quality, either elevated at present or a noted increasing trend. In general, these wells require upgrades for water quality treatment and to provide the required disinfection contact time. Most of these facilities will require completion of Class Environmental Assessment (EA) studies to establish

recommended treatment systems. The total increase in potential quantity available from these wells ranges from 8,000 to 14,000 m³/d. **Table ES-6** summarizes the capital cost estimates for implementation.

Table ES-6 Cost Estimate to Restore Existing Off-line Municipal Wells

	Clythe	Smallfield	Sacco	Edinburgh	Lower Road Collector	Admiral
Potential Capacity (m³/d)	3,395	1,408	1,150	3,000	2,000	500
Total Cost	\$4,809,000	\$3,820,000	\$4,135,000	\$6,029,000	\$9,161,000	\$2,998,000
Cost per m³/d	\$1,400	\$2,700	\$3,600	\$2,000	\$4,600	\$6,000

Develop Existing Municipal Test Wells

An extensive review and assessment of existing municipal test wells was undertaken to determine potential well yields and treatment requirements. Due to the information available from previous studies including pumping tests and water quality testing, there is more certainty regarding these alternatives in regards to location, potential yields and treatment requirements. The City can move more readily to the next steps including Class EA and treatability studies, should these be part of the recommended solution. The total increase in a potential quantity available from these wells is from 14,800 m³/d (includes only 4,500 m³/d from SWQ wells). **Table ES-7** summarizes the cost estimate for implementation.

Table ES-7 Cost Estimate to Develop Existing Municipal Test Wells

	NEQ Fleming/Logan	SEQ Scout Camp	SWQ Steffler	SWQ Ironwood	NWQ Hauser
Potential Capacity (m³/d)	4,714	5,789	3,600	8,000	900
Total Cost	\$4,735,000	\$4,702,000	\$3,252,000	\$4,036,000	\$3,691,000
Cost per m³/d	\$1,000	\$800	\$900	\$500	\$4,100

Develop New Wells Inside Existing City Boundary

Using the Tier Three groundwater flow model, analyses was completed to identify new potential groundwater supply source locations within the City. Due to interference effects amongst existing groundwater supply sources as well as new proposed supply sources (off-line wells and test wells), it is advised that additional new supplies within the remainder of the City are limited. For example, less than 10 metres of further groundwater level drawdown is available within the Gasport Formation in the northeast end of the City. In the northwest portion of the City, potential concerns are related to lower aquifer hydraulic conductivity and further stress of the Chilligo/Ellis Creek catchment area. Recognizing these constraints, only one new well inside the City is proposed located in or near Sunny Acres Park, located along Edinburgh Road approximately 600 metres north of the Speed River. The rationale for this location is its proximity to an area with high transmissivity within the Gasport aquifer. Due to the limited available drawdown at this location (approximately 7 m), the estimated capacity of a well in this area ranges from 1,000 m³/day on an average basis to 1,500 m³/day to meet maximum day demands. The cost estimate for implementation is \$4,522,000, resulting in a cost per capacity of \$3,015/m³/day.

Install New Wells Outside City Boundaries

The Tier Three groundwater flow model was used to review potential for new water supply outside the City. Areas with potential for future groundwater supply sources were focused within Mill Creek (southeast of the City), Marsden Creek (north of the City) and Speed River (northeast of city) catchment areas. Groundwater modelling analysis concluded that additional groundwater supplies (ranging from 3,500 to 5,000 m³/day on an average basis) can potentially be established within each of these respective areas, without significantly changing base flow rates encountered at the nearby watercourses. Two areas were evaluated including Guelph South (Victoria Road and

Maltby Road) and Guelph North (Conservation Road). The total increase in a potential quantity available from these wells is 11,500 m³/d. **Table ES-8** summarizes the cost estimate for implementation of these two well supplies.

Table ES-8 Cost Estimate for Guelph South well and Guelph North well

	Guelph South	Guelph North
Potential Capacity (m ³ /d)	5,281	6,291
Total Cost	\$5,185,000	\$5,289,000
Cost per m ³ /day	\$990	\$840

Arkell Collector System ASR Wells

Review of the current Glen Collector system and off-line Lower Road Collector system flows indicates high seasonal variability, with elevated flows in the spring which do not correspond to a period of corresponding demand. As a result, these flows cannot be considered as part of the maximum daily supply capacity. For the purposes of reviewing feasibility of an alternative that captures some of the excess flow available from these collector systems, it was assumed that an excess of 10,000 m³/day would be available continuously for a period of 4 months. It is also assumed that the Lower Road Collector system is repaired and placed back online.

The advantage of this alternative is that a surface water treatment plant would not be required as it would be if water was taken directly from the Eramosa River. The additional seasonal volumes from the collector systems would be discharged to the aqueduct to combine with other Arkell wellfield supplies for disinfection at the Woods Pumping Station (PS). However, rather than shutting off the other Arkell wells while these high seasonal volumes are available, all will continue to be pumped and subsequently stored to recover as required to meet demands. The additional volume would be pumped into the distribution system and obtained similar to a large customer demand at two ASR wells for injection and storage in the aquifer. It is anticipated that the ASR wells would be located in the area of the Park and Emma wells where the high transmissivity would allow for optimization. It is assumed that two wells would be required, each capable of injection at 5,000 m³/day. Based on the above assumption of 10,000 m³/day over a four month period, this results in a potential supply capable of 3,300 m³/day. The cost estimate for implementation is \$9,954,000, resulting in a cost per capacity of \$2,700/m³/day.

ES-5.3 Establish New Local Surface Water Supply

Two possible local surface waters for assessment of volume available for taking water on a continuous or seasonal basis include the Speed River (at Guelph Lake) and the Eramosa River. Surface water must either be treated to provide a continuous flow into the distribution system, or alternatively, volumes of water can be taken from the surface water when available, treated and stored underground in aquifers. This option is referred to as an aquifer storage recovery (ASR) system. The supply capacity available from this source on a continuous basis is equal to the volume taken from surface water when available and treated and injected, and then removed over the period of a full year.

For both continuous flow and ASR approaches, construction of a water treatment plant (WTP) is required to fully treat the surface water to meet Ontario Drinking Water Quality Standards (ODWQS). In the first option, the WTP is sized to treat a continuous input to the plant with direct discharge to the City's distribution system. In the second option, the WTP would be required to treat varying flows ranging from the continuous flow requirement to the maximum design capacity based on high seasonal flows.

To evaluate potential quantity available through this alternative, the Grand River Conservation Authority (GRCA) was contacted for their expert opinion on this managed watershed. The GRCA undertook an evaluation of the Speed River (at Guelph Lake) and the Eramosa River (at Arkell) to determine the water volumes available throughout the

year, utilizing historical flow information and modeling tools. It was determined that only the Guelph Lake option provided a reasonable surface water alternative for continuous and seasonal flows. Through this evaluation, a base level water taking was established which would be available year-round, while maintaining minimum river flows in the rivers and minimizing potential environmental impacts of reducing total river flows. The GRCA also reviewed historical records to establish reliability of taking additional volumes during times of higher river flows.

Historical water quality information for the Speed River was referenced to determine treatment processes required to achieve drinking water quality. Conventional treatment is required with treatment for taste and odour on a seasonal basis, as necessary. The proposed WTP has been sized to accommodate the following alternatives at Guelph Lake:

- continuous taking of 150 L/s – Municipal Base Taking
- maximum taking of 300 L/s – ASR option

The total increase in a potential quantity available from a surface water treatment and ASR system based on after-treatment flows is 25,825 m³/d. This can be viewed as two alternatives, the first being a continuous surface WTP, and the second an expansion to the WTP and development of the ASR well system. The costs and capacities shown are for two independent alternatives. **Table ES-9** summarizes the cost estimate for implementation of the surface water alternatives.

Table ES-9 Estimated Capital Costs to Develop Surface Water Alternatives

	Guelph Lake WTP	Guelph Lake WTP + ASR
Potential Capacity (m ³ /d)	12,312	25,825
Total Cost	\$36,708,000	\$78,905,000
Cost per m ³ /day	\$3,471	\$3,055

ES-6 Environmental Assessment Process

Evaluation criteria were developed based on the environmental components that address the broad definition of the environment described in the Environmental Assessment Act, as summarized in **Table ES-10**.

Table ES-10 Evaluation Criteria Components Summary

Component	Criteria
Built Environment	<ul style="list-style-type: none"> • Effect on existing and/or planned residences, businesses, community, institutional or recreational facilities • Effect on private and municipal wells
Natural Environmental	<ul style="list-style-type: none"> • Effect of construction and operation on aquatic and terrestrial species & habitat • Effect on surface water quantity and quality
Social/Cultural Environment	<ul style="list-style-type: none"> • Ability to meet municipal and provincial growth targets • Public acceptance • Effect of noise/vibration on sensitive receptors • Effect on cultural heritage landscapes and built heritage resources • Effect on potential archaeological resources
Financial Considerations	<ul style="list-style-type: none"> • Estimated capital costs; capital cost per capacity • Estimated operation and maintenance costs • Life cycle cost (per volume produced)
Legal/Jurisdictional Considerations	<ul style="list-style-type: none"> • Location inside vs. outside of City boundaries
Technical Considerations	<ul style="list-style-type: none"> • Constructability

Component	Criteria
	<ul style="list-style-type: none"> • Potential productivity and reliability • Water treatment requirements • Approval requirements

Each potential alternative was assessed using a consistent approach and evaluation criteria along with specific indicators for each. The evaluation was qualitative – not a numerical ranking system – and considered the suitability of alternative solutions and strategies based on significant advantages and disadvantages. The summary evaluation tables (in the full report) provide an overall recommendation for each of the alternatives which can be compared to the other alternatives. This provides a means to rank the alternatives to allow for incorporation into an implementation plan in order to meet the water supply requirement to 2038. The alternatives are listed in **ES-11** in order of the priority as determined by the summary outputs:

Table ES-11 Summary of Evaluation Outputs

Alternative	Ranking	Comments
1A – Conservation & Demand Management	1	Strong public support for continued and enhanced water conservation; target reduction explored further through financial analysis
2B – Groundwater: Existing Municipal Off-line Wells	1	Support for optimizing water takings within the City; order of implementation to be determined by the City with consideration for regulatory, treatment, financial constraints
2C – Groundwater: Municipal Test Wells	1	
2D – Groundwater: New Well inside City	1	
2F – Arkell Collectors & ASR Wells	2	ASR alternative requires additional feasibility investigation with respect to Eramosa River PTTW optimization; water volumes available via collector systems; need to install ASR wells vs. changing existing well permits to allow for flexible takings
2E – Groundwater: New Wells outside City	2	Incorporates Townships' staff and public response to maximize water takings inside the City before pursuing wells in the Townships
3A – Surface water: Guelph Lake Water Treatment Plant	3	While this alternative is not required to provide water supply within the 25 year study period, the City will track timeline to determine 10 year lead-in required prior to implementation; Speed River/Guelph Lake water taking requires GRCA policy approvals
3B – Surface water: Guelph Lake Water Treatment Plant & ASR Wells	3	
1B – Re-Use – Centralized	3	Potential of this alternative to be explored further; highly dependent on end use customer demand; integration and alignment with future WWTP treatment requirements
Limit Growth	4	This alternative does not meet the Study Problem Statement and contravenes the Official Plan
Do Nothing	4	This alternative does not meet the Study Problem Statement and contravenes the Official Plan

Figure ES-2 compares the implementation of all of the water supply alternatives to the water demand curve with and without conservation to 2038. It can be seen that with conservation, the groundwater options ranked first ('1') are sufficient to satisfy the demand in the study period.

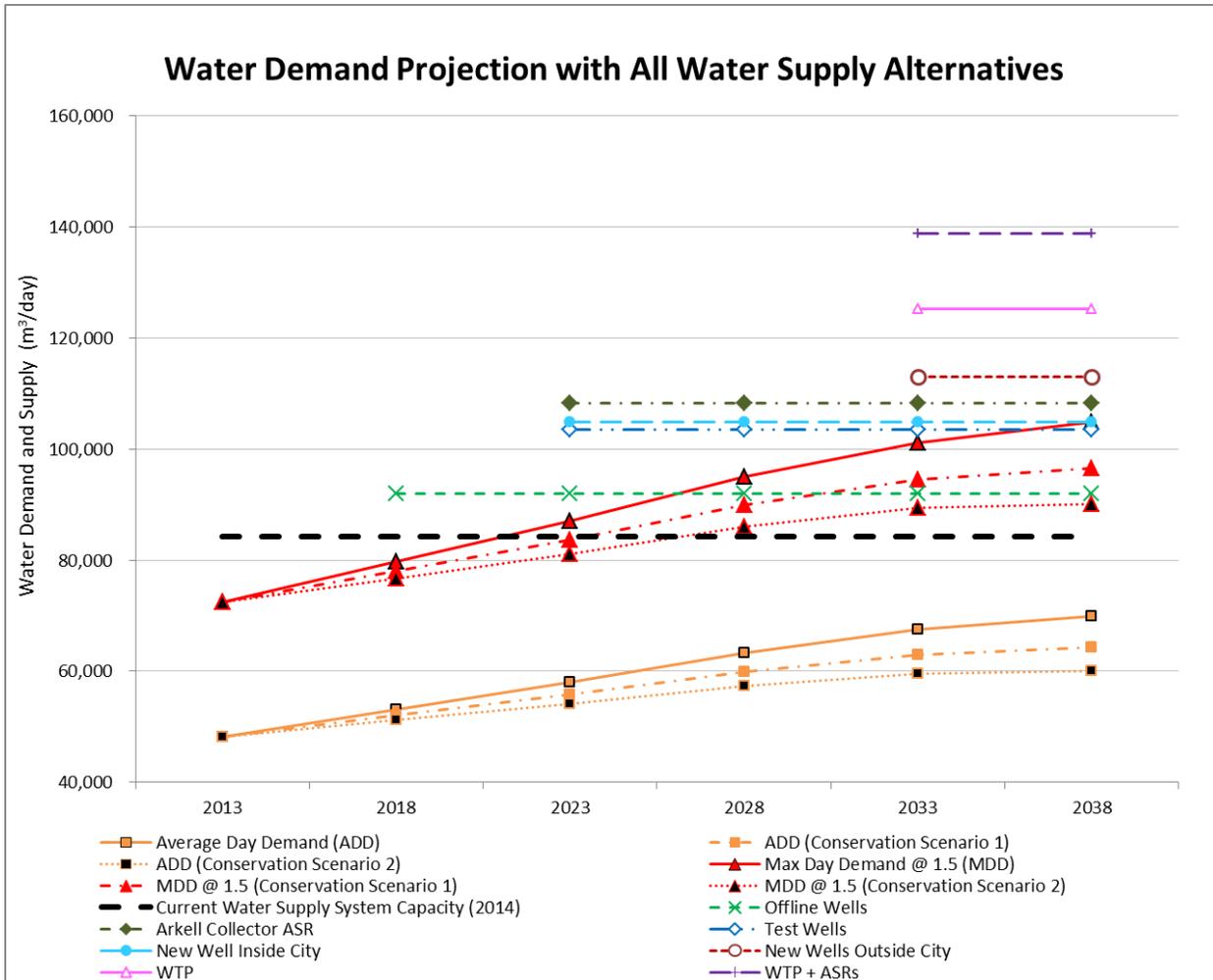


Figure ES-2 Water Demand Projection with All Water Supply Alternatives

ES-7 Public Consultation Plan/Outputs

Communications and consultation activities formed a key component of the process to develop the Guelph Water Supply Master Plan (WSMP). Community input is an essential part of the Water Supply Master Plan update process. People care about where their water comes from, and they want to see a safe and sustainable supply maintained for present and future generations. With this in mind:

- **Pre-consultation Interviews** were held with select community members and prospective Community Liaison Committee members to understand perspectives related to water supply and to confirm community engagement needs.
- A **Community Liaison Committee (CLC)** was established to advise and provide feedback to the project team throughout the process;
- A **Municipal / Agency Workshop** provided crucial inputs from a government and approval agency perspective;

- Two public **Open Houses** were held during the course of the study, giving community members an opportunity to discuss the project with the Study Team and provide comments;
- Presentations and discussion related to the WSMP update were included at four meetings of the Water Conservation and Efficiency Public Advisory Committee;
- Presentations were made at the Puslinch Township and the Guelph Eramosa Township Councils' meetings at their request; and,
- **Guelph Water User Survey:** Expectations of Service was completed in early 2014.

Figure ES-3 illustrates the communications and consultation activities undertaken as part of the EA process for the Guelph WSMP.

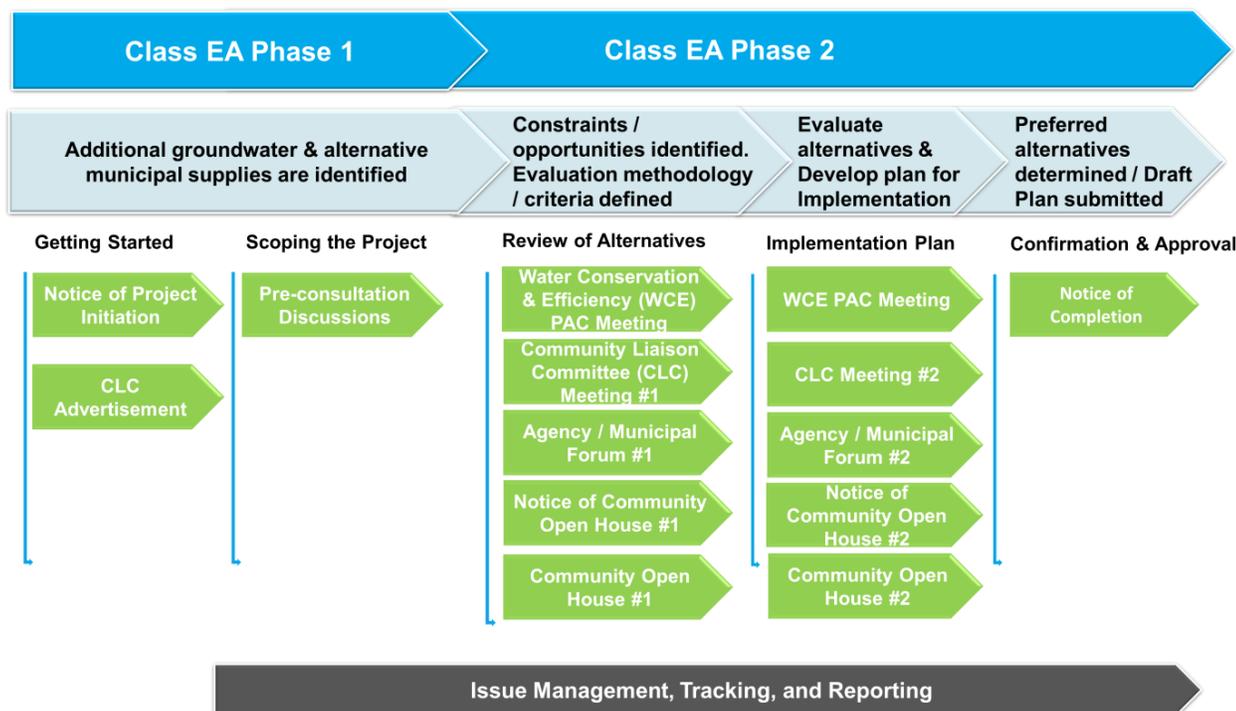


Figure ES-3 Consultation Process

Overall the public was pleased to be informed and to participate in this study. The main points of discussion at the Community Open Houses were water conservation programming, the impact of major water users on the water system, source water protection and water quality. The quality of questions and the engagement of those present at the Community Open Houses was a positive indicator of the interest in water supply issues within the City of Guelph and the surrounding area.

The additional consultation offered and provided to the Townships at their request was also well received and provides a good starting point for future discussions around the potential for new wells to be located just outside the City's boundaries in the neighbouring Townships. Township representatives raised concerns regarding source protection issues and potential constraints on land uses resulting from new water supplies.

ES-8 Implementation Recommendations

ES-8.1 Implementation Approach

Based on the evaluation outputs for each of the alternatives, a timeline and budget was to be established for implementation of the preferred alternative. This strategy included a financial analysis for determining the optimum conservation scenario when considered with the need for new water supply sources. This analysis takes into consideration the following:

- Timeline and costs associated with each alternative – including technical investigations, water quality analysis, environmental impact studies, land acquisition, preliminary and detailed design, and construction and commissioning. The timeline allowed in advance of water supply availability is as follows:
 - Groundwater - 5 year timeline
 - Arkell Collector ASR wells – 8 year timeline
 - Surface Water/ Surface Water + ASR wells – 10 year timeline
- The exception to the above is that the investigative phase for all of the test wells and inside-City groundwater options is scheduled to occur earlier so that the City has sufficient information to determine whether the alternative is feasible, to identify any constraints, and to confirm capacity and treatment requirements prior to the next WSMP update.
- An assumed order of groundwater projects based on the following priorities:
 - water supply sources currently included in on-going Class EAs pursuant to recommendations from the 2007 WSMP: Southwest Quadrant (e.g. Ironwood test well); and Clythe Well
 - test well with high potential for large volume production and low anticipated treatment requirements (i.e. lower costs) – Logan test well
 - off-line wells - Sacco Well; Smallfield Well
 - upgrades to Lower Road Collector System – although at a higher per capacity cost, this must be done in advance of the Collector System/ASR well project
 - new well in City
 - test wells with lower certainties – Scout Camp test well; Hauser test well
 - Collector Systems & ASR wells – longer lead-in time to allow for feasibility review; also Lower Road Collector System would require upgrades prior to implementation.

It is important to note that the assumptions made to the above prioritization were for the purpose of determining the requirement for new supplies against the demand curve in comparison to varying conservation scenarios. Most of these projects would be in investigation and design phases concurrently and the schedule for each would be a function of constraints and ease of implementation.

- Provide a schedule for implementation such that supply is always greater than 90% to ensure sufficient capacity for proposed development commitment, and industrial/commercial applications, as well as to respond to large increases in demand by current customers. This flexibility is important to address growth needs or demands that do not follow the planned demand projection. This 90% trigger is not to be compared to the redundancy and security of supply allowance which is included in the design maximum day factor of 1.5.

ES-8.2 Recommended Water Conservation Strategy

A number of conservation scenarios were explored in order to establish the cost associated with varying combinations of possible programs. As discussed, five original scenarios were developed to represent a range of possible target reductions and associated costs. With reference to these five scenarios, three were included in the financial evaluation as shown in **Table ES-12**. Current WCESR Approved Programming represents Scenario 1; Maximum Water Conservation represents Scenario 2; and Enhanced Water Conservation is a variation on Scenarios 3 to 5 developed through a closer review of the overall costs and reductions. Under the Base Case without any spending on water conservation, natural savings in water demand are forecasted due to improving building standards (changes in 2014 Ontario Building Code), and consumer reaction to real increases in the price of

water. Each of the water conservation scenarios explored will delay the need to implement proposed projects for increasing the water supply, assuming that the conservation is successfully implemented to achieve the desired targets.

Table ES-12 Water Conservation Scenarios

	Timing	Reduction in Average Day Demand (m ³ /d)	Total Program Cost (Non-Discounted)
Base Case	NA	990	–
Current WCESU Approved Programming	2014 to 2025	5,556	\$5,685,930
Enhanced Water Conservation	2014 to 2038	9,147	\$13,864,780
Maximum Water Conservation	2014 to 2038	9,842	\$42,267,600

This analysis compares the forecasted impacts of different water conservation scenarios on the demand for potable water, the timing of the City's proposed water supply projects, and the City's capital spending and operating expenditure on water supply projects and water conservation. Water conservation allows water supply projects to be delayed and/or avoided within the 25 year study period. This is because as increased water conservation is achieved, per capita demand is reduced, lowering overall water demand. If overall demand is lowered, the City's current water sources will meet demand for a longer period of time before more sources are needed to meet an increased overall demand.

The forecasted timing of proposed water supply projects under the different scenarios is presented in **Table ES-13**. The indicated year is when the new source is required to be on-line; as indicated earlier, there is a timeline for implementation including investigation, Class EA studies, design and construction prior to the year that the new supply is required.

Table ES-13 Timing of Proposed Water Supply Projects under Different Conservation Scenarios

Project No./ Order of Implementation	Project Name	Timing			
	Base Forecast	Base Case	Current WCESU Approved Programming	Enhanced Conservation	Maximum Conservation
Project 1	SWQ (Ironwood test well)	2015	2017	2019	2019
Project 2	Clythe Well	2018	2022	2024	2024
Project 3	Logan test well	2020	2025	2027	2027
Project 4	Sacco Well	2022	2026	2029	2029
Project 5	Smallfield Well	2023	2027	2030	2030
Project 6	Lower Road Collector System	2023	2028	2031	2032
Project 7	Sunny Acre (new well inside City)	2025	2029	2033	2035
Project 8	Scout Camp test well	2026	2030	2036	2038
Project 9	Hauser test well	2027	2033	Post 2038	Post 2038
Project 10	Arnell Collector ASR wells	2028	2034	Post 2038	Post 2038
Project 11	Guelph South (new well outside City)	2030	2038	Post 2038	Post 2038
Project 12	Guelph North (new well outside City)	2034	Post 2038	Post 2038	Post 2038

Project No./ Order of Implementation	Project Name	Timing			
	Base Forecast	Base Case	Current WCESU Approved Programming	Enhanced Conservation	Maximum Conservation
Project 13	Guelph Lake WTP	2038	Post 2038	Post 2038	Post 2038
Project 14	Guelph Lake WTP and ASR wells in Northeast Quadrant	Post 2038	Post 2038	Post 2038	Post 2038

The timing of new water supply projects is dependent on the City’s overall demand for water and is different under each of the four water conservation scenarios. This in turn impacts capital and operational spending. The capital spending on water supply projects is combined with the spending on water conservation to result in a net present value of cost for each of the four different water conservation scenarios, presented in **Table ES-14**.

Table ES-14 Present Value and Reduction in Average Day Demand for Conservation Scenarios

	Reduction in Average Day Demand (m ³ /d)	Present Value (PV) Cost of System
Base Case	990	\$78,260,000
Current WCESU Approved Programming	5,556	\$58,696,000
Enhanced Water Conservation	9,147	\$59,959,000
Maximum Water Conservation	9,842	\$75,467,000

Based on the completed financial analysis, the Enhanced Water Conservation Scenario is recommended for implementation. This scenario will result in a target for reduction in average day demand of 9,150 m³/d by 2038. Although the water conservation programs included in the Enhanced Water Conservation Scenario are not fully specified to allow for flexibility in subsequently determining the best strategy for achieving the water conservation target, it is important to note that rate reform is a key driver of water conservation in the enhanced scenario. If the City does not proceed with rate reform, it will likely be difficult to hit the specified water conservation target, which would consequently necessitate additional water supply projects within the study period to meet the required system capacity.

ES-8.3 Preferred Water Supply Alternative

The preferred water supply alternative consists of the Enhanced Water Conservation Scenario as well as Projects 1 through 8 listed as identified in **Table ES-15**. These are all groundwater projects included in the first ranked alternatives in the evaluation process, consisting of existing municipal off-line wells, existing municipal test wells, and a new well inside the City. A recommended implementation strategy for all required projects is provided in detail in the full report.

Table ES-15 Preferred Water Supply Alternatives

Alternative	Evaluation Ranking	Projects
1A – Conservation & Demand Management	1	Enhanced Water Conservation Scenario
2B – Groundwater: Existing Municipal Off-line Wells	1	1. Southwest Quadrant well (e.g. Ironwood test well) 2. Clythe Well 3. Logan test well 4. Sacco Well 5. Smallfield Well 6. Lower Road Collector System 7. Sunny Acre (new well inside City) 8. Scout Camp test well
2C – Groundwater: Municipal Test Wells	1	
2D – Groundwater: New Well inside City	1	

It will be important for the City to closely track the success of the water conservation program to ensure that the predicted reductions are being achieved, and to be able to trigger the initial phases of supply projects noting the lengthy lead-in time to complete all of the necessary investigations, approvals and design such that the water is available when needed. The City may decide to take a more conservative approach to complete more of the preliminary steps in advance to allow for a shorter final implementation time required for final construction and commissioning once triggered. This would also assist in identifying project issues early, and also securing land requirements.

ES-8.4 Recommendations

Planning Recommendations

The estimated water supply demand in any given future year is based on the projected residential population and employment numbers for that year multiplied by design values for unit consumption. Actual demand averaged over time generally follows a similar linear trend. In reality, however, required water supply capacity is subject to planning applications for developments which require commitment of a large volume at one time regardless of the timeline for construction or when the demand will be realized, and proposals from industries which may require a large volume in a short period of time. These planning obligations present challenges for infrastructure planning as they can result in expediting water supply projects and the associated budgets to bring water supply on-line prior to when it is actually needed, or conversely use up available capacity on an accelerated schedule that was intended for future growth. This can be partially addressed by including a conservative trigger for bringing on-line new supply capacity (e.g. at demand/supply of 90%). However, optimizing the schedule for water supply capacity planning may also be addressed through appropriate planning policies that ensure the City has suitable lead-time and budgets in place for required supplies. As such, it is recommended that the City review its planning and approvals process for managing allocation of water supply capacity.

Future City policies addressing water supply may address these challenges as follows:

- Build on the current process and guidelines for review of applications from new large volume users (e.g. industry), which considers a balance of employment and water use.
- Investigate more robust policies for supply capacity allocation for both new and existing customers that take into account the relatively large capital expenses and lengthy timelines required to fully commission new water supply facilities. These policies would ensure maximum value to the City for supply capacity allocated to both new and existing customers.
- Develop a tracking system to closely monitor conservation successes and whether results are in-line with the forecasted demand for the preferred scenario.
- Consider time limits on development commitments such that water capacity is not ‘held’ for long periods of time.

- Determine a consultation and approval process for existing customers to request additional large volumes of water takings, to avoid sudden and unexpected increases in demand.
- Review possible mechanisms to synchronize approvals of significant capacity increases with the proposed timing of new supplies in accordance with the master planning schedule.
- Assess the Development Charges planning process for the ability to provide flexibility in funding.

Supply Capacity Management Recommendations

The supply capacity in any given year is dependent on the existing water supply system to deliver the optimal capacity from each of the municipal wells or collector system. Maintaining the system for optimal capacity requires regular reviews of system capacity and consideration of potential threats in quantity and quality. The City's Source Protection Program under the Clean Water Act is expected to protect and improve the quality aspects of the existing water supply system. The following are recommendations to manage the maintenance of water supply capacity:

- Water Services should conduct annual reviews of each component of the water supply system to determine the supply capacity and to identify any changes in the capacity from previous years or any constraints in delivering the optimal supply capacity;
- Based on the annual reviews of water supply capacity, Water Services should develop programs and implement maintenance and upgrades to the water supply system so that the system can deliver its optimal supply capacity;
- To protect water quantity and to mitigate potential impacts on quantity from other water takings, the City should consider implementing a municipal by-law to restrict new private groundwater supply wells in the City as well as other areas where municipal water services are present.

From: fjf@stopthenucleardump.com [mailto:fjf@stopthenucleardump.com]

Sent: March 5, 2014 3:04 PM

To: Mayors Office

Subject: Urgent Request for Resolution Against a Nuclear Waste Dump

Dear Mayor Farbridge,

I am a member of Stop The Great Lakes Nuclear Dump, a non-profit organization formed by a group of citizens who are deeply concerned about an important national issue: Ontario Power Generation (OPG) plans to build and later abandon a nuclear waste repository to bury radioactive nuclear waste right beside the Great Lakes, 21% of the world's fresh surface water and the source of drinking water for 40 million people in two countries. The Great Lakes are a precious national treasure. Public hearings on this project commenced on September 16, 2013 and ended on October 30, 2013. Approval is expected to occur sometime in 2014.

I am writing to you today to encourage the City of Guelph to join other cities and municipalities in Canada and the US that are taking action to oppose this ill-conceived plan. It may interest you to know that Toronto, Mississauga, Oakville, Hamilton, London, Windsor, Chatham-Kent, St. Catharines, Kingston, Ajax, Sarnia and many other communities have passed resolutions opposing the proposed nuclear waste repository. **The combined population of communities that have passed resolutions is currently about 9.3 million people.** For a complete list of resolutions that have been passed so far in Ontario, Michigan, Ohio and Illinois opposing OPG's plan, see <http://stopthegreatlakesnucleardump.com/resolutions.php>

There are many reasons why the City of Guelph should be concerned about OPG's plan, namely:

- Lake Michigan and Lake Huron are interconnected and considered a single lake from a hydrology perspective because their waters move in either direction. Any contamination resulting from a leaking nuclear waste repository located on Lake Huron could affect Lake Michigan's waters. In addition, Lake Erie, the Welland Canal and Lake Ontario, are all downstream of the proposed nuclear waste repository.
- Despite the fact the OPG was required under the Environmental Impact Statement guidelines to consider alternative sites, **OPG did not consider or investigate any other sites for this nuclear waste repository.** We note with interest that OPG's

owner, the Government of Ontario, owns and controls 87% of Ontario's land mass, this being crown land.

- OPG's public consultation focused primarily on Bruce County with some very limited outreach in Michigan; **OPG failed to inform or seek input from citizens living in many Great Lakes communities in Canada and the US, or their elected officials.**
- This nuclear waste repository will need to safely house the most lethal waste ever created by humans - radioactive nuclear waste, some of which remains toxic for 100,000 years.
- No scientist or geologist can provide a 100,000 year guarantee that this nuclear waste will not leak and contaminate the Great Lakes.
- A nuclear waste repository in limestone is unprecedented and unproven anywhere in the world.

You should know that opposition to OPG's plan is growing daily.

Our organization launched a petition that to date has gathered over 50,000 signatures, including signatories from every Province and Territory in Canada, all 50 US States, and 96 countries of the world. Various environmental groups are actively opposing OPG's plan.

We believe that the residents of the City of Guelph deserve to know about this issue and have an opportunity to speak out for the protection of this precious national treasure.

I am writing to you today to ask the City of Guelph to consider formally expressing its opposition to OPG's plan and to speak out for the protection of the Great Lakes. If the City of Guelph passed a resolution about this issue, this would send a clear message to Canada's Minister of the Environment, Leona Aglukkaq that the City of Guelph view the Great Lakes as an important national resource that must be protected.

We sincerely hope that you and the Members of Council will consider passing a resolution against this nuclear waste repository approximately 1 km from the shore of Lake Huron.

Some further information which may assist you and fellow Councillors with your deliberations:

- Oral testimony to the Joint Review Panel by Beverly Fernandez, Spokesperson for Stop The Great Lakes Nuclear Dump. See <http://tinyurl.com/m49dev7>
- Submission to the Joint Review Panel by the Great Lakes and St. Lawrence Cities Initiative (GLSLCI), a group of 111 Great Lakes Mayors representing 16 million people living in the Great Lakes region. The GLSLCI organization testified at the public hearings and formally expressed its concerns and opposition to OPG's plan. See <http://www.ceaa.gc.ca/050/documents/p17520/92802E.PDF>
- Submission to the Joint Review Panel by Dr. Duinker, an independent expert in environmental assessments engaged by the Joint Review Panel to review OPG's analysis. He states that OPG's analysis is "**not credible, not defensible, unclear, not reliable, inappropriate**" See <http://www.ceaa.gc.ca/050/documents/p17520/94202E.pdf>
- Oral testimony to the Joint Review Panel by Michigan State Senator Hoon-Yung Hopgood expressing concern and opposition to OPG's plan. See <http://tinyurl.com/kjjol8l>
- A youtube video by Michigan State Representative Sarah Roberts opposing OPG's plan and encouraging citizens to sign the Stop The Great Lakes Nuclear Dump petition. See http://www.youtube.com/watch?v=otMayg_4KXg
- A draft resolution that the City of Guelph might consider passing together with some sample resolutions that have already been passed by other Canadian and US communities. See attached.

Thank you very much for your time and consideration of this matter.

Most sincerely,

Frank Fernandez

To learn more please visit our website:
www.stopthegreatlakesnucleardump.com

To sign the online petition:
<http://www.gopetition.com/petitions/stopthegreatlakesnucleardump.html>

*Stop The Great Lakes Nuclear Dump Inc. is a non-profit organization comprised of concerned Canadians who believe that the **protection of the Great Lakes from buried radioactive nuclear waste is responsible stewardship**, and is of national and international importance.*

The Great Lakes were created by an ice age 12,000 years ago.

The Egyptian pyramids were created 4,500 years ago.

Some nuclear waste remains radioactive for 100,000 years.

The Great Lakes constitute 21% of the world's fresh water.

The Great Lakes are the water source supporting 40 million people in 2 countries.

An underground nuclear waste dump 1 km from the shore of Lake Huron defies common sense



300 Dufferin Avenue
P.O. Box 5035
London, ON
N6A 4L9

London
CANADA

October 2, 2013

Deep Geologic Repository Project
Canadian Environmental Assessment Agency
160 Elgin Street, 22nd Floor
Place Bell Canada
Ottawa, ON K1A 0H3

RE: Deep Geologic Repository Project – Reference No. 17520

I hereby certify that the Municipal Council, at its session held on October 1, 2013 resolved:

WHEREAS the Great Lakes are a connected water system;

AND WHEREAS the Great Lakes Basin is home to 90% of Ontario's population;

AND WHEREAS the Great Lakes contribute an estimated \$180 billion to Canada-U.S. trade;

AND WHEREAS the Great Lakes support 45% of Canada's industrial capacity;

AND WHEREAS the Great Lakes sustain a \$100 million commercial fishing industry;

AND WHEREAS the Great Lakes sustain a \$350 million recreational fishing industry;

AND WHEREAS the Municipal Council, on January 29, 2013, requested further information and consultation which has not been forthcoming, nor has a consultative approach been taken regionally, though the Joint Water Boards;

AND WHEREAS the City of London is concerned that the proposal for a nuclear waste repository near Kincardine, Ontario may set a precedent for possible future expansion of Deep Geological Repositories (DGR) for high level nuclear waste, without full engagement and consultation with Great Lakes Basin municipalities;

AND WHEREAS the Clean Water Act of Ontario demands that Municipal Councils uphold a high standard of care in order to protect water quality;

NOW THEREFORE BE IT RESOLVED that the Municipal Council of The Corporation of the City of London, in order to protect the Great Lakes and its tributaries, urges that neither this proposed nuclear waste repository near Kincardine, Ontario, nor any other underground nuclear waste repository, be constructed in the Great Lakes Basin, in Canada, in the United States, or on any First Nations property.

C. Saunders
City Clerk
/jb

cc: A. Zuidema, City Manager
J. Braam, Managing Director, Environmental and Engineering Services & City Engineer
J. Lucas, Director, Water and Wastewater
G.T. Hopcroft, Director, Intergovernmental and Community Liaison

The Corporation of the City of London
Office: 519-661-2500 ext. 0969
Fax: 519-661-4892
www.london.ca

Lake Huron Primary Water Supply System Joint Board of Management
Elgin Area Primary Water Supply System Joint Board of Management
S. Truppe, 546 King Street, London, ON N6B 1T5
E. Holder, 200-390 Commissioners Road West, London, ON N6J 1Y3
I. Mathysen, 1700 Dundas Street, London, ON N5W 3C9
J. Preston, 24, 1st Avenue, Unit 2, St. Thomas, ON N5R 4M5
Association of Municipalities of Ontario

September 12, 2013

The Right Honourable Stephen Harper
Prime Minister of Canada
Office of the Prime Minister
80 Wellington Street
Ottawa, ON K1A 0A6

The Honourable Kathleen Wynne
Premier of Ontario
Legislative Building
Queen's Park
Toronto, ON M7A 1A1

The Honourable Leona Aglukkaq
Minister of the Environment
House of Commons
458 Confederation Building
Ottawa, Ontario K1A 0A6

Re: Ontario Power Generation's Plans to Build a Nuclear Waste Repository beside the Great Lakes

Hamilton City Council, at its meeting held on September 11, 2013 endorsed the following resolution:

5.5 Correspondence from Beverly Fernandez, Spokesperson for Stop the Great Lakes Nuclear Dump, respecting Ontario Power Generation's Plans to Build a Nuclear Waste Repository beside the Great Lakes

Recommendation: That the Resolution Opposing the Construction of the Nuclear Waste Repository in the Great Lakes Basin be supported and copies be forwarded to the Hamilton Conservation Authority, Conservation Halton, the Grand River Conservation Authority, and the Niagara Peninsula Conservation Authority.

Yours truly,

R. Bratina
Mayor
Attachment

File C13-016
(5.5)

c.c. Hamilton Conservation Authority
Conservation Halton
Grand River Conservation Authority
Niagara Peninsula Conservation Authority

Resolution Opposing the Construction of the Nuclear Waste Repository in the Great Lakes Basin

WHEREAS Ontario Power Generation is proposing to construct an underground long-term burial facility for all of Ontario's low and intermediate level radioactive nuclear waste at the Bruce Nuclear Generating Station, some of which is highly radioactive and will remain toxic for over 100,000 years. This site is approximately one kilometre inland from the shore of Lake Huron and about 400 metres below the lake level;

WHEREAS water is Canada's most important resource and should be protected and managed prudently;

WHEREAS the Great Lakes are an irreplaceable natural resource, containing 21% of the worlds, and 95% of North America's, fresh water vital to human and environmental health;

WHEREAS the Great Lakes are vital to the economic and agricultural well-being to both Canada and the United States of America;

WHEREAS Lake Huron and the connecting waters, including Lake St. Clair, are a source of drinking water for millions of people downstream in Canada, the United States of America and First Nations;

WHEREAS concern has been expressed by individuals, citizen and environmental groups and municipalities and counties in both Canada and the United States;

WHEREAS under the *2012 Protocol Amending the Agreement Between Canada and the United States of America on Great Lakes Water Quality*, the governments of Canada and the United States acknowledge the importance of anticipating, preventing and responding to threats to the waters of the Great Lakes;

WHEREAS the Governments of Canada and of the United States share a responsibility and an obligation to protect the Great Lakes from contamination from various sources of pollution, including the leakage of nuclear waste from an underground nuclear waste repository;

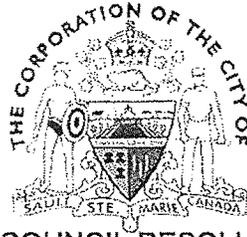
WHEREAS placing a permanent nuclear waste burial facility so close to the Great Lakes is ill-advised. The potential damage to the Great Lakes from any leak or breach of radioactivity far outweighs any suggested economic benefit that might be derived from burying radioactive nuclear waste at this site. The ecology of the Great Lakes, valuable beyond measure to the health and economic well-being of the entire region, should not be placed at risk by storing radioactive nuclear waste underground so close to the shoreline;

NOW THEREFORE BE IT RESOLVED,

- (a) That the City of Hamilton, in order to protect the Great Lakes and its tributaries, urges that neither this proposed nuclear waste repository at the Bruce Nuclear Generating Station nor any other underground nuclear waste repository be

constructed in the Great Lakes Basin, in Canada, the United States, or any First Nation property.

- (b) That the City of Hamilton urges the Government of Canada and the Government of Ontario to reject (and seek alternatives to) Ontario Power Generation's proposal to bury radioactive nuclear waste in the Great Lakes Basin.
- (c) That copies of this resolution be provided to Ontario Premier Kathleen Wynne, Canada's Prime Minister Stephen Harper, and Canada's Federal Minister of the Environment Leona Aglukkaq.



CITY COUNCIL RESOLUTION

Agenda Number: 6.1
Title: Stop the Great Lakes Nuclear Dump Inc.
Date: Monday, January 20, 2014

Moved by: Steve Butland
Seconded by: Joe Krmpotich

Whereas Ontario Power Generation is proposing to construct an underground long-term burial facility for all of Ontario's low and intermediate level radioactive nuclear waste at the Bruce Nuclear Generating Station, some of which is highly radioactive and will remain toxic for over 100,000 years. This site is approximately one kilometre inland from the shore of Lake Huron and about 400 metres below the lake level; and

Whereas water is Canada's most important resource and should be protected and managed prudently; and

Whereas the Great Lakes are an irreplaceable natural resource, containing 21% of the world's, and 95% of North America's, fresh water vital to human and environmental health; and

Whereas the Great Lakes are vital to the economic and agricultural well-being to both Canada and the United States of America; and

Whereas Lake Huron and the connecting waters, including Lake St. Clair, are a source of drinking water for millions of people downstream in Canada, the United States of America and First Nations; and

Whereas concern has been expressed by individuals, citizen and environmental groups and municipalities and counties in both Canada and the United States; and

Whereas under the *2012 Protocol Amending the Agreement Between Canada and the United States of America on Great Lakes Water Quality*, the governments of Canada and the United States acknowledge the importance of anticipating, preventing and responding to threats to the waters of the Great Lakes; and

Whereas the Governments of Canada and of the United States share a responsibility and an obligation to protect the Great Lakes from contamination from various sources of pollution, including the leakage of nuclear waste from an underground nuclear waste repository; and

Whereas placing a permanent nuclear waste burial facility so close to the Great Lakes is ill-advised. The potential damage to the Great Lakes from any leak or breach of radioactivity far outweighs any suggested economic benefit that might be derived from burying radioactive nuclear waste at this site. The ecology of the Great Lakes, valuable beyond measure to the health and economic well-being of the entire region, should not be placed at risk by storing radioactive nuclear waste underground so close to the shoreline;

Now Therefore Be It Resolved that the City of Sault Ste. Marie, in order to protect the Great Lakes and its tributaries, urges that neither this proposed nuclear waste repository at the Bruce Nuclear Generating Station nor any other underground nuclear waste repository be constructed in the Great Lakes Basin, in Canada, the United States, or any First Nation property.

Further Be It Resolved that the City of Sault Ste. Marie urges the Government of Canada and the Government of Ontario to reject (and seek alternatives to) Ontario Power Generation's proposal to bury radioactive nuclear waste in the Great Lakes Basin.

Further Be It Resolved that copies of this resolution be provided to Ontario Premier Kathleen Wynne, Canada's Prime Minister Stephen Harper, and Canada's Federal Minister of the Environment Leona Aglukkaq.

Carried

Postponed

Defeated

Referred



Debbie Amaroso

Draft Resolution Opposing the Construction of the Nuclear Waste Repository in the Great Lakes Basin

WHEREAS Ontario Power Generation is proposing to construct an underground long-term burial facility for all of Ontario's low and intermediate level radioactive nuclear waste at the Bruce Nuclear Generating Station, some of which is highly radioactive and will remain toxic for over 100,000 years. This site is approximately one kilometre inland from the shore of Lake Huron and about 400 metres below the lake level;

WHEREAS water is Canada's most important resource and should be protected and managed prudently;

WHEREAS the Great Lakes are an irreplaceable natural resource, containing 21% of the world's, and 95% of North America's, fresh water vital to human and environmental health;

WHEREAS the Great Lakes are vital to the economic and agricultural well-being to both Canada and the United States of America;

WHEREAS Lake Huron and the connecting waters, including Lake St. Clair, are a source of drinking water for millions of people downstream in Canada, the United States of America and First Nations;

WHEREAS concern has been expressed by individuals, citizen and environmental groups and municipalities and counties in both Canada and the United States;

WHEREAS under the *2012 Protocol Amending the Agreement Between Canada and the United States of America on Great Lakes Water Quality*, the governments of Canada and the United States acknowledge the importance of anticipating, preventing and responding to threats to the waters of the Great Lakes;

WHEREAS the Governments of Canada and of the United States share a responsibility and an obligation to protect the Great Lakes from contamination from various sources of pollution, including the leakage of nuclear waste from an underground nuclear waste repository;

WHEREAS placing a permanent nuclear waste burial facility so close to the Great Lakes is ill-advised. The potential damage to the Great Lakes from any leak or breach of radioactivity far outweighs any suggested economic benefit that might be derived from burying radioactive nuclear waste at this site. The ecology of the Great Lakes, valuable beyond measure to the health and economic well-being of the entire region, should not be placed at risk by storing radioactive nuclear waste underground so close to the shoreline;

NOW THEREFORE BE IT RESOLVED, that the city of Guelph, Ontario, in order to protect the Great Lakes and its tributaries, urges that neither this proposed nuclear waste repository at the Bruce Nuclear Generating Station nor any other underground nuclear waste repository be constructed in the Great Lakes Basin, in Canada, the United States, or any First Nation property.

BE IT FURTHER RESOLVED, that the city of Port Guelph, Ontario urges the Government of Canada and the Government of Ontario to reject (and seek alternatives to) Ontario Power Generation's proposal to bury radioactive nuclear waste in the Great Lakes Basin.

BE IT FURTHER RESOLVED, that copies of this resolution be provided to Ontario Premier Kathleen Wynne, Canada's Prime Minister Stephen Harper, Canada's Federal Minister of the Environment Leona Aglukkaq, as well as Joint Review Panel Deep Geological Repository for Low and Intermediate Level Radioactive Waste Case Reference Number 17520, Panel Co-Manager, Ms. Debra Myles, all Members of Ontario's Provincial Parliament and all Members of Canada's Parliament.

STAFF REPORT



TO Planning & Building, Engineering and Environment Committee
SERVICE AREA Planning, Building, Engineering and Environment
DATE July 7, 2014
**SUBJECT SIGN BY-LAW VARIANCES
40 Wellington Street West**

REPORT NUMBER

EXECUTIVE SUMMARY

PURPOSE OF REPORT

To advise Council of two (2) Sign By-law variance requests for 40 Wellington Road West.

KEY FINDINGS

Table 1, Row 3 of Sign By-law Number (1996)-15245, as amended, restricts the projection of a sign that is perpendicular to a building face to a maximum of 0.76 metres from the building face. Additionally, the Sign By-law does not permit the sign to have lighting.

Daniel Johnson Architect Inc. had submitted a sign variance application on behalf of the property owner, Belmont Equity Partners, for a double faced Starbucks Coffee Company sign to be located perpendicular to the building face with a projection of 1.02 metres and to contain internal lighting.

The requested variances from the Sign By-law are recommended for approval for the following reasons:

- The applicant had originally proposed a larger sign with a further projection, but has since compromised and reduced both the size and projection;
- the size now complies and the projection is now only 26cm more than what is permitted by the Sign By-law;
- the proposed internal lighting will have minimal impact to the streetscape; and
- the proposed sign complies with all other regulations.

FINANCIAL IMPLICATIONS

N/A

ACTION REQUIRED

To approve the requested Sign By-law variances for 40 Wellington Street West.

STAFF REPORT

RECOMMENDATION

1. That the report from Planning, Building, Engineering and Environment dated July 7, 2014, regarding sign by-law variances for 40 Wellington Street West, be received.
2. That the request for variances from the Sign By-law for 40 Wellington Street West to permit a sign perpendicular to the building face to project 1.02 metres from the building face and contain internal lighting, be approved.

BACKGROUND

Daniel Johnson Architect Inc. had submitted a sign permit application for a double faced projecting sign which contained internal lighting. Upon review of the sign permit application, staff identified that the proposed sign did not comply with Table 1, Row 3 of Sign By-law No. (1996)-15245, as amended, which restricts the size of a sign that is perpendicular to a building face to a maximum projection of 0.76 metres. Additionally, staff also identified that the sign was proposed to have internal lighting, which is not permitted for projecting signs. The sign permit application was refused.

Daniel Johnson Architect Inc. has submitted a sign variance application on behalf of the property owner, Belmont Equity Partners, for Starbucks Coffee Company.

REPORT

Daniel Johnson Architect Inc. has reduced the original proposed size of the sign and has submitted a sign variance application for two (2) sign variances; see "Schedule B- Sign Permit Drawings" for illustrations. The following is a summary of the reasons that have been supplied by the applicant in support of the variance requests (Also see Schedule C - "Letter of Rationale from Applicant"):

- Two of the three building faces of the Starbucks location will have limited visibility due to the space's site location and the store will be difficult to see by southbound pedestrian and vehicular traffic along Gordon Street;
- The proposed sign will not obstruct any adjacent tenants;
- Given the scale of the overall site and the setback from the street, the applicant believes that the sign will have a minimal impact to the streetscape.

The requested variances are as follows:

Building Sign Perpendicular to the Building Face	By-law Requirements	Request
Maximum Projection From Building Face Permitted	0.76m	1.02m
Lighting	Not Permitted	Internal Lighting

STAFF REPORT



The requested variances from the Sign By-law are recommended for approval for the following reasons:

- The applicant had originally proposed a larger sign with a further projection, but has since compromised and reduced both the size and projection;
- The size now complies and the projection is now only 26cm more than what is permitted by the Sign By-law;
- The proposed internal lighting will have minimal impact to the streetscape; and
- The proposed sign complies with all other regulations.

CORPORATE STRATEGIC PLAN:

3.1- Ensure a well-designed, safe, inclusive, appealing and sustainable City

FINANCIAL IMPLICATIONS:

N/A

DEPARTMENTAL CONSULTATION:

N/A

COMMUNICATIONS:

N/A

ATTACHMENTS

Schedule A	Location Map
Schedule B	Sign Permit Drawings
Schedule C	Letter of Rationale from Applicant

Prepared By:

Bill Bond
Senior By-Law Administrator
Building Services
519-837-5615, ext. 2382
bill.bond@guelph.ca

Approved By

Bruce A. Poole
Chief Building Official
Building Services
519-837-5615, ext. 2375
bruce.poole@guelph.ca

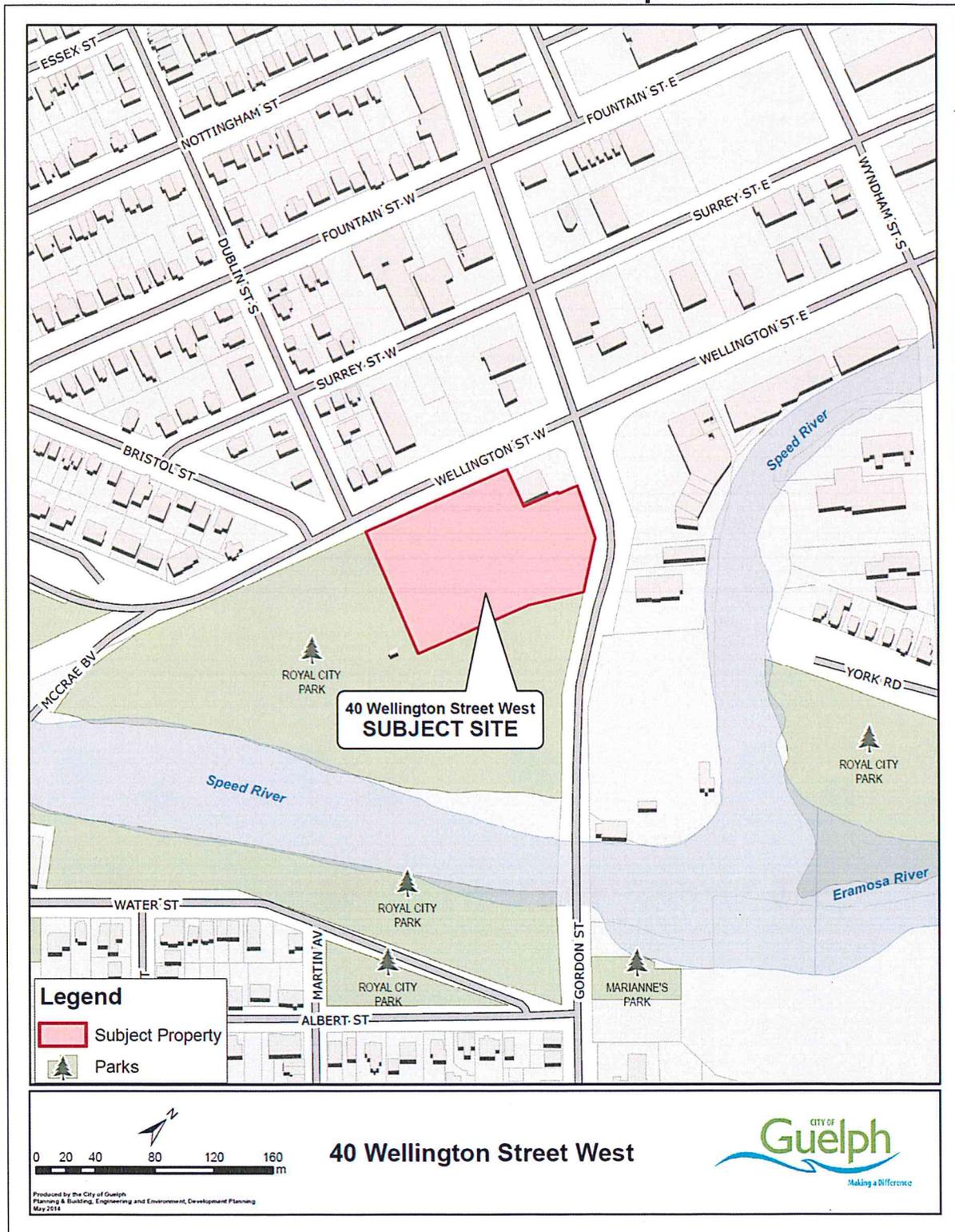
Recommended By:

Patrick Sheehy
Program Manager - Zoning
Building Services
519-837-5615, ext. 2388
patrick.sheehy@guelph.ca

Recommended By

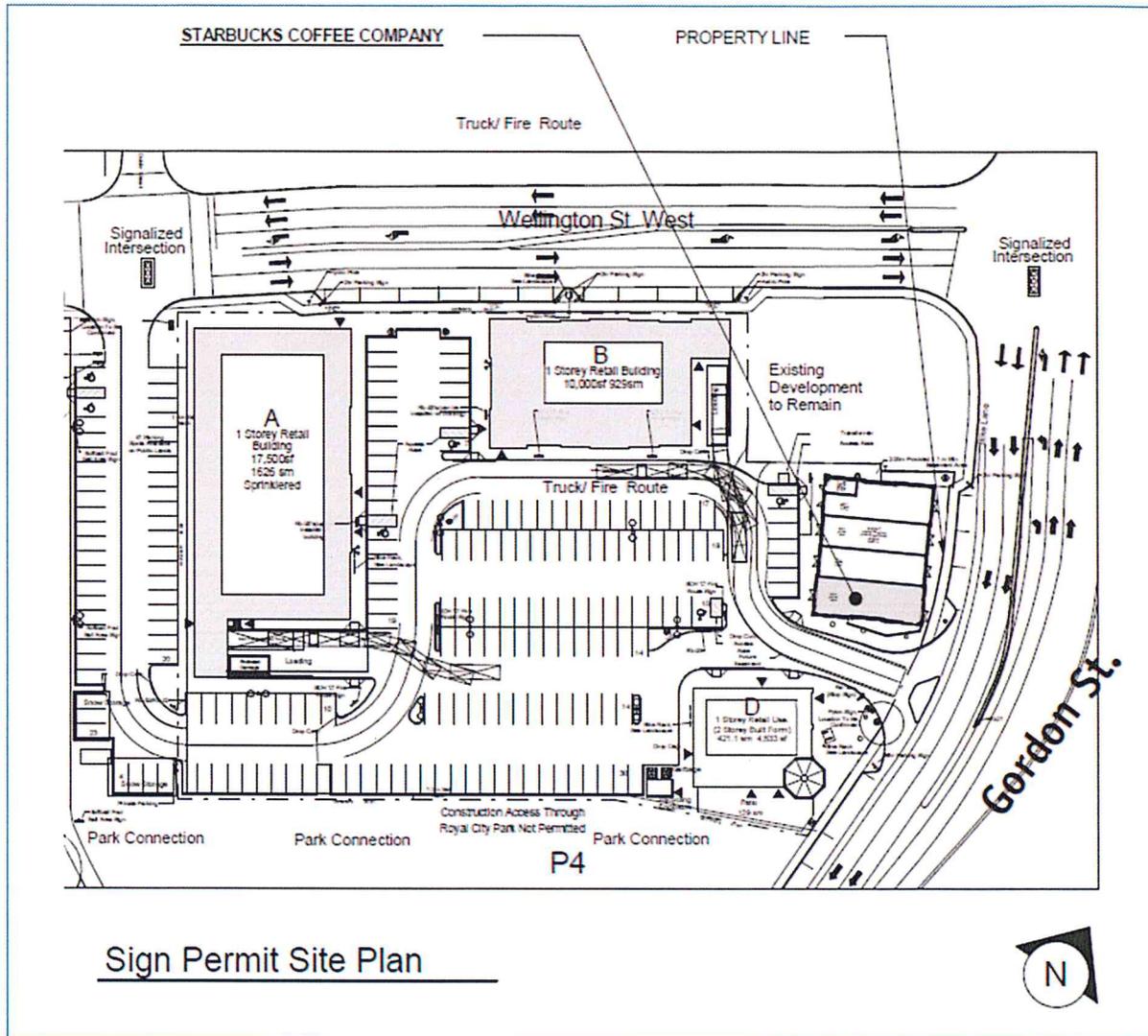
Janet L. Laird, Ph.D.
Executive Director
Planning, Building, Engineering
and Environment
519-822-1260, ext. 2237
janet.laird@guelph.ca

SCHEDULE A- Location Map



STAFF REPORT

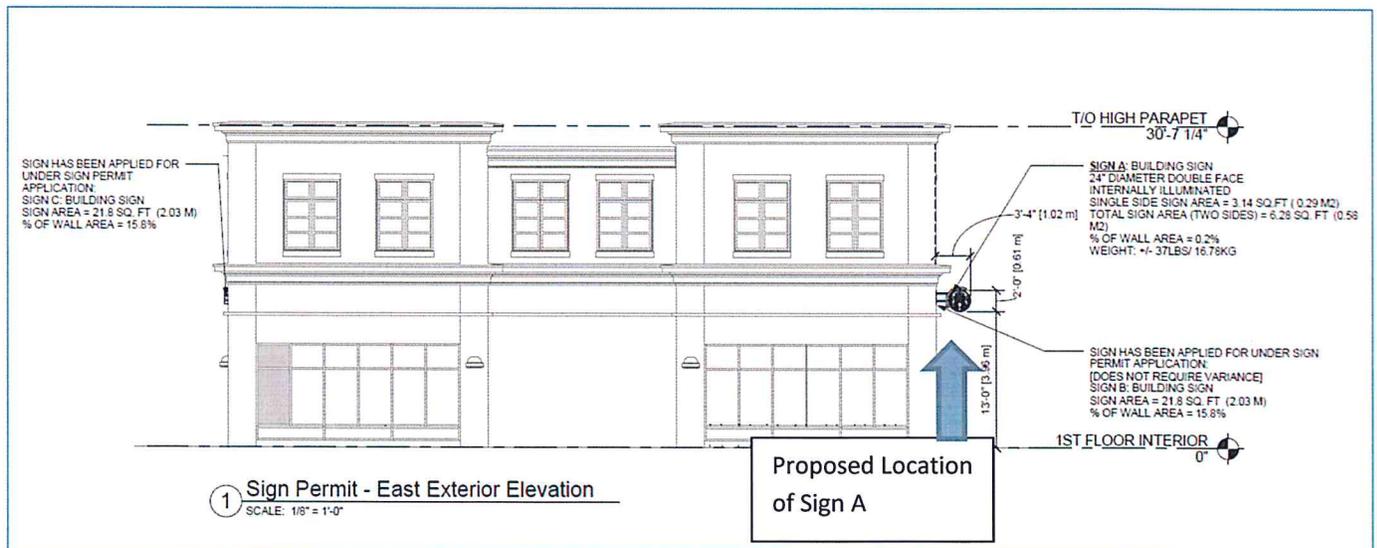
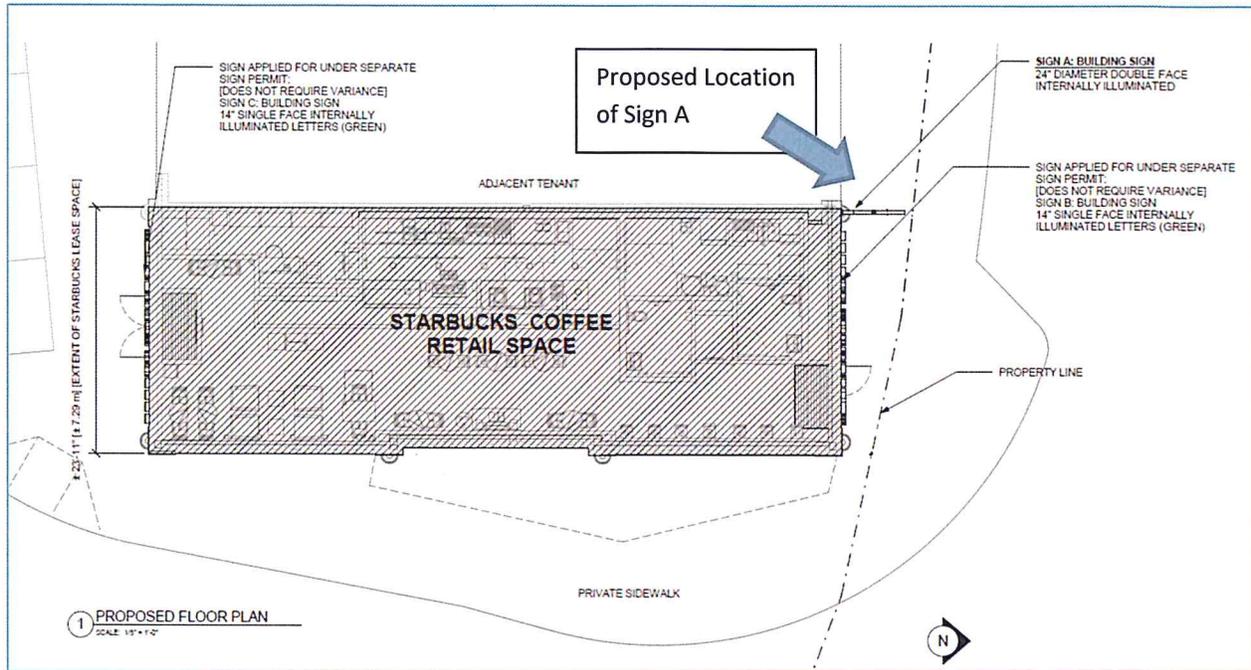
SCHEDULE B- Sign Permit Drawings (Sign A is the sign subject to the variance requests)



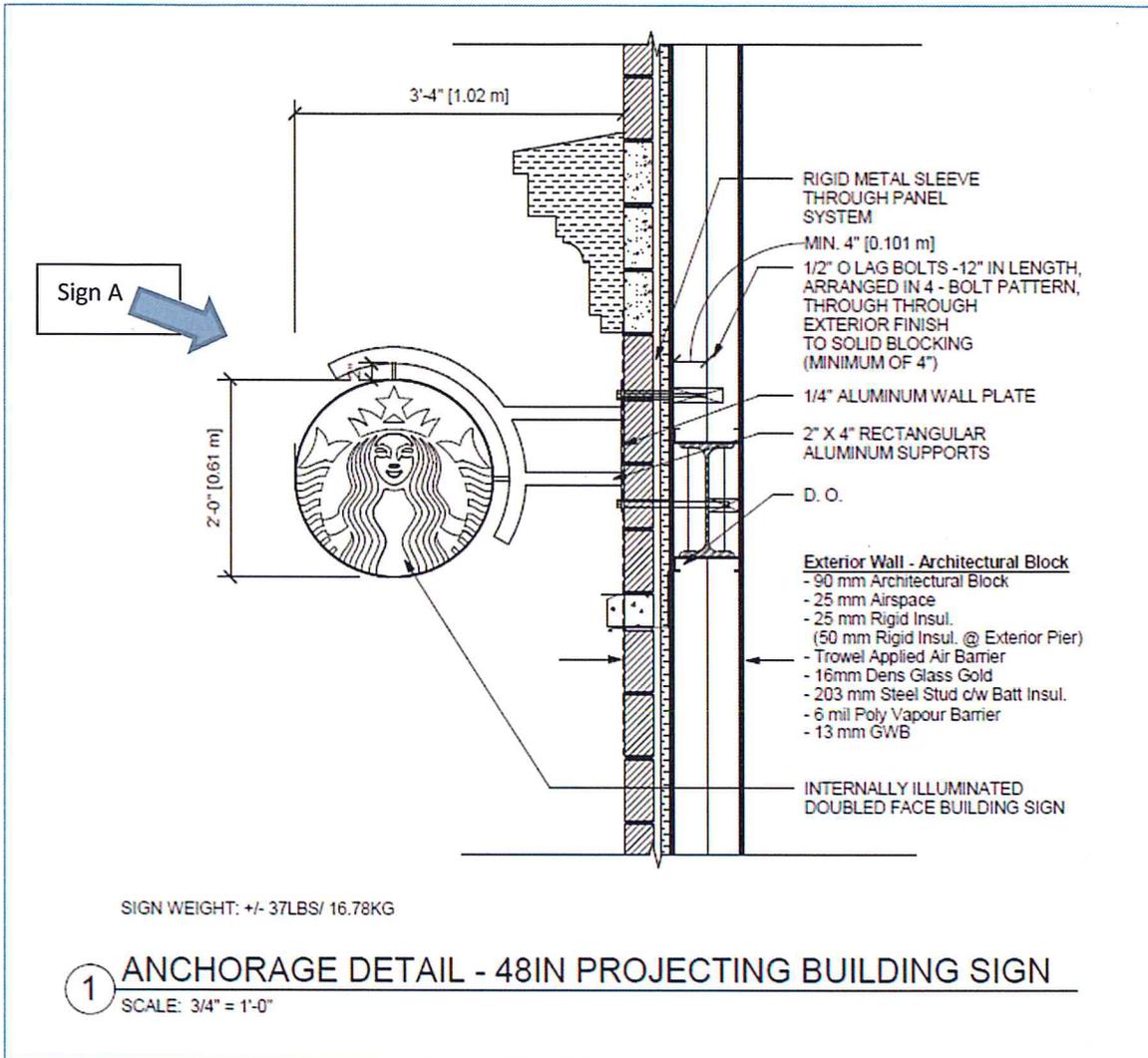
Sign Permit Site Plan

STAFF REPORT

SCHEDULE B Continued – Sign Permit Drawings (Sign A is the sign subject to the variance requests)



**SCHEDULE B Continued – Sign Permit Drawings
(Sign A is the sign subject to the variance requests)**



Sign A

SCHEDULE C- Letter of Rationale from the Applicant

Letter of Rationale

We are applying for a Sign Variance for a projecting sign for the proposed Starbucks at 40 Wellington St. West, Building C, Guelph, ON. The space is located southwest of the intersection at Wellington St. West and Gordon Street in the end suite of a 1 storey retail use multi-tenant building. The proposed sign will be facing Gordon Street but will be immediately adjacent to another tenant and will be one of four tenants in the building.

The proposed space has three building faces. Two of the space's building faces have limited visibility due to the space's site location. The remaining building face looking towards Gordon Street would be the space's primary means of attracting southbound pedestrian and vehicular traffic along Gordon Street. Due to the buildings that are adjacent to the store, the location of the store in the multi-tenant building of which it resides and the position of the store in the overall site, the store will be difficult to see by pedestrian and vehicular traffic southbound along Gordon Street.

A 2'-0" (0.61m) diameter, circular, internally illuminated, double sided, 0.29 m², projecting building sign that projects 40" (1.02m) from the building face will help southbound pedestrian and vehicular traffic to see the store and attract potential customers. The projecting sign will not have writing on it and will only have the Starbucks siren logo on it.

We are proposing to install one projecting building sign onto the storefront. Therefore, we are seeking relief from:

- Table 1, Row 3, column 4 of the City of Guelph Sign by-law (1996)-15245
- Table 1, Row 3, column 6 of the City of Guelph Sign by-law (1996)-15245
- Table 1, Row 3, column 7 of the City of Guelph Sign by-law (1996)-15245

We feel that the proposed sign is sympathetic to the building because it will not be obstructing any adjacent tenants. Moreover, given the scale of the overall site and the setback from the street, we feel that the sign will have a minimal impact to the streetscape.

Without the projecting sign, the store will be difficult to see by pedestrians and vehicular traffic southbound along Gordon Street due to the buildings that are adjacent to the store, the location of the multi-tenant building and position of the store in the overall site. The projecting sign is elegant, simple in design, relatively small and does not distract. It is not only sympathetic to the building, but it also lends the complex a more dynamic and a less flat aesthetic. The sign can become an attractive addition to the pedestrian lines of sight as they stroll down Gordon Street.

Thank you for your consideration.

Regards,

Wil Ching

STAFF REPORT



TO Planning & Building, Engineering and Environment Committee

SERVICE AREA Planning, Building, Engineering and Environment

DATE July 7, 2014

**SUBJECT SIGN BY-LAW VARIANCES
765 Woodlawn Road West**

REPORT NUMBER

EXECUTIVE SUMMARY

PURPOSE OF REPORT

To advise Council of two (2) Sign By-law variance requests for 765 Woodlawn Road West.

KEY FINDINGS

Table 2, Row 2 of Sign By-law Number (1996)-15245, as amended, restricts the height of a freestanding sign located at least 6 metres from the nearest road allowance to 7 metres above an adjacent roadway. Table 2, Row 2 of the Sign By-law also requires that a freestanding sign be a minimum distance of 30 metres from a freestanding sign on an adjacent property.

Pattison Sign Group has applied for variances to permit a freestanding sign located 6 metres from the nearest road allowance to be a height of 8.05 metres above the adjacent roadway and 27 metres from a freestanding sign on an adjacent property.

The requested variance from the Sign By-law is recommended for approval for the following reasons:

- The freestanding sign is an existing sign that is being relocated from 785 Woodlawn Road West to 765 Woodlawn Road West;
- the height variance is only required due to the grading change between properties; and
- Given the 6 metre setback from the nearest road allowance and the 27 metre separation distance, there will be minimal impact to the streetscape.

FINANCIAL IMPLICATIONS

N/A

ACTION REQUIRED

To approve the requested Sign By-law variances for 765 Woodlawn Road West.

RECOMMENDATION

1. That the report from Planning, Building, Engineering and Environment dated July 7, 2014, regarding two (2) Sign By-law variances for 765 Woodlawn Road West, be received.
2. That the requested variances from the Sign By-law for 765 Woodlawn Road West for a freestanding sign to be a height of 8.05 metres and within 27 metres of a freestanding sign on an adjacent property, be approved.

BACKGROUND

Guelph Imported Cars Ltd. (Guelph Hyundai) is moving from 785 Woodlawn Road West to 765 Woodlawn Road West and would like to move their existing freestanding sign to the new property. There is a grading difference between properties which will result in the existing sign being 8.05 metres above the adjacent roadway at 765 Woodlawn Road West once installed. The freestanding sign location is also approximately 27 metres from a freestanding sign on the adjacent property of 695 Woodlawn Road West.

In a Service Commercial Zone, Table 2, Row 2 of City of Guelph Sign By-law Number (1996)-15245, as amended, requires that a freestanding sign that is set back 6 metres from the nearest road allowance be restricted to a height of 7 metres and be a minimum of 30 metres from a freestanding sign on an adjacent property.

Pattison Sign Group has submitted a sign variance application on behalf of Guelph Imported Cars Ltd (Guelph Hyundai) to permit a freestanding sign located 6 metres from the nearest road allowance to be a height of 8.05 metres above the adjacent roadway and 27 metres from a freestanding sign on an adjacent property.

REPORT

Pattison Sign Group has submitted a sign variance application for a sign variance; see "Schedule B- Sign Variance Drawings" for illustrations of the sign. The following is a summary of the reasons that have been supplied by the applicant in support of the variance requests:

- Guelph Hyundai is moving to their new building at 765 Woodlawn Road West and they would like to relocate their existing freestanding sign to the new property;
- The freestanding sign will not create any sightline concerns since there is no sidewalk and the sign will be set back 6 metres from the nearest road allowance;
- The owner does not want to purchase a new freestanding and would like to use the existing sign without having to reduce its height.

STAFF REPORT

The requested variances are as follows:

Freestanding Signs (set back at least 6 metres away from the nearest road allowance)	By-law Requirements	Request
Maximum Height Above Adjacent Roadways	7.0 metres	8.05 metres
Minimum Required Separation Distance Between Signs on Any Adjacent Property	30 Metres	27 metres

The requested variances from the Sign By-law is recommended for approval for the following reasons:

- The freestanding sign is an existing sign that is being relocated from 785 Woodlawn Road West to 765 Woodlawn Road West;
- the height variance is only required due to the grading change between properties; and
- Given the 6 metre setback from the nearest road allowance and the 27 metre separation distance, there will be minimal impact to the streetscape.

CORPORATE STRATEGIC PLAN:

3.1- Ensure a well-designed, safe, inclusive, appealing and sustainable City.

FINANCIAL IMPLICATIONS:

N/A

DEPARTMENTAL CONSULTATION:

N/A

COMMUNICATIONS:

N/A

STAFF REPORT



ATTACHMENTS

Schedule A Location Map
Schedule B Sign Variance Drawing

Prepared By:

Bill Bond
Senior By-Law Administrator
Building Services
519-837-5615, ext. 2382
bill.bond@guelph.ca

Recommended By:

Patrick Sheehy
Program Manager - Zoning
Building Services
519-837-5615, ext. 2388
patrick.sheehy@guelph.ca

Approved By

Bruce A. Poole
Chief Building Official
Building Services
519-837-5615, ext. 2375
bruce.poole@guelph.ca

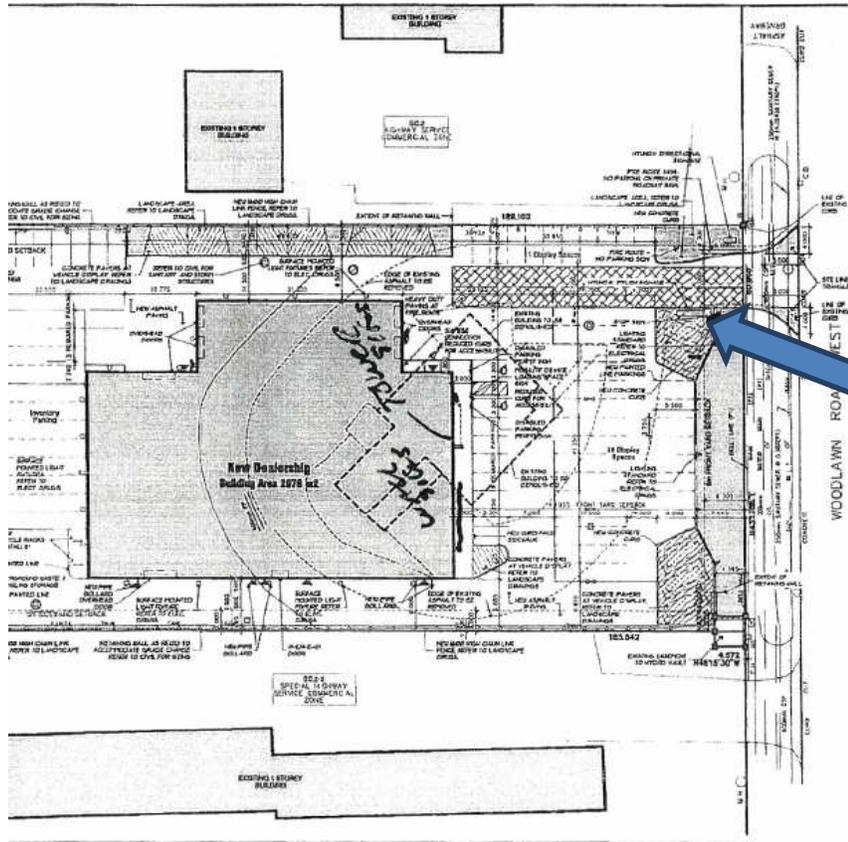
Recommended By

Janet L. Laird, Ph.D.
Executive Director
Planning, Building, Engineering
and Environment
519-822-1260, ext. 2237
janet.laird@guelph.ca

SCHEDULE A- Location Map



SCHEDULE B- Sign Variance Drawings



New Freestanding Sign Location

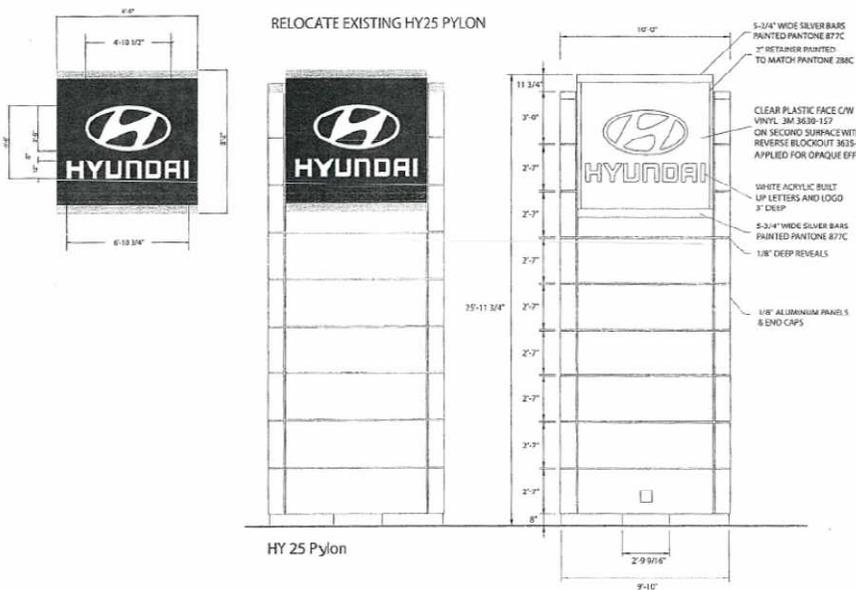
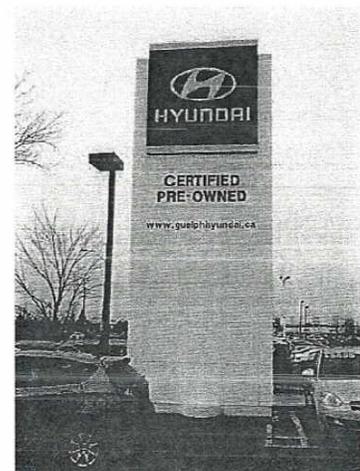


PHOTO OF EXISTING PYLON



The dealer has added non-illuminated graphics since the pylon was installed

STAFF REPORT



TO Planning & Building, Engineering and Environment Committee

SERVICE AREA Planning, Building, Engineering and Environment

DATE July 7, 2014

**SUBJECT Outstanding Motions of the Planning & Building,
Engineering and Environment Committee**

REPORT NUMBER

EXECUTIVE SUMMARY

PURPOSE OF REPORT

To advise the Planning & Building, Engineering and Environment Committee of the status of all outstanding Committee resolutions, and to advise the Committee if there are any outstanding resolutions that may no longer be of community and Council interest.

KEY FINDINGS

Staff are continuing to plan work required to address outstanding motions previously passed by the Committee. In some cases, motions previously passed may no longer be of community interest or have the same level of priority, based on more recent events or circumstances.

The status of all outstanding motions is provided.

FINANCIAL IMPLICATIONS

All work previously endorsed by Council has been resourced through the approved Operating and Capital budgets.

ACTION REQUIRED

To be advised of the status/timing of all outstanding PBEE Committee motions and to update the outstanding motion list by eliminating any motions no longer of priority to the Committee.

RECOMMENDATION

1. That the report dated July 7, 2014 regarding outstanding motions of the Planning & Building, Engineering and Environment Committee, be received.

STAFF REPORT

BACKGROUND

For some time, with input from the City Clerk's Department, a record of outstanding motions of Committee has been maintained. The Executive Team has decided to bring to each Committee of Council a biannual update of all outstanding motions. The biannual report may include recommendations, where appropriate, to eliminate from the list any outstanding motions that may no longer be of priority to the Committee. The current report is the third biannual report.

REPORT

Please find attached for information the outstanding motion list for the Planning & Building, Engineering and Environment Committee, including the status of the work and the timing, when available, for when the work may be completed. As not all outstanding motions will generate a report, a column has been added to indicate those which staff intend to report to Committee/Council ("report required").

CORPORATE STRATEGIC PLAN

Innovation in Local Government

2.3 Ensure accountability, transparency and engagement.

DEPARTMENTAL CONSULTATION

N/A

COMMUNICATIONS

N/A

ATTACHMENTS

Attachment 1 Planning, Building, Engineering and Environment -
Council/Committee Outstanding Motions



Approved and Recommended By

Janet L. Laird, Ph.D.

Executive Director

Planning, Building, Engineering
and Environment

519-822-1260 ext 2237

janet.laird@guelph.ca

Planning, Building, Engineering and Environment
Council/Committee Outstanding Motions
 ATTACHMENT 1

Date	Resolution	Contact	Report Required to Committee? Yes/No	Status
PLANNING SERVICES				
May 26, 2014	That the matter of the Rental Housing Licensing Recommended Approach be referred back to Planning & Building, Engineering and Environment Committee.	(Planning) Joan Jylanne	Yes	Outstanding – report scheduled for August 2014.
May 21, 2014	<ol style="list-style-type: none"> 1. That report CHR-2014-39 entitled "Wilson Farmhouse – Submissions to the Request for Expression of Interest" be received. 2. That Council withdraw the Notice of Intention to Designate the property known as 80 Simmonds Drive, in accordance with Section 29 (14) of the Ontario Heritage Act. 3. That once the Notice of Intention to Designate has been withdrawn, the farmhouse be demolished, while documenting and salvaging, where possible, significant architectural and heritage features to the satisfaction of the City's Senior Heritage Planner. 4. That the existing walnut trees be protected, prior to and during demolition, by fencing to define a Tree Protection Zone beyond the dripline of the trees. 5. That the land area surrounding the farmhouse be retained as parkland and that Park staff integrate the parcel into the Wilson Farm Park Master Plan. 	<p>(Planning) Stephen Robinson</p> <p>(Parks) Karen Sabzali</p>	No (not by Planning)	<ol style="list-style-type: none"> 2. Completed. Advertised June 2014 3. To be completed July 2014 4. To be completed July 2014 5. Referred by Council to Parks
February 10, 2014	<ol style="list-style-type: none"> 1. That the application by 5 Arthur Street Developments, 2278560 Ontario Inc. for a Tax Increment-Based Grant (TIBG) pursuant to the Brownfield Redevelopment Community Improvement Plan and applying to 5 Arthur Street South, be approved with an upset limit of \$3,121,305. 2. That \$2,319,694 of Brownfield TIBG Reserve Funds be reallocated to the Downtown TIBG Reserve Funds. 3. That the application by 5 Arthur Street Developments, 2278560 Ontario Inc. for a Tax Increment-Based Grant pursuant to the Downtown Guelph Community Improvement Plan and applying to 5 Arthur Street South, be approved with an upset limit of \$8,566,117. 4. That staff be directed to finalize Brownfield and Downtown Tax Increment-Based Grant agreements between the City and 5 Arthur Street Developments, 2278560 Ontario Inc., or any subsequent owner, as described in this report to the satisfaction of the General Manager of Planning Services, the Corporate Manager, Downtown Renewal, the City Solicitor, and the City Treasurer. 5. That staff be directed to respond to the next application (Tricar) received in sequence within the remaining funds allocated across 	<p>(Planning) Tim Donegani</p> <p>5. Downtown Renewal Office -</p>	No	<ol style="list-style-type: none"> 1. Completed 2. Completed 3. Completed 4. Outstanding 5. Completed

Planning, Building, Engineering and Environment
Council/Committee Outstanding Motions
 ATTACHMENT 1

Date	Resolution	Contact	Report Required to Committee? Yes/No	Status
	<p>the TIBG reserves and provide their recommendation to committee.</p> <p>6. That staff include options for the replenishment and/or continuation of TIBG programs reserve funding within the Guelph Economic Investment Fund discussions occurring over Q1/2 2014.</p>	<p>Ian Panabaker</p> <p>6. Downtown Renewal Office – Ian Panabaker</p>		<p>6. Completed. GEIS framework presented to Council June 2014; will address TIBG programming.</p>
<p>November 4, 2013</p>	<p>1. That Report 13-67 regarding the proposed demolition of a four (4) unit apartment building at 1159 Victoria Road South, legally described as Concession 8, Rear Part Lot 5, City of Guelph, from Planning, Building, Engineering and Environment dated November 4, 2013, be received.</p> <p>2. That the proposed demolition of the four (4) unit apartment building at 1159 Victoria Road South be approved.</p> <p>3. That the applicant shall erect protective fencing at one (1) metre from the dripline of any existing trees on the property being preserved and also that have the potential of being impacted by demolition activities, prior to commencement of demolition and maintain fencing during demolition.</p> <p>4. That the applicant consult with the Ministry of Natural Resources regarding Barn Swallow habitat, undertake any habitat screening activities and obtain clearance as required, prior to commencement of any demolition activities.</p> <p>5. That the applicant be requested to contact the General Manager of Solid Waste Resources, within Planning, Building, Engineering and Environment regarding options for the salvage or recycling of all demolition materials.</p>	<p>(Planning) Michael Witmer</p>	<p>No</p>	<p>2. Completed.</p> <p>3. Outstanding</p> <p>4. Outstanding. MNR contacted. No clearance obtained yet.</p> <p>5. Completed. Applicant advised of request.</p>
<p>October 9, 2013</p>	<p>That the Chair of Planning & Building, Engineering and Environment Committee be directed to bring the concerns related to coordinating work regarding stranded assets, brownfield field liabilities and the implementation of the Brownfield Redevelopment Community Improvement Plan to the CAO to discuss with the Executive Team.</p>		<p>Yes</p>	<p>Finance is lead. PBEE staff is involved in work regarding stranded assets.</p>
<p>September 30, 2013</p>	<p>1. Whereas a great deal has been learned from the failed conservation of the Wilson Farmhouse.</p> <p>2. That the matter of appropriate funding for the maintenance and conservation of heritage resources in City ownership be referred to the 2014 capital budget process.</p> <p>3. That the matter of the appropriate commemoration of heritage sites throughout the City be referred to Heritage Guelph for review and a recommendation to come back to PBEE.</p> <p>4. That Council seek the advice of Heritage Guelph, in consultation with the Senior Heritage Planner or delegate, research best</p>	<p>2. CSS (Corporate Bldg. Maintenance) - Mario Petricevic</p> <p>3. & 4. (Planning) – Stephen Robinson</p>	<p>Yes</p>	<p>2. Completed. Responded to by Corporate Building Maintenance during 2014 Operating Budget process.</p> <p>3 & 4. Ongoing. Added to the Heritage Guelph Workplan</p>

Planning, Building, Engineering and Environment
Council/Committee Outstanding Motions
 ATTACHMENT 1

Date	Resolution	Contact	Report Required to Committee? Yes/No	Status
	practices in Ontario for municipal heritage marker/plaque programs as part of its review.			
April 8, 2013	<ol style="list-style-type: none"> 1. That the Council Planning Report 13-11, regarding the proposed removal of the barn at 132 Hart's Lane West from the Municipal Register of Cultural Heritage Properties, dated April 8, 2013, be received. 2. That, given the severe structural condition of the Hart barn and the addition, Council authorize staff to amend the description of the heritage attributes pertaining to 132 Hart's Lane West, a listed non-designated property in the City's Municipal Register of Cultural Heritage Properties, to refer only to the Hart farmhouse and to remove all references to the large bank barn and the addition as identified in this report. 3. That the property owner and applicant be directed to develop and implement a strategy at their cost, to the satisfaction of City staff, that satisfies the following cultural heritage conditions: <ul style="list-style-type: none"> • that the Hart barn and its interior framing be completely documented through measured drawings and photographs (before and during disassembly); • that all salvageable wood members (e.g. beams, posts or cladding) and the stone foundation wall be retained and appropriately stored for future study of potential reuse in situ or within a future proposed subdivision; • that heritage interpretive material presented in the form of an outdoor plaque be created by the proponent and installed for public view near the retained farmhouse to explain the former Hart farm complex and its cultural heritage value. 	(Planning) Stephen Robinson	No	<ol style="list-style-type: none"> 2. Outstanding. 3. <ul style="list-style-type: none"> • Completed. • Completed. • Outstanding. Part of future development application.
April 8, 2013	<ol style="list-style-type: none"> 1. That staff be directed to report back to the Planning & Building, Engineering and Environment Committee on the most appropriate mechanism to determine the integrity and potential retention of any barns that remain on the City of Guelph Heritage Register. 	(Planning) Stephen Robinson	Yes	Outstanding. Added to Heritage Guelph Workplan.
February 25, 2013	<ol style="list-style-type: none"> 1. That the proposal for an affordable housing project by Michael House, and located at 185-187 Bristol Street, be approved in principle. 2. That staff be directed to finalize the form of an Indemnity Agreement between the City and the County of Wellington, to the satisfaction of the City Solicitor and the Chief Financial Officer. 3. That the Mayor and Clerk be authorized to execute the Indemnity Agreement in time for it to be received by the County by February 28, 2013. 	(Planning) Tim Donegani	No	<ol style="list-style-type: none"> 2. Completed. 3. Completed.

Planning, Building, Engineering and Environment
Council/Committee Outstanding Motions
 ATTACHMENT 1

Date	Resolution	Contact	Report Required to Committee? Yes/No	Status
	<ol style="list-style-type: none"> 4. That the Clerk be directed to inform the County of Wellington by February 28, 2013 of the City's decision regarding the proposal, and to further advise that no City action is required to provide the mandatory municipal incentives required by the Investment in Affordable Housing for Ontario program. 5. That municipal incentives be offered in the form of a grant equivalent to the cost of the rezoning application site plan fees, building permit fees, development charges and parkland levy to Michael House, and notwithstanding various by-laws that staff be authorized to accept deferred payment of required municipal fees and charges to coincide with the timing of receipt of funds through the Investment in Affordable Housing program. 6. That staff be directed to finalize an agreement with Michael House to implement the municipal incentives to the satisfaction of the General Manager of Planning Services, the City Solicitor and the Chief Financial Officer. 7. That the Mayor and Clerk be authorized to execute the Municipal Incentives Agreement. 8. That the proposed demolition of one detached dwelling at 185 Bristol Street be approved. 9. That the applicant be requested to contact the General Manager of Solid Waste Resources, Planning, Building, Engineering and Environment, regarding options for the salvage or recycling of all demolition materials. 			<ol style="list-style-type: none"> 4. Completed – letter to County Clerk from City Clerk dated Feb.27/13 5. Completed. 6. Outstanding. Zoning By-law Amendment Appealed. Timing of Agreement tbd following appeal. 7. Outstanding. 8. Completed. 9. Completed. Applicant advised of request.
December 10/12	<ol style="list-style-type: none"> 1. THAT the Planning, Building, Engineering and Environment Report 12-102, regarding the Brooklyn and College Hill Heritage Conservation District Boundary – Final Recommendation, dated December 10, 2012, be received; 2. AND THAT Council adopt the Alternative Boundary Option B as the final boundary for the Brooklyn College Hill Heritage Conservation District Plan as shown in Attachment 4 of PBEE Report 12-102 (dated December 10, 2012); 3. AND THAT staff and Heritage Guelph be directed to undertake background research and initiate preliminary discussion with the property owners of 220 Gordon Street and 22 James Street East regarding the potential for individual designation under Part IV of the Ontario Heritage Act; 4. AND THAT the City enter into discussion with the University of Guelph regarding height and scale limits and appropriate setbacks with respect to the redevelopment of 346 Gordon Street. 	(Planning) Stephen Robinson	No	<ol style="list-style-type: none"> 2. Completed 3. Ongoing – Added to Heritage Workplan 4. Outstanding

Planning, Building, Engineering and Environment
Council/Committee Outstanding Motions
 ATTACHMENT 1

Date	Resolution	Contact	Report Required to Committee? Yes/No	Status
September 24, 2012 Council	1. THAT the Planning, Building, Engineering and Environment report 12-58, regarding the Heritage Planning: Annual Activity Report and Four Year Work Plan Update, dated September 17, 2012, be received; 2. AND THAT Heritage Guelph be requested to report to Council on financial mechanisms utilized in other communities best practices to support the maintenance and restoration of heritage properties; 3. AND THAT staff be directed to conduct an orientation session for Council in consultation with Heritage Guelph.	(Planning) Stephen Robinson	Yes	2. Outstanding. Added to Heritage Guelph Workplan. 3. Outstanding. Following election 2014.
September 26, 2011	THAT the proposed renaming of York Road Park be referred back to the Planning & Building, Engineering and Environment Committee; AND THAT the Committee give consideration to alternative opportunities for recognizing the legacy of Jessica's Footprint in our community including the possibility of renaming a portion of York Road Park.	(Planning) Rory Templeton	Yes	Staff are continuing to work with Jessica's Footprint to resolve the resolution.
BUILDING SERVICES				
April 7, 2014	That the definition of "Mobile Sign" within the City's Zoning By-law be referred to the Comprehensive Sign By-law Review.	(Building) Bruce Poole	No	Has been referred to the next comprehensive sign by-law review process. Future work: sign by-law review is not scheduled in any present or future work plans.
September 10, 2013	1. That the request to change the cell tower policy be referred to staff to report back to the Planning & Building, Engineering and Environment Committee on options regarding: a) changes to City policy; and b) advocacy for a review of Safety Code 6. 2. That the matter of the Grange and Starwood cell towers and the extended pole on Auden Road be placed on a future meeting agenda of the Planning & Building, Engineering and Environment Committee.	Bruce Poole Grant Ferguson	2. Yes	1. Completed. Report to PBEE/Council December 2013. 2. Outstanding. Neither cell tower nor extended pole has been installed. Service provider is confirming usage levels and will be required to undertake further community consultation prior to any installation.
April 26, 2010	THAT the matter of reducing and minimizing the proliferation of all election signs on private and public properties be deferred until 2011 and considered during the 2011 priority planning session.	Bruce Poole	No	Outstanding. There have been no Council priority planning sessions and no concerns raised by the public or Council since April, 2010. Will bring a motion to remove from Outstanding Motion List following 2014 election.

Planning, Building, Engineering and Environment
Council/Committee Outstanding Motions
 ATTACHMENT 1

Date	Resolution	Contact	Report Required to Committee? Yes/No	Status
ENGINEERING SERVICES				
September 10, 2013	<ol style="list-style-type: none"> 1. That a Recycled Water Distribution System and an Edinburgh Road Trail Underpass not be included within the scope of final design and construction of the York Trunk Sewer and Paisley-Clythe Feedermain project. 2. That staff review the proposed business case and timing for implementation of a proposed Recycled Water Distribution System as part of future master plan updates such as the ongoing update to the City's Water Supply Master Plan, Wastewater Treatment Master Plan, Water and Wastewater Servicing Master Plan and Water Conservation and Efficiency Plan. 3. That staff review the proposed timing for implementation of an Edinburgh Road Trail Underpass or alternative trail connection in conjunction with the future reconstruction of the Edinburgh Road bridge. 	(Engineering) Don Kudo	No	<ol style="list-style-type: none"> 1. Completed. 2. Future work. 3. Future work.
April 29, 2013	<ol style="list-style-type: none"> 1. That the report entitled "Supporting the Expansion of Community CarShare Cooperative to Guelph", dated April 22, 2013, be received. 2. That Council approve the transfer of entitlement of the free parking space in the Baker Street Parking Lot from the former Guelph Community Car Coop (GCCC) to the Community CarShare Cooperative. 3. That Council approve providing a second dedicated CarShare space downtown free of charge in a location mutually agreed upon by Community CarShare and staff. 4. That staff be directed, as part of the Zoning By-law Review, to develop a change in policy to reduce parking requirements for a development that has provided access to a car sharing practice. 5. That staff be directed to set the term of the proposed spaces for car sharing to ten years. 	Jennifer Juste Don Kudo Pat Sheehy Melissa Aldunate Anna Marie O'Connell	4. Yes	<ol style="list-style-type: none"> 1. Completed. 2. Completed. 3. Completed. 4. Outstanding. Transportation Demand Coordinator to coordinate response with Planning staff. 5. Completed.
April 8, 2013	That the Site Alteration by-law be referred back to staff for review and report back to the Planning, Building, Engineering and Environment Committee.	(Engineering) Kealy Dedman	Yes	Outstanding. Report back to PBEE in Q1-2015.

Planning, Building, Engineering and Environment
Council/Committee Outstanding Motions
 ATTACHMENT 1

Date	Resolution	Contact	Report Required to Committee? Yes/No	Status
February 19, 2013	<ol style="list-style-type: none"> 1. That the Planning, Building, Engineering and Environment Report entitled "Guelph Cycling Master Plan", dated February 19, 2013, be received. 2. That Council approve the Cycling Master Plan, including the cycling network, as illustrated in Schedule 1 to this report, and the recommendations for implementing physical and social infrastructure for cycling, as outlined in this report. 3. That Council approve the recommended network of on-street bike lanes, and direct staff to implement them as part of road reconstruction or road restriping projects, subject to appropriate budget approvals as outlined in this report, and categorized in Schedules to the report as follows: <ol style="list-style-type: none"> a. Schedule 3: On-street bike lanes involving road widening b. Schedule 4: On-street bike lanes without road widening c. Schedule 5: On-street Shared (Sharrow) lanes without road widening 4. That Council approve the implementation of on-street bike lanes on the five streets (Downey Road, Eastview Road, Grange Road, Starwood Drive and Stevenson Street) listed in Schedule 4, that will result in the removal of on-street parking as currently provided on those streets, and direct staff to: <ol style="list-style-type: none"> (i) inform residents, as well as the community at large, that on-street parking may be impacted by the need to provide bike lanes on those streets to establish a continuous and convenient citywide cycling network; (ii) give those residents adequate notice and opportunity to provide feedback on safety concerns or other relevant information; and (iii) take steps to address residents' concerns and minimize the impact on parking to the extent possible. 5. That Council authorize staff to investigate the feasibility, including costs, of paving and maintaining approximately 30 km of the City's existing primary trail system to provide a continuous system of on-street and off-street cycling network for commuter use. 6. That a summary of capital financing to implement the Guelph Cycling Master Plan be brought back in advance of the capital prioritization process. 7. That staff consider current trail systems that currently do not allow bicycling within the overall network. 	(Engineering) Jennifer Juste	No	<ol style="list-style-type: none"> 1. Completed. 2. Completed. 3. Completed <ul style="list-style-type: none"> - Network approved; - Staff is implementing. 4. Completed Stevenson Street. Ongoing work for other locations. 5. Outstanding. Feasibility work scheduled for 2014. 6. Completed. 7. Ongoing.

Planning, Building, Engineering and Environment
Council/Committee Outstanding Motions
 ATTACHMENT 1

Date	Resolution	Contact	Report Required to Committee? Yes/No	Status
February 4, 2013	<ol style="list-style-type: none"> 1. That Council endorse the Proposed Source Water Protection Plan, provided in Attachment 1, to the Planning, Building, Engineering and Environment Report 13-05, including the City of Guelph specific policies; 2. That staff comments on the implementation and next steps in the process, provided to the Source Protection Authority, dated January 21, 2012 and as set out in Attachment 3, to the Planning, Building, Engineering and Environment Report 13-05, be endorsed; 3. That Council request the Source Protection Authority to consult the City of Guelph on any comments or requested revisions to the Source Water Protection Plan proposed by the Ministry of Environment as part of the approval of the Plan or any subsequent amendments to the Source Water Protection Plan; 4. That City staff be directed to consult with adjacent municipalities regarding options and opportunities for coordinated implementation of the Source Water Protection Plan, and to identify synergies and efficiencies, and report back to Council by late 2013; 5. That City staff be directed to inform the Source Protection Authority that the staff comments and the Proposed Source Water Protection Plan have been endorsed by Council. 	(Engineering) Peter Rider	Yes	<ol style="list-style-type: none"> 1. Completed. 2. Completed. 3. Completed. 4. Outstanding – Report back to Council in Q1, 2015. 5. Completed.
SOLID WASTE RESOURCES				
April 28, 2014	<ol style="list-style-type: none"> 1. That the Executive Director of Planning, Building, Engineering and Environment be authorized to enter into a contract with Recyclable Material Marketing (ReMM) and Rizzo Environmental Services to process recyclable material at Guelph's Material Recovery Facility (MRF), subject to the satisfaction of the Executive Director of Finance and Enterprise and the City Solicitor, or their designates. 2. That the Executive Director of Planning, Building, Engineering and Environment be authorized to enter into a contract with ReMM to haul and dispose of 22,500 tonnes of residual waste at a waste-to-energy facility, subject to the satisfaction of the City Solicitor, or designate. 3. That Council approves the hiring of up to an additional thirty-six (36) staff to operate a second shift at the MRF for the term of this contract. 	(Solid Waste) Dean Wyman	No	<ol style="list-style-type: none"> 1. Outstanding. Contract being written. 2. Outstanding. Contract being written. 3. Completed.

Planning, Building, Engineering and Environment
Council/Committee Outstanding Motions
 ATTACHMENT 1

Date	Resolution	Contact	Report Required to Committee? Yes/No	Status
June 27, 2011	<p>WHEREAS the Executive Team has been directed to advise Council, based on Council's ranking of the initial 75 services, regarding which services are recommended for a service review and which are recommended for an operational review;</p> <p>AND WHEREAS the residential waste collection service was ranked by Council fairly low on "total score rank" with a fairly high standard deviation;</p> <p>AND WHEREAS through the service review process Council will consider what our relationship to the provision of services should be, including any potential impacts on both capital and operational costs;</p> <p>THEREFORE BE IT RESOLVED that staff be directed to identify residential waste collection for a service review and report back through the Service Review process on the best timing and cost to conduct this service review;</p> <p>AND THAT the service review be restricted to whether or not the curbside residential waste collection service be provided internally by City staff.</p>	(Solid Waste) Dean Wyman	Yes	<p>Completed. Best timing reported to Council.</p> <p>Outstanding. Referred to Internal Auditor. Review to be considered following full implementation of cart collection program (i.e. 2015).</p>
WASTEWATER SERVICES				
	No outstanding motions.			
WATER SERVICES				
	No outstanding motions.			