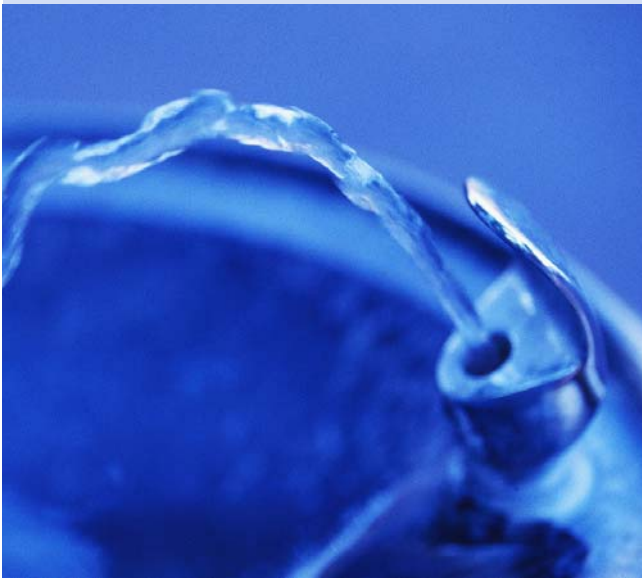




Region of Waterloo



## Water Supply Strategy Report

# VOLUME 1 FINAL REPORT

May 25, 2007

Prepared for:

**Regional Municipality of Waterloo**  
Transportation and Environmental Services Department  
150 Fredrick Street  
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**XCG File #5-035-34-01**

May 25, 2007

**REGION OF WATERLOO  
WATER SUPPLY STRATEGY UPDATE  
FINAL REPORT**

Prepared for:

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Transportation and Environmental Services Department  
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## **EXECUTIVE SUMMARY**

### **Background and Objectives of the Water Supply Strategy Update**

The Regional Municipality of Waterloo (the Region) adopted a Water Supply Master Plan in 2000 (2000 WSMP) that established a long term water supply strategy to 2041 for the Integrated Urban System (IUS) area comprising Cambridge, Kitchener, Waterloo, Elmira and St. Jacobs. Since the adoption of the 2000 WSMP, there have been a number of significant changes from a planning, technical and regulatory perspective that could affect the Region's Water Supply Strategy. In January 2006, the Region initiated an update of the Water Supply Strategy to reassess the philosophy and staging that had been adopted in the 2000 WSMP and to update the strategy.

The objectives of the Water Supply Strategy Update are:

- to investigate the planning, technical and regulatory changes that had occurred since the 2000 WSMP was completed and determine their effect on the Region's water supply strategy;
- to modify the 2000 WSMP and the recommended implementation schedule to reflect the current needs; and,
- to communicate the results of the Update to the public, regulatory agencies and other stakeholders.

The results of the investigation and the Region's Water Supply Strategy Update are presented in this report.

### **Update Methodology**

The consulting team responsible for the Water Supply Strategy Update worked closely with Regional staff as a combined Project Team. A Steering Committee comprised of representatives of other Regional departments and key stakeholders was established to provide guidance to the Project Team. The Update involved three workshops and three technical memoranda to address the three key components of the Update, namely: the future water demand, the available water supply, and the key regulations and policies that may affect the Strategy. The Update included consultation with the public, agencies and stakeholders as well as three Public Information Centres (PICs) to present the findings of the Update and receive comments.

### **Water Demand**

Water demand estimates were prepared based on the forecasted populations and water use projections. Water efficiency efforts will play a key role in minimizing the impact on demand of the increased population growth in the IUS area resulting from the significant changes in land use planning policy that have occurred in Ontario since 2000. Table ES1 presents the projected water demand for the IUS area with and without participation in water efficiency programs and water use restrictions.

**Table ES1 Projected Maximum Week Demand**

Scenario	IUS Maximum Week Demand (ML/d)							
	2006	2011	2016	2021	2026	2031	2036	2041
With water efficiency and water use restrictions	205.8	212.9	224.2	238.4	252.9	270.7	287.1	304.1
Without water efficiency and water use restrictions	211.3	226.3	240.7	255.3	270.3	287.6	305.4	323.1

### Water Supply

The present and short-term future water supply was developed and discussed at a workshop with Regional staff. The IUS capacity including current supplies and short-term future supplies (projects that will be completed in the next three to five years) was established as 282 ML/d (62 MIgd). The sustainable summer capacity was established as 255 ML/d (56 MIgd). The present and short-term future IUS water supply capacity is summarized in Table ES2.

**Table ES2 Present and Short-Term Future System Capacity**

Municipality	Maximum Source Capacity <sup>1</sup> (L/s)	Short Term Peaking Capacity <sup>2</sup> (L/s)	Maximum Sustainable Summer Capacity <sup>3</sup> (L/s)
Cambridge <sup>4</sup>	1,003	929	881
Kitchener <sup>5</sup>	2,232	2,058	1,814
Waterloo <sup>6</sup>	287	258	258
<b>IUS Total Capacity</b>	<b>L/s</b>	<b>3,522</b>	<b>3,255</b>
	<b>ML/d</b>	<b>304</b>	<b>282</b>
	<b>MIgd</b>	<b>67</b>	<b>62</b>

**Notes:**

- Capacity of each system running under theoretical conditions (includes near-term upgrades).
- Capacity sustainable under an isolated maximum week condition.
- Capacity sustainable throughout the summer (includes declining performance loss of 20% and WTP loss of 5%)
- Includes North Dumfries and Lloyd Brown settlement area
- Includes Breslau, Wilmot, Mannheim and Shingletown settlement areas
- Includes Market, St. Jacobs, and Elmira settlements areas

### Updated Water Supply Strategy

Based on the water demand projections and a review of current and short-term capacity, the Update confirmed that the water supply projects identified in the 2000 Water Supply Master Plan were still valid. The Updated Water Supply Strategy will involve the following measures:

- continued implementation of the Water Efficiency Master Plan and achievement of water reduction targets (8.2 ML/d (1.8 MIgd) by 2015);

- continued support of the once a week lawn watering restrictions
- continued examination of well life cycle, including annual examination of the overall source capacity;
- construction of Phase II of the Aquifer Storage and Recovery (ASR) facilities (23 ML/d (5 MIgd));
- continued development of new groundwater supplies up to 23 ML/d (5 MIgd); and,
- construction of a Great Lakes displacement pipeline.

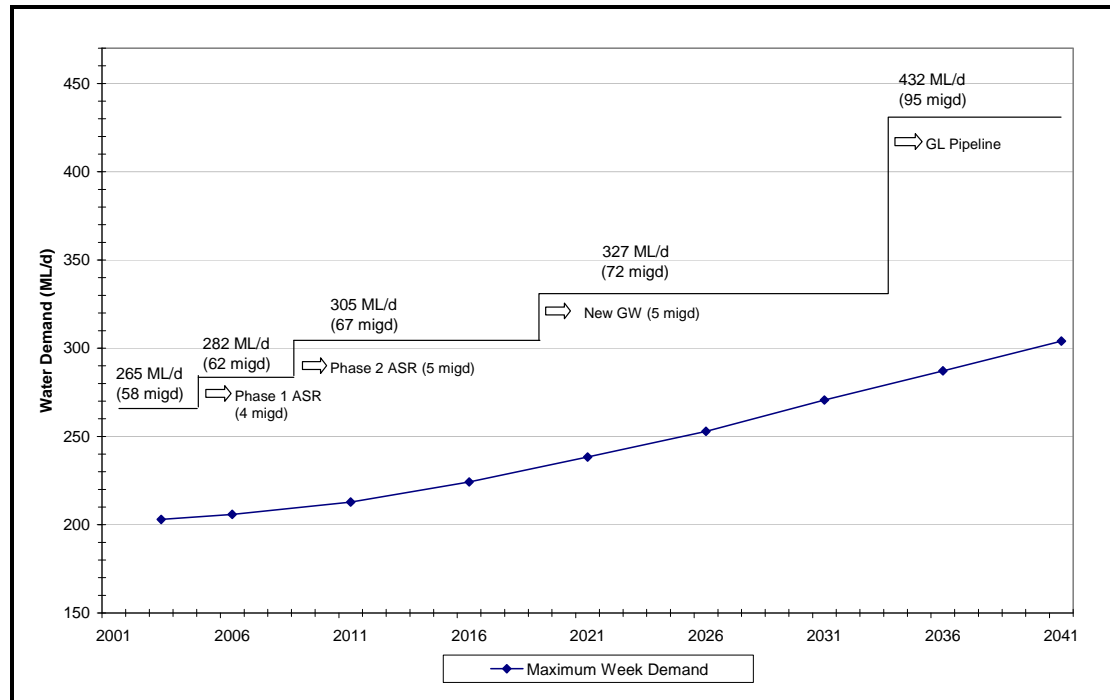
A summary of the short-term future system capacity, as well as the components of the updated Water Supply Strategy which are expected to increase system capacity, is shown in Table ES3.

**Table ES3 Short Term Peaking Capacity and Expected System Capacity**

Component	Capacity	
	ML/d	MIgd
Short Term Peaking Capacity	282	62
Phase II ASR Facilities	23	5
Additional Groundwater Supplies	23	5
Great Lakes Displacement Pipeline	432	95

Based on the projected demand and the expected system capacity, the recommended implementation plan for the updated Water Supply Strategy is shown in Figure ES1.

**Figure ES1 Updated Water Supply Strategy**



As shown in Figure ES1, it is expected that the additional groundwater sources will be required by approximately 2018. The Great Lakes displacement pipeline will be needed to meet demand by 2034 if participation in the water efficiency program and the water restrictions are maintained. Without water efficiency and water restrictions, the pipeline supply would be required in 2029 (not shown).

The Update confirmed that the original WSMP components are still relevant. As a result, a number of actions have been recommended and are summarized below.

*General*

- Continued support of the WEMP that was updated in 2006, including realization of water reduction targets contained therein;
- Continued support for the once a week lawn watering restrictions during the summer;
- Continued maintenance and improvements to existing water supply facilities, such as the present well monitoring program, well life cycle analysis, annual water supply reviews, Mannheim WTP optimization, etc.;
- Continued monitoring of legislative, regulatory and policy direction which could affect source supply; and,
- Continued updates of the WSMP every five years.

*ASR and Additional Groundwater*

- Commencement of the construction of Phase II of the ASR project to be completed by 2009; and,
- Continuation of a program to identify and develop additional groundwater supplies up to 23 ML/d (5 MIgd), to be completed by 2018.

*Great Lakes Displacement Pipeline*

- Focus on Lake Erie source for the Great Lakes displacement pipeline;
- Continue the investigation of the possibility to use the existing intake facilities at Nanticoke (Lake Erie);
- Continue with investigation to obtain a Permit to Take Water and other necessary approvals for the Lake Erie alternative, and to acquire land for treatment, pumping and transmission facilities;
- Continue to explore potential partnerships for developing the above; and,
- Direct staff to develop a detailed financing plan for the Great Lakes displacement pipeline, including financing alternatives and their impacts on water rates and development charges.

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Appendix 2:	Technical Memorandum No. 2 – Present and Short-Term Future Water Supply, Workshop #2 Materials
Appendix 3:	Technical Memorandum No. 3 – Key Legislation, Regulations and Policy Initiatives, Workshop #3 Materials
Appendix 4:	Supplementary Technical Memorandum – Updated Cost Estimates
Appendix 5:	Steering Committee Presentations and Meeting Notes
Appendix 6:	Public, Agency and Stakeholder Consultation

## ACRONYMS AND ABBREVIATIONS

ASR	Aquifer Storage and Recovery
Burnside	R.J. Burnside & Associates Limited
CEAA	Canadian Environmental Assessment Act
CEA Agency	Canadian Environmental Assessment Agency
Class EA	Class Environmental Assessment
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CTA	Canadian Transportation Act
DCDA	D.C. Damman and Associates
D&C (Region)	Transportation and Environmental Services – Design & Construction
EA	Environmental Assessment
EAAB	Environmental Assessment and Approvals Branch
EBR	Environmental Bill of Rights
ENR	Engineering News Record
GLWQA	Great Lakes Water Quality Agreement
GRCA	Grand River Conservation Authority
HADD	Harmful alteration, disruption or destruction of fish habitat
IJC	International Joint Commission
IUS	Integrated Urban System
2000 WSMP	Long Term Water Strategy
MacKinnon	MacKinnon & Associates
MEA	Municipal Class Environmental Assessment
MMAH	Ministry of Municipal Affairs and Housing
MNR	Ministry of Natural Resources
MOE	Ministry of Environment
MPIR	Ministry of Public Infrastructure and Renewal
NEB	National Energy Board Act
NWPA	Navigable Waters Protection Act
OEAA	Ontario Environmental Assessment ACT
OSAA	Ontario Secretariat for Aboriginal Affairs
OWRA	Ontario Water Resources Act
PH&CS (Region)	Planning, Housing and Community Services Department
PIC	Public Information Centre
PTG	Places to Grow Act
PTTW	Permit to Take Water
RA	Responsible Authority
RMOW or Region	Regional Municipality of Waterloo
RGMS	Regional Growth Management Strategy
ROP	Regional Official Plan
RSO	Revised Statute of Ontario
SARA	Species at Risk Act
SDWA	Safe Drinking Water Act
SWPP	Source Water Protection Plan
TES (Region)	Transportation and Environmental Services Department

ToR	Terms of Reference
WDMP	Water Distribution Master Plan
WEMP	Water Efficiency Master Plan
WS (Region)	Water Services Department
WSMP	Water Supply Master Plan
WSSU	Water Supply Strategy Update
WTP	Water Treatment Plant
WWTMP	Wastewater Treatment Master Plan
XCG	XCG Consultants Limited

## **UNIT CONVERSIONS**

1 MIgd = 4.545 ML/d

## **1. INTRODUCTION**

### **1.1 Background**

The Long Term Water Strategy (LTWS), Phase III Report (Regional Municipality of Waterloo, August 2003) was the final report of a three-phased approach to developing a water supply strategy for the Regional Municipality of Waterloo (the Region) to the forecast year 2041. The primary goal of the LTWS was to evaluate the water supply options put forward in previous phases of the study and to select the preferred water supply strategy for the Region.

The LTWS considered only the Integrated Urban Supply (IUS) area, which includes Cambridge, Kitchener, Waterloo, Elmira and St. Jacobs.

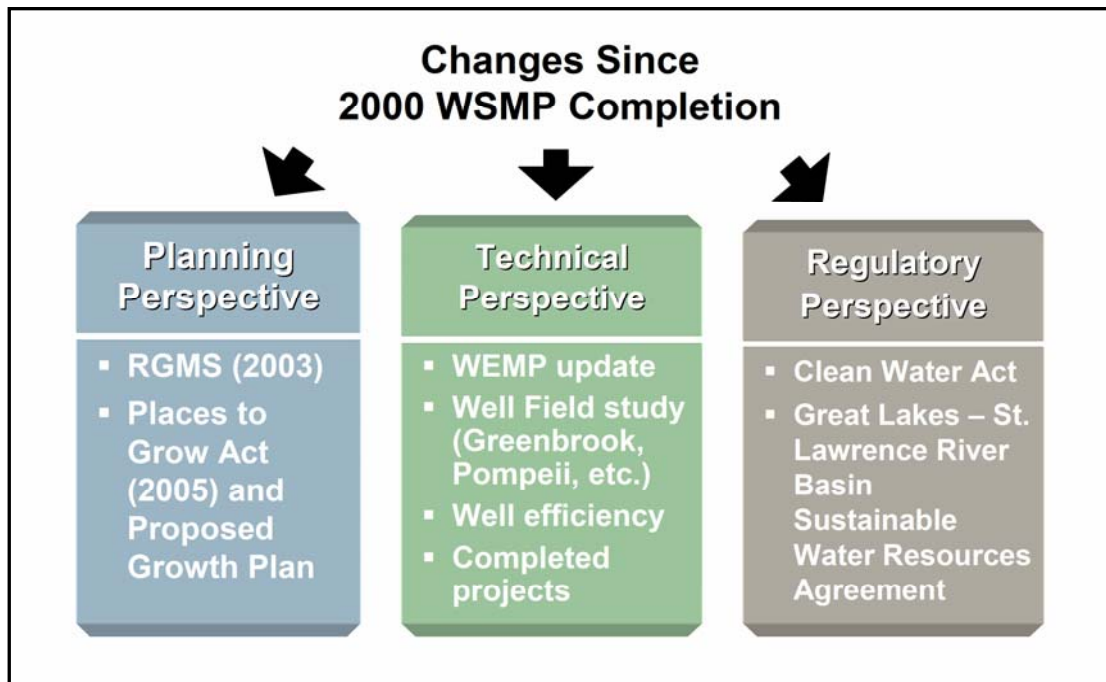
While the Region also operates a number of other smaller, rural water supply systems in the Townships of North Dumfries, Wellesley, Wilmot and Woolwich, the Region's planning policy limits the amount of growth in these small communities subject to the completion of a growth strategy according to specific environmental and servicing criteria.

Regional Council approved the adoption of the LTWS in its entirety as its Water Supply Strategy Master Plan (WSMP) in 2000. Hereafter in this report, the LTWS will be referred to as the 2000 Water Supply Master Plan or the 2000 WSMP.

In June 2003, Regional Council approved the Regional Growth Management Strategy (RGMS). This vision document outlines the Region's overall strategic direction for the long-term management of growth within the Region to 2041 by employing a balanced approach to planning for the future. The RGMS recognized the Province's "Smart Growth" policies and reflected this in a call for intensification of the urban core areas (Cambridge, Kitchener and Waterloo). As well, the RGMS called for development of a major new East Side service area. The RGMS concluded that at that time the water supply strategy proposed by the 2000 WSMP would be adequate to service the anticipated growth in the Region.

Since the adoption of the 2000 WSMP and the completion of the RGMS in June 2003, there have been some significant changes that, from a planning, technical and regulatory perspective, may influence the Region's 2000 WSMP. These changes are discussed in the following subsections and are illustrated schematically in Figure 1.1.

**Figure 1.1 Overview of Planning, Technical and Regulatory Changes**



**1.1.1 Changes from a Planning Perspective**

In 2005, the Province of Ontario enacted the *Places to Grow Act* (PTG) and the Ministry of Public Infrastructure Renewal (MPIR) published the *Growth Plan for the Greater Golden Horseshoe* (2006). The Growth Plan identified the Region as one of the “primary economic drivers within Ontario”. In keeping with the Growth Plan’s goal of intensification of urban areas, uptown Waterloo, downtown Kitchener and downtown Cambridge were identified as areas subject to intensification. The Growth Plan published population and employment forecasts and land use policy directions for the municipalities which comprise the Greater Golden Horseshoe to 2031, ten years shorter than the RGMS planning horizon. The Growth Plan also stated that 40 percent of all new residential units must be accommodated in built-up areas by 2015.

As a result of PTG, the Region’s Planning, Housing and Community Services Department began refining components of the RGMS. During this process, the Region identified that the revised population forecasts could have a significant impact on the water demand in the area served by the IUS.

**1.1.2 Changes from a Technical Perspective**

Since the 2000 WSMP was completed, there have been several factors that may have affected either the water demand or the water supply in the Region and could have an effect on the 2000 WSMP.

### *Water Efficiency Master Plan Update*

Prior to the completion of the 2000 WSMP, Regional Council approved a Water Efficiency Master Plan (WEMP) that established a goal of reducing water consumption by 6.8 ML/d (1.5 MIgd) by 2009. As part of the WSMP, the Region endorsed an “enhanced water efficiency program” that included subsidized rain barrel distribution, an Ayr Water Efficiency Program, a new Outdoor Water Use Bylaw and an increased public education program. The 1998 WEMP and its enhancements formed an effective strategy to achieve water savings. In June 2004, the Water Efficiency Advisory Committee (WEAC) recommended that the WEMP be updated. An updated WEMP for 2007 – 2015 was accepted by Regional Council in July 2006. Details regarding the WEMP Update are provided in Section 1.4.3.

### *Production of Existing Wells*

Several Regional well fields including Greenbrook, Pompeii and Forwell have been out of service due to water quality concerns. Some other wells are operating at flows less than their design capacity.

### *Optimization of Existing Supplies and Identification of New Supplies*

The development of 13.6 to 22.7 ML/d (3 to 5 MIgd) of new groundwater supplies was a component of the 2000 WSMP (refer to Section 1.3). In April 2005, the Region initiated the IUS Project with the goal of restoring the capacity of existing wells that were operating at less than their design capacity and to identify possible new groundwater sources in strategic areas. More information regarding this investigation is provided in Section 1.4.1.

### *Completed Projects*

The 2000 WSMP recommended that an Aquifer Storage and Recovery (ASR) facility be constructed in two stages, each stage to provide 22.7 ML/d (5 MIgd) of capacity. Stage 1 of the ASR was completed and brought on-line in 2005. The capacity provided by Stage 1 of the ASR needs to be recognized.

### **1.1.3 Changes from a Regulatory Perspective**

Since the adoption of the 2000 WSMP, the O’Connor Inquiry into the Walkerton contaminated water tragedy has resulted in sweeping changes to the legislative framework that regulates how drinking water is treated and delivered in Ontario. The

*Safe Drinking Water Act* was passed in 2002 (SDWA, 2002) and the *Clean Water Act* was enacted in 2006 as a result of the O'Connor Inquiry.

The Great Lakes – St. Lawrence River Basin Sustainable Water Resources Agreement<sup>1</sup>, a good faith agreement among the two Canadian provinces and eight U.S. states bordering on the Great Lakes and St. Lawrence River, prohibited with strict exceptions the transfers of water from the Great Lakes Basin into another watershed (inter-basin transfers) or from the watershed of one Great Lake to that of another Great Lake (intra-basin transfers). This good faith agreement is encompassed in the *Clean Water Act*.

The 2000 WSMP provided for the construction of a 432 ML/d (95 MIgd) Great Lakes displacement pipeline to provide water to the Region. The water supply source identified in the 2000 WSMP Phase III report was either Lake Huron or Lake Erie. These regulatory and policy changes may affect the possible supply source.

## **1.2 Objectives of the Water Supply Strategy Update**

The Region, in January 2006, identified that these planning, technical and regulatory changes necessitated a review and update of the 2000 WSMP to ascertain the present status of the Region's water demand and supply and to reassess the philosophy and staging that have been adopted in the 2000 WSMP. This review is called the Water Supply Strategy Update (the Update).

The objectives of the Water Supply Strategy Update are:

- to investigate the planning, technical and regulatory changes that had occurred and determine their effect on the Region's WSMP;
- to modify the 2000 WSMP and the recommended implementation schedule to reflect the current needs; and,
- to communicate the results of the Update to the public, regulatory agencies and other stakeholders.

In May 2006, the Region retained a Project Team comprised of XCG Consultants Limited, R.J. Burnside and Associates Limited, MacKinnon & Associates, and D.C.

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<sup>1</sup> The proposed Safeguarding and Sustaining Ontario's Water Resources Act would implement the Great Lakes – St. Lawrence River Basin Sustainable Water Resources Agreement. The province's existing ban on diversions of water out of the Great Lakes – St. Lawrence River, Nelson and Hudson Bay basins would become law under the act. It would also prohibit new or increase diversions of water from one Great Lake watershed to another, subject to strictly regulated exceptions.



Damman and Associates to complete the Water Supply Strategy Update. The Water Supply Strategy Update addresses water demand and water supply in the tri-cities area of Cambridge, Kitchener and Waterloo, as well as Elmira and St. Jacobs, which are serviced from the IUS. Several smaller settlement areas, including Lloyd Brown and Mannheim, are serviced from one of the tri-cities and are included in the forecasts. The service area covered by this update is shown in Figure 1.2.

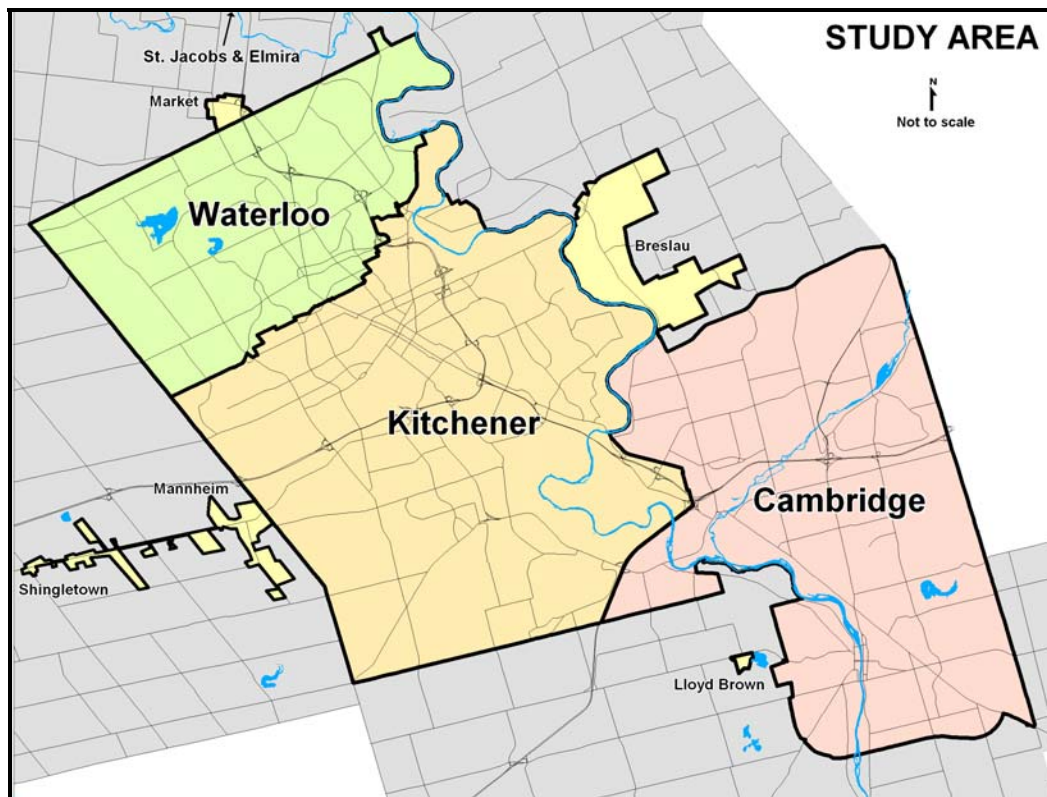
The results of the investigation and the Region of Waterloo’s Water Supply Strategy Update are presented in this report.

### 1.3 **Current Water Supply Master Plan**

The primary goal of the 2000 WSMP was to provide direction on long term water supply to the IUS area that included Cambridge, Kitchener, Waterloo, Elmira and St. Jacobs.

The 2000 WSMP examined population, land use and water consumption to develop a water demand forecast based on maximum week demand to the year 2041. Figure 1.3 presents the IUS maximum week water demand projections that resulted from this process.

**Figure 1.2 Service Area included in the Water Supply Strategy Update**



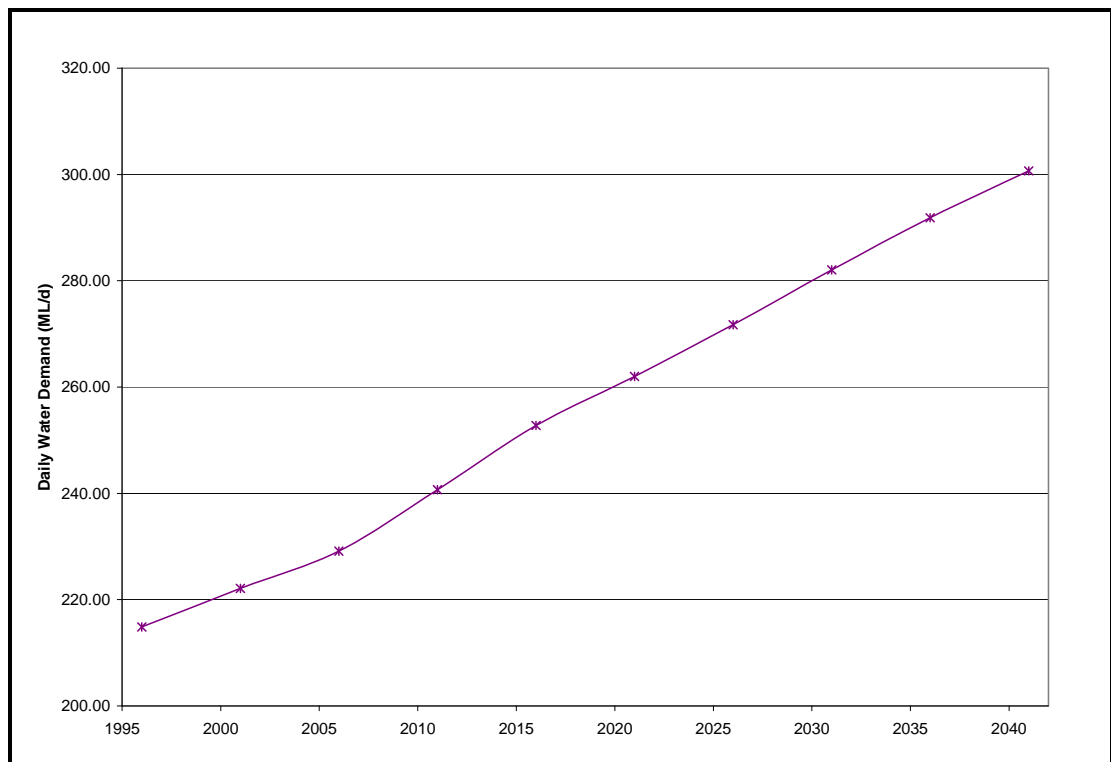


Thirty-three different water supply options were considered in Phase III of the 2000 WSMP to meet the water demand projections. After a comprehensive evaluation process that included short-listing of options, input from a Public Advisory Committee, and public consultation, a preferred long term water supply option for the Region was selected. The preferred strategy consisted of the following components and staging:

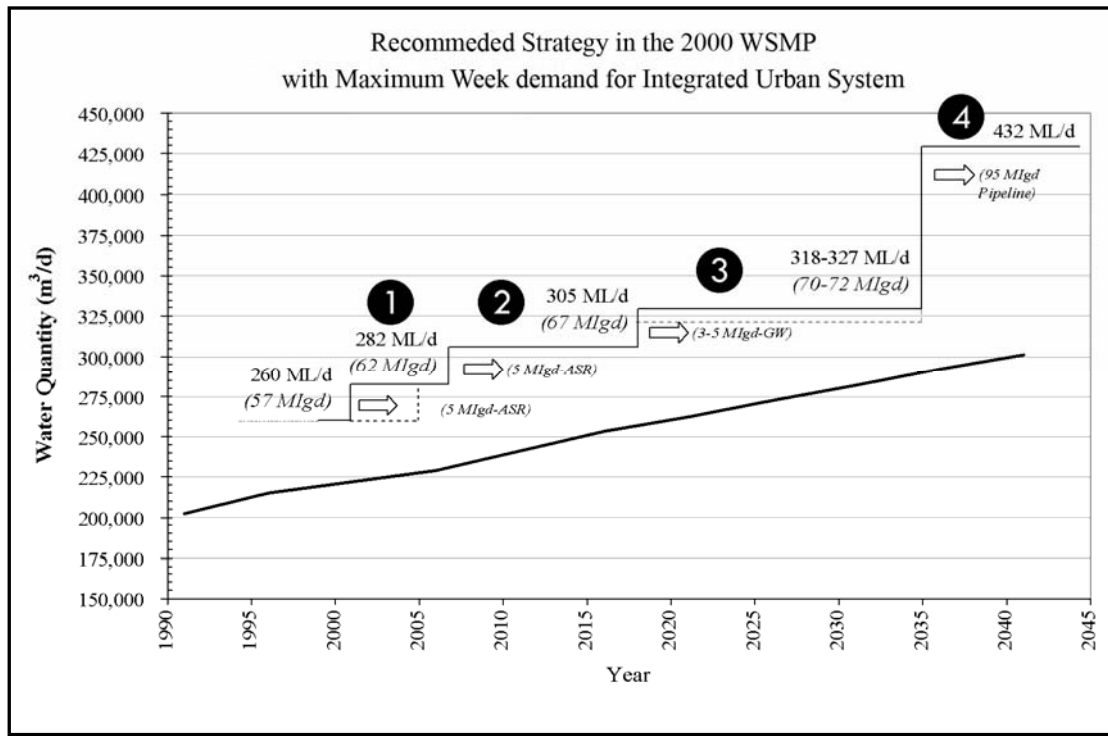
- immediate construction of a 22.7 ML/d (5 MIgd) Phase I Aquifer Storage and Recovery (ASR) facility (see Figure 1.4, Item 1);
- construction of an additional 22.7 ML/d (5 MIgd) Phase II ASR facility in 2007 (see Figure 1.4, Item 2);
- construction of 13.6 to 22.7 ML/d (3 to 5 MIgd) of additional groundwater supplies in 2018 (see Figure 1.4, Item 3);
- construction of a nominal 432 ML/d (95 MIgd) displacement pipeline from either Lake Huron or Lake Erie in 2035 (see Figure 1.4, Item 4); and,
- continued water efficiency efforts.

The recommended implementation strategy in the 2000 WSMP is shown in Figure 1.4.

**Figure 1.3 2000 WSMP Projected Maximum Week Daily Water Demand for IUS**



**Figure 1.4 2000 WSMP Recommended Implementation Strategy**



The costs associated with the proposed strategy (2000 dollars) are summarized in Table 1.1.

**Table 1.1 Capital, Operating and Net Value Costs for the WSMP (2000 dollars)**

Component	Capital Cost (\$M)	Annual Operating Cost (\$M)	Net Present Value (\$M)
ASR/Additional Groundwater	\$26	<u>2001 to 2035</u> \$0.4 plus \$10 for the existing system	\$566 to \$575 including ASR + GW component
		<u>After 2035</u>	
Lake Erie Pipeline	\$467	\$9.9	
Lake Huron Pipeline	\$513	\$10.4	

The Region of Waterloo Long Term Water Strategy was presented to Regional Council for approval on May 10, 2000 and adopted as the Region's Water Supply Master Plan.

#### 1.4 Related Studies

Several related studies are being undertaken in parallel with the Region's Water Supply Strategy Update. These studies are discussed briefly below. It is important that the findings of all of these studies be considered to obtain a comprehensive understanding of the Region's water and wastewater infrastructure needs in the future as none of these plans can be undertaken in isolation.

#### **1.4.1 Integrated Urban System Groundwater Optimization and Expansion Project (IUS Project)**

The IUS Project is a multi-area water supply project initiated by the Region in 2005. The overall goal of the IUS is to restore approximately 20 ML/d of supply capacity from existing wells that are operating at less than their design capacity and to increase the water supply capacity of the IUS by up to 23 ML/d. The project consolidates 12 individual water supply assessments into one project. The major components of the study include:

- an Environmental Assessment (EA) for the establishment of new supply wells for three existing treatment plants on the east side of Cambridge;
- assessment and potential upgrade of several existing, underutilized supply wells to bring them back to full service;
- investigation of the potential for developing new supply wells within the boundaries of Kitchener, Waterloo and Breslau; and,
- investigation of the potential for developing new supply wells in other areas identified in the 2000 WSMP.

Considerable progress has been made on the IUS Project and most Phase 1 activities will be completed in 2007. The outcomes of the IUS Project to-date were considered in the assessment of the current and short-term water supply capacity in the Water Supply Workshop (refer to Section 2.2 and Section 4).

#### **1.4.2 Tri-City Water Distribution System Master Plan**

The Region initiated the Tri-City Water Distribution System Master Plan (WDMP) to develop a 20-year plan for the major water distribution components in the tri-city area. This study is scheduled for completion in 2007 and is being undertaken as a Municipal Class Environmental Assessment (Class EA) under the *Environmental Assessment Act*. Alternatives being considered include improvements to the existing water distribution system and consideration of new infrastructure such as pipelines, pumping stations and reservoirs.

The WDMP includes water demand forecasts for the IUS service area. These water demands were considered in the development of the demand forecasts used for the Water Supply Strategy Update (refer to Section 3).

#### **1.4.3 Water Efficiency Master Plan Update**

As discussed in Section 1.1.2, an updated Water Efficiency Master Plan (WEMP) was accepted by Regional Council in July 2006. The updated WEMP establishes the plan for water conservation in the Region from 2007 to 2015. This nine-year program focuses on the following areas:

- General Public Education;
- Outdoor Water Use Reduction;
- Efficient Toilet Replacement;
- Industrial, Commercial and Institutional Efficiencies;
- Municipal Leak Reduction; and,
- Research and Development.

The plan targets a water savings of more than 8,146 m<sup>3</sup>/d (1.8 MIgd) over the nine year period. The estimated annual average budget (operating and capital) is \$1.1 million per year.

The targets established in the updated WEMP were reflected in the development of the water demand forecasts used for the Water Supply Strategy Update (refer to Section 3).

#### **1.4.4 Wastewater Treatment Master Plan**

In 2005, the Region began the development of the Wastewater Treatment Master Plan (WWTMP). The WWTMP will update the last plan that was completed in 1995 to reflect the RGMS and the *Places to Grow Act*, as well as technical and regulatory changes that have occurred since the last plan that may affect wastewater treatment in the future. The WWTMP planning horizon is 2041, the same as is in the Water Supply Strategy Update.

The WWTMP is based on population growth projections that are consistent with the projections used in the Water Supply Strategy Update and the other ongoing servicing studies and plans. Wastewater generation estimates have been prepared and a number of alternative solutions to provide wastewater treatment capacity in the Region to the end of the planning period have been developed. These alternatives are being evaluated and the WWTMP will be presented to Regional Council for comment and approval in June 2007.

## 2. UPDATE METHODOLOGY

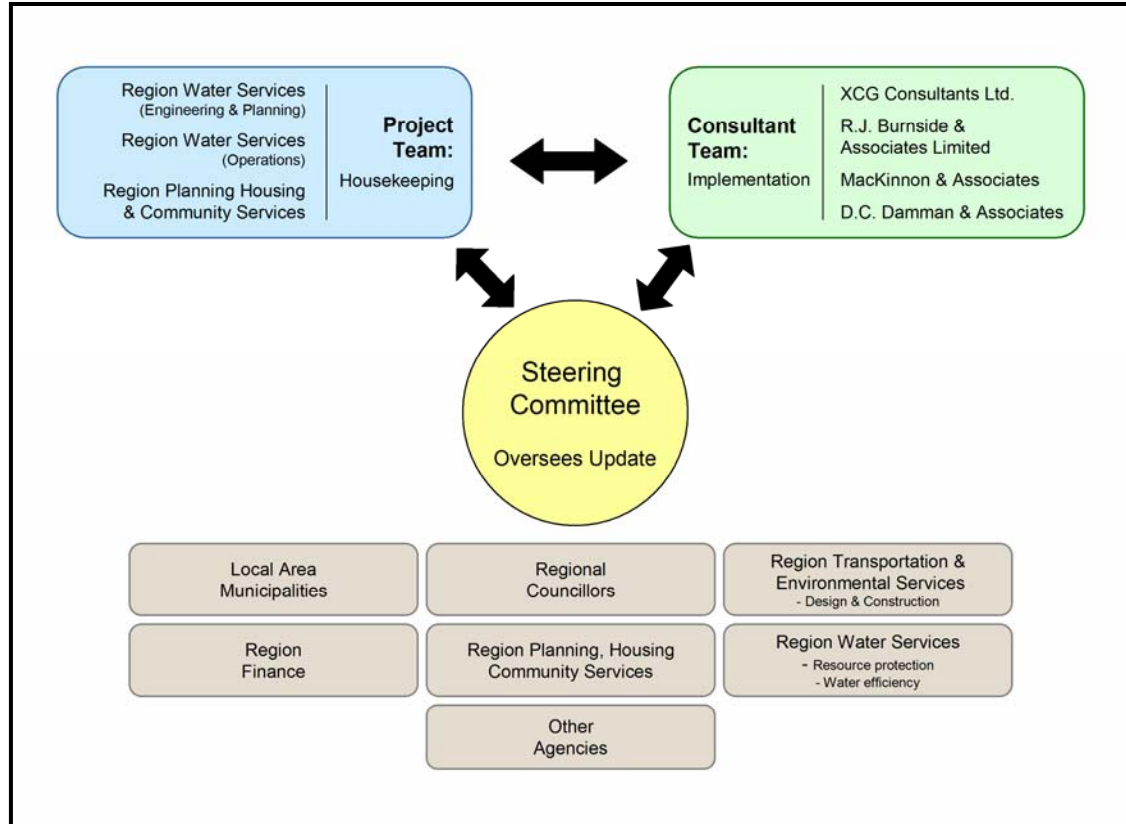
The Water Supply Strategy Update was conducted by a consulting team comprised of XCG Consultants Limited (XCG), R.J. Burnside & Associates Limited (Burnside), MacKinnon & Associates (MacKinnon), and D.C. Damman and Associates (DCDA). XCG was the prime consultant for the Update, with overall responsibility for project delivery. Burnside led the evaluation of the existing water supply system capacity. MacKinnon provided planning input to the development of the water demand projections. DCDA led the public consultation component of the Update. The entire project team was involved in the assessment of the impact of regulatory and policy changes on the Region’s WSMP.

The consulting team worked closely with Regional staff as part of the Project Team. A Steering Committee comprised of representatives from other Regional departments and key stakeholders was also established to provide guidance to the Project Team. The project organization and the overall approach used to complete the Water Supply Strategy Update are described in this subsection.

### 2.1 Project Organization

Overall project organization is illustrated in Figure 2.1. Roles and participants in each committee are presented in the following subsections.

**Figure 2.1 Organization of Update**



### **2.1.1 Project Team and Consulting Team**

The Project Team was the “house-keeping” group responsible for day-to-day activities related to the Update. This group included members of the consulting team and staff representing the Region’s Planning, Housing and Community Services Department, the Region’s Water Services Division, and the Commissioner of Transportation & Environmental Services.

### **2.1.2 Steering Committee**

A Steering Committee was established at project initiation to provide guidance to the Project Team and Consulting Team. The Steering Committee was comprised of:

- designated Regional political representatives with a direct interest in the Update;
- representatives from local area municipalities served by the IUS;
- representatives from other agencies with a direct interest in the Update including the Ministry of the Environment (MOE) and the Grand River Conservation Authority (GRCA); and,
- staff from various Regional Departments.

The individuals comprising the Steering Committee for the Water Supply Strategy Update are identified with their affiliation in Table 2.1.

The Steering Committee met on three occasions during the project:

- at project initiation;
- after the completion of the three Update Workshops to present the workshop findings (refer to Section 2.2); and,
- after the completion of the three Public Information Centres to summarize the Updated Water Supply Strategy and the public comments received.

Presentation material from each of the three Steering Committee meetings and Steering Committee meeting notes are provided in Appendix 5. Many of the members of the Steering Committee were also participants in one or more of the workshops undertaken during the Update (refer to Section 2.2.1).

## **2.2 Approach**

The Water Supply Strategy Update was developed as a Master Plan as described in the Municipal Class Environmental Assessment (MEA, June 2000) under the *Environmental Assessment Act*. As such, completion of the Update satisfies the requirements of Phases 1 and 2 of the Class EA process.

**Table 2.1 Participants in the Water Supply Strategy Update Steering Committee**

No.	Organization	Name	Position
1	Ministry of Environment	Jennifer Arthur	Environmental Assessment and Planning Coordinator
2	Grand River Conservation Authority	James Etienne	Senior Water Resources Engineer
3	City of Cambridge	Ed Kovacs	Commissioner of Transportation and Public Works
4	City of Cambridge	Cathy Robertson	Director of Engineering
5	City of Kitchener	Angela Mick	Utilities Water Engineer
6	City of Waterloo	Bill Garibaldi	Director of Utilities
7	Township of Woolwich	Rod Kruger	Manager of Engineering Operations
8	Regional Council	Kim Denouden	Councillor
9	Regional Council	Jim Wideman	Councillor
10	Region – Transportation and Environmental Services (TES) Department	Thomas Schmidt	Commissioner of TES
11	Region – Finance Department	Calvin Barrett	Director of Financial Services
12	Region – Finance Department	Connie Bogusat	Financial Analyst
13	Region – Planning, Housing & Community Services (PH&CS) Department	Kevin Curtis	Assoc. Director, Policy Planning
14	Region – TES (Design & Construction)	Phil Bauer	Head, Environmental Engineering
15	Region – TES, Water Services (WS – Operations)	Olga Vrentzos	Manager of Operations & Maintenance
16	Region – TES (WS – Water Efficiency)	Steve Gombos	Manager of Water Efficiency
17	Region – TES (WS – Water Resources Protection)	Eric Hodgins	Manager of Water Resources Protection
18	Region – Corporate Communications	Bryan Stortz	Director, Corporate Communications

### 2.2.1 Workshops and Technical Memoranda

The Water Supply Strategy Update was organized around three workshops and three technical memoranda (Tech Memos). Prior to each Workshop, a draft Technical Memorandum was provided to the participants to summarize the material to be covered. This material was then reviewed with the participants in a facilitated workshop forum with the objective of reaching consensus on the key issues being discussed. The workshop discussions and outcomes allowed the draft Tech Memos to be finalized after review by the members of the Project Team.



Workshop No. 1 was undertaken to confirm the population growth projections for the Region and assist the consulting team with the development of the water demand forecasts. The agenda and presentation material from Workshop No. 1, notes summarizing the outcomes from Workshop No. 1, and the list of participants are provided in Appendix 1. Also included in Appendix 1 is Tech Memo #1 entitled “Population and Water Demand Forecasts”. Key findings presented in Tech Memo #1 are summarized in Section 3 of the Update report.

Workshop No. 2 was undertaken to determine the water supply capacity of the existing IUS and involved key staff from the Region’s Water Services Division, including representatives from Water Resources Protection, Water Efficiency, Operations and Maintenance, Engineering and Planning. An important part of this workshop was the discussion with Regional staff regarding the factors that may be limiting the capacity of specific components of the IUS. The agenda and presentation material from Workshop No. 2, notes summarizing the outcomes from Workshop No. 2, and the list of participants are provided in Appendix 2. Also included in Appendix 2 is Tech Memo #2 entitled “Current and Short-Term Water Supply Capacity”. Key findings presented in Tech Memo #2 are summarized in Section 4 of the Update report.

Workshop No. 3 involved a discussion of the key legislation, regulations and policies that might affect the Region’s Water Supply Strategy, including those related to planning, water and the environment at both the federal and provincial level. Based on these discussions, the consulting team developed an action plan for the Region that presented a time-line for initiating discussions with relevant regulatory and other agencies and initiating other key activities. The agenda and presentation material from Workshop No. 3, notes summarizing the outcomes from Workshop No. 3, and the list of participants are provided in Appendix 3. Also included in Appendix 3 is Tech Memo #3 entitled “Key Legislation, Regulations and Policy Initiatives”. Key findings presented in Tech Memo #3 are summarized in Section 5 of the Update report.

### **2.2.2 Public, Agency and Stakeholder Consultation**

The Water Supply Strategy included extensive consultation with the public, agencies and stakeholders, including the issuance of a Notice of Commencement, the development and regular updating of a contact list, and three Public Information Centres (PICs) to present the findings of the Update and receive comments. More detailed discussion of the consultation process is provided in Section 6 of the Update report.



### **3. WATER DEMAND**

#### **3.1 Population Projections**

##### **3.1.1 General**

Serviced population projections were developed during the 2000 WSMP for the IUS. Updated population projections were prepared as part of this Update based on updated forecasts provided by the Region. These updated forecasts take into account significant changes that have taken place in the policy environment governing land use planning in the Province of Ontario since 2000, including the passing of the *Places to Grow Act* and the proposed Growth Plan for the Greater Golden Horseshoe.

##### **3.1.2 Serviced Population Projections**

Tables 3.1 and 3.2 reflect the Interim Population and Household Forecast developed by the Region to be utilized for long-term infrastructure studies, including the Region's Water Distribution Master Plan Update and Water Supply Strategy Update. To be consistent with the Tri-City Water Distribution Master Plan, the forecasts of population have been assessed based on pressure zone and municipality. Tables 3.1 and 3.2 summarize these forecasts by Area Municipality. Several smaller settlement areas that are connected to the IUS settlement areas such as Lloyd Brown, Mannheim and St. Jacobs, which are serviced from one of the tri-cities, Cambridge, Kitchener and Waterloo respectively, have been combined with these larger municipalities for projection purposes.

Serviced population projections for the IUS have been provided only for the system as a whole. In light of the uncertainties associated with growth beyond 2031, it would be imprudent and highly speculative to attempt a further geographical breakdown of this growth; therefore, the Pressure Zone cells for 2036 and 2041 in Tables 3.1 and 3.2 have been deliberately left blank. Further, Pressure Zone details are not essential to the strategic purpose of this Update.

#### **3.2 Definitions**

The Region's Tri-City Water Distribution Master Plan (WDMP) includes water demand forecasts. The WDMP projected per capita demands developed for each municipality are shown in Table 3.3.

Average daily water demand, maximum weekly water demand, and total annual water use projections presented in the Update are based on the per capita demands shown in Table 3.3 and the maximum week factor of 1.25, as used in the WDMP.

**Table 3.1 IUS Population Forecast to 2041**

IUS Zones	2001	2006	2011	2016	2021	2026	2031	2036	2041
<b>Waterloo<sup>1</sup></b>	106,011	122,287	130,798	139,163	147,438	156,936	165,976		
<b>Cambridge<sup>2</sup></b>	112,236	122,872	133,514	143,791	153,375	165,503	178,586		
<b>Kitchener<sup>3</sup></b>	195,813	215,854	233,366	253,578	276,563	297,827	317,980		
<b>IUS Total</b>	<b>414,060</b>	<b>461,014</b>	<b>497,675</b>	<b>536,535</b>	<b>577,375</b>	<b>620,265</b>	<b>662,542</b>	<b>708,400</b>	<b>753,400</b>
Notes:									
1. Includes Market, St. Jacobs, and Elmira settlements areas									
2. Includes North Dumfries and Lloyd Brown settlement area									
3. Includes Breslau, Wilmot, Mannheim and Shingletown settlement areas									

**Table 3.2 IUS Employment Forecast to 2041**

IUS Zones	2001	2006	2011	2016	2021	2026	2031	2036	2041
<b>Waterloo<sup>1</sup></b>	63,775	72,052	78,920	84,616	89,811	94,978	100,479		
<b>Cambridge<sup>2</sup></b>	61,144	70,370	77,896	83,567	88,426	92,979	97,382		
<b>Kitchener<sup>3</sup></b>	90,307	100,006	108,247	115,248	122,410	128,923	137,585		
<b>IUS Total</b>	<b>215,226</b>	<b>242,428</b>	<b>265,066</b>	<b>283,431</b>	<b>300,646</b>	<b>317,629</b>	<b>335,447</b>	<b>348,440</b>	<b>362,458</b>
Notes:									
1. Includes Market, St. Jacobs, and Elmira settlements areas									
2. Includes North Dumfries and Lloyd Brown settlement area									
3. Includes Breslau, Wilmot, Mannheim and Shingletown settlement areas									

**Table 3.3 Projected Per Capita Water Use by Municipality**

Municipality	Residential (L/c-d) <sup>1</sup>	Employment (L/c-d)
Tri-Cities	209	10 – 383 <sup>2</sup>
St. Jacob and Elmira	250	146
North Dumfries	278	278
Mannheim	203	203
Shingletown	248	248
Notes:		
1. Litres per capita per day		
2. Values shown indicate the range of the employment per capita water demand for the Tri-Cities area. Demand varies by pressure zone. Average employment per capita water demand for the IUS is 210 L/c-d.		

### 3.3 Water Demand Forecast

Average daily water demand, maximum weekly water demand and total annual water use projections were generated based on the population projections presented in Section 3.1, and the per capita demands and maximum week factor presented in Section 3.2. These projections were prepared for four scenarios:

1. An effective water conservation program (100% participation);
2. An average water conservation program (50% participation);
3. No participation in the water conservation program; and,
4. No participation in the water conservation program and no seasonal outdoor water use restrictions.

The results are shown in Tables 3.4 to 3.7, respectively.

#### 3.3.1 Impact of Water Efficiency on Demand

Water efficiency can be improved by implementing water conservation programs on a year round basis. Such programs would result in a decrease in the average daily per capita water demands. The impact of water conservation on projected average daily water demands is shown in Figure 3.1. The following operating conditions are represented on the figure:

1. An effective water conservation program (100% participation);
2. An average water conservation program (50% participation); and
3. No participation in the water conservation program.

The projected demands, as included in the 2000 WSMP, are also shown for reference.

**Table 3.4 Water Demand by Municipality – 100% Participation in Water Efficiency Programs**

Municipality	Water Demand (ML/d)							
	2006	2011	2016	2021	2026	2031	2036	2041
Cambridge <sup>1</sup>	51.53	53.39	55.94	58.76	61.99	67.10		
Kitchener <sup>2</sup>	70.38	72.75	77.10	82.97	88.43	95.68		
Waterloo <sup>3</sup>	42.73	44.15	46.31	48.97	51.88	53.76		
IUS Total (ML/d average)	<b>164.6</b>	<b>170.3</b>	<b>179.3</b>	<b>190.7</b>	<b>202.3</b>	<b>216.5</b>	<b>229.7</b>	<b>243.2</b>
IUS Total Max Week (ML/d)	<b>205.8</b>	<b>212.9</b>	<b>224.2</b>	<b>238.4</b>	<b>252.9</b>	<b>270.7</b>	<b>287.1</b>	<b>304.1</b>
IUS Total (1000 ML/yr)	<b>60.09</b>	<b>62.16</b>	<b>65.46</b>	<b>69.61</b>	<b>73.84</b>	<b>79.04</b>	<b>83.85</b>	<b>88.78</b>
Notes:								
1. Includes North Dumfries and Lloyd Brown settlement area								
2. Includes Breslau, Wilmot, Mannheim and Shingletown settlement areas								
3. Includes Market, St. Jacobs, and Elmira settlements areas								

**Table 3.5 Water Demand by Municipality – 50% Participation in Efficiency Programs**

Municipality	Water Demand (ML/d)							
	2006	2011	2016	2021	2026	2031	2036	2041
Cambridge <sup>1</sup>	51.53	54.33	57.21	60.02	63.25	68.37		
Kitchener <sup>2</sup>	70.38	74.03	78.86	84.74	90.21	97.48		
Waterloo <sup>3</sup>	42.73	44.92	47.36	50.02	52.93	54.78		
IUS Total (ML/d average)	<b>164.6</b>	<b>173.3</b>	<b>183.4</b>	<b>194.8</b>	<b>206.4</b>	<b>220.6</b>	<b>234.4</b>	<b>248.3</b>
IUS Total Max Week (ML/d)	<b>205.8</b>	<b>216.6</b>	<b>229.3</b>	<b>243.5</b>	<b>258.0</b>	<b>275.8</b>	<b>293.0</b>	<b>310.3</b>
IUS Total (1000 ML/yr)	<b>60.09</b>	<b>63.25</b>	<b>66.95</b>	<b>71.10</b>	<b>75.33</b>	<b>80.53</b>	<b>85.57</b>	<b>90.61</b>
Notes:								
1. Includes North Dumfries and Lloyd Brown settlement area								
2. Includes Breslau, Wilmot, Mannheim and Shingletown settlement areas								
3. Includes Market, St. Jacobs, and Elmira settlements areas								

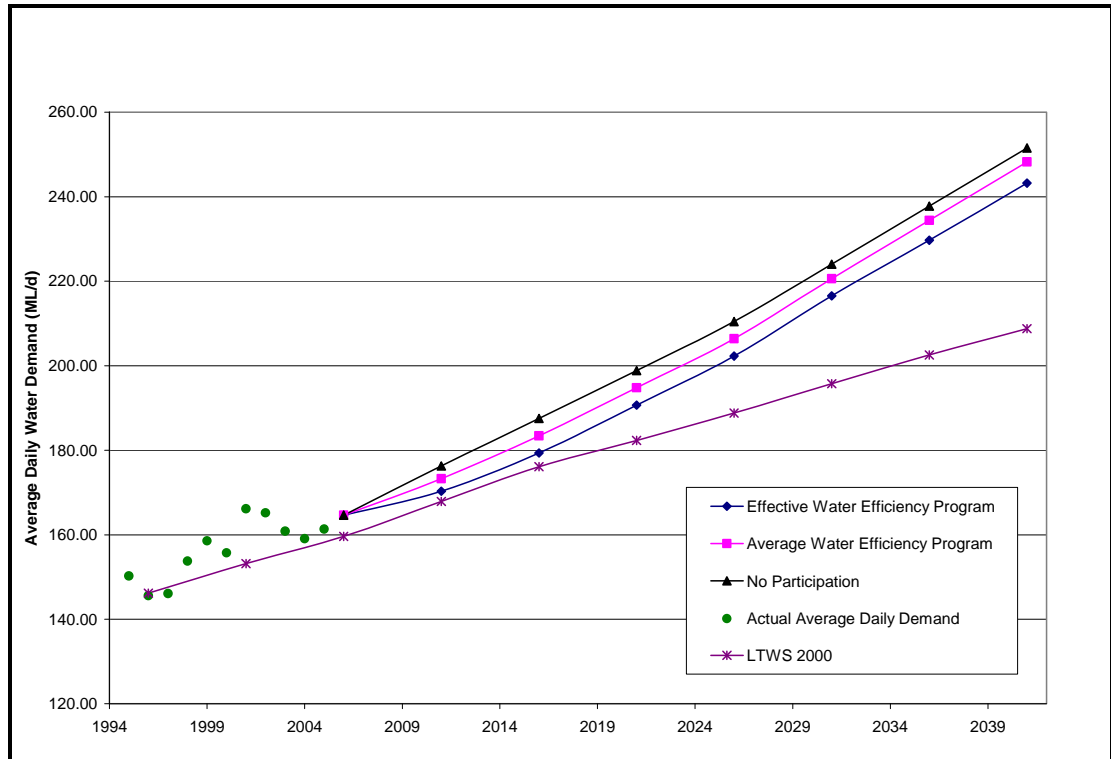
**Table 3.6 Water Demand by Municipality – No Participation in Water Efficiency Programs**

Municipality	Water Demand (ML/d)							
	2006	2011	2016	2021	2026	2031	2036	2041
Cambridge <sup>1</sup>	51.53	55.27	58.49	61.28	64.50	69.45		
Kitchener <sup>2</sup>	70.38	75.31	80.62	86.52	92.00	98.96		
Waterloo <sup>3</sup>	42.73	45.70	48.42	51.07	53.97	55.62		
<b>IUS Total (ML/d average)</b>	<b>164.6</b>	<b>176.3</b>	<b>187.5</b>	<b>198.9</b>	<b>210.5</b>	<b>224.0</b>	<b>237.8</b>	<b>251.6</b>
IUS Total Max Week (ML/d)	205.8	220.4	234.4	248.6	263.1	280.0	297.2	314.4
IUS Total (1000 ML/yr)	60.09	64.34	68.44	72.59	76.82	81.77	86.79	91.82
Notes:								
1. Includes North Dumfries and Lloyd Brown settlement area								
2. Includes Breslau, Wilmot, Mannheim and Shingletown settlement areas								
3. Includes Market, St. Jacobs, and Elmira settlements areas								

**Table 3.7 Water Demand by Municipality – No Water Efficiency Program and No Outdoor Water Use Restrictions**

Municipality	Water Demand (ML/d)							
	2006	2011	2016	2021	2026	2031	2036	2041
Cambridge <sup>1</sup>	51.53	55.27	58.49	61.28	64.50	69.45		
Kitchener <sup>2</sup>	70.38	75.31	80.62	86.52	92.00	98.96		
Waterloo <sup>3</sup>	42.73	45.70	48.42	51.07	53.97	55.62		
<b>IUS Total (ML/d average)</b>	<b>164.6</b>	<b>176.3</b>	<b>187.5</b>	<b>198.9</b>	<b>210.5</b>	<b>224.0</b>	<b>237.8</b>	<b>251.6</b>
IUS Total Max Week (ML/d)	211.3	226.3	240.7	255.3	270.3	287.6	305.4	323.1
IUS Total (1000 ML/yr)	60.09	64.34	68.44	72.59	76.82	81.77	86.79	91.82
Notes:								
1. Includes North Dumfries and Lloyd Brown settlement area								
2. Includes Breslau, Wilmot, Mannheim and Shingletown settlement areas								
3. Includes Market, St. Jacobs, and Elmira settlements areas								

**Figure 3.1 IUS Projected Average Daily Water Demand**



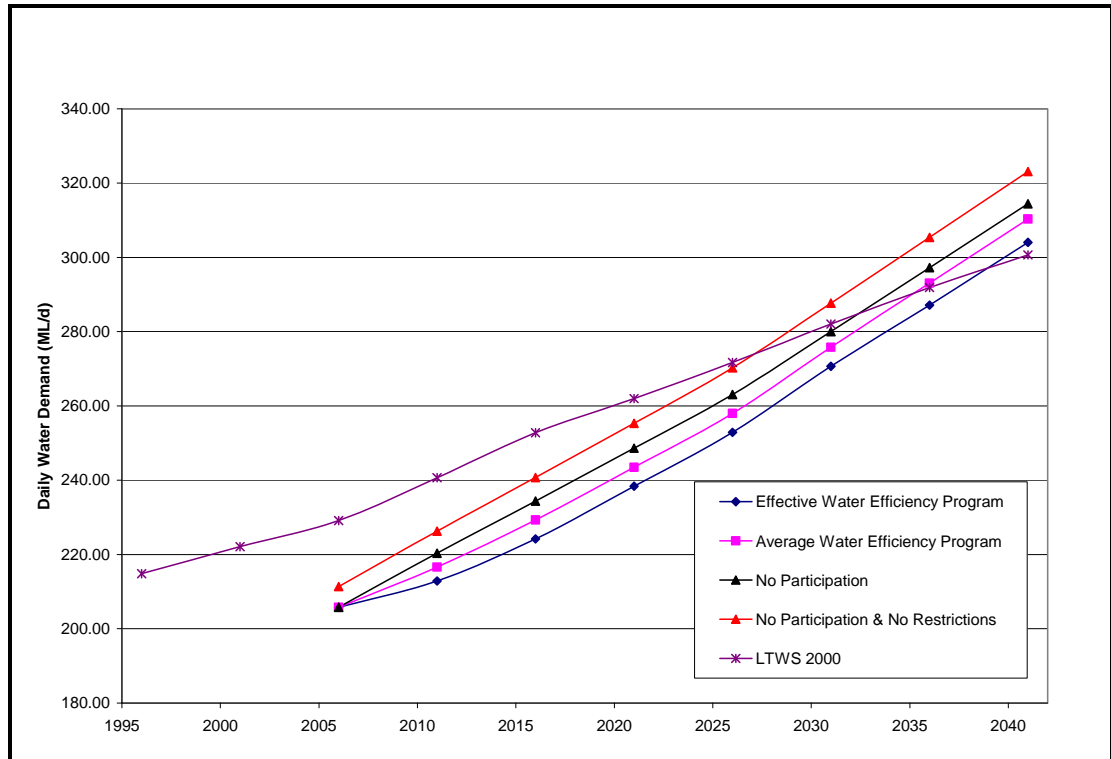
As can be seen, implementing water efficiency programs reduces the projected average daily water demands. By 2041, this would equate to a projected reduction in average daily water use of 1.3%, assuming an average water efficiency program, and 3.3%, assuming an effective water efficiency program.

### 3.3.2 Impact of Outdoor Water Use Restrictions on Demand

Outdoor water use restrictions would be implemented on a seasonal basis to reduce water use during high demand periods. Such restrictions would have no impact on average per capita demands; however, they would result in a decrease in the maximum week daily water demands.

The impact of outdoor water use restrictions on maximum week daily water demands can be seen in Figure 3.2. The “no participation and no restrictions” curve represents the projected maximum week daily water demands with no participation in a water conservation program and no outdoor water use restrictions. The “no participation” curve represents the projected maximum week daily water demands with no participation in a water conservation program but with enforcement of outdoor water use restrictions.

**Figure 3.2 IUS Projected Maximum Week Daily Water Demand**



As can be seen, implementing outdoor water use restrictions reduces the projected maximum week demands. Assuming no participation in a water efficiency program, implementation of seasonal outdoor water use restrictions would reduce the estimated maximum week factor from 1.28 to 1.25.

### 3.4 Summary

Water demand estimates were prepared based on the forecasted populations and water use projections. The water demand conditions match those used in the Region's Tri-City Water Distribution Master Plan. Table 3.8 shows the projected water demands with and without participation in water efficiency programs and seasonal outdoor water use restrictions.

**Table 3.8 Projected Water Demand**

Total for Integrated Urban System (IUS)	Water Demand – million litres per day (ML/d)							
	2006	2011	2016	2021	2026	2031	2036	2041
Average Daily Demand <sup>1</sup>	164.64	170.30	179.35	190.70	202.30	216.54	229.71	243.24
Daily Demand during Maximum Week <sup>2,4</sup>	205.80	212.88	224.19	238.38	252.87	270.68	287.14	304.05
Daily Demand during Maximum Week <sup>3,4</sup>	211.33	226.26	240.70	255.31	270.25	287.64	305.37	323.12
Notes:								
1. With effective water efficiency program.								
2. With effective water efficiency program and implementation of seasonal outdoor water use restrictions.								
3. No water efficiency program and no seasonal outdoor water use restrictions.								
4. 'Maximum week' is the period of highest water demand; it normally occurs during the summer.								



## **4. WATER SUPPLY**

### **4.1 Description of Existing Water Supply**

The Region's water supply to the IUS is currently obtained from three primary sources, as follows:

- Groundwater;
- Surface water (Grand River); and
- Aquifer Storage and Recovery (ASR) at the Mannheim Water Treatment Plant.

#### **4.1.1 Groundwater**

The Region operates more than 120 groundwater wells. The Region's ability to supply water from these wells in the short-term has been constrained due to:

- water quantity and quality issues with a number of wellfields;
- declining efficiencies of some water supply wells; and
- operational constraints.

To address these constraints, the Region is actively pursuing new groundwater supply sources, rehabilitating wells and considering the re-commissioning of wells that have been out of service. This is being undertaken through the IUS Project (refer to Section 1.4.1)

#### **4.1.2 Surface Water (Grand River)**

The current Permit to Take Water (PTTW) for the Mannheim Water Treatment Plant (WTP) allows the Region to take up to 245 ML/d (54 MIgd) from the Grand River during higher flow periods of the year. However, in summer (June through September), the permitted water taking is limited to 72.7 ML/d (16 MIgd). The rated capacity of the Mannheim WTP is 72.6 ML/d (16 MIgd).

#### **4.1.3 Aquifer Storage and Recovery (ASR)**

The first phase of the ASR System at the Mannheim WTP has been constructed and is in operation. The second phase is scheduled for completion by the end of 2009 and plans to carry out assessments are underway; however, this phase may be delayed due to planned additional testing of the existing scheme by the Region.

## **4.2 Definitions**

The following definitions have been adopted for the purposes of this Update.

**System Capacity:** The capacity that can be reasonably sustained during the week of maximum water demand.

**Contingent Capacity:** Additional capacity required to maintain adequate water supply if any wellfield is not in operation.

The system capacity excludes contingent capacity and assumes that all supply facilities are set for optimum use. The contingent capacity is from stand-by sources held in reserve for emergency supply. In effect, the contingent capacity is used to secure the system capacity against operational contingencies.

### **4.3 Water Supply Capacity**

Presented below are the maximum source, short term peaking, and maximum sustainable summer capacities of the existing and short-term future water supplies. Short-term future supplies refer to recovery or construction projects which have been or will be initiated.

#### **4.3.1 Maximum Source Capacity**

The maximum source capacity is defined as the sum of the theoretical capacities of each of the individual water supply sources. This value assumes that all water sources are in service.

Table 4.1 presents the maximum source capacity for each well field and surface water source in the IUS. These values are based on findings of the IUS Project to-date. Detailed information regarding source capacities is included in Appendix 2.

Based on the information presented in Table 4.1, the short-term future maximum source capacity of the IUS water supply is 304 ML/d (67.0 MIgd).

#### **4.3.2 Short Term Peaking Capacity**

The short term peaking capacity is defined as the capacity sustainable under an isolated maximum week condition. This value assumes that all water sources are in service.

Table 4.2 presents the short term peaking capacity for each well field and surface water source in the IUS. These values are based on findings of the IUS Project to-date. Detailed information regarding source capacities is included in Appendix 2.

Based on the information presented in Table 4.2, the short-term peaking capacity of the IUS water supply is 282 ML/d (61.9 MIgd).

At this stage of the IUS Project, the confirmed new wells to be developed will be used to cover existing deficiencies and to maintain the current system capacity of 282 ML/d (62 MIgd) and is accounted for in this report. This project is presently ongoing and will continue to search for up to 22.7 ML/d (5 MIgd) of groundwater as recommended in the 2000 WSMP. The second phase of the ASR facility, scheduled for completion by the end of 2009, will provide an additional 22.7 ML/d (5 MIgd). Additional groundwater supplies of up to 22.7 ML/d (5 MIgd) are anticipated from future groundwater studies.

#### **4.3.3 Maximum Sustainable Summer Capacity**

The maximum sustainable summer capacity is defined as the capacity sustainable throughout the summer, and includes a declining performance loss of 20 percent and a WTP loss of 5 percent. This value assumes that all water sources are in service.

Table 4.3 presents the maximum sustainable summer capacity for each well field and surface water source in the IUS. These values are based on findings of the IUS Project to-date. Detailed information regarding source capacities is included in Appendix 2.

Based on the information presented in Table 4.3, the maximum sustainable summer capacity of the IUS water supply is 255 ML/d (56.1 MIgd).

**Table 4.1 Present and Short-Term Future Maximum Source Capacity**

Water Service Area	Well Field / Facility Name	Maximum Source Capacity <sup>(1)</sup> (L/s)
<b>Cambridge</b>	Blair Road	17
	Clemens Mill	140
	Dunbar Road	18
	Elgin Street	30
	Fountain Street	20
	Hespeler	46
	Middleton Street	405
	Pinebush Road	177
	Shades Mills	100
	Willard	50
	<b>Cambridge Sub-Total</b>	<b>1,003</b>
<b>Kitchener</b>	Greenbrook	142
	Mannheim East	332
	Peaking	180
	Parkway	95
	Pompeii, Forwell and Woolner	254
	Strange Street	100
	Strasburg	35
	Mannheim WTP	840
	Mannheim West	167
	Wilmot Centre	87
	<b>Kitchener Sub-Total</b>	<b>2,232</b>
<b>Waterloo</b>	Waterloo North	47
	William Street	100
	Erb Street	140
	<b>Waterloo Sub-Total</b>	<b>287</b>
<b>IUS Total Capacity</b>	<b>L/s</b>	<b>3,522</b>
	<b>ML/d</b>	<b>304</b>
	<b>MIgd</b>	<b>67.0</b>
Notes:		
(1) Capacity of each system running under theoretical conditions (includes near-term upgrades).		

**Table 4.2 Present and Short-Term Future Short Term Peaking Capacity**

Water Service Area	Well Field / Facility Name	Short Term Peaking Capacity <sup>(1)</sup> (L/s)
<b>Cambridge</b>	Blair Road	14
	Clemens Mill	130
	Dunbar Road	14
	Elgin Street	24
	Fountain Street	16
	Hespeler	36
	Middleton Street	405
	Pinebush Road	160
	Shades Mills	100
	Willard	40
	<b>Cambridge Sub-Total</b>	<b>939</b>
	<b>Kitchener</b>	Greenbrook
Mannheim East		306
Peaking		144
Parkway		76
Pompeii, Forwell and Woolner		241
Strange Street		100
Strasburg		28
Mannheim WTP		800
Mannheim West		134
Wilmot Centre		87
<b>Kitchener Sub-Total</b>		<b>2,058</b>
<b>Waterloo</b>		Waterloo North
	William Street	80
	Erb Street	140
	<b>Waterloo Sub-Total</b>	<b>258</b>
<b>IUS Total Capacity</b>	<b>L/s</b>	<b>3,255</b>
	<b>ML/d</b>	<b>282</b>
	<b>MIgd</b>	<b>61.9</b>
Notes:		
(1) Capacity sustainable under an isolated maximum week condition.		

**Table 4.3 Present and Short-Term Future Maximum Sustainable Summer Capacity**

Water Service Area	Well Field / Facility Name	Maximum Sustainable Summer Capacity <sup>(1)</sup> (L/s)
<b>Cambridge</b>	Blair Road	14
	Clemens Mill	130
	Dunbar Road	14
	Elgin Street	24
	Fountain Street	16
	Hespeler	36
	Middleton Street	347
	Pinebush Road	160
	Shades Mills	100
	Willard	40
	<b>Cambridge Sub-Total</b>	<b>881</b>
<b>Kitchener</b>	Greenbrook	142
	Mannheim East	106
	Peaking	100
	Parkway	76
	Pompeii, Forwell and Woolner	241
	Strange Street	100
	Strasburg	28
	Mannheim WTP	800
	Mannheim West	134
	Wilmot Centre	87
	<b>Kitchener Sub-Total</b>	<b>1,814</b>
<b>Waterloo</b>	Waterloo North	38
	William Street	80
	Erb Street	140
	<b>Waterloo Sub-Total</b>	<b>258</b>
<b>IUS Total Capacity</b>	<b>L/s</b>	<b>2,953</b>
	<b>ML/d</b>	<b>255</b>
	<b>MIgd</b>	<b>56.1</b>
Notes: (1) Capacity sustainable throughout the summer (includes declining performance loss of 20% and WTP loss of 5%)		

#### 4.4 Summary

The System Capacity has been determined as follows:

- The system capacity including current supplies and short-term future supplies (current projects which will be complete in the next three to five years) is 282 ML/day (62 MIgd).
- While the above is limited to the week of maximum demand, the sustainable summer capacity is 255 ML/d (56 MIgd).
- The second phase of the ASR facility, scheduled for completion by the end of 2009, will provide an additional 22.7 ML/d (5 MIgd).
- Additional groundwater supplies of up to 22.7 ML/d (5 MIgd) are anticipated from future groundwater studies.

**Table 4.4 Present and Short-Term Future System Capacity**

Municipality		Maximum Source Capacity <sup>(1)</sup> (L/s)	Short Term Peaking Capacity <sup>(2)</sup> (L/s)	Maximum Sustainable Summer Capacity <sup>(3)</sup> (L/s)
Cambridge		1,003	929	881
Kitchener		2,232	2,058	1,814
Waterloo		287	258	258
<b>IUS Total Capacity</b>	<b>L/s</b>	<b>3,522</b>	<b>3,255</b>	<b>2,953</b>
	<b>ML/d</b>	<b>304</b>	<b>282</b>	<b>255</b>
	<b>MIgd</b>	<b>67.0</b>	<b>61.9</b>	<b>56.1</b>
Notes:				
(1) Capacity of each system running under theoretical conditions (includes near-term upgrades).				
(2) Capacity sustainable under an isolated maximum week condition.				
(3) Capacity sustainable throughout the summer (includes declining performance loss of 20% and WTP loss of 5%)				

Future master plan updates may also explore the possibility of utilizing the maximum allowable water taking specified in the Mannheim PTTW during higher flow periods of the year.

## **5. REGULATORY AND POLICY FRAMEWORK**

### **5.1 Applicable Legislation, Regulation and Policy Initiatives**

A review of current and proposed legislation, regulations and policy initiatives with the potential to apply to the water supply strategy was undertaken. These initiatives were grouped into the following categories:

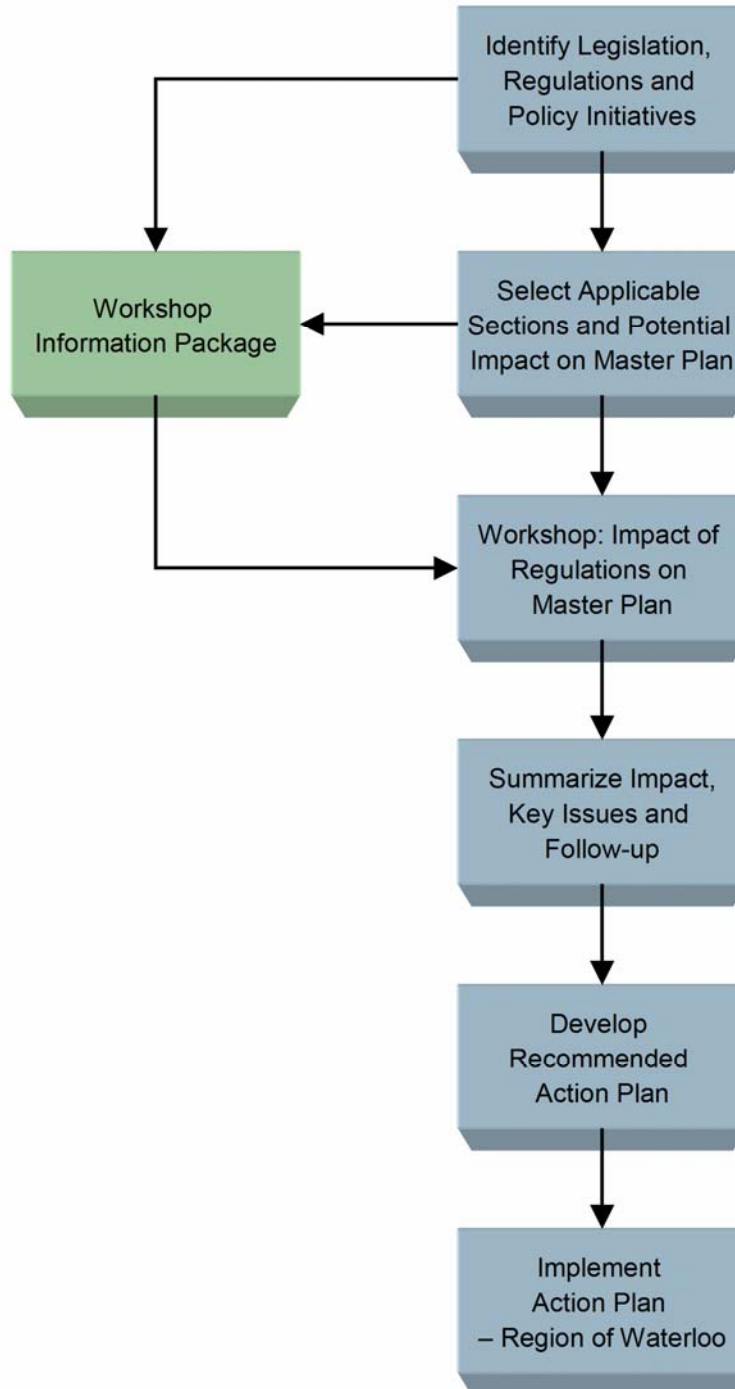
- planning;
- water;
- environmental; and,
- other (includes consultation with First Nations).

The methodology that was used to conduct the regulatory review is shown schematically in Figure 5.1.

Table 5.1 provides a list of regulatory and policy initiatives that were identified as potentially having an impact on the Water Supply Strategy Update.

The list of regulatory and policy initiatives was subsequently reviewed to evaluate their potential applicability to the projects that will comprise the Region's updated Water Supply Strategy (refer to Section 5.2). Table 5.2 provides a summary of the potential implications of the regulations and policies that were reviewed on the updated Water Supply Strategy.

Figure 5.1 Regulatory Review Process





**Table 5.1 List of Legislation, Regulations and Policy Initiatives**

Category	Legislation, Regulation or Policy Initiative
Planning	Provincial Policy Statement, 2005 Places to Grow Act, 2005 Growth Plan for the Greater Golden Horseshoe, 2006 Planning Act, 1990 Planning and Conservation Land Statute Law Amendment Act – Bill 51 (Royal Assent, October 19, 2006) Conservation Lands Act, 1990 Greenbelt Act, 2005 Greenbelt Plan, 2005 Niagara Escarpment Planning and Development Act, 1990 Niagara Escarpment Plan (last revised December 2006)
Water	Great Lakes – St. Lawrence River Basin Sustainable Water Resources Agreement, Boundary Waters Treaty, U.S.-Canada Great Lakes Water Quality Agreement, Great Lakes Charter <sup>2</sup> Ontario Water Resources Act Safe Drinking Water Act, 2002 Clean Water Act – Bill 43 (October 2006) Sustainable Water and Sewage Systems Act, 2002 <i>Watertight</i> (Ministry of Public Infrastructure Renewal Expert Panel)
Environmental	Ontario Environmental Assessment Act Canadian Environmental Assessment Act Canada-Ontario Agreement on Environmental Assessment Cooperation Municipal Class Environmental Assessment Fisheries Act Species at Risk Act Canadian Transportation Act Navigable Waters Protection Act National Energy Board Act
Other	Draft Guidelines for Ministries on Consultation with Aboriginal Peoples Related to Aboriginal Rights and Treaties Public Transportation and Highways Improvement Act

<sup>2</sup> The Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem (2002) is being updated by the governments of Canada and Ontario in 2007. A draft document has been produced that indicates that “the purpose of the Agreement is to restore, protect and conserve the Great Lakes Basin Ecosystem in order to assist in achieving the vision of a healthy, prosperous and sustainable Basin Ecosystem for present and future generations”.

**Table 5.2 Summary of Potential Implications for Water Supply Strategy**

Category	Legislation, Regulation or Policy Initiative	Potential Implications for Long Term Water Supply Strategy
<b>Planning</b>	Provincial Policy Statement	<ul style="list-style-type: none"> <li>need to co-ordinate any Great Lakes displacement pipeline with adjacent municipalities</li> </ul>
	Places to Grow Act	<ul style="list-style-type: none"> <li>Regional Official Plan and local municipal official plans to accommodate future growth and consider effects of growth.</li> <li>Water Supply Strategy needs to consider the broader geographical impacts of all recommendations</li> <li>Great Lakes displacement pipeline impacts will cross natural and municipal boundaries and co-ordination will be required amongst adjacent municipalities</li> </ul>
	Growth Plan for the Greater Golden Horseshoe	<ul style="list-style-type: none"> <li>Region has been proactively identifying need for Great Lakes displacement pipeline to accommodate population distribution forecasted by Province</li> <li>will require further clarification from MNR and MOE about ability to transfer water between basins</li> </ul>
	Planning Act	<ul style="list-style-type: none"> <li>need to co-ordinate Great Lakes displacement pipeline with applicable agencies and adjacent municipalities</li> <li>need to establish transmission corridor to be refined through subsequent EA</li> </ul>
	Planning and Conservation Land Statute Law Amendment Act - Bill 51 (Royal Assent, October 19, 2006)	<ul style="list-style-type: none"> <li>improved opportunity to protect existing and future water supply sources through corresponding amendments to Conservation Land Act</li> </ul>
	Conservation Lands Act	<ul style="list-style-type: none"> <li>opportunity for Region to accept easements to land to protect groundwater supplies</li> </ul>
	Greenbelt Act	<ul style="list-style-type: none"> <li>further study of Great Lakes displacement pipeline will have to consider effects on natural environment within Greenbelt if transmission corridor passes through area regulated by Greenbelt Act</li> </ul>
	Greenbelt Plan	<ul style="list-style-type: none"> <li>Region continuing to pursue greenbelt designations in RMOW to protect groundwater supply</li> <li>planning, design and construction of future Great Lakes displacement pipeline will have to minimize impact on natural heritage systems</li> </ul>
	Niagara Escarpment Planning and Development Act	<ul style="list-style-type: none"> <li>Planning, design and construction of future Great Lakes displacement pipeline will have to minimize impact on natural heritage systems</li> </ul>
	Niagara Escarpment Plan	<ul style="list-style-type: none"> <li>consider Niagara Escarpment features and potential disturbance in Great Lakes displacement pipeline planning</li> </ul>
<b>Water</b>	Great Lakes – St. Lawrence River Basin Sustainable Water Resources Agreement, Boundary Waters Treaty, US-Canada Great Lakes Water Quality Agreement, Great Lakes Charter	<ul style="list-style-type: none"> <li>implications for Great Lakes displacement pipeline from Lake Huron/Georgian Bay or Lake Ontario</li> </ul>

**Table 5.2 Summary of Potential Implications for Water Supply Strategy**

Category	Legislation, Regulation or Policy Initiative	Potential Implications for Long Term Water Supply Strategy
	Ontario Water Resources Act	<ul style="list-style-type: none"> <li>Permits to Take Water (PTTWs) are required for all new water sources</li> <li>requires descriptions of water conservation best management practices currently in place and planned</li> <li>adherence to Great Lakes Charter (agreement between MOE and MNR)</li> <li>may have implications regarding the selection of the source water for the Great Lakes displacement pipeline project</li> </ul>
	Safe Drinking Water Act, 2002	<ul style="list-style-type: none"> <li>future development of a Regional Quality Management Standard</li> <li>future accreditation as an operating authority or enter into an agreement with an accredited operating authority</li> <li>financial plans required</li> <li>all new groundwater sources, treatment facilities, pipelines, etc. require approvals from the MOE (as now)</li> <li>future need to apply for permit</li> <li>future need to apply for licence</li> </ul>
	Clean Water Act (October 2006)	<ul style="list-style-type: none"> <li>water flowing into a Great Lake (i.e., Grand River) – must consider all Great Lakes basin agreements</li> <li>implications of greater volume of wastewater generated</li> <li>quantity and quality of sources within the Region (groundwater and surface water)</li> <li>water taking could impact on water budget in Grand River</li> </ul>
	Sustainable Water and Sewage Systems Act, 2002	<ul style="list-style-type: none"> <li>possible impact of water rates to recover costs of Great Lakes displacement pipeline</li> </ul>
	Watertight (MPIR Expert Panel)	<ul style="list-style-type: none"> <li>implications for governance and financing of water system</li> </ul>
<b>Environment</b>	Ontario Environmental Assessment Act	<ul style="list-style-type: none"> <li>Great Lakes displacement pipeline assessment may be undertaken as an Individual EA – this requires further investigation</li> <li>the Region of York decided to undertake their assessment of a Lake Ontario water supply as an Individual EA due to the magnitude of the project and inter-regional supply issues; York Region also wanted the assessment to have a comprehensive government and public review, as provided for in an Individual EA process</li> <li>for projects where federal and provincial EA requirements must be met, these requirements will be coordinated (see summary sheet on Canada-Ontario Agreement on EA Cooperation)</li> </ul>
	Canadian Environmental Assessment Act	<ul style="list-style-type: none"> <li>CEAA could be triggered if a project requires a permit, authorization or approval under certain pieces of federal legislation – e.g., <i>Fisheries Act, Navigable Waters Protection Act, Canadian Transportation Act, National Energy Board Act</i></li> <li>these are the most common CEAA triggers for linear facilities such as a pipeline – separate summary sheets have been prepared for each of these pieces of legislation</li> <li>CEAA could also be triggered if a pipeline were to require access through an Indian reserve</li> <li>if CEAA were triggered, a screening would be undertaken</li> <li>for projects where federal and provincial EA requirements must be met, these requirements will be coordinated (see summary sheet on Canada-Ontario Agreement on EA Cooperation)</li> </ul>

**Table 5.2 Summary of Potential Implications for Water Supply Strategy**

Category	Legislation, Regulation or Policy Initiative	Potential Implications for Long Term Water Supply Strategy
	Canada-Ontario Agreement on EA Co-operation	<ul style="list-style-type: none"> <li>potential for some projects (i.e., pipeline) to require provincial and federal EA approvals</li> <li>this would occur if CEAA is triggered (see CEAA summary sheet for further details)</li> </ul>
	Municipal Class EA	<ul style="list-style-type: none"> <li>water supply projects could be subject to the Municipal Class EA</li> <li>example of a potential Schedule A project – install new wells or deepen existing wells or increase pumping capacity of existing wells, at an existing municipal well site, where the existing rated yield will not be exceeded</li> <li>example of a potential Schedule B project – establish a new well at a new municipal well site</li> <li>example of a potential Schedule C project – construct new water system including a new well and water distribution system</li> <li>Great Lakes displacement pipeline assessment may be undertaken as an Individual EA (see summary sheet on Ontario <i>Environmental Assessment Act</i>) – this requires further investigation</li> </ul>
	Fisheries Act	<ul style="list-style-type: none"> <li>Great Lakes displacement pipeline route could potentially cross a watercourse, resulting in a harmful alteration, disruption or destruction (HADD) of fish habitat</li> <li>any project involving works in water could result in a HADD</li> <li>if an authorization is required from Fisheries and Oceans Canada, CEAA is triggered</li> <li>this means that a federal screening must be undertaken in accordance with the provisions of CEAA</li> <li>federal screening would be coordinated with provincial EA requirements</li> </ul>
	Species At Risk Act	<ul style="list-style-type: none"> <li>the definition of “environmental effect” in the <i>Canadian Environmental Assessment Act</i> (CEAA) includes “any change that the project may cause in the environment, including any change it may cause to a listed wildlife species, its critical habitat or the residences of individuals of that species, as those terms are defined in subsection 2(1) of the <i>Species at Risk Act</i>”</li> <li>potential environmental effects on species at risk would be assessed as part of Great Lakes displacement pipeline EA</li> </ul>
	Canadian Transportation Act	<ul style="list-style-type: none"> <li>Great Lakes displacement route could potentially cross a rail line</li> <li>if an agreement cannot be reached with the rail company, a permit under the CTA is required, and CEAA is triggered</li> </ul>
	Navigable Waters Protection Act	<ul style="list-style-type: none"> <li>Great Lakes displacement pipeline route could potentially cross a navigable waterway</li> <li>if a permit is required from Transport Canada, CEAA is triggered</li> <li>this means that a federal screening must be undertaken, in accordance with the provisions of CEAA</li> <li>federal screening would be coordinated with provincial EA requirements</li> </ul>
	National Energy Board Act	<ul style="list-style-type: none"> <li>Great Lakes displacement pipeline route could potentially cross an NEB regulated facility</li> <li>if an NEB regulated facility is crossed, CEAA is triggered</li> <li>this means that a federal screening must be undertaken, in</li> </ul>

**Table 5.2 Summary of Potential Implications for Water Supply Strategy**

Category	Legislation, Regulation or Policy Initiative	Potential Implications for Long Term Water Supply Strategy
		<ul style="list-style-type: none"> <li>accordance with the provisions of CEAA</li> <li>federal screening would be coordinated with provincial EA requirements</li> </ul>
<b>Other</b>	Draft Guidelines for Ministries on Consultation with Aboriginal Peoples Related to Aboriginal Rights and Treaties	<ul style="list-style-type: none"> <li>consultation with Aboriginal peoples will be a consideration in the assessment of water supply options</li> </ul>
	Public Transportation and Highways Improvement Act	<ul style="list-style-type: none"> <li>Great Lakes displacement pipeline route could potentially cross a provincial highway</li> <li>encroachment permit requirement</li> </ul>

## **5.2 Implications of Regulations and Policies on Water Supply Strategy**

Tables 5.3, 5.4, 5.5 and 5.6 provide a Legislation and Regulations Applicability Matrix for planning, water, environmental and other groupings, respectively. These tables provide an indication of the applicability and importance of the legislation, regulation or policy initiative relative to the management of existing sources of supply and the development of new sources of supply as contained in the 2000 WSMP.

**Table 5.3** Legislation and Regulations Applicability Matrix: Planning

	Planning					
	Provincial Policy Statement / Planning Act	Places to Grow Act / Growth Plan	Conservation Land Act	Planning & Conservation Land Statue Law Amendment Act	Greenbelt Act / Greenbelt Plan	Niagara Escarpment Planning & Development Act / Niagara Escarpment Plan
<b>Management of Existing Sources of Supply</b>						
Rehabilitation/maintenance of existing wells to maintain capacity	x	x	x	x	x	x
New treatment facilities	x	x	x	x	x	x
Source water protection activities	○ □	x	○ □	○ □	x	x
<b>Development of New Sources of Supply (Water Supply Master Plan. 2000)</b>						
Construction of additional 23 ML/d ASR	x	x	x	x	x	x
Construction of 23 ML/d additional groundwater	x	x	○ □	○ □	x	x
Displacement Great Lakes – based supply	x	○ -	x	x	○ □	○ □
<p><b>Legend:</b></p> <p><b>Applicability</b></p> <ul style="list-style-type: none"> <li>● Applicable</li> <li>⊖ Likely applicable</li> <li>○ Potentially applicable (further project details required)</li> <li>× Not applicable (based on current available information)</li> </ul> <p><b>Importance</b></p> <ul style="list-style-type: none"> <li>▲ Key Approval Requirement</li> <li>□ Secondary Approval Requirement</li> <li>- No approvals Required</li> </ul>						

**Table 5.4**      **Legislation and Regulations Applicability Matrix: Water**

	Water																
	Great Lakes – St. Lawrence Sustainable Water Resources Agreement	Ontario Water Resources Act/ Permit to Take Water	Safe Drinking Water Act, 2002	Conservations Authority Act	Clean Water Act	Sustainable Water and Sewage Systems Act	Watertight										
<b>Management of Existing Sources of Supply</b>																	
Rehabilitation/maintenance of existing wells to maintain capacity	x	x	x	x	x	○	x										
New treatment facilities	x	x	● ▲	x	x	○	x										
Source water protection activities	x	x	x	x	● ▲	○	x										
<b>Development of New Sources of Supply (Water Supply Master Plan, 2000)</b>																	
Construction of additional 23 ML/d ASR	x	● ▲	● ▲	x	● -	○	x										
Construction of 23 ML/d additional groundwater	x	● ▲	● ▲	x	● -	○	x										
Displacement Great Lakes – based supply	● ▲	● ▲	● ▲	○ ▲	● -	○	x										
<p><b>Legend:</b></p> <table> <tr> <td><b>Applicability</b></td> <td><b>Importance</b></td> </tr> <tr> <td>● Applicable</td> <td>▲ Key Approval Requirement</td> </tr> <tr> <td>⊖ Likely applicable</td> <td>□ Secondary Approval Requirement</td> </tr> <tr> <td>○ Potentially applicable (further project details required)</td> <td>- No approvals Required</td> </tr> <tr> <td>x Not applicable (based on current available information)</td> <td></td> </tr> </table>								<b>Applicability</b>	<b>Importance</b>	● Applicable	▲ Key Approval Requirement	⊖ Likely applicable	□ Secondary Approval Requirement	○ Potentially applicable (further project details required)	- No approvals Required	x Not applicable (based on current available information)	
<b>Applicability</b>	<b>Importance</b>																
● Applicable	▲ Key Approval Requirement																
⊖ Likely applicable	□ Secondary Approval Requirement																
○ Potentially applicable (further project details required)	- No approvals Required																
x Not applicable (based on current available information)																	

**Table 5.5 Legislation and Regulation Applicability Matrix: Environmental**

	Environment																		
	Municipal Class EA	Ontario Environmental Assessment Act (i.e. individual EA)	Canadian Environmental Assessment Act	Canada-Ontario Agreement on EA Cooperation	Fisheries Act	Navigable Water Protection Act	Canadian Transportation Act	National Energy Board	Species At Risk Act										
<b>Management of Existing Sources of Supply</b>																			
Rehabilitation/maintenance of existing wells to maintain capacity	x	x	x	x	x	x	x	x	x										
New treatment facilities	x	x	x	x	x	x	x	x	x										
Source water protection activities	x	x	x	x	x	x	x	x	x										
<b>Development of New Sources of Supply (Water Supply Master Plan, 2000)</b>																			
Construction of additional 23 ML/d ASR (EA requirements completed)	-	-	-	-	-	-	-	-	-										
Construction of 23 ML/d additional groundwater	● ▲	x	○ ▲	○ -	○ ▲	x	x	x	x										
Displacement Great Lakes – based supply	● ▲	● ▲	⊖ ▲	⊖ -	○ □	⊖ ▲	○ □	○ □	○ ▲										
<p><b>Note: For Displacement Great Lakes – based supply, a decision will be required regarding Municipal Class EA or Individual EA</b></p> <p><b>Legend:</b></p> <table> <tr> <td><b>Applicability</b></td> <td><b>Importance</b></td> </tr> <tr> <td>● Applicable</td> <td>▲ Key Approval Requirement</td> </tr> <tr> <td>⊖ Likely applicable</td> <td>□ Secondary Approval Requirement</td> </tr> <tr> <td>○ Potentially applicable (further project details required)</td> <td>- No approvals Required</td> </tr> <tr> <td>x Not applicable (based on current available information)</td> <td></td> </tr> </table>										<b>Applicability</b>	<b>Importance</b>	● Applicable	▲ Key Approval Requirement	⊖ Likely applicable	□ Secondary Approval Requirement	○ Potentially applicable (further project details required)	- No approvals Required	x Not applicable (based on current available information)	
<b>Applicability</b>	<b>Importance</b>																		
● Applicable	▲ Key Approval Requirement																		
⊖ Likely applicable	□ Secondary Approval Requirement																		
○ Potentially applicable (further project details required)	- No approvals Required																		
x Not applicable (based on current available information)																			



**Table 5.6**      **Legislation and Regulations Applicability Matrix: Other**

	Other			
	Draft Guidelines for Ministries on Consultation with Aboriginal Peoples	Public Transportation and Highways Improvement Act		
<b>Management of Existing Sources of Supply</b>				
Rehabilitation/maintenance of existing wells to maintain capacity	x	x		
New treatment facilities	○ - -	x		
Source water protection activities	○ -	x		
<b>Development of New Sources of Supply (Water Supply Master Plan, 2000)</b>				
Construction of additional 23 ML/d ASR	○ - -	x		
Construction of 23 ML/d additional groundwater	○ - -	x		
Displacement Great Lakes – based supply	⊖ -	○ □		
<p><b>Legend:</b></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><b>Applicability</b></p> <ul style="list-style-type: none"> <li>● Applicable</li> <li>⊖ Likely applicable</li> <li>○ Potentially applicable (further project details required)</li> <li>x Not applicable (based on current available information)</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><b>Importance</b></p> <ul style="list-style-type: none"> <li>▲ Key Approval Requirement</li> <li>□ Secondary Approval Requirement</li> <li>- No approvals Required</li> </ul> </td> </tr> </table>			<p><b>Applicability</b></p> <ul style="list-style-type: none"> <li>● Applicable</li> <li>⊖ Likely applicable</li> <li>○ Potentially applicable (further project details required)</li> <li>x Not applicable (based on current available information)</li> </ul>	<p><b>Importance</b></p> <ul style="list-style-type: none"> <li>▲ Key Approval Requirement</li> <li>□ Secondary Approval Requirement</li> <li>- No approvals Required</li> </ul>
<p><b>Applicability</b></p> <ul style="list-style-type: none"> <li>● Applicable</li> <li>⊖ Likely applicable</li> <li>○ Potentially applicable (further project details required)</li> <li>x Not applicable (based on current available information)</li> </ul>	<p><b>Importance</b></p> <ul style="list-style-type: none"> <li>▲ Key Approval Requirement</li> <li>□ Secondary Approval Requirement</li> <li>- No approvals Required</li> </ul>			

## **6. PUBLIC, AGENCY AND STAKEHOLDER CONSULTATION**

### **6.1 Overview of Public and Agency Consultation Program**

The public and agency consultation program was multi-faceted and involved the following:

- Steering Committee Meetings;
- Public and Agency Notifications;
- Project Mailing List;
- Internal Project Workshops; and
- Public Information Centres (PICs).

A Notice of Commencement was issued in June 2006 (see Section 6.3). A Notice of Public Information Centres was issued in February/March 2007. All project notices included contact information for members of the public who had questions or wanted more information on the project.

Further details on the public and agency consultation program are provided in Sections 6.2 to 6.6. Additional materials on the public and agency consultation program are included in Appendix 6.

### **6.2 Steering Committee**

A Steering Committee was formed to provide overall guidance and direction to the project team undertaking the Update. The members of the Steering Committee are shown in Table 2.1.

Three Steering Committee meetings were held as follows (see Appendix 5 for meeting notes):

<b>Meeting Date</b>	<b>Purpose of Meeting</b>
May 30, 2006	<ul style="list-style-type: none"> <li>• provide background information on the Region's current Water Supply Master Plan (May 2000)</li> <li>• note planning, technical and regulatory changes since the completion of the Master Plan</li> <li>• outline the objectives and organization of the Update, as well as a work plan and schedule</li> </ul>
November 23, 2006	<ul style="list-style-type: none"> <li>• provide an overview of project status</li> <li>• present the initial findings on water demand, water supply and regulatory issues</li> <li>• outline next steps for the Update</li> </ul>
March 23, 2007	<ul style="list-style-type: none"> <li>• provide an overview of project status</li> <li>• present the recommended water supply strategy</li> <li>• report on the comments received from the public at the PICs and through submissions to the Region</li> <li>• outline next steps for the completion of the Update</li> </ul>

### 6.3 **Public and Agency Notifications**

#### *Notice of Commencement*

A Notice of Commencement (see Appendix 6) was published in the following newspapers:

- June 13, 2006 – KW Record and Cambridge Times;
- June 14, 2006 – Waterloo Chronicle and New Hamburg Independent;
- June 16, 2006 – Elmira Independent; and
- June 17, 2007 – Woolwich Observer.

Federal, provincial and municipal agencies, along with stakeholders, were also notified of the project by letter. An example Notice of Commencement letter is included in Appendix 6. Table 6.1 outlines agencies and stakeholders who were notified of the project.

Three members of the public responded to the published newspaper Notice of Commencement and requested that they be added to the project mailing list.

Agency responses to the Notice of Commencement are included in Appendix 6. In addition, Table 6.2 provides a summary of comments received from:

- Ministry of Municipal Affairs and Housing;
- Ministry of the Environment, West Central Region;
- Grand River Conservation Authority;
- Ministry of Natural Resources;
- Canadian Environmental Assessment Agency;
- Transport Canada;
- City of Cambridge;
- City of Guelph;
- Oxford County; and,
- City of Brantford.

#### *Notice of Public Information Centres*

The Public Information Centres (PICs) were also advertised in advance in the following newspapers:

- February 27 and March 2, 2007 – KW Record;
- February 28, 2007 – Waterloo Chronicle and New Hamburg Independent;
- February 27, 2007 – Cambridge Times;
- March 2, 2007 – Elmira Independent; and
- March 3, 2007 – Woolwich Observer.

A Notice of the PICs was also sent to those on the project mailing list, which consisted of those agencies and stakeholders listed in Table 6.1, along with members of the public who requested that they be added to the list. An additional individual requested that they be added to the project mailing list subsequent to the PICs.

**Table 6.1 List of Agency and Stakeholder Contacts**

<b>Federal</b>	Fisheries and Oceans Canada Canadian Environmental Assessment Agency, Ontario Region Office Environment Canada Indian and Northern Affairs Canada Transport Canada	
<b>Provincial</b>	Ministry of the Environment, West Central Region Ministry of the Environment, Guelph District Office Grand River Conservation Authority Ministry of Natural Resources, Guelph District Office Ministry of Municipal Affairs and Housing, Southwestern Municipal Services Office Ministry of Culture, Kitchener Regional Office Ministry of Agriculture, Food and Rural Affairs, Guelph District Office Ministry of Transportation, Southwestern Region Ministry of Public Infrastructure Renewal	
<b>Municipal</b>	City of Cambridge City of Kitchener City of Waterloo Township of North Dumfries Township of Wellesley Township of Wilmot Township of Woolwich County of Brant County of Oxford	County of Wellington City of Guelph City of Brantford Haldimand County Norfolk County City of Hamilton Township of Puslinch County of Perth
<b>First Nations</b>	Six Nations of the Grand River Territory Mississaugas of the New Credit	
<b>Environmental Groups</b>	Region of Waterloo, Ecological and Environmental Advisory Committee Waterloo Public Interest Research Group Friends of the Grand River Cambridge Environmental Advisory Committee City of Waterloo Environmental Advisory Committee Kitchener Environmental Advisory Committee Canadian Water Resources Association University of Waterloo, Environment and Resource Studies	
<b>Business Groups</b>	Greater KW Chamber of Commerce Cambridge Chamber of Commerce Kitchener Downtown Business Association Waterloo Region Home Builders Association Waterloo Regional Labour Council	

**Table 6.2 Summary of Agency Comments Received for the Notice of Commencement**

Date	Contact	Comment	Response to Comment
<b>Provincial</b>			
June 27, 2006	Ministry of Municipal Affairs and Housing Craig Cooper, Assistant Planner	<ul style="list-style-type: none"> <li>• have no additional comments at this time</li> <li>• would like to be informed of future developments on the file</li> <li>• MMAH comments on this undertaking should not be considered as approval for any other related applications under the <i>Planning Act</i> that may be required, or that may be related to (or result from) this project</li> </ul>	<ul style="list-style-type: none"> <li>• no response provided</li> </ul>
June 29, 2006	Ministry of the Environment West Central Region Cora Sheppard A/EA and Planning Coordinator	<ul style="list-style-type: none"> <li>• work undertaken in updating Master Plans should recognize the Planning and Design Process of the Municipal Class EA and should incorporate key principles of successful environmental assessment planning</li> <li>• it is important that public and agency consultation take place during the study process, specifically at the initiation of the Master Plan update and at the effects on the preferred set of alternatives stage</li> <li>• once the Master Plan update is complete, a revised Notice of Completion should be issued allowing the public an opportunity to review and provide input for any Schedule B or C projects identified in the study</li> <li>• request that one copy of the Notice of Completion with the complete Master Plan Document be</li> </ul>	<ul style="list-style-type: none"> <li>• no response provided</li> <li>• MOE attended Steering Committee meetings held on November 23, 2006 and March 23, 2007</li> </ul>

Date	Contact	Comment	Response to Comment
		forwarded to their office for review, filing and potential comments	
June 28, 2006	Grand River Conservation Authority George Sousa Manager, Resource Science, Information and Policy	<ul style="list-style-type: none"> <li>• GRCA is very interested in the update</li> <li>• GRCA would be pleased to participate on the project team</li> <li>• James Etienne, Senior Water Resources Engineer, has been appointed to work on this project</li> </ul>	<ul style="list-style-type: none"> <li>• GRCA invited to participate on project Steering Committee</li> </ul>
June 30, 2006	Ministry of Natural Resources Mike Stone, District Planner	<ul style="list-style-type: none"> <li>• MNR has an interest in the project</li> <li>• add Ken Cornelisse, Water Resources Coordinator to mailing list</li> <li>• would appreciate receiving a copy of the original Water Supply Master Plan</li> </ul>	<ul style="list-style-type: none"> <li>• Ken Cornelisse added to mailing list</li> <li>• copy of Water Supply Master Plan provided</li> </ul>
<b>Federal</b>			
June 28, 2006	Canadian Environmental Assessment Agency Darla Cameron, Senior Program Officer	<ul style="list-style-type: none"> <li>• advised regarding when the Canadian Environmental Assessment Act (CEAA) is triggered</li> <li>• advised that for projects subject to CEAA, the Agency will act as federal environmental assessment coordinator and facilitate federal involvement</li> <li>• advised that a project description is required in order to provide advice on CEAA and/or to act as coordinator</li> <li>• project description is required to identify any federal interests</li> </ul>	<ul style="list-style-type: none"> <li>• Agency was advised that a project description would be more appropriate at a subsequent stage in the master planning process</li> <li>• no other response provided</li> </ul>

<b>Date</b>	<b>Contact</b>	<b>Comment</b>	<b>Response to Comment</b>
July 5, 2006	Transport Canada Rebecca Earl, Environmental Officer	<ul style="list-style-type: none"> <li>have reviewed the project and have determined that the project does not currently fall within Transport Canada's mandate</li> </ul>	<ul style="list-style-type: none"> <li>no response provided</li> </ul>
<b>Municipal</b>			
June 29, 2006	City of Cambridge April Souwand Senior Environmental Planner	<ul style="list-style-type: none"> <li>the Cambridge Environmental Advisory Committee is interested in participating in the update</li> <li>please send any notices of upcoming Public Information Forums or other opportunities for review and comment to April Souwand</li> </ul>	<ul style="list-style-type: none"> <li>no response provided</li> </ul>
June 30, 2006	City of Guelph Janet Laird Director, Environmental Services Department	<ul style="list-style-type: none"> <li>include the City of Guelph on project documentation, as well as meeting notices as we may wish to attend</li> <li>direct notices to Janet Laird</li> </ul>	<ul style="list-style-type: none"> <li>no response provided</li> </ul>
July 5, 2006	Oxford County Deborah Goudreau Manager of Water Services	<ul style="list-style-type: none"> <li>Oxford County wishes to be on project mailing list</li> <li>correspondence should be directed to Deborah Goudreau</li> </ul>	<ul style="list-style-type: none"> <li>no response provided</li> </ul>
July 17, 2006	City of Brantford W. Wood General Manager Engineering and Operational Services	<ul style="list-style-type: none"> <li>this study will have an impact on the City of Brantford's long-term water supply strategy</li> <li>interested in receiving notifications of Public Information Centres for this study</li> </ul>	<ul style="list-style-type: none"> <li>no response provided</li> </ul>

### *Notice of Completion*

A Notice of Completion, indicating the completion of the Water Supply Strategy Update and the availability of the draft report for public review and comment, will be published in the following newspapers:

- KW Record;
- Waterloo Chronicle and New Hamburg Independent;
- Cambridge Times;
- Elmira Independent; and
- 2007 – Woolwich Observer.

A Notice of Completion was also be mailed to all those on the project mailing list.

## **6.4 Internal Project Workshops**

Three internal project workshops were held at key points in the study process. These workshops were facilitated by the consulting team. Staff from the City of Cambridge, City of Waterloo, City of Kitchener and the Township of Woolwich were invited to participate in the workshops. In addition, Regional staff from the Transportation and Environmental Services, Planning, Housing and Community Services, and Finance Departments participated. A representative from the GRCA attended the regulatory review workshop (see below).

The workshops were held on the dates shown in Table 6.3.



**Table 6.3 Master Plan Update Workshops**

Date	Workshop	Purpose of Workshop
September 7, 2006	Water Demand Workshop	<ul style="list-style-type: none"> <li>• revisit key assumptions from the 2000 Water Supply Strategy</li> <li>• review planning, technical and regulatory changes since 2000</li> <li>• review the approach and methodology for the revised population and water demand forecasts</li> <li>• review and reach agreement on the updated population and water demand forecasts</li> </ul>
September 19, 2006	Water Supply Workshop	<ul style="list-style-type: none"> <li>• revisit key assumptions from the 2000 Water Supply Strategy</li> <li>• review the approach and methodology used for updating the water supply capacity</li> <li>• review historical water supply data</li> <li>• identify constraints and opportunities for each source</li> </ul>
October 19, 2006	Regulatory Review Workshop	<ul style="list-style-type: none"> <li>• review current and proposed legislation, regulations and policy initiatives with the potential to have an impact on water supply options</li> <li>• identify potential regulatory implications for the water supply strategy</li> <li>• discuss the experience of workshop participants with these initiatives and the potential implications for the water supply strategy</li> <li>• identify follow-up actions required to address outstanding issues and concerns</li> </ul>

### 6.5 Public Information Centres (PICs)

PICs were held at the following locations to provide an opportunity for the public to review the results of the work completed to date, including the Water Supply Strategy, and to obtain comments to be considered prior to the completion of the Update.

Date: Tuesday, March 6, 2007  
 Time: 4:00 p.m. to 8:30 p.m.  
 Location: Conestoga Mall, 550 King Street North, Waterloo

Date: Wednesday, March 7, 2007  
 Time: 4:00 p.m. to 8:30 p.m.  
 Location: Mannheim WTP, 2069 Ottawa Street South, Kitchener

Date: Thursday, March 8, 2007  
 Time: 4:00 p.m. to 8:30 p.m.

Location: Cambridge Centre Mall, 355 Hespeler Road, Cambridge

A copy of the newspaper notification for the PICs is provided in Appendix 6. Agencies and stakeholders on the project mailing list were also sent a letter notifying them of the PICs. An example notification letter is also included in Appendix 6.

Regional staff and members of the consulting team were available to provide information, answer questions and discuss comments. Sign-in sheets were available at all three PICs and thirty-nine people provided their name and contact information on these sheets. Additional people attended the PICs but did not sign-in at the Conestoga Mall and Cambridge Centre Mall locations. Original copies of the sign-in sheets are in the Region's project file and, for purposes of privacy, have not been included in this report.

The PIC posters (display boards) and a hand out were both posted on the project web site. These materials are included in Appendix 6.

Input received from the PICs was considered in finalizing the Water Supply Strategy Update.

## **6.6 Comments Received on the Water Supply Strategy Update**

Four PIC comment sheets were submitted to the Region. Copies of these comment sheets are included in Appendix 6. Contact information has been deleted on the comment sheets for purposes of privacy. Original copies of the comment sheets are in the Region's project file.

In addition, Table 6.4 outlines comments received on the Water Supply Strategy Update through submissions to the Region, including those received from:

- Six Nations of the Grand River;
- City of Cambridge Environmental Advisory Committee;
- Ministry of Natural Resources;
- Transport Canada; and
- Indian and Northern Affairs Canada.

Generally, the comments received were supportive of the updated Water Supply Strategy, including the Great Lakes pipeline and continuing water efficiency measures. The following themes were expressed in the comment sheets and submissions:

- greater efficiency could extend the need for a Great Lakes pipeline beyond 2034;
- higher prices for peak demand or summer water use would assist in reducing peak demands and deferring the need for a pipeline;
- there is room for additional conservation and water efficiency (e.g., low flow taps for restaurants, grey water recovery, collection of rain water);
- there should be more effort placed on "soft" solutions;
- interested in full costs of pipeline – i.e., capital and operating costs;
- request for information package or to be placed on mailing list;
- supportive of once a week summer watering restrictions;

- Region should monitor impacts of water takings by Laurel Springs Water Company;
- vehicles and road maintenance continue to threaten water supply; and
- Lake Erie is volatile water source – phosphate and nitrate emissions in Region affect well being of Lake Erie.

Two submissions indicated that they do not support a Great Lakes pipeline. One submission suggested that it would be better for the Region to invest in the preservation of recharge areas.

**Table 6.4 Summary of Agency and Stakeholder Comments Received Through PIC Comment Sheets and Submissions on the Water Supply Strategy Update**

Date	Contact	Comment	Response to Comment
<b>Members of the Public</b>			
March 8, 2007  PIC Comment Sheet	PIC Attendee	<ul style="list-style-type: none"> <li>• has concerns about water taking by the Region from three wells along Townline Road</li> <li>• suggestion to reduce water usage in the Region, based on users paying much more for water than they do now</li> <li>• suggestions include (other suggestions noted in Comment Sheet in Appendix 5):               <ul style="list-style-type: none"> <li>– fit all properties with remote reading water meters</li> <li>– charge for water usage under an increasing block rate structure</li> <li>– keep raising the water rates annually to reduce usage</li> <li>– ban the watering of grass on all industrial properties and industrial subdivisions year round</li> <li>– offer incentives to industry and commercial establishments to reduce/recycle water used in process or for once-through cooling</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• the Region has been recognized as one of the leaders in Canada with respect to water efficiency programs, and continues to actively implement programs which aim to reduce water consumption in the Region</li> <li>• for example, the Region will once again be enforcing its outdoor water use by-law this summer which limits lawn watering to once a week</li> <li>• as another example, the Region promotes education of water conservation to local residents on an on-going basis</li> <li>• contact Kaoru Yajima if you have any questions</li> <li>• for more information on water efficiency programs, contact Mr. Steve Gombos, Manager of Water Efficiency</li> </ul>
March 6, 2007  PIC Comment Sheet	PIC Attendee	<ul style="list-style-type: none"> <li>• does Region have tap “things” for saving water when brushing your teeth</li> </ul>	<ul style="list-style-type: none"> <li>• request forwarded to Mr. Steve Gombos, Manager of Water Efficiency</li> </ul>

**Table 6.4 Summary of Agency and Stakeholder Comments Received Through PIC Comment Sheets and Submissions on the Water Supply Strategy Update**

Date	Contact	Comment	Response to Comment
March 6, 2007  PIC Comment Sheet	PIC Attendee	<ul style="list-style-type: none"> <li>greater efficiency efforts could extend the need for a Great Lakes pipeline</li> </ul>	<ul style="list-style-type: none"> <li>comments will be included with input received from other area residents in finalizing the Update</li> </ul>
March 6, 2007  PIC Comment Sheet	PIC Attendee	<ul style="list-style-type: none"> <li>has questions about underlying assumptions and operative calculations; will go back to the Strategy for answers or contact the Region</li> <li>encouraging to see the “good news” that a pipeline need date is not moved forward even with anticipation of greater population growth</li> <li>room for much more in terms of efficiency and conservation</li> <li>do the estimates of pipeline costs include the electricity needed?; are these capital costs only?; are there plans for the public to be informed about the full costs of pipeline?</li> </ul>	<ul style="list-style-type: none"> <li>the costs are capital costs only and do not include operating costs</li> <li>for the purposes of the Update, the costing is meant to be on a very high level and more accurate cost estimates will be developed in the future through a subsequent environmental assessment</li> </ul>
March 1 and 8, 2007  E-mail submission	PIC Attendee	<ul style="list-style-type: none"> <li>good displays and informed staff</li> <li>provided web link information on how water conservation leads to reduction of greenhouse gases</li> <li>supports one day per week watering</li> <li>water restrictions should also be applied to those with automatic sprinkler systems</li> <li>would like to see mandatory use of low flow taps</li> </ul>	<ul style="list-style-type: none"> <li>advised of PICs to be held on March 6, 7 and 8, 2007</li> <li>comments will be included with input received from other area residents in finalizing the Update</li> </ul>

**Table 6.4 Summary of Agency and Stakeholder Comments Received Through PIC Comment Sheets and Submissions on the Water Supply Strategy Update**

Date	Contact	Comment	Response to Comment
		<p>for restaurants throughout the Region</p> <ul style="list-style-type: none"> <li>• activities of Laurel Springs Water Company should be monitored</li> <li>• actions in the Region relative to handling of phosphate and nitrate emissions are critical to the well-being of Lake Erie</li> <li>• a pipeline invested in so volatile a water source [i.e., Lake Erie] may not be a wise investment</li> <li>• does not support the building of a pipeline – it would be a wiser investment to put that money towards the preservation of our primary recharge areas</li> </ul>	
<p>March 16, 2007</p> <p>E-mail Submission</p>	<p>Member of the Public</p>	<ul style="list-style-type: none"> <li>• strongly opposed to a pipeline and would like to see more done to conserve water</li> <li>• there’s no mention of gray water recovery; this technology is available and should be required in all new buildings</li> <li>• as well as rain barrels, new buildings should be required to incorporate cisterns</li> <li>• more should be done to insist that developers ensure that maximum rainwater is allowed to percolate into the soil by strictly limiting the amount of ground that can be covered with impermeable surfaces</li> </ul>	<ul style="list-style-type: none"> <li>• the Region has been recognized in the water supply industry by its work in water efficiency programs</li> <li>• most of your suggestions have been addressed in the Region’s Water Efficiency Master Plan completed in 2006; if you need additional details about this master plan or these programs, please contact Steve Gombos, Manager of Water Efficiency</li> <li>• the Region is also undertaking studies to identify additional groundwater sources recommended in the Water Supply</li> </ul>

**Table 6.4 Summary of Agency and Stakeholder Comments Received Through PIC Comment Sheets and Submissions on the Water Supply Strategy Update**

Date	Contact	Comment	Response to Comment
		<ul style="list-style-type: none"> <li>• does the development of new ground water sources take into account the GRCA’s project which has identified some very deep aquifers south of Cambridge?</li> </ul>	<p>Master Plan; these studies includes areas located in the City of Cambridge and the Township of North Dumfries; if you need further details about these studies, please contact Jim Robinson, Senior Hydrogeologist</p>
<p>April 16, 2007  E-mail Submission</p>	<p>Georgian Bay Association</p>	<ul style="list-style-type: none"> <li>• questioned whether the Region is considering a pipeline to Lake Huron as an option for long term water supply and whether MNR has commented on this option</li> </ul>	<ul style="list-style-type: none"> <li>• as part of the Water Supply Strategy Update commenced in 2006, the Region is looking at all planning, technical and regulatory changes that have taken place in the past six to seven years to update the 200 strategy</li> <li>• such investigations are currently underway and will be reported on in late spring/early summer of this year</li> <li>• as part of the process, Region staff have informed the MNR of this option and continue to have an open dialogue with them to discuss the various issues</li> </ul>
<p>March 3, 2007  E-mail Submission</p>	<p>Member of the Public</p>	<ul style="list-style-type: none"> <li>• suggest that the Region consider stopping or reducing all traffic flow from Homer Watson Boulevard on to Stirling Avenue</li> <li>• road salt and other chemicals used to maintain winter traffic volume are entering Greenbrook</li> </ul>	<ul style="list-style-type: none"> <li>• Water Services agrees with your comment about the importance of the Greenbrook system</li> <li>• upgrades are ongoing so that later this year it can be brought back to operation, and continue to provide safe water to</li> </ul>

**Table 6.4 Summary of Agency and Stakeholder Comments Received Through PIC Comment Sheets and Submissions on the Water Supply Strategy Update**

Date	Contact	Comment	Response to Comment
		<p>well system</p> <ul style="list-style-type: none"> <li>• the danger is a salt plume – an underground flow of salt pollution</li> <li>• the actions and road maintenance of ten thousand vehicles will continue to threaten our water supply</li> </ul>	<p>our customers</p> <ul style="list-style-type: none"> <li>• acknowledge that some of the issues you raise could impact the Greenbrook system, and the Water Resource Protection Group has worked diligently to address some of these issues</li> <li>• however, most of the issues you have raised are road planning issues; the Region’s Transportation Division, who you have also contacted, would likely be able to better discuss some of your traffic concerns</li> </ul>
<b>Municipal</b>			
<p>March 28, 2007</p> <p>Letter and report of the Cambridge Environmental Advisory Committee</p>	<p>Ms. April Souwand City of Cambridge Environmental Advisory Committee (CEAC)</p>	<ul style="list-style-type: none"> <li>• CEAC would like Regional staff to explore mandated conservation efforts, particularly aimed at the industrial/commercial/institutional sectors in order to delay the need for very expensive infrastructure upgrades in the future</li> </ul>	<ul style="list-style-type: none"> <li>• Glad that some members of the committee were able to attend the PIC</li> <li>• The Region will be incorporating the comments from the Committee in the report for the updated Water Supply Strategy</li> <li>• In addition, the comments will be forwarded to the Region’s Water Efficiency Master Plan group</li> </ul>



**Table 6.4 Summary of Agency and Stakeholder Comments Received Through PIC Comment Sheets and Submissions on the Water Supply Strategy Update**

Date	Contact	Comment	Response to Comment
<b>First Nations</b>			
March 27, 2007  Letter	Councillor George Montour, Chair Six Nations Lands and Resources Committee  Six Nations Council  Six Nations of the Grand River	<ul style="list-style-type: none"> <li>• due to lack of capacity, a representative was unable to attend the PIC centre on March 6, 2007</li> <li>• requested a copy of the information package distributed at the meeting</li> <li>• contact Jo-Anne Greene for further information</li> </ul>	<ul style="list-style-type: none"> <li>• copy of PIC display materials forwarded by Region to Six Nations Council</li> </ul>
<b>Federal and Provincial Agencies</b>			
March 28, 2007  E-mail Submission	Mr. Mike Stone Ministry of Natural Resources	<ul style="list-style-type: none"> <li>• thank you for providing Notice of PICs</li> <li>• Ministry staff were unable to attend but would appreciate receiving the information that was provided at the PIC</li> <li>• look forward to receiving new information about this project as it becomes available</li> </ul>	<ul style="list-style-type: none"> <li>• PIC information provided</li> <li>• response also noted that PIC posters and hand out could be found on the project web site</li> </ul>
March 27, 2007  E-mail Submission	Ms. Rebecca Earl Environmental Officer Transport Canada – Ontario Region	<ul style="list-style-type: none"> <li>• Transport Canada is responsible for the administration of the <i>Navigable Waters Protection Act</i> (NWPA), which prohibits the construction or placement of any “works” in navigable waters without first obtaining approval</li> <li>• if any of the related project elements or activities may cross or affect a potentially navigable waterway, you must prepare and submit an NWPA application</li> </ul>	<ul style="list-style-type: none"> <li>• this information will be reviewed by our project team and incorporated into the final report</li> <li>• thank you for your interest and for taking the time to forward the information to us</li> <li>• Section 5 outlines the Regulatory and Policy Framework and acknowledges potential NWPA and CEEA requirements for the assessment of</li> </ul>

**Table 6.4 Summary of Agency and Stakeholder Comments Received Through PIC Comment Sheets and Submissions on the Water Supply Strategy Update**

Date	Contact	Comment	Response to Comment
		<ul style="list-style-type: none"> <li>• note that certain approvals under the NWPA or <i>Railway Safety Act</i> trigger the requirement for a federal environmental assessment under the <i>Canadian Environmental Assessment Act</i> (CEAA)</li> <li>• provided various additional information re. application process</li> </ul>	<p>projects resulting from the water supply strategy update</p>
<p>March 12, 2007</p> <p>Letter</p>	<p>Ms. Miranda Lesperance Environmental Officer Environmental Unit Indian and Northern Affairs Canada – Ontario Region</p>	<ul style="list-style-type: none"> <li>• for all provincial and/or municipal undertakings, INAC requests that proponents of such projects make efforts directly from the initiation of a project to identify and notify all potentially interested First Nation communities</li> <li>• recommended that this identification and notification occur at the earliest planning stages of the undertaking and if requested by any First Nation(s), maintain communication with such communities</li> <li>• also advise that if a proponent believes that the proposed project is likely to trigger a requirement for a federal environmental assessment under CEAA, the proponent should contact the Canadian Environmental Assessment Agency</li> </ul>	<ul style="list-style-type: none"> <li>• comments noted</li> <li>• the Six Nations of the Grand River Territory and the Mississaugas of the New Credit First Nation have both been advised of the Update</li> </ul>

## 7. **UPDATED WATER SUPPLY STRATEGY**

### 7.1 **Updated Strategy**

Water demand projections for the IUS were developed with and without water efficiency measures and water use restrictions. These maximum week water demand projections are summarized in Table 7.1.

**Table 7.1 Projected Maximum Week Demand**

Scenario	IUS Maximum Week Demand (ML/d)							
	2006	2011	2016	2021	2026	2031	2036	2041
With water efficiency and water use restrictions	205.8	212.9	224.2	238.4	252.9	270.7	287.1	304.1
Without water efficiency and water use restrictions	211.3	226.3	240.7	255.3	270.3	287.6	305.4	323.1

Based on the water demand projections and a review of current and short-term capacity, the Update confirmed that the water supply projects identified in the 2000 Water Supply Master Plan are still valid. The Updated Water Supply Strategy will involve the following measures:

- continued implementation of the Water Efficiency Master Plan and achievement of water reduction targets (8.2 ML/d (1.8 MIgd) by 2015);
- continued support of the once a week lawn watering restrictions
- continued examination of well life cycle, including annual examination of the overall source capacity;
- construction of Phase II of the Aquifer Storage and Recovery (ASR) facilities (23 ML/d (5 MIgd));
- continued development of new groundwater supplies up to 23 ML/d (5 MIgd); and,
- construction of a Great Lakes displacement pipeline.

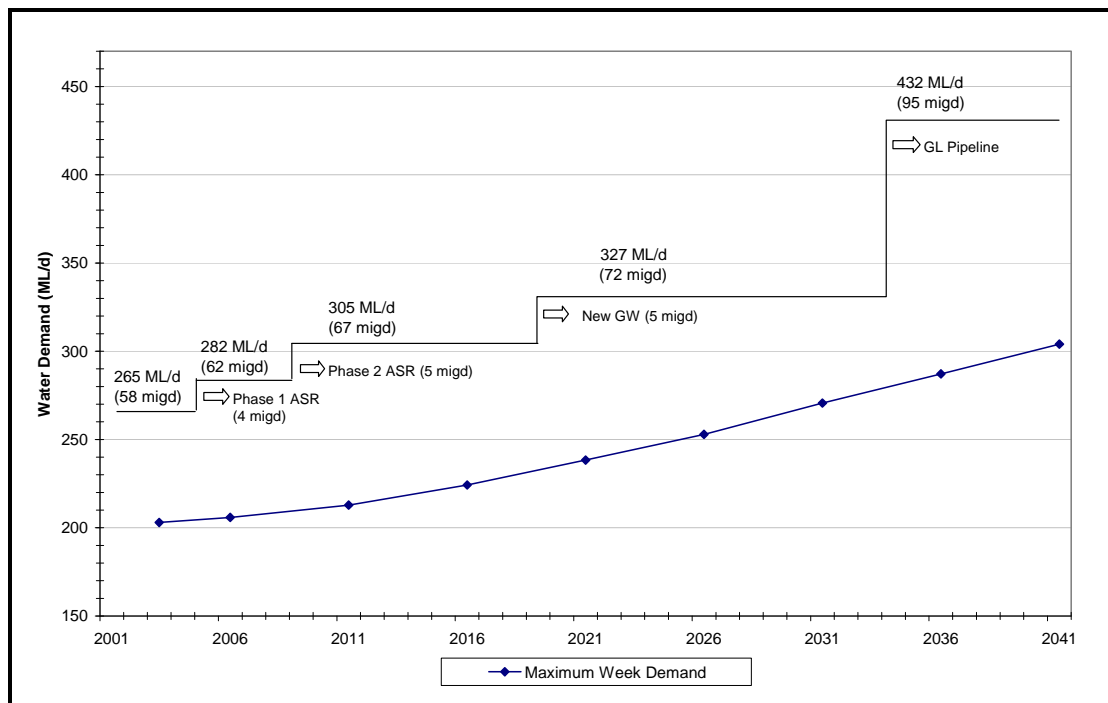
A summary of the short-term future system capacity, as well as the components of the Updated Water Supply Strategy which are expected to increase system capacity, is shown in Table 7.2.

**Table 7.2 Short Term Peaking Capacity and Expected System Capacity**

Component	Capacity	
	ML/d	MIgd
Short Term Peaking Capacity	282	62
Phase II ASR Facilities	23	5
Additional Groundwater Supplies	23	5
Great Lakes Displacement Pipeline	432	95

Based on the projected demand and the expected system capacity, the recommended implementation plan for the Updated Water Supply Strategy is shown in Figure 7.1. Figure 7.2 illustrates the timing for the implementation of key action items (see Tables 7.3 and 7.4).

**Figure 7.1 Updated Water Supply Strategy**



As shown in Figure 7.1, it is expected that the additional groundwater sources will be required by approximately 2018. The Great Lakes Displacement Pipeline will be needed to meet demand by 2034 if participation in the water efficiency program and the water restrictions are maintained. Without water efficiency and water restrictions, the pipeline supply would be required in 2029 (not shown).

In addition, the Region should consider the following in reference to the Water Supply Strategy:

- evaluate all funding options for master planning projects currently being considered or undertaken, together with cost-benefit analysis of master plan projects;
- continue to develop Regional Official Plan infrastructure policies that reflect the updated Water Supply Strategy;
- relative to the implementation of revisions to the development permit system as part of Bill 51, incorporate appropriate policies by amendment to the ROP or integration in the new ROP, and enforce through corresponding amendments to local area municipal official plans.

Section 7.2 describes each of the components of the Updated Water Supply Strategy.

## **7.2 Components of Updated Water Supply Strategy**

### **7.2.1 Management of Existing Supplies**

These projects include the rehabilitation/maintenance of existing supplies to maintain capacity, new treatment facilities (up to existing rated capacity) and source protection activities.

The Region's ability to supply water from its groundwater supplies in the short-term has been constrained due to:

- water quantity and quality issues with a number of wellfields;
- declining efficiencies of some water supply wells; and,
- operational constraints.

To address these constraints, the Region should develop and implement a well maintenance and rehabilitation program to ensure its ability to sustain the capacity currently available from its supply wells. An annual review of the status of all of the well supplies serving the IUS that involves key operational, hydrogeological and engineering staff should be undertaken. A format similar to that used in the Water Supply Workshop conducted as part of this Update might be appropriate.

During the Water Supply Workshop, reduced capacity at some water treatment plants was identified after UV disinfection equipment was installed. This reduced capacity may be a result of the higher discharge head through the treatment process. Opportunities to recover this lost capacity through changes to the system pumping should be reviewed.

These are Schedule A projects in accordance with the Municipal Class EA which means that they are pre-approved and the Region may proceed to implementation.

The following are general activities that the Region may want consider for these projects:

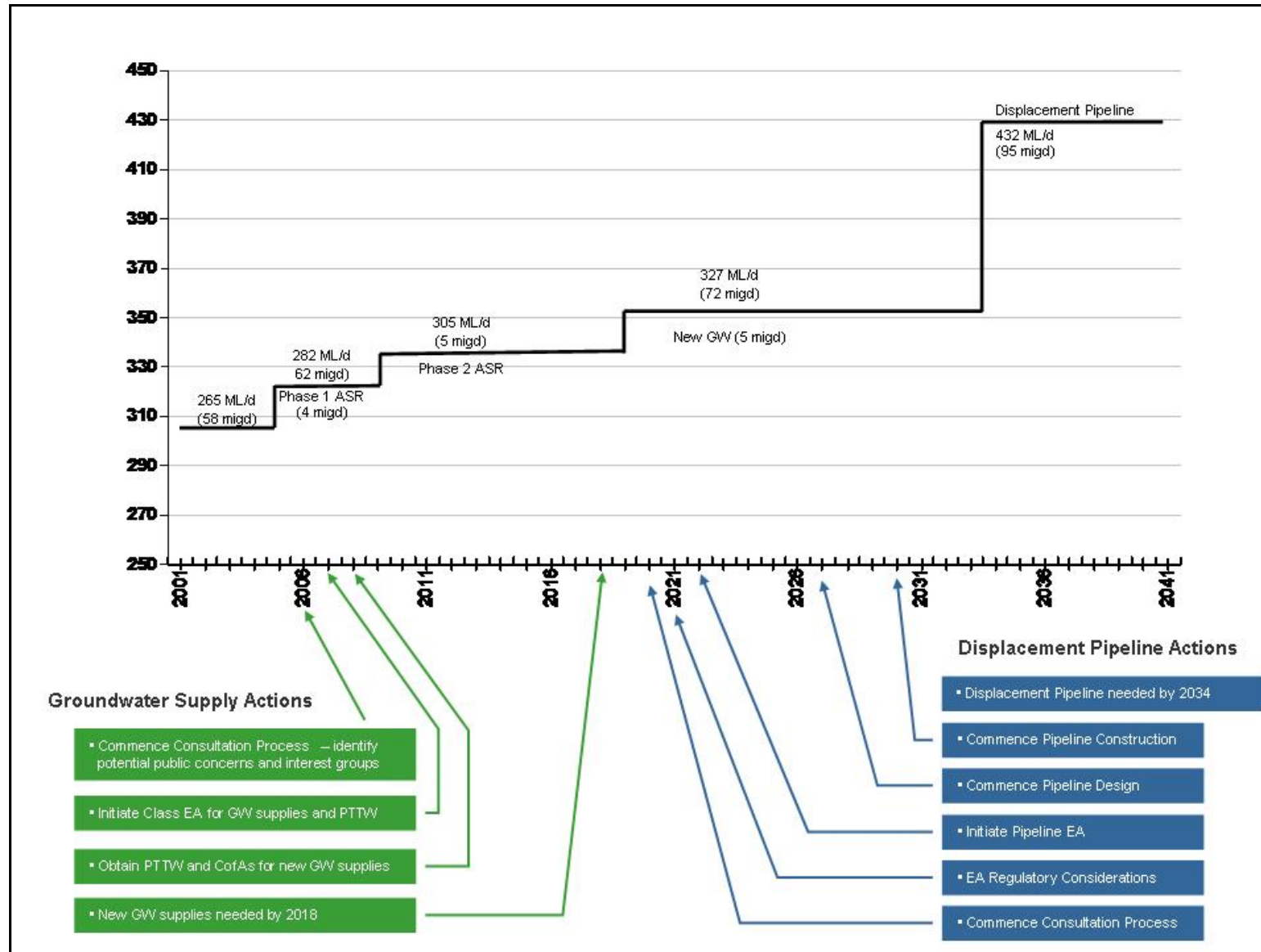
- continue the on-going renewal of existing Permits to Take Water (PTTW);
- continue to monitor changing water quality and new/anticipated standards;
- monitor the development of *Clean Water Act* regulations;
- monitor the 5-year review of the Municipal Class EA (updated document likely to be issued in 2007) to determine if there are changes that could affect projects for the management of existing sources of supply; and,

- continually be aware of changes to other legislative, regulatory and policy requirements to determine if there is an impact on the management of existing sources of supply.

### **7.2.2 Treatment Upgrades at Existing Facilities**

New or upgraded groundwater treatment facilities are being considered at a number of the Region's wellfields, including Greenbrook, Middleton and Well K36. Class Environmental Assessments (Class EA) are underway at each of these facilities.

Figure 7.2 Timing for Implementation of Key Action Items



In the summer of 2004, the chemical 1,4-dioxane was found in water from some of the Greenbrook wells and the supply system was shut down as a precaution. The Region has initiated a study in accordance with Class EA requirements to identify and define a publicly acceptable solution that will restore the Greenbrook water system to provide high quality potable water and operate efficiently at an optimum capacity.

The purpose of the Class EA study for the Middleton Pumping Station is to address water quality concerns associated with the Middleton Water Supply including: the potential influence of surface water on the groundwater supply wells; the presence of low-levels of industrial chemicals; and the occurrence of iron and manganese. The Class EA will also evaluate the long term aquifer yield to ensure that Middleton will continue to supply high quality potable water well into the future.

The EA at Well K36 is being undertaken to address aesthetic water quality issues related to manganese in the water at levels greater than the Ontario Drinking Water Aesthetic Objective. The project will allow the Region to implement a permanent solution for the use of Well K36.

### **7.2.3 ASR Phase II**

Implementation of an ASR system at the Mannheim WTP area was one of the preferred strategies identified in the 1987 Master Water Supply Plan. ASR consists of storing treated drinking water in suitable aquifers during periods of water surplus for later recovery to meet peak or emergency water demands. Two aquifers could be used for water storage at the Mannheim WTP - upper unconfined aquifer and the deep bedrock confined aquifer.

A pilot testing program was undertaken from 1996 to 1998 to assess the feasibility of the ASR at the Mannheim WTP aquifers. This testing program demonstrated that implementation of the ASR technology in the shallow unconfined sand and gravel aquifer at the Mannheim WTP site was both feasible and economical. The tests also provided design and operational criteria necessary for the planning and design of the full scale ASR system.

The conceptual design for the full scale 45.4 ML/d (10 MIgd) ASR facilities included 5 ASR wells and 6 recovery wells, each with an expected capacity of 4.54 ML/d (1 MIgd), to be implemented in two stages of 22.7 ML/d (5 MIgd) each. The ASR wells would be used for both injection and recovery. The recovery wells were strategically placed around the perimeter of the injection area to capture water that could flow away from the storage “bubble” formed by the injected water.

The first phase of the ASR facility, consisting of 4 injection/recovery wells and 2 recovery wells constructed at the Mannheim WTP, was commissioned in 2005 and has increased the Region’s supply capacity by approximately 17.2 ML/d (3.8 MIgd).

The current Certificate of Approval for the Mannheim WTP includes the provision for the construction of Phase II of the ASR. The EA requirements for this project have already been addressed.



Preliminary design for Phase II of the ASR will be completed in 2007 and will include an evaluation of approaches to improve the efficiency and increase the capacity of Phase II relative to that achieved in Phase I.

#### **7.2.4 Additional Well Supplies**

Potential locations to supply up to 91 ML/d (20 MIgd) of additional groundwater within the Region of Waterloo were identified in the 2000 WSMP. Of this amount, the Integrated Urban System (IUS) Groundwater Supply Optimization and Expansion Project was initiated early in 2005 to identify the preferred locations to supply the required amount of groundwater mentioned in the 2000 WSMP and to determine possible improvements in current supplies.

As discussed in Section 4, confirmed new wells to be developed as part of the IUS Project will be used to cover existing deficiencies and to maintain the current system capacity of 282 ML/d (62 MIgd). This project is ongoing and will continue to search for up to 22.7 ML/d (3 to 5 MIgd) of groundwater to meet the projected demand. In each case, appropriate Environmental Assessment requirements will need to be met (refer to Section 5).

The assessment of 22.7 ML/d (5 MIgd) additional groundwater supply will be undertaken as Class EAs. As noted above, the Region should monitor the 5-year review of the Municipal Class EA (updated document likely to be issued in 2007) to determine if there are changes that could affect these projects. Further recommended actions are identified in Table 7.3.

Iron/manganese treatment is a common requirement for new wells in the Region. Costs for iron/manganese treatment of the groundwater were considered in the cost estimate for the Update (refer to Section 7.3).

In developing new wells to service an urban area, it is common for these wells to be located some distance from the urban area to ensure that there are not adverse impacts on existing wells. Therefore, the length of feedermain that will be necessary to connect these wells to the existing distribution system may be greater than the lengths assumed in the year 2000.

#### **7.2.5 Displacement Pipeline**

The preferred alternative in the 2000 WSMP was a pipeline to either Lake Huron or Lake Erie. The public preferred the Lake Huron option given the perception that the water quality in this lake is better than that of Lake Erie. However, from a treated water perspective, both water sources would be equally acceptable. Given the recent developments regarding the Great Lakes – St. Lawrence River Basin Sustainable Water Resources Agreement and the proposed *Safeguarding and Sustaining Ontario's Water Act*, the Lake Erie option may be preferable as the water taken from Lake Erie would return to Lake Erie through treated wastewater disposal to the Grand River. However, the feasibility of utilizing other Great Lakes sources should be reviewed as the planning for the displacement pipeline proceeds. In addition, discussions and negotiations regarding the displacement pipeline should consider possible partners (public sector, private sector and First Nations) in the construction of the infrastructure.

The pipeline is intended to fulfill two functions – to reduce the Region’s dependency on groundwater and to augment the water supply available to meet future needs. The implications of reduced groundwater taking on the aquifer and surface water features in the Region will need to be carefully considered as part of the Environmental Assessment process. Reduced groundwater taking may result in rising water levels in some areas of the Region.

The Region’s IUS is extremely complicated due to the number of wellfields and treatment facilities. There are also restrictions within the IUS area that limit the ability of the Region to deliver water from one area to another. The nature of the existing IUS also results in high operating costs and complex regulatory reporting. As planning for the displacement pipeline proceeds, the reduced complexity resulting from the availability of a displacement pipeline and reduced dependency on groundwater needs to be considered.

A key issue for the Great Lakes displacement pipeline is whether the environmental assessment for this project would be undertaken as a Class EA (in accordance with the Municipal Class EA) or as an Individual EA. Some of the implications of proceeding with a Class EA versus an Individual EA include:

*Class EA:*

- a Class EA contains provision for projects to be made subject to an Individual EA (i.e. Part II Order) – if granted by the Minister of the Environment, this could extend the time and cost for the assessment;
- with a Class EA, the Region makes the decision on the project (if no Part II Order Requests).

*Individual EA:*

- an Individual EA requires the preparation of a legally binding Terms of Reference (ToR), which is not required for a Municipal Class EA;
- an Individual EA has a provision for formal government and public review of the ToR and EA;
- with an Individual EA, the Minister of the Environment makes the decision on the project, with Cabinet approval; and,
- with an Individual EA, there is the potential for an Environmental Tribunal hearing, however unlikely.

Both types of EA could be coordinated with federal EA requirements. Further details on how to address this issue, as well as other recommendations for the implementation of the 2000 WSMP, are provided in the Action Plan.

A number of actions are recommended in Table 7.4 to address this issue, including meeting with representatives from the MOE Environmental Assessment and Approvals Branch to seek their advice on this matter.

Proponency is another major outstanding issue relative to the Great Lakes displacement pipeline. Proponency has implications for the application of EA legislation and EA requirements. For example, it would be less likely that the EA for the Great Lakes displacement pipeline would be undertaken in accordance with the

Municipal Class EA if the project were a multi-jurisdictional initiative. The issue of proponenty is multi-faceted and involves considerations such as:

- the implications of a private entity as proponent;
- the Region of Waterloo as proponent; partnerships with other municipalities;
- the definition of proponenty in a potential private sector venture; and,
- would the Region be viewed as the proponent in a private sector venture due to its responsibilities for long-term operation and maintenance of the system.

The issue of proponenty will need to be resolved prior to the initiation of the EA process – specific actions to address this are outlined in Table 7.4.

In addition, further consultation with First Nations will be required as part of the overall environmental assessment. The Region should continue to work with the appropriate First Nations, as well as relevant provincial and federal departments, to determine how these consultation efforts should be structured and implemented in order to achieve the greatest efficiencies and to maximize benefits.

The following are other general recommendations:

- ensure that consultant project team incorporates expertise and experience in dealing with First Nations and coordinating federal/provincial EAs;
- be proactive in approaching the MPIR relative to the development of the terms of reference for the assessment of sub-areas, in accordance with the *Growth Plan for the Greater Golden Horseshoe*;
- consider presenting the Great Lakes displacement pipeline initiative to MPIR together with participating municipalities and First Nations to reinforce importance of determining provincial interest
- review conditions in PTTW for Nanticoke intake and develop justification for retaining PTTW;
- develop schedule for ensuring Nanticoke intake PTTW is retained;
- continue to monitor any interpretations of the Great Lakes – St. Lawrence River Basin Sustainable Water Resources Agreement;
- continue to maintain dialogue with potential partner municipalities.

Further clarification will also be required regarding the ability to undertake inter-basin transfers. It is recommended that the Region engage in on-going dialogue with MOE and MNR to seek policy direction on this matter.

### **7.2.6 Continued Water Efficiency Efforts**

As noted in Section 3, continued and expanded water efficiency efforts are a key component of the Water Supply Strategy. The initiatives contained in the WEMP Update will serve to defer the need to develop new groundwater supplies and construct a displacement pipeline despite the significant projected population increase in the Region relative to that predicted in the 2000 WSMP. Public input at the PICs (refer to Section 6) showed strong support for continued and expanded water efficiency.

The Region has been a leader in the development and implementation of water efficiency measures. This pro-active approach by the Region should be continued and new opportunities to further reduce water use should be explored to assess their feasibility and cost-benefit.

### **7.3 Estimated Implementation Costs**

The original and updated costs for the ASR facility, the additional groundwater supply and the displacement pipeline from Lake Erie are summarized in Table 7.5. Additional details on the methodology and assumptions that were used in updating the cost estimates are provided in Appendix 4.

The updated costs are based on the rather limited details that are provided in the 2000 WSMP and therefore should be used with due consideration for the inherent limitations. In order to increase the confidence of these estimates, it would be appropriate to prepare conceptual designs of the three initiatives, determine preliminary quantities of the corresponding infrastructure components, and apply current unit prices. This approach would enable a more detailed breakdown of the estimate and enhance both the confidence level and the ability to review and make further adjustments in the future.

### **7.4 Development of Detailed Financial Model on Financing Alternatives**

It is expected that the long term water supply components to the Region (ASR Phase II and additional groundwater) can be financed through normal means using the existing user rates. However, for the Great Lakes displacement pipeline, a detailed financial model for this component should be developed to carry out the analysis of financing alternatives. Such analysis could consider financing alternatives that include combinations of the following:

- User rates;
- Debentures;
- Development charges; and/or,
- Grants and loans (provincial and federal).

By conducting such a study, the Region can plan the timing of fund collection. Such a model can be updated appropriately as more details of this component are elaborated.

### **7.5 Future Updates**

The Region should review and update the Water Supply Strategy on a regular basis to ensure the assumptions regarding water demand and water supply are still valid.

Key points at which an update would be warranted in the near term would be:

- on completion of Phase II of the ASR when the total capacity provided by both phases of the ASR is known;
- upon completion of the IUS Project so that the supply calculations can be revised as necessary to reflect the capacity that is recovered from those supplies that are under study; and,

- as new groundwater supplies are identified, approved and brought into production.

Future updates will need to consider the impacts of climate change on both the Region's water demand and water supply. Climate change may reduce the flows in the Grand River during dry summer months, affecting the allowable water taking for the Mannheim WTP. Groundwater supplies may also be reduced during sustained periods of warmer, drier weather. At the present time, it is difficult to predict the short and long term impacts of climate change. These impacts will become clearer in the future.

## 7.6 **Recommended Action**

The Update confirmed that the original WSMP components are still relevant. As a result, a number of actions have been recommended and are summarized below.

### *General*

- Continued support of the WEMP that was updated in 2006, including realization of water reduction targets contained therein;
- Continued support for the once a week lawn watering restrictions during the summer;
- Continued maintenance and improvements to existing water supply facilities, such as the present well monitoring program, well life cycle analysis, annual water supply reviews, Mannheim WTP optimization, etc.;
- Continued monitoring of legislative, regulatory and policy direction which could affect source supply; and,
- Continued updates of the WSMP every five years.

### *ASR and Additional Groundwater*

- Commencement of the construction of Phase II of the ASR project to be completed by 2009; and,
- Continuation of a program to identify and develop additional groundwater supplies up to 23 ML/d (5 MIgd), to be completed by 2018.

### *Great Lakes Displacement Pipeline*

- Focus on Lake Erie source for the Great Lakes displacement pipeline;
- Continue the investigation of the possibility to use the existing intake facilities at Nanticoke (Lake Erie);
- Continue with investigation to obtain a Permit to Take Water and other necessary approvals for the Lake Erie alternative, and to acquire land for treatment, pumping and transmission facilities;
- Continue to explore potential partnerships for developing the above; and,
- Direct staff to develop a detailed financing plan for the Great Lakes displacement pipeline, including financing alternatives and their impacts on water rates and development charges.

**Table 7.3**      **Actions to Address Construction of 23 ML/d Additional Groundwater**

Issue	Pre EA	EA Process and Permitting Stage
EA Process	<ul style="list-style-type: none"> <li>• determine relevant project schedule in accordance with Appendix 1 of the Municipal Class EA</li> <li>• review potential CEAA triggers for all projects being assessed in accordance with the Municipal Class EA</li> </ul>	
Other Approval Requirements	<ul style="list-style-type: none"> <li>• undertake update of other legislative, regulatory and policy approval requirements (EA approvals must be obtained before seeking approvals and permits under other legislation)</li> </ul>	<ul style="list-style-type: none"> <li>• coordinate Class EA and <i>Planning Act</i> requirements (if relevant), to the extent possible, in accordance with Section A.2.9 of the Municipal Class EA, if appropriate</li> <li>• obtain other permits and approvals such as Permit to Take Water and Certificate of Approval</li> </ul>
Consultation	<ul style="list-style-type: none"> <li>• identify potential public concerns and interest groups that may want to participate in project assessment</li> </ul>	<ul style="list-style-type: none"> <li>• in undertaking Municipal Class EAs, ensure that public consultation program is tailored to the requirements of the project; there may be community groups with an interest in a project – engage these groups at the outset of the assessment</li> </ul>

**Table 7.4 Actions to Address Great Lakes Displacement Pipeline**

Issue	Pre EA	EA Process and Permitting Stage
EA Process	<ul style="list-style-type: none"> <li>• meet with MOE to seek advice re. the issue of Municipal Class EA (Schedule C) vs. Individual EA</li> <li>• review experience of other municipalities (e.g., Region of York) relative to EA decision and rationale</li> <li>• hold facilitated workshop attended by key Regional staff to discuss advantages and disadvantages of one approach vs. the other</li> <li>• develop overall EA schedule, including timelines for: preparation of Terms of Reference (ToR) (if undertaken as an Individual EA); EA Report; addressing federal issues; public and agency consultation; consultation with First Nations; and subsequent permitting stage</li> <li>• develop understanding of federal/provincial EA coordination procedures – <i>Federal/Provincial Environmental Coordination. A Guide for Proponents and the Public</i> (draft 2006)</li> <li>• preliminary identification of possible <i>Canadian Environmental Assessment Act</i> (CEAA) triggers, federal Responsible Authorities (RAs) and the relevant federal authorities with a potential interest in the project</li> </ul>	<ul style="list-style-type: none"> <li>• develop a project description in accordance with the Canadian Environmental Assessment Agency’s (CEA Agency) <i>Operational Policy Statement for Preparing Project Descriptions</i> (August 2000); this is an important first step in the federal EA process and will be a mechanism by which the CEA Agency and other federal departments can be engaged in the EA process</li> <li>• meet with CEA Agency to introduce project and review and discuss project description – this could be a joint meeting with MOE if assessment is undertaken as an Individual EA</li> <li>• review current <i>Comprehensive Study List Regulations</i> (regulation under CEAA) prior to initiating EA to ensure that project does not require a comprehensive study</li> <li>• seek understanding of federal information requirements for EA in order to undertake technical studies and documentation in a coordinated manner</li> <li>• although not a legal requirement, it is recommended that a scoping document be prepared that outlines the scope of project and scope of assessment, as per the CEAA</li> <li>• work with provincial and federal departments to determine specifics of EA documentation</li> <li>• if Great Lakes displacement pipeline routes involve a crossing(s) of a rail line(s), initiate discussions with the relevant rail company as soon as possible to avoid potential delays later in the process; if agreement cannot be reached with rail company on design of crossing and who will pay, a permit under the <i>Canadian Transportation Act</i> is required (a CEAA <i>Law List Regulations</i> trigger)</li> <li>• if Great Lakes displacement pipeline would require crossing of Greenbelt Plan area, EA must address potential negative impacts on Natural Heritage System and shall avoid key natural heritage features or key hydrologic features, unless there is no reasonable alternative, in accordance with Greenbelt Plan</li> </ul>



**Table 7.4 Actions to Address Great Lakes Displacement Pipeline**

Issue	Pre EA	EA Process and Permitting Stage
EA Coordination	<ul style="list-style-type: none"> <li>identify opportunities for coordination</li> <li>MOE, the CEA Agency and other players such as MNR, would provide useful information on how to coordinate federal/provincial EA process requirements, and potential coordination with other legislative and regulatory approval requirements</li> </ul>	
Other Approval Requirements	<ul style="list-style-type: none"> <li>undertake update of other legislative, regulatory and policy approval requirements (EA approvals must be obtained before seeking approvals and permits under other legislation)</li> </ul>	<ul style="list-style-type: none"> <li>obtain other permits and approvals such as Permit to Take Water and Certificate of Approval</li> <li>other authorizations or approvals may also need to be obtained to address other permitting requirements (e.g., <i>Fisheries Act</i> authorization)</li> </ul>
Consultation	<ul style="list-style-type: none"> <li>identify First Nations with a potential interest in the project</li> <li>identify potential public concerns and interest groups that may want to participate in project assessment</li> </ul>	<ul style="list-style-type: none"> <li>meet with First Nations with a potential interest to determine if and how they would like to be involved</li> <li>ensure that public consultation program is tailored to the requirements of the project</li> </ul>
Proponency	<ul style="list-style-type: none"> <li>continue discussions with potential municipal partners, specifically addressing this issue</li> <li>seek advice from MOE re. proponency for multi-jurisdictional projects</li> <li>seek advice from MOE re. whether Region would be considered to be proponent even if private sector venture, under the following scenarios: (a) if owned, maintained and operated by the Region; (b) if owned, maintained and operated by private sector</li> <li>continue to monitor provincial position and potential involvement of MPIR in broader based water supply initiative</li> <li>review experience of other municipalities – e.g., London, Region of York, Collingwood-Alliston, Bradford</li> </ul>	



**Table 7.5 Updated Cost Estimate Summary**

Item	Estimated Cost Year 2000 (\$ million)	Revised Cost Year 2007 (\$ million)	Comments
ASR Facilities Phase II (23 ML/d)	\$6	\$12	-Based on actual cost from Phase I. Determined cost per well, assumed 8 wells in Phase II. Adjusted costs from 2004 to 2007 dollars using ENR Construction Cost Index (Toronto) and experience from recent costs of similar infrastructure (additional 10% increase).
New Groundwater Supply (14 – 23 ML/d)	\$17	\$47	- Based on estimated costs from Regional Municipality of Waterloo Council Report of May 2000. Adjusted costs from 2000 to 2007 dollars using ENR Construction Cost Index (Toronto) and experience from recent costs of similar infrastructure (additional 20% increase). Added cost for Fe/Mn treatment plant based on recent actual construction costs for similar treatment plants.
Displacement Pipeline from Lake Erie (Nanticoke)	\$467	\$700	- Based on estimated costs from 1999 for a 318 ML/d water treatment plant and pipeline from Lake Erie. Estimated cost for 432 ML/d pipeline based on costs from Regional Municipality of Waterloo Council Report in May 2000. Adjusted costs from 1999 to 2007 dollars using ENR Construction Cost Index (Toronto) and experience from recent costs of similar infrastructure (additional 20% increase). Revised cost for WTP based on recent construction costs of similar surface water source WTPs.

**APPENDIX 1**  
**TECHNICAL MEMORANDUM NO. 1**  
**POPULATION AND WATER DEMAND FORECAST**  
**WORKSHOP #1 MATERIALS**

**APPENDIX 2**  
**TECHNICAL MEMORANDUM NO. 2**  
**PRESENT AND SHORT-TERM FUTURE WATER SUPPLY**  
**WORKSHOP #2 MATERIALS**

**APPENDIX 3**  
**TECHNICAL MEMORANDUM NO. 3**  
**KEY LEGISLATION, REGULATIONS AND POLICY INITIATIVES**  
**WORKSHOP #3 MATERIALS**

***APPENDIX 4***  
***SUPPLEMENTARY TECHNICAL MEMORANDUM***  
***UPDATED COST ESTIMATES***

**APPENDIX 5**  
**STEERING COMMITTEE**  
**PRESENTATIONS AND MEETING NOTES**

**APPENDIX 6**  
***PUBLIC, AGENCY AND STAKEHOLDER CONSULTATION***