

Provincial Regulation 170/03  
Annual and Summary Report  
for the Period  
January 1 to December 31, 2005  
for the City of Guelph and  
Gazer/Mooney Water Systems

*Submitted to:*

*Guelph City Council  
and Guelph/Eramosa Township*

*Prepared by: The City of Guelph*



# GUELPH WATERWORKS DIVISION

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SECTION 1  
EXECUTIVE SUMMARY



# Section 1 Executive Summary

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This report is submitted to satisfy Schedule 22 of Ontario Regulation 170/03 (O.Reg. 170/03, Schedule 22) requirement to prepare and distribute a Summary report. According to this regulation, the Summary report must contain the following information:

- List the requirements of the Safe Drinking Water Act, the regulations, the system's approval and any order that the system failed to meet at any time during the period covered by the report and specify the duration of the failure;
- For each failure, describe the measures that were taken to correct the failure;
- A summary of the quantities and flow rates of the water supplied during the period covered by the report, including monthly average and maximum daily flows, and daily instantaneous peak flow rates; and
- A comparison of the actual flows to the rated capacity and flow rates approved in the system's approval.

As well, this report is submitted to satisfy Section 11 of Ontario Regulation 170/03 (O. Reg. 170/0, S. 11) requirement to prepare and distribute an Annual report. According to this regulation, the Annual report must contain the following information:

- A brief description of the water system;
- A list of water treatment chemicals used;
- A summary of the most recent water test results required under O. Reg. 170/03 or an approval;
- A summary of adverse test results and other issues including corrective actions taken; and
- A description of major expenses incurred to install, repair or replace equipment.

This report is prepared and submitted for both the City of Guelph Water System and the Gazer/Mooney distribution system.

Section 2 of this report contains a brief description of the drinking water systems.

In 2005, all water was treated consistent with Ontario Ministry of the Environment (MOE) standards using approved treatment chemicals – specifically sodium hypochlorite and sodium silicate. Additional, ultra-violet light (UV) treatment was initiated at one water source in 2005.

In 2005, over 15,000 microbiological and chemical quality tests were performed on treated water supplied by Guelph Waterworks. All samples were collected by certified Waterworks operators following industry standard protocols. Analyses were performed by these same operators and by accredited independent laboratories on water samples collected throughout the water system (supply and distribution).

In 2005, all water supplied to consumers met or bettered all health-related Ontario Drinking Water Standards.

Of the 6,677 treated water bacteriological analyses performed on treated water, seven samples or 0.1 percent indicated the presence of adverse indicator bacteria or high general bacteria counts. The indicator bacteria are not disease causing but show potential for a bacterial concern. None of these incidents, when resampled, confirmed any water quality deterioration. At no time was E. coli detected in the systems' drinking water.

Of the 8,000 chemical analyses performed, 0 samples or 0 percent indicated the presence of chemicals above regulatory health guidelines.

In 2005, Waterworks operated and maintained the water supply and distribution system in such a manner that water supplied to all consumers serviced by the system met the requirements of the Safe Drinking Water Act, 2002. All management, operation, and maintenance duties were performed by certified, adequately trained supervisors and operators.

In 2005, operation and major maintenance of the water supply and distribution system was accomplished with \$5.5 million in funding from the operating budget and \$5.7 million in capital funding.

In 2005, Waterworks complied fully with the requirements of the Safe Drinking Water Act, the Drinking-Water Systems Regulation 170/03, and the Consolidated Certificate of Approval.

Copies of the Provincial Regulation 170/03 Annual and Summary Report for the Period January 1 to December 31, 2005 can be obtained at the following locations:

- Woods Station, 29 Waterworks Place (837-5627);
- The main branch of the Guelph Public Library;
- The Environment Services Department administrative office located at 2 Wyndham Street, 3<sup>rd</sup> floor; and
- Electronically on the City's website, [www.guelph.ca/waterworks](http://www.guelph.ca/waterworks).

## SECTION 2 INTRODUCTION



## Section 2 Introduction

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The mission of the City of Guelph Waterworks Division is to provide customers and the community with valued service through responsible water resource management. Waterworks provides and promotes reliable, cost effective systems for the safe production and delivery of consistently high quality water.

Guelph Waterworks is a municipally owned and operated water utility first established in 1879. The source of Guelph's drinking water is a series of 23 groundwater wells and a shallow groundwater collector system. Guelph's water supply and distribution system is comprised of the following infrastructure:

- 6 kilometres of 1,067 mm diameter water supply aqueduct;
- 5 underground storage reservoirs with a combined capacity of 48,000 cubic metres;
- 3 water towers with a combined capacity of 11,300 cubic metres;
- 590 kilometres of buried water main ranging in diameter from 100 mm to 900 mm;
- 3,300 watermain valves;
- 2,260 fire hydrants; and
- 34,700 water services and water meters.

This distribution infrastructure (including water mains, valves, fire hydrants, services, and meters) includes the Gazer/Mooney distribution system.

The replacement cost of the entire system is estimated to be \$327 million (uninflated) or \$3,000 per capita. The 2005 Operating Budget contained expenditures totalling \$12.6 million. All Waterworks operations and capital projects are funded directly from the sale of water.

In 2005, a total of 19.2 million cubic metres of water was pumped and treated. Lost water totalled approximately 14 percent of all water pumped. The average daily water demand was 52,579 cubic metres. The highest daily use of water occurred on July 11 when 67,975 cubic metres of water was pumped. This is 13 percent higher than the maximum pumpage day of 2004.

In 2005, over 15,000 treated water microbiological and chemical quality tests were performed by certified operators and accredited, licensed laboratories on water samples collected throughout the water system. In all cases, the drinking water supplied to all customers was safe and better than all Ontario and Canadian health-related guidelines.

### Regulatory Changes

In response to an outbreak of *Escherichia (E.coli):O157* in Walkerton, the Ontario Provincial Ministry of the Environment (MOE) announced Operation Clean Water and enacted the Safe Drinking Water Act (the Act) in 2002. The Act prescribes strict, mandatory requirements for testing and treatment of all municipal drinking water, and actions necessary when standards are not met. The regulation also identifies accountability for drinking water safety and supports the consumer's right to timely and accurate reporting of water quality information.

The Act has impacted Guelph Waterworks and its customers in the following ways:

- Previously, Waterworks relied on regular bacteriological testing to determine the chlorine levels required for disinfection of our various groundwater supplies. Minimum, prescribed levels of chlorine must now be added to all water supplies and maintained in all water distributed to customers. Customers have noticed and commented on the increased chlorine taste and odour in Guelph's water. Waterworks is working with the Ministry of the Environment to minimize chlorine use;
- The additional chlorine in Guelph's water is reacting with natural iron and manganese in the groundwater to create more frequent episodes of discoloured water for customers. Waterworks has increased watermain cleaning activities to limit these incidents and is planning water treatment upgrades to remove these minerals from our well supplies;
- Additional sampling and testing, and the generation of both this Summary Report and an Annual report are required by the legislation;
- All water systems must follow minimum disinfection standards. This involves upgrades to system infrastructure including chemical systems, control and monitoring systems, and storage reservoirs;
- System upgrades have resulted in decreased system capacity in the short term as existing supplies undergo treatment upgrades to comply with new legislation; and
- Schedule 22 and Section 11 of Regulation 170/03 requires Waterworks to produce and distribute this annual Summary Report. Copies will be available for customers at both Woods Station at 29 Waterworks Place, and at the Environmental Services Division offices located on the 3<sup>rd</sup> floor of 2 Wyndham Street. An electronic copy of the report will also be available on the City's web site at [www.guelph.ca/waterworks](http://www.guelph.ca/waterworks).

Water rates have been increased significantly to pay for these activities and upgrades with the goal of providing a more secure water supply.

On December 21, 2005 the MOE issued Guelph's latest Consolidated Certificate of Approval (CC of A). The CC of A acts as a license for water supply and distribution operations and sets out a schedule of mandatory facility upgrades to comply with the Act. Currently 2 of our 23 water supply facilities require major disinfection and treatment upgrades.

The Guelph water system is currently licensed as a MOE Class IV Water Distribution and Supply Sub-System. Currently 24 water operators and 3 supervisors are licensed to operate and maintain the water system.

Figure A shows the locations of water supply facilities that were active in 2005.

Figure B shows the location of the Gazer/Mooney distribution system.

Figure A 2005 Active Water Supply Facilities

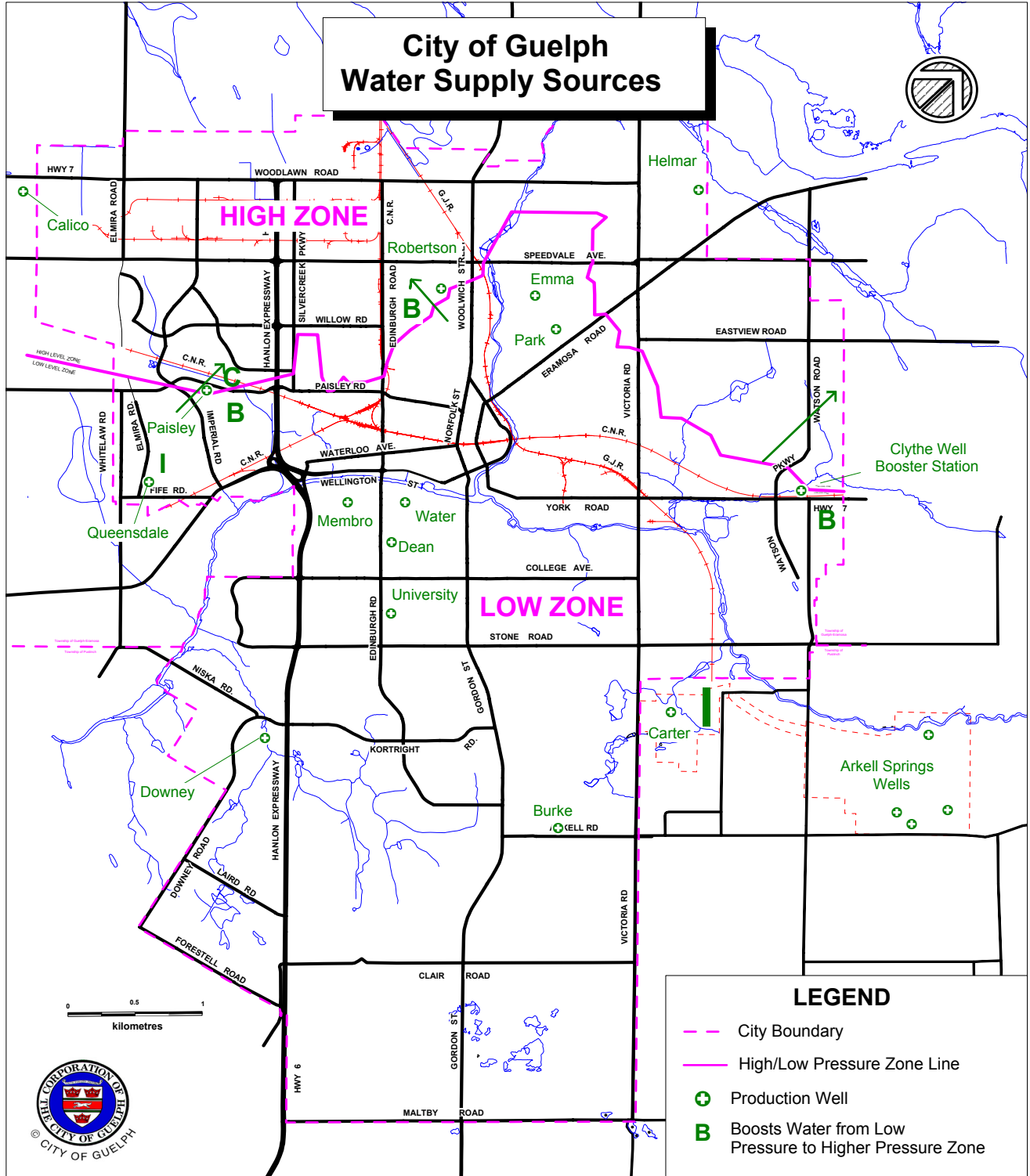
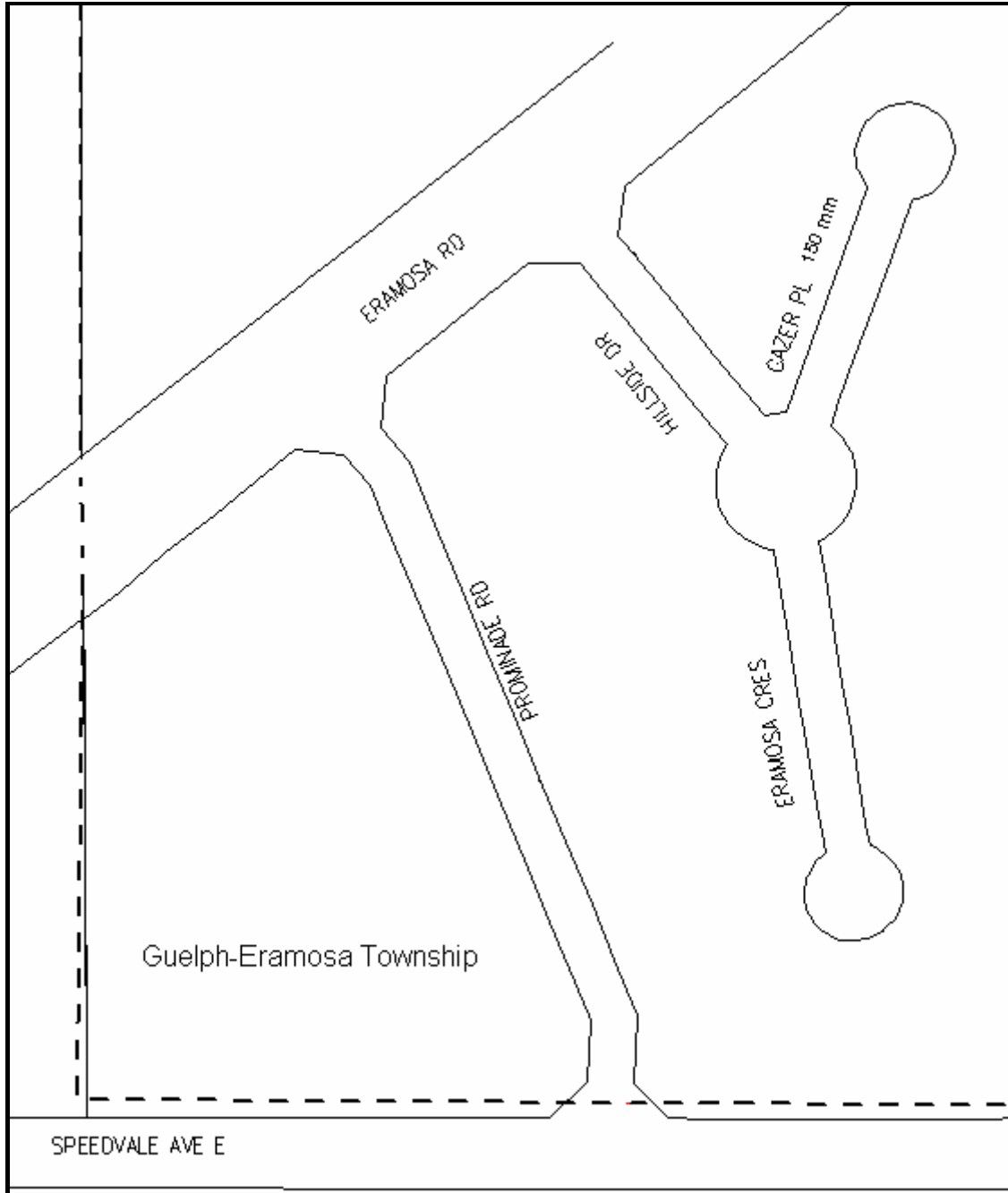


Figure B 2005 Gazer/Mooney Distribution System



SECTION 3  
WATER TREATMENT SUMMARY



## Section 3 Water Treatment Summary

This section describes the type and amount of drinking water treatment chemicals used in 2005.

In 2005, chlorine in the form of a 12 percent sodium hypochlorite solution was added to disinfect all water supplied to consumers. Liquid sodium silicate was also added to all water supplied from the Helmar and Queensdale wells to control high levels of naturally occurring iron and manganese. Through the act of sequestration, sodium silicate prevents this iron and manganese from precipitating when the water is treated and thereby prevents discoloured water.

In 2005, there were no periods of abnormal use of sodium hypochlorite or sodium silicate.

Tables A and B below summarize sodium hypochlorite and sodium silicate use at each supply facility in 2005.

<b>FACILITY</b>	<b>12 % SODIUM HYPOCHLORITE kg/Day<sup>a</sup></b>	<b>WATER PRODUCED Cubic Metres/Day<sup>a</sup></b>	<b>CHLORINE DOSE mg/L</b>	<b>PURPOSE</b>
Woods	351.8	24,685	1.71	Well water disinfection
Helmar	38.2	1,067	4.3	Well water disinfection
Park	63.8	4,642	1.65	Well water disinfection
Burke	85.2	5,745	1.78	Well water disinfection
Downey	43.4	3,522	1.48	Well water disinfection
Membro	47.1	3,672	1.54	Well water disinfection
Queensdale	31.4	1,126	3.35	Well water disinfection
Water	9.6	965	1.19	Well water disinfection
Dean	15.2	1,294	1.41	Well water disinfection
University	21.15	1,681	1.51	Well water disinfection
Calico	14.6	1,003	1.73	Well water disinfection
Emma	30.6	2,039	1.8	Well water disinfection
Clythe	0 <sup>b</sup>	2,544	0 <sup>b</sup>	Re-chlorination
Paisley	36.2	6,386	0.68	Re-chlorination & well water disinfection
Robertson	0 <sup>b</sup>	4,029	0 <sup>b</sup>	Re-chlorination

mg/L - milligrams per litre. Equivalent to parts per million.  
a - Average based on days in operation  
b - re-chlorination system operable but not active due to high chlorine content of inlet water

Table B 2005 Sodium Silicate Usage and Dosage

FACILITY	SODIUM SILICATE kg/Day <sup>a</sup>	WATER PRODUCED Cubic Metres/Day <sup>a</sup>	SILICATE DOSE mg/L <sup>a</sup>	PURPOSE
Helmar	13.4	1,067	4.4	Iron control
Queensdale	14.3	1,126	4.45	Iron control

mg/L - milligrams per litre. Equivalent to parts per million.  
<sup>a</sup> Average based on days in operation

In operating the UV treatment system in 2005, the UV dosage was maintained above 40 mJ/cm<sup>2</sup> at all times as required. For additional security, the facility is equipped with an automatic shutdown alarm if the UV dosage drops below 40 mJ/cm<sup>2</sup>.

SECTION 4  
SUMMARY OF WATER TEST RESULTS



## Section 4 Summary of Water Test Results

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This section summarizes water quality test results required by the Ontario Drinking-Water System Regulation 170/03 for the period January to December 2005.

In 2005, all water supplied to consumers met or bettered all health-related Ontario Drinking Water Standards. Of the 6,677 bacteriological analyses performed on treated water, seven samples or 0.1 percent showed the presence of adverse indicator bacteria or high general bacteria counts. The indicator bacteria are not disease causing but show potential for a bacterial problem. None of these incidents, when resampled, confirmed water quality deterioration. At no time was *E. coli* detected in Guelph's drinking water.

Of the 8,050 chemical analyses performed on treated water, 0 samples or 0 percent indicated the presence of chemicals above regulatory health guidelines. Mandatory retesting confirmed in all instances that the water supplied met regulatory requirements.

The following Tables C through H provide a summary of 2005 laboratory and process parameter results.

**Table C-1 2005 Guelph Water Supply (WW22000095)  
Bacteriological Results Summary**

Parameter	O.D.W.S.	Total Samples	Adverse Samples	Percent Adverse	Range	Average	Typical Source of Contaminant
Total Coliform count/100 mL	*	632	0	0	N/A	N/A	Indicates possible presence of fecal matter
E. Coli count/100 mL	*	632	0	0	N/A	N/A	Definite indicator of fecal matter
Heterotrophic Plate Count count/100 mL	500	605	0	0	0-13	N/A	Indicator of water quality deterioration
Raw Water Bacti Tests	N/A	3,128	N/A	N/A	N/A	N/A	Indicator of Environmental Water Quality

O.D.W.S. – Regulation 169/03 Ontario Drinking Water Standards  
 N/A – Not Applicable  
 mL – Millilitre  
 \* Indicator of Adverse Water Quality if Detected in Treated Water  
 \*\* Resample Results Were Good and below O.D.W.S guidelines.

**Table C-2 2005 Gazer/Mooney (W260057967)  
Bacteriological Results Summary**

Parameter	O.D.W.S.	Total Samples	Adverse Samples	Percent Adverse	Range	Average	Typical Source of Contaminant
Total Coliform count/100 mL	*	33	0	0	N/A	N/A	Indicates possible presence of fecal matter
E. Coli count/100 mL	*	33	0	0	N/A	N/A	Definite indicator of fecal matter
Heterotrophic Plate Count count/100 mL	500	30	0	0	0-3	0.23	Indicator of water quality deterioration

O.D.W.S. – Regulation 169/03 Ontario Drinking Water Standards  
 N/A – Not Applicable  
 mL - Millilitre  
 \* Indicator of Adverse Water Quality if Detected in Treated Water

**Table D 2005 Guelph Water Distribution (WW220000095)  
Bacteriological Results Summary**

<b>Parameter</b>	<b>O.D.W.S.</b>	<b>Total Samples</b>	<b>Adverse Samples</b>	<b>Percent Adverse</b>	<b>Range</b>	<b>Typical Source of Contaminant</b>
Total Coliform count/100 mL	*	1,387	0	0	0-3**	Indicates possible presence of Pathogenic organisms
E. Coli count/100 mL	*	1,387	0	0	0	Definite indicator of fecal matter
Background Counts cfu/200ml	200	1,387	0	0	0-201**	Indicator of water quality deterioration
Heterotrophic Plate Count count/mL	500	647	0	0	0-47	Indicator of water quality deterioration

**Table E- 1 2005 Guelph (WW220000095) Water Supply & Distribution  
Process Parameter Results Summary**

Parameter	O.D.W.S.	Total Samples	Adverse Samples	Average	Range	Health Exceedance	Typical Source of Contaminant
Turbidity in Supply (NTU)	1	1,041	0	0.196	0.06-0.43	NO	Indicator of particles in water
Free Chlorine in Supply (mg/L)	0.06-4.0	4,074	0	0.86	0.16-1.72	NO	MOE recommends 0.2 mg/L to maintain microbiological quality
Free Chlorine in Distribution (mg/L)	0.06-40	1,092	0	0.74	0.18-1.34	NO	MOE recommends 0.2 mg/L to maintain microbiological quality

O.D.W.S. – Regulation 169/03 Ontario Drinking Water Standards  
 NTU – Nephelometric Turbidity Units  
 mg/L – milligrams per litre. Equivalent to parts per million

**Table E -2 2005 Gazer/Mooney (WW260057967) Distribution Process  
Parameter Results Summary**

<b>Parameter</b>	<b>O.D.W.S.</b>	<b>Total Samples</b>	<b>Adverse Samples</b>	<b>Average</b>	<b>Range</b>	<b>Health Exceedance</b>	<b>Typical Source of Contaminant</b>
Free Chlorine in Distribution (mg/L)	0.06-40	37	0	0.5	0.18-0.8	NO	MOE recommends 0.2 mg/L to maintain microbiological quality

O.D.W.S. – Regulation 169/03 Ontario Drinking Water Standards  
mg/L – milligrams per litre. Equivalent to parts per million

<b>Table F 2005 Reg. 170/03 Schedule 23 Results Summary</b>							
<b>Parameter</b>	<b>ODWS mg/L</b>	<b>Total Samples</b>	<b>Samples Above Detection</b>	<b>Average mg/L</b>	<b>Range mg/L</b>	<b>Health Exceedance</b>	<b>Typical Source of Contaminant</b>
Antimony	0.006	33	5	0.0009	0.0000 – 0..001	NO	Natural Component of Water
Arsenic	0.025	33	3	0.0023	0.000- 0.003	NO	Natural Component of Water
Barium	1	33	33	0.050	0.005 – 0.068	NO	Natural Component of Water
Boron	5	33	33	0.036	0.013 - 0.084	NO	Natural Component of Water
Cadmium	0.005	33	9	.00052	0.00000- 0.0036	NO	Natural Component of water
Chromium	0.05	33	0	N/A	N/A	NO	Natural Component of water
Mercury	0.001	13	0	N/A	N/A	NO	Rare in Groundwater
Selenium	0.01	33	0	N/A	N/A	NO	Natural Component of Water
Uranium	0.1	33	31	0.0012	0.0000- 0.0019	NO	Natural Component of Water
O.D.W.S. – Regulation 169/03 Ontario Drinking Water Standards mg/L - milligrams per litre. Equivalent to parts per million							

**Table G 2003 Reg. 170/03 Schedule 24 Results Summary**

Parameters	O.D.W.S. mg/L	Total Samples	Samples Above Detection	Average mg/L	Range mg/L	Health Exceedance
Benzene	0.005	63	0	N/A	N/A	NO
Carbon Tetrachloride	0.005	63	0	N/A	N/A	NO
Chlorobenzene	0.080	63	0	N/A	N/A	NO
1,2-Dichlorobenzene	0.2	63	0	N/A	N/A	NO
1,4-Dichlorobenzene	0.005	63	0	N/A	N/A	NO
1,2-Dichloroethane	0.005	63	0	N/A	N/A	NO
1,1-Dichloroethylene (Vinylidene Chloride)	0.014	63	0	N/A	N/A	NO
Dichloromethane	0.05	63	0	N/A	N/A	NO
Tetrachloroethylene (perchloroethylene)	0.03	63	7	0.00029	0.0000- 0.0004	NO
Trichloroethylene	0.05	63	23	0.00099	0.0000- 0.0027	NO
Vinyl Chloride	0.002	63	0	0	0	NO

O.D.W.S. – Regulation 160/03 Ontario Drinking Water Standards  
mg/L - milligrams per litre. Equivalent to parts per million.

**Table H -1 2005 Guelph (WW220000095)  
Miscellaneous Water Quality Results Summary**

<b>Parameters</b>	<b>O.D.W.S. mg/L</b>	<b>Total Samples</b>	<b>Samples Above Detection</b>	<b>Average mg/L</b>	<b>Range mg/L</b>	<b>Health Exceedance</b>
Treated Water - Nitrate	10	62	46	1.51	0.0-3.9	NO
Treated Water -Nitrite	1.0	62	2	0.65	0.3-1.0	NO
Lead in Distribution System	0.01	4	0	N/A	N/A	NO
Trihalomethanes in Distribution System	0.1	15	15	0.02912	0.0132-0.046	NO
Sodium	N/A	25	25	50.9	20-110	NO

O.D.W.S. – Regulation 169/03 Ontario Drinking Water Standards  
mg/L - milligrams per litre. Equivalent to parts per million.

**Table H-2 2005 Gazer/Mooney (WW260057967)  
Miscellaneous Water Quality Results Summary**

<b>Parameters</b>	<b>O.D.W.S. mg/L</b>	<b>Total Samples</b>	<b>Samples Above Detection</b>	<b>Average mg/L</b>	<b>Range mg/L</b>	<b>Health Exceedance</b>
Lead in Distribution System	0.01	1	0	N/A	N/A	NO
Trihalomethanes in Distribution System	0.1	4	4	31.15	20.2-50.7	NO
Sodium	200	1	1	23	N/A	NO

O.D.W.S. – Regulation 169/03 Ontario Drinking Water Standards  
mg/L - milligrams per litre. Equivalent to parts per million.

SECTION 5  
SUMMARY OF ADVERSE TEST RESULTS  
AND CORRECTIVE ACTIONS



## Section 5 Summary of Adverse Test Results and Corrective Actions

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This section summarizes adverse water quality test results and incidents, and corresponding corrective actions taken for the period January to December 2005.

Schedule 16 of the Drinking-Water Systems Regulation 170/03 prescribes the reporting procedures that must immediately be followed when adverse water quality is observed or detected during routine testing. Waterworks contract laboratories must notify the MOE, the Wellington-Dufferin-Guelph Health Unit (Health Unit), and the Waterworks Supervisor of the adverse result by phone. The Waterworks Supervisor must then again notify, both by phone and in writing, the MOE and Health Unit of the adverse result and the conditions of operation at the time of sampling. If applicable, the Supervisor will then implement corrective actions such as resampling, increasing the chlorine dose, isolating a source, or flushing the system. Waterworks must then report the results of the corrective actions taken to both the MOE and Health Unit within seven days of the issue resolution.

When an adverse bacteriological or chemical result is detected, the first action required under Schedule 17 of Regulation 170/03 is the resampling and testing of the source with the adverse result. It is the nature of both microbiological and chemical analysis to occasionally have false-positive results. If additional adverse results are not detected, then routine monitoring resumes.

**Table I 2005 Summary of Adverse Test Results  
and Corrective Actions**

<b>#</b>	<b>Date</b>	<b>Location</b>	<b>Description</b>	<b>Corrective Action</b>	<b>Resample Results Good</b>
1	Feb 1	Queensdale	Sodium above 20mg/l (Max ODWS = 20 mg/L)	Health Unit and MOE notified - Resampled	Yes
2	April 27	Eramosa 7/11	Background >200cfu/100ml (Max ODWS =200cfu/200ml)	Health Unit and MOE notified - Resampled	Yes
3	June 3	Gordon Lift Station	Background >200cfu/100ml (Max ODWS =200cfu/200ml)	Health Unit and MOE notified - Resampled	Yes
4	July 14	West End Rec. Centre	Background >200cfu/100ml (Max ODWS =200cfu/200ml)	Health Unit and MOE notified - Resampled	Yes
5	July 27	Guelph Wastewater Plant	Background >200cfu/100ml (Max ODWS =200cfu/200ml)	Health Unit and MOE notified - Resampled	Yes
6	Aug 24	Speedvale tower	3 Total Coliform (Max ODWS = 0 cfu)	Health Unit and MOE notified - Resampled	Yes
7	Aug 26	Marksam	Unsanitary Conditions – soil entry into watermain break	Health Unit and MOE notified - Flushed, disinfected, resampled	Yes

O.D.W.S. – Regulation 169 Ontario Drinking Water Standards  
cfu = colony forming units

SECTION 6  
SUMMARY OF MAINTENANCE



## Section 6 Summary of Maintenance

---

This section summarizes the 2005 major operating and capital expenses incurred to maintain the water supply and distribution system.

The Waterworks Division of the Environmental Services Department is responsible for the supply and distribution of potable water to the citizens of Guelph. Water quality objectives established by the MOE are achieved through a combination of groundwater protection initiatives, disinfection of water from 23 groundwater wells and the maintenance of a distribution network consisting of almost 600 km of watermain. All Waterworks revenue is derived directly from the sale of water to customers.

The water programs and services described below contribute to the Waterworks and Wastewater vision:

“We will be a recognized leader in municipal water management, moving forward consistently at the forefront of our industry and setting a standard for others to follow.”

### Regulatory Compliance

In February 2002, the Ministry of the Environment (MOE) issued a Consolidated Certificate of Approval (CCofA) to Waterworks based on the findings of the *2001 Engineers Report*. The CCofA outlines the following requirements that have direct budgetary impact:

#### A) Completion of Disinfection Upgrades by June 2006

Disinfection upgrades are required at nine facilities with two remaining facilities to be upgraded in 2006. Funding for these upgrades is split equally between the municipality, province and federal government with the City portion forecast at approximately \$6 million.

#### B) Completion of Groundwater Under the Direct Influence of Surface Water (GUDI) Compliance Treatment Study and Potential Treatment Upgrades

In July of 2002, the City completed and submitted for MOE review a GUDI study of five water sources. In December 2005, a revised CC of A was received listing additional treatment upgrades and a compliance schedule. The upgrades are required to be completed by the end of 2006. Staff anticipate these upgrades will cost an additional \$11 million and have received Provincial and Federal support for a portion of this cost.

## Sustaining Infrastructure

The Waterworks mission supports sustaining infrastructure to ensure reliable service. Over 80 percent of the water system is underground. In 2005, \$1.1 million was spent on watermain and valve replacement.

## Operating Budget Highlights

In 2005, Waterworks budgeted \$2.6 million and \$2.9 million to operate and maintain the water distribution and supply systems respectively.

The following maintenance activities were funded by the Waterworks Operating budget in 2005:

- Repair of 68 watermain breaks;
- Replacement of 36 watermain valves;
- Repair of 49 fire hydrants;
- Replacement of 1,201 water meters; and
- Replacement of 4 water supply pumps.

SECTION 7  
COMPLIANCE WITH TERMS AND  
CONDITIONS OF THE CONSOLIDATED  
CERTIFICATE OF APPROVAL



## Section 7 Compliance with Terms and Conditions of the Consolidated Certificate of Approval

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In 2005, Waterworks operated under three Consolidated Certificates of Approval (CC of A). CC of A 2866-5SQHGF was issued on September 10, 2004 and was replaced by CC of A 5379-67PKWY on April 25, 2005. The most recent CC of A, 3319-6HGHC7, was issued on December 21, 2005 and replaces the previous CC of A.

In 2005, Waterworks complied with all terms and conditions of each of the CCs of A, the Safe Drinking Water Act, and related regulations. The following section briefly summarizes Waterworks' compliance with main terms and conditions as listed in the various CCs of A.

### *Certificate of Approval Part 1 – Drinking-Water System Description*

The first section of the CC of A describes the various parts of the drinking water system operated by the City.

### *Certificate of Approval Part 2 – Definitions and Information*

This section of the CC of A provides standard MOE definitions of terms used in the CC of A.

### *Certificate of Approval Part 3 - General*

In 2005, Waterworks informed contractors working on the water supply and distribution systems of the requirements of regulations and legislation related to the work being conducted.

In accordance with Part 3 – General, Guelph Waterworks operated the drinking water system in accordance with the *Safe Drinking-Water Act, 2002*. Over 15,000 water quality tests of the Guelph drinking water were performed in 2005. The results demonstrate that Guelph tap water is safe, and are summarized in tables provided in Section 4 of this report. As well, Guelph Waterworks had valid Permits To Take Water for all municipal water supplies at the rates listed in the CC of A.

A copy of the CC of A was “kept in a conspicuous place so that it [was] available for reference by all persons responsible for all or part of the operation of the approved drinking-water system”.

All records required by or related in accordance with the CC of A have been, and are being retained for five years in a convenient location. Waterworks continues to maintain all records and information related to water quality monitoring, sampling and analyzing programs for a minimum period of five years.

#### *Certificate of Approval Part 4 – Performance*

In accordance with Part 4 – Performance, Guelph Waterworks ensured that distribution flows did not exceed the maximum flow rates as set out in the CC of A, *Table 4.1: Rated Capacities*.

#### *Certificate of Approval Part 5 – Monitoring and Recording*

In accordance with Part 5 – Monitoring and Recording, Guelph Waterworks operated and maintained devices to measure flow rate and daily quantity of water being supplied from each source. All flow measuring devices were checked and calibrated in accordance with the manufacturer's instructions. In 2005, Waterworks verified the accuracy of each flow measuring device.

In 2005, Waterworks recorded total daily flows at each water supply. This information is provided in summary tables included in Appendix B of this report.

#### *Certificate of Approval Part 6 – Operations and Maintenance*

In accordance with Part 6 – Operations and Maintenance, Guelph Waterworks ensured that all chemicals used in the operation of the drinking water system met all applicable standards set by the American Water Works Association (AWWA) and the American National Standards Institute (ANSI) safety criteria standards NSF/60 and NSF/61.

With regards to new stock, materials and infrastructure, Waterworks ensures that all new equipment, materials and chemicals comply with the AWWA and ANSI standards

As well, an up-to date operations manual including all information required by the CC of A was maintained and available for reference by all persons responsible for all or part of the operation of the approved drinking-water system. As part of the operations manual, Waterworks is required to maintain documentation and procedures for responding to customer complaints.

In 2005, Waterworks maintained procedures for receiving, responding to, and documenting customer complaints. Staff received customer complaints and entered relevant information into the complaints database. This database allowed management to track and resolve issues and review trends in complaint information.

In 2005, a total of 446 complaints were recorded in the complaints database. The majority of these complaints were related to yellow or brown water caused by disruption of rust in water mains. The following Table J summarizes the types of complaints received in 2005. "Other" refers to customer inquiries related to health concerns, water meters and general information requests.

<b>Table J 2005 Customer Water Quality Complaints</b>		
<b>Number</b>	<b>Complaint Type</b>	<b>Complaint Group</b>
385	Yellow, Brown, Black	Appearance
24	Chlorine, Sulphur, Metallic, Stale	Taste/Odour
28	Water Pressure	Pressure
9	Other	Miscellaneous

Additionally, up-to-date Process and Instrumentation Diagrams and as-constructed drawings for the drinking water system were kept on site at each drinking water facility.

In 2005, Waterworks continued to follow written standard operating procedures for the notification of both the MOW and local health unit in the event of adverse water quality as defined by the Drinking Water Systems regulation.

Further, Waterworks continued to develop the Waterworks Emergency Plan to support the overall City of Guelph Emergency Plan. Staff training was provided on standard operating procedures related to incident and emergency response.

As well, Waterworks ensured the availability of adequate equipment and materials to assist with incident and emergency response.

*Certificate of Approval Part 7 – Future Alterations*

In 2005, there were no applicable terms and references included in Part 7 – Future Alterations

*Certificate of Approval Part 8 – Studies and Upgrades Required*

As required by condition 8.3 of the current CC of A, the installation of enhanced disinfection upgrades for the Carter Wells and Arkell Glen collector system was commenced in 2004. These upgrades are scheduled for completion by June 30, 2006.

As required by condition 8.4 of the current CC of A, the chlorine contact upgrades at Emma Well and Park Well were completed 2005. The chlorine contact upgrades required at the Water Street Well should be completed by October 2006.

As required by condition 8.5 (i) of the current CC of A, the installation of backflow prevention devices on reservoir overflows was completed in October 2004. Rechlorination system upgrades at Paisley Pumping Station and Robertson Booster Pumping Station were completed in October and November 2004 respectively.

The control system facility upgrades are ongoing and will be completed by June 30, 2006.

Conditional inspections of Burke, Downey and Crater Wells were completed and the results were submitted to the MOE in March 2004.

Conditional inspection of City-owned wells located within the 50-day time of travel of municipal supply wells was completed and submitted to the MOE in March 2004. All identified deficiencies will be corrected by June 30, 2006.

The interim measures listed in conditions 8.6 and 8.6.1 of the current CC of A to ensure enhanced disinfection at Burke, Downey Wells and at the Glenn Collector and Carter Wells were implemented and maintained in 2005.

SECTION 8  
NON-COMPLIANCE WITH TERMS  
AND CONDITIONS OF THE CONSOLIDATED  
CERTIFICATE OF APPROVAL AND REGULATIONS



## Section 8 Non-Compliance with Terms and Conditions of the Certificate of Approval and Regulations

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This section of the Summary Report consists of a short description of issues of non-compliance with the terms and conditions as listed in the CC of A and with applicable provincial regulations.

In 2005, there were no instances in which Waterworks operations were conducted in non-compliance with the terms and conditions listed in the CC of A.

The promulgation of the Ontario "Drinking Water Protection Regulation 459/00" in August of 2000 placed a number of Guelph Waterworks facilities in non-compliance in terms of disinfection treatment. MOE procedure B13-3 entitled "Chlorination of Potable Water Supplies in Ontario, January 2001", requires all supply facilities to have chlorine contact chambers providing a minimum of 15 minutes of effective chlorine contact time. The following facility was found not to comply with this requirement, and continues to be in non-compliance as of the date of this report:

1. Water Street Well (expected compliance October 2006)

At no time in 2005 did the operation of these supplies result in the provision of unchlorinated or unsafe water to customers.



SECTION 9  
SUMMARY OF SODIUM ANALYTICAL RESULTS



## Section 9 Summary of Sodium Analytical Results

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Guelph Waterworks is required to periodically report to the Wellington-Dufferin-Guelph Health Unit (WDGHU) the sodium sampling results for all facilities. This information has been incorporated into this Summary Report in order to effectively disseminate this information to all Waterworks customers and other interested parties. The MOE requires that sodium sampling be conducted every five years for all points of entry into the water distribution system. The results of the 2005 sampling are included in Table K.

Table K 2005 Sodium Analytical Results	
Facility	Sodium Result (mg/L)*
Burkes Well	22
Downey Well	25
University Well	65.7
Dean Well	90.9
Membro Well	110
Water Street Well	68.2
Queensdale Well	20.2
Paisley Booster Station	54
Calico Well	27
Helmar Well	26
Park Wells (combined)	100
Emma Well	76
F. M. Woods Station	20.3
Clythe Booster Station	23
Robertson Booster Station	28.7
Gazer Mooney Subdivision	23
mg/L – milligrams per litre	
*Ontario Drinking Water Standard for sodium is 200 mg/L	



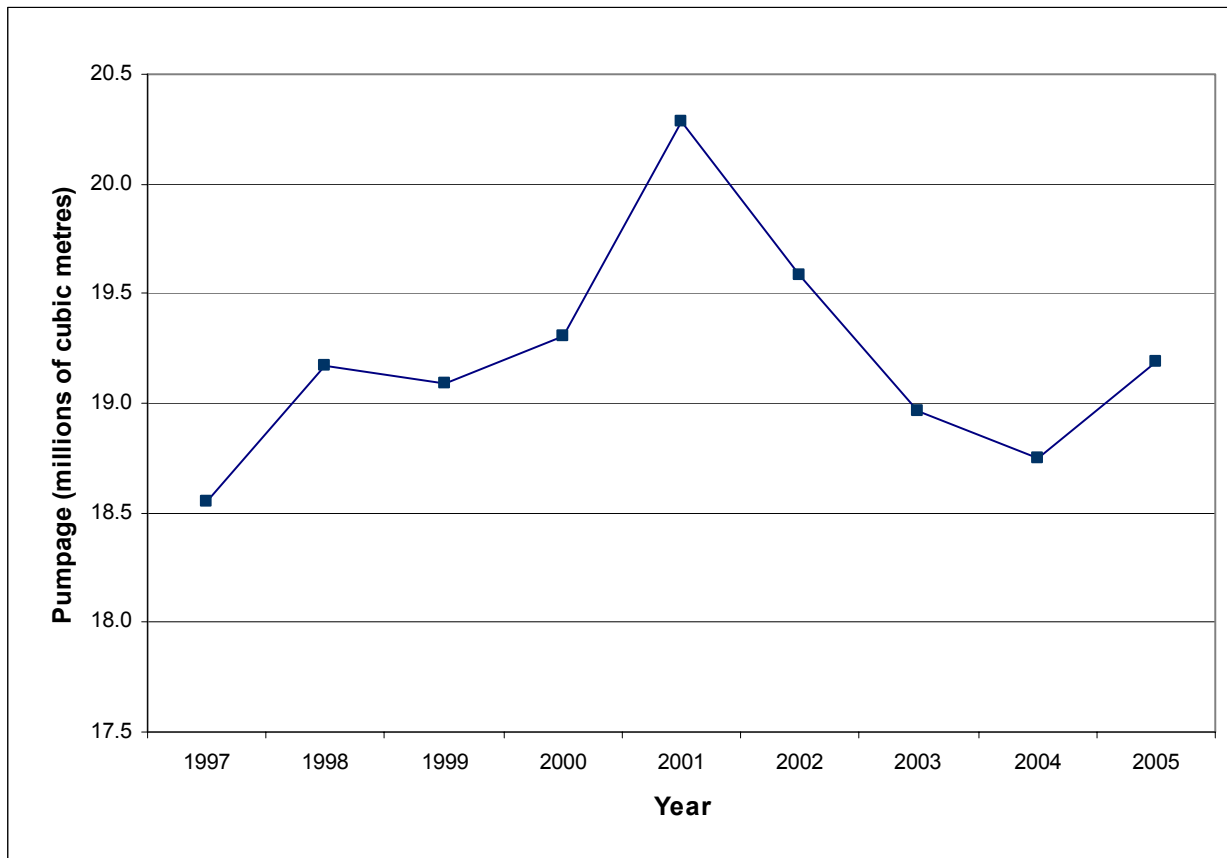
SECTION 10  
SUMMARY OF QUANTITY  
OF WATER SUPPLIED



## Section 10 Summary of Quantity of Water Supplied

In 2005, 19 of 20 water supplies were operated to satisfy customer water demand. A total of 19,191,319 cubic metres of water was pumped to the water distribution system. This total represents a 2.6 percent increase from the previous year's total. A graph showing the nine year trend in total water pumpage is shown in Figure C.

Figure C Nine Year Trend of Total Annual Water Pumpage



The 2005 total average day demand was 52,579 cubic metres per day. This volume is lower than the current dry perennial water system capacity of 63,000 cubic metres per day. The continuous multi-year drought, degradation in water quality, and compliance with new regulations has reduced system capacity below the rated capacity of about 75,000 cubic metres per day.

Tables L to W located in Appendix B detail 2005 monthly pumpage summaries from all active water supplies. Table X in Appendix C details 2005 monthly maximum instantaneous flow from all active water supplies.





APPENDIX A  
CONSOLIDATED CERTIFICATE OF APPROVAL



Dec. 21, 2005

C.N.O. 22-122-004-B

*Ray Fine Copy*

Ministry of the Environment  
Environmental Assessment and  
Approvals Branch  
Floor 12A  
2 St Clair Ave W  
Toronto ON M4V 1L5  
Fax: (416)314-1037  
Telephone: (416) 314-8184

Ministère de l'Environnement  
Direction des évaluations et des  
autorisations environnementales  
Étage 12A  
2 av St Clair O  
Toronto ON M4V 1L5  
Télécopieur: (416)314-1037  
Téléphone : (416) 314-8184



December 21, 2005

FBE

James Etienne, P.Eng., Director of Environmental Services  
The Corporation of the City of Guelph  
59 Carden Street  
Guelph, Ontario  
N1H 3A1

*cc: PLB*

Dear Sir:

**Re: Application for Approval of Municipal Drinking Water Systems  
Upgrades to the system  
Guelph City, County of Wellington  
MOE Reference Number 4668-6GPQNK**

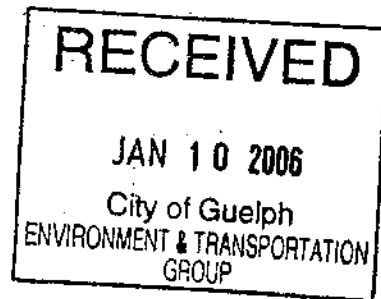
We have enclosed a new Certificate of Approval in accordance with Part V, of the SDWA. This Certificate revokes and replaces Certificate of Approval No. 5379-67PKWY dated April 25, 2005. The Proposed Water Works section provides details of new approval.

You have requested for extension of deadline for implementation of upgrades at Water Street Well site. We concur with your request and have extended the deadline to October 31, 2006 in condition no. 8.4

If you have any questions regarding the above, please contact me at the above phone number.

Yours truly,

Ranee Mahalingam, P.Eng.,  
Director, Part V SDWA



- c: Supervisor, DWI, MOE Guelph
- Joseph Gemin, P.Eng. and/or Patricia Quackenbush, P.Eng., Earth Tech Inc.  
Manager, Drinking Water, Wastewater and Watershed Standards Section, Standards  
Development Branch.

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JAN 10 1906

City of Chicago

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JAN 10 1906  
City of Chicago



Ontario

Ministry of the Environment  
Ministère de l'Environnement

AMENDED CERTIFICATE OF APPROVAL  
MUNICIPAL DRINKING WATER SYSTEMS  
NUMBER 3319-6HGHC7  
Issue Date: December 21, 2005

The Corporation of the City of Guelph  
59 Carden Street  
Guelph, Ontario  
N1H 3A1

Site Location: 200 Water Street  
Guelph City, County of Wellington  
N1G 1B2

*Pursuant to the Safe Drinking Water Act, 2002, S.O. 2002, c. 32, and the regulations made thereunder and subject to the limitations thereof, this approval is issued under Part V of the Safe Drinking Water Act, 2002, S.O. 2002, c. 32 to:*

The Corporation of the City of Guelph  
59 Carden Street  
Guelph, Ontario  
N1H 3A1

### PART 1 - DRINKING-WATER SYSTEM DESCRIPTION

- 1.1 for part of a drinking-water system serving the City of Guelph, rated as set out in Part 4 consisting of the following:

#### **Proposed Water Works - No. 9**

(as per Application for Approval dated August 31, 2005)

#### Modifications to Water Street Well Pump Station

Modifications to the existing pump station by expanding the existing building structure having dimensions approximately 4.3 m x 5.4 m by constructing a structure having approximate dimensions 6.6 m x 6.8 m on the northern side of the building, equipped with:

- Primary disinfection system consisting of one (1) on line Ultra Violet (UV) reactor rated at 65 L/s dosing 40 mJ/cm<sup>2</sup>, portable UV transmittance analyzer, flowmeter transmitter, and associated controls necessary to ensure a minimum dosing of 40 mJ/cm<sup>2</sup>, alarms and controls necessary to shut well pumps in the event of UV failure;

- Secondary disinfection system consisting of sodium hypochlorite system dosing chemicals at the down stream of the UV reactor, using two (2) existing chemical pumps (one duty one stand by), one residual chlorine analyzer, one (1) 800 L (nominal) chemical tank;
- Supervisory Control and Data Acquisition (SCADA) system; and
- associated modifications to the electrical, structural, and mechanical system.

**Proposed Water Works - No. 8**

(as per Application for Approval dated November 23 2004)

Replacement of existing oversized well pumps with the following new pumps, as follows;

Location	Existing	New
Carter Well #1	61 L/s @ 29m Submersible pump	44 L/s @ 31.7 m Submersible pump
Carter Well No.2	61 L/s @ 29m Submersible pump	50.4 L/s @ 31.7 m Submersible pump
Calico	60.6 l/s @ 31.4m Vertical turbine	20 L/s @ 38 m Vertical turbine
Queensdale	60.7 L/s @ 32m Submersible pump	30 L/s @ 54 m Vertical turbine

**Proposed Water Works - No. 7**

(as per Application for Approval dated November 18 2004)

- Upgrading the existing Downey Road Reservoir to increase chlorine contact time by constructing baffle walls inside the reservoir and associated works by increasing the baffling factor to 0.55.

**Proposed Water Works - No. 6**

(as per Application for Approval dated January 6, 2004 submitted by Gamsby and Mannerow Ltd.)

### Clythe Creek Well and Booster Pumping Station

- Increasing the firm capacity of the Booster Pumping Station to 10,886 m<sup>3</sup>/d by installing a third high lift pump with a rated capacity of 63 L/s at a TDH of 76 m complete with all associated piping and appurtenances, VFD, and all additional mechanical, electrical, and controls required for proper operation.
- Installation of a reservoir fill line bypass.
- Modifications to the reservoir fill line as per the contract drawings.

### **Proposed Water Works - No. 5**

(as per Application for Approval dated December 23, 2003 submitted by Associated Engineering Ltd.)

[Note: The following works are being implemented to satisfy Condition 8.5(i)]

- Installation of backflow prevention devices complete with all associated appurtenances including (where necessary) insect/vermin screening on the reservoir overflows at the following locations:
  - F. M. Woods Station
  - Burke Well
  - Calico Well
  - Clythe Creek Well and BPS
  - Dean Well
  - Downey Road Well
  - Helmar Well
  - Membro Well
  - Paisley Well and BPS
  - Queensdale Well
  - University of Guelph Well and BPS

### **Proposed Water Works - No. 4**

(as per Application for Approval dated December 10, 2003 submitted by Associated Engineering Ltd.)

### Paisley Well and Booster Pumping Station Upgrades

[Note: The following works are being implemented to satisfy Condition 8.5(ii) for the Paisley Well and Booster Pumping Station]

- Installation of a rechlorination system within the existing booster station comprised of the following:
  - two (2) chemical metering pumps (one duty, one shelved standby) each rated at 3.6 L/h complete with all associated piping and appurtenances for injection of sodium hypochlorite into the 450 mm diameter feedermain prior to water entering the centrifugal in-line booster pumps and one (1) 300 L sodium hypochlorite solution tank complete with spill containment;
  - one (1) free chlorine residual analyzer sampling at a point before the chlorine injection point on the 450 mm diameter feedermain;
  - one (1) free chlorine residual analyzer sampling at a point on the discharge side of the booster pumps (already exists);
  - all associated piping modifications and installation of controls and alarm systems as per the contract documents for the above noted works.
- Installation of one (1) magnetic flow meter located on the discharge side of the booster pumps.
- Replacement of an existing 75 mm diameter propeller meter with a new magnetic flow meter.
- Replacement of an existing 500 mm diameter propeller meter on the discharge of the pumping station with a new 300 mm diameter magnetic flow meter.

**Proposed Water Works - No. 3**

(as per Application for Approval dated December 10, 2003 submitted by Associated Engineering Ltd.)

Robertson Booster Pumping Station Upgrades

[Note: The following works are being implemented to satisfy Condition 8.5(ii) for the Robertson Booster Pumping Station]

- Installation of a rechlorination system within the existing booster station comprised of the following:
  - two (2) chemical metering pumps (one duty, one shelved standby) each rated at 3.6 L/h complete with all associated piping and appurtenances for injection of sodium hypochlorite into the 305 mm line on the suction side of the booster pumps and one (1) 300 L sodium hypochlorite solution tank complete with spill containment;
  - one (1) free chlorine residual analyzer sampling at a point before the chlorine injection point on the suction side of the booster pumps;
  - one (1) free chlorine residual analyzer sampling at a point on the discharge side of the booster pumps;

- all associated piping modifications and installation of controls and alarm systems as per the contract documents for the above noted works.
- Installation of one (1) magnetic flow meter located on the discharge side of the booster pumps.

### **Proposed Water Works - No. 2**

(as per Application for Approval dated November 10, 2003 submitted by Earth Tech Canada Inc.)

#### Emma Street Well Upgrades

- Replacement of the existing submersible well pump with a new submersible well pump rated at 35.9 L/s at a TDH of 97 m, complete with all associated piping, valves, additional appurtenances, electrical, and control equipment.
- Installation within the existing pumphouse one (1) ultraviolet (UV) disinfection unit capable of providing a minimum end-of-lamp-life dose of 40 mJ/cm<sup>2</sup> at a minimum UVT of 90% and at a rated capacity of 65 L/s, located on the well discharge header, complete with all associated piping, appurtenances, automatic sleeve cleaning device, online UV intensity sensor, portable unit for UVT monitoring, electrical, and additional controls. [Note: This upgrade is being implemented to satisfy Condition 8.4 for the Emma Street Well.]
- Replacement of the existing 500 L sodium hypochlorite solution tank with one (1) 800 L tank.
- All additional structural, mechanical, and electrical work required to bring the above-noted works into operation.

#### Park Wells Upgrades

- Replacement of the existing vertical turbine well pump in Park Well No. 1 with a new vertical turbine well pump rated at 70 L/s at a TDH of 48 m complete with all associated piping, valves, additional appurtenances, electrical, and control equipment.
- Replacement of the existing vertical turbine well pump in Park Well No. 2 with a new vertical turbine well pump rated at 70 L/s at a TDH of 48 m complete with all associated piping, valves, additional appurtenances, electrical, and control equipment.

- Construction of a dual-cell below ground chlorine contact chamber with a useable volume of 430 m<sup>3</sup> (215 m<sup>3</sup> per cell) complete with all associated baffling, piping, appurtenances, access hatches, and the two high lift pumps described below, as per the contract documents. [Note: This upgrade is being implemented to satisfy Condition 8.4 for the Park Wells.]
- Construction of a new building addition onto the existing pumphouse located partially above the new chlorine contact chamber containing two (2) vertical turbine high lift pumps (one pump equipped with a VFD) each rated at 70 L/s at a TDH of 54 m complete with all associated piping, valves, additional appurtenances, electrical, and control equipment.
- Replacement of the existing sodium hypochlorite feed system with two (2) metering pumps (one duty, one standby) rated at 6.6 L/h with feed line discharging into the chlorine contact chamber outlet, and two (2) 700 L solution tanks complete with spill containment and all associated piping, appurtenances, electrical and controls.
- Replacement of the existing diesel generator set with a new 320 kW diesel generator set complete with all associated equipment.
- Construction of a manhole for the discharge of reservoir overflow to the existing storm sewer complete with water level alarm sensors to alert operation staff.
- All additional structural, mechanical, and electrical work required to bring the above-noted works into operation.

### **Proposed Water Works - No. 1**

(as per Application for Approval dated November 10, 2003 submitted by Associated Engineering Ltd.)

#### Burke Well Upgrades

- installation of a new 175 kW standby diesel generator set complete with fuel tank and all associated mechanical, electrical, control, and alarm components required for proper operation.

### **Existing Water Works**

(as per Certificate of Approval No. 2866-5SQHGF issued on November 18, 2003, as per appeal negotiations)

#### F. M. Woods Station and Related Water Supply Systems

- consisting of five distinct systems, the Arkell Well Field, the Arkell Spring Collector System, the Arkell Artificial Recharge System, the Carter Well Field, and the F.M. Woods Pumping Station and Reservoir described as follows:

#### Arkell Well Field

- a groundwater supply system, comprising of four drilled production wells consisting of the following:

##### Arkell Well #1

- a 300 mm diameter, 14.2 m deep drilled groundwater production well (Well PW1/66) located in the Arkell Spring Grounds, at East Part of Lot 5, Conc. 10 in the Township of Puslinch, County of Wellington at (NAD27: UTM Zone 17: 567470.00 m E, 4822357.00 m N), rated for 37.9 L/s to a maximum volume of 3,273 m<sup>3</sup>/d, equipped with a vertical turbine well pump rated at 37.9 L/s at a TDH of 19.8 m, with a 200 mm diameter discharge line, discharging to a 400 mm transmission main to Arkell Manhole #29

##### Arkell Well #6

- a 300 mm diameter, 44.2 m deep drilled groundwater production well (Well PW6/63) located in the Arkell Spring Grounds, at Lot 5 Conc. 10 in the Township of Puslinch, County of Wellington at (NAD27: UTM Zone 17: 567470.00 m E, 4822419.00 m N.), rated for 75.8 L/s to a maximum volume of 6,546 m<sup>3</sup>/d, equipped with a submersible well pump rated at 75.8 L/s at a TDH of 39.6 m, with a 200 mm diameter discharge line, discharging to 350 mm transmission main to Arkell Manhole #30.

##### Arkell Well #7

- a 300 mm diameter, 43.8 m deep drilled groundwater production well (Well PW7/63) located in the Arkell Spring Grounds, at Lot 4 Conc. 10 in the Township of Puslinch, County of Wellington at (NAD27: UTM Zone 17: 567492.00 m E, 4822419.00 m N), rated for 75.8 L/s to a maximum volume of 6,546 m<sup>3</sup>/d, equipped with a submersible well pump rated at 75.8 L/s at a TDH of 38.1 m, with a 200 mm diameter discharge line, discharging to a 400 mm transmission main to Arkell Manhole #29, a 300 kW Diesel Engine Standby Power Generator set located in a separate enclosure adjacent to the pumphouse.

##### Arkell Well #8

- a 300 mm diameter, 42.1 m deep drilled groundwater production well (Well PW8/63) located in the Arkell Spring Grounds, in the Township of Puslinch, County of Wellington at (NAD27: UTM Zone 17: 568412.00 m E, 4822459.00 m N), rated for 75.8 L/s to a maximum volume of 6,546 m<sup>3</sup>/d, equipped with a submersible well pump rated at 75.8 L/s at a TDH of 39.6 m, with a with a 200 mm diameter discharge line, discharging to 350 mm transmission main to Arkell Manhole #30.

#### Portable Standby Diesel Generator

- a 250 kW portable diesel generator set shared amongst the Arkell Well #1, #6, and #8 facilities.

#### Arkell Springs Collector System (Glen Collector System)

- consisting of a series of small diameter collector pipes capturing shallow groundwater rated for 289.4 L/s and a maximum daily flow of 25,000 m<sup>3</sup>/d; discharging to an aqueduct consisting of 900 mm diameter reinforced concrete gasketed pipe between the Arkell Spring Grounds and Scout Camp and a 1,050 mm concrete section installed to the F.M.Woods Pumping Station.

#### Arkell Artificial Recharge System

- located in the Arkell Spring Grounds at Lot 3, Conc. 10, Township of Puslinch, County of Wellington, (NAD27: UTM Zone 17: 567193.00 m E, 4823156.00 m N), consisting of one (1) vertical turbine pump rated at 107.17 L/s at a TDH of 47.2 m, 300 mm discharge line to infiltration basin and trenches.

#### Carter Well Field

- consisting of two drilled production wells, located at 747 Victoria Road South in the Carter-Stone Spring Grounds, in the City of Guelph, (NAD27: UTM Zone 17: 564119.00 m E, 4820874.00 m N), rated for 91 L/s to a maximum volume of 7,855 m<sup>3</sup>/d, consisting of the following:

#### Carter Well No.1 (Well PW1/89)

- a 250 mm diameter, 20.1 m deep drilled groundwater production, equipped with a submersible well pump rated at 61 L/s at a TDH of 29 m, with a 350 mm diameter discharge line, discharging to the Scout Camp valve chamber.

Carter Well No.2 (Well PW2/62)

- a 250 mm diameter, 20.7 m deep drilled groundwater production well, equipped with a submersible well pump rated at 61 L/s at a TDH of 29 m, with a 350 mm diameter discharge line, discharging to the Scout Camp valve chamber.

F. M. Woods Pumping Station and Reservoir

- located at 29 Waterworks Place in the City of Guelph with a firm capacity of 1,061 L/s, housing treatment, storage and control facilities, including:
  - underground reservoir approximately 38 m x 82 m x 3 m with a storage volume of 9,000 m<sup>3</sup>;
  - underground reservoir approximately 53 m x 53 m x 5 m S.W.D. with a storage volume of 14,000 m<sup>3</sup>;
  - underground reservoir approximately 41 m x 44 m x 5.7 m S.W.D. with a storage volume of 9,000 m<sup>3</sup>;
  - five (5) high lift, vertical turbine pumps drawing from wet wells in the 9,000 m<sup>3</sup> reservoir with the following capacities:
    - two (2) @ 379 L/s at a TDH of 80.5 m,
    - one (1) @ 227 L/s at a TDH of 69.5 m,
    - one (1) @ 303 L/s at a TDH of 71.3 m,
    - one (1) @ 152 L/s at a TDH of 85.3 m;
  - valve chambers, metering chamber, discharge piping, flowmeter, valving and appurtenances;
  - one (1) low lift pump with a capacity of 379 L/s at a TDH of 6.1 m to fill the 14,000 m<sup>3</sup> reservoir;
  - a sodium hypochlorite disinfection system, consisting of three (3) 5,900 L capacity sodium hypochlorite solution storage tanks and three (3) chemical metering pumps (two duty, one standby) with a feed line discharging into the reservoir inlet at valve chamber 1A and the water outlet from the reservoir;

- emergency eyewash station and shower station;
- a 750 kW diesel engine stand-by power generator set located in an adjacent room.

### Burke Well

- a groundwater supply system serving the City of Guelph, rated at a maximum daily volume of 6,546 m<sup>3</sup>/d consisting of the following:
  - a 300 mm diameter, 78.9 m deep drilled groundwater production well (Well P W2/66) located at 164 Arkell Road in the City of Guelph, (NAD27: UTM Zone 17: 564611.00 m E, 4818626.00 m N) rated for 75.8 L/s to a maximum volume of 6,546 m<sup>3</sup>/d, equipped with a vertical turbine well pump rated at 75.7 L/s at a TDH of 48.8 m, with 250 mm diameter discharge piping, flowmeter, backflow prevention device on well lubrication line, valving and appurtenances, discharging to an on-site underground reservoir;
  - underground reservoir approximately 6.9 m x 13.9 m x 3.0 m S.W.D. with a useable storage volume of 303 m<sup>3</sup>, complete with reservoir vent;
  - pumphouse building located above the reservoir, housing the well pump and vertical turbine high lift pump rated at approximately 75.7 L/s at a TDH of 67.1 m, equipped with 250 mm diameter discharge piping, flowmeter, valving and appurtenances;
  - a sodium hypochlorite disinfection system, consisting of a 750 L capacity sodium hypochlorite solution storage tank and two (2) chemical metering pumps (one duty, one standby) with a feed line discharging into the reservoir inlet and chlorine residual analyzer.

### Calico Well

- a groundwater supply system serving the City of Guelph, rated at a maximum daily volume of 5,237 m<sup>3</sup>/d consisting of the following:
  - a 305 mm diameter, 64.3 m deep drilled groundwater production well (Well P W4/76) located in Part Lot 10, Concession 2, Township of Guelph-Eramosa, County of Wellington (NAD27: UTM Zone 17: 554177.00 m E, 4820725.00 m N), rated for 60.6 L/s to a maximum volume of 5,237 m<sup>3</sup>/d, equipped with a vertical turbine well pump rated at 60.7 L/s at a TDH of 31.4 m, with a 200 mm diameter discharge line, discharging to an on-site underground reservoir;
  - underground reservoir approximately 6.7 m x 8.8 m x 2.54 m S.W.D. with a useable storage volume of 147 m<sup>3</sup>;

- pumphouse building located above the reservoir, housing the well pump and vertical turbine high lift pump rated at approximately 60.7 L/s at a TDH of 67.1 m, equipped with 200 mm diameter discharge piping, flowmeter, backflow prevention device on the well lubrication line, valving and appurtenances;
- a sodium hypochlorite disinfection system, consisting of a 300 L capacity sodium hypochlorite solution storage tank and two (2) chemical metering pumps (one duty, one standby) with a feed line discharging into the reservoir inlet and a chlorine residual analyzer.

#### Clythe Creek Well and Booster Pumping Station

- a groundwater supply system rated at a maximum daily volume of 5,237 m<sup>3</sup>/d and a booster pumping station with a firm capacity of 5,443 m<sup>3</sup>/d, serving the City of Guelph, consisting of the following:
  - a 305 mm diameter, 64 m deep drilled groundwater production well (Well PW1/73) located at 22 Watson Road in the City of Guelph, (NAD27: UTM Zone 17: 563587.00 m E, 4824911.00 m N), rated for 60.6 L/s to a maximum volume of 5,237 m<sup>3</sup>/d, equipped with a submersible well pump rated at 60.7 L/s at a TDH of 47.2 m, with a 200 mm diameter discharge line, discharging to an on-site underground reservoir, currently not connected;
  - 250 mm reservoir fill line from the distribution system;
  - underground reservoir approximately 21.9 m x 13.75 m x 3.25 m S.W.D. with a useable storage volume of 672 m<sup>3</sup>;
  - pumphouse building located above the reservoir, housing the well pump and two vertical turbine high lift pumps each rated at approximately 63 L/s at a TDH of 76 m, equipped with 200 mm diameter discharge piping, flowmeter, valving and appurtenances;
  - a sodium hypochlorite disinfection system, consisting of a 300 L capacity sodium hypochlorite solution storage tank and two (2) chemical metering pumps (one duty, one standby) with a feed line discharging into the reservoir inlet and chlorine residual analyzer;
  - a 300 kW Diesel Engine Stand-by Power Generator set located in the pump house.

#### Dean Well

- a groundwater supply system serving the City of Guelph rated at a maximum daily volume of 2,300 m<sup>3</sup>/d consisting of the following:

- a 330 mm diameter, 57.2 m deep drilled groundwater production well (Well PW1/58) located at 103 Dean Avenue in the City of Guelph, (NAD27: UTM Zone 17: 560351.00 m E, 4820500.00 m N) rated for 26.6 L/s and a maximum daily flow of 2,300 m<sup>3</sup>/d; equipped with a submersible well pump currently rated at 26.7 L/s at a TDH of 57.9 m, with a 100 mm diameter discharge line, discharging to an on-site underground reservoir;
- underground reservoir approximately 7.1 m x 7.1 x 2.2 m with a useable storage volume of 109 m<sup>3</sup>;
- pumphouse building located above the reservoir, housing the well pump and vertical turbine high lift pump rated at approximately 26.7 L/s at a TDH of 70.1 m, equipped with 150 mm diameter discharge piping, flowmeter, backflow prevention device on the well lubrication line, valving and appurtenances;
- a sodium hypochlorite disinfection system, consisting of a 500 L capacity sodium hypochlorite solution storage tank and two (2) chemical metering pumps (one duty, one standby) with a feed line discharging into the reservoir inlet and a chlorine residual analyzer.

#### Downey Road Well

- a groundwater supply system serving the City of Guelph, rated at a maximum daily volume of 5,237 m<sup>3</sup>/d consisting of the following:
- a 300 mm diameter 73.8 m deep drilled groundwater production well (Well PW5/67) located at 28 Downey Road in the City of Guelph, (NAD27: UTM Zone 17: 560072.00 m E, 4819047.00 m N), rated for 60.6 L/s to a maximum volume of 5,237 m<sup>3</sup>/d, equipped with a vertical turbine well pump rated at 60.7 L/s at a TDH of 5.7 m, with a 200 mm diameter discharge line, discharging to an on-site underground reservoir;
- underground reservoir 6.1 m x 4.3 m x 1.6 m and circular wet well with radius of 0.61 m and 1.5 m S.W.D. with a useable storage volume of 42.6 m<sup>3</sup>;
- pumphouse building located above the reservoir, housing the well pump and vertical turbine high lift pump rated at approximately 60.7 L/s at a TDH of 70.1 m, equipped with 200 mm diameter discharge piping, flowmeter, backflow prevention device on the well lubrication line, valving and appurtenances;
- a sodium hypochlorite disinfection system, consisting of a 500 L capacity sodium hypochlorite solution storage tank and two (2) chemical metering pumps (one duty, one standby) with a feed line discharging into the reservoir inlet and a chlorine residual analyzer.

#### Emma Street Well

- a groundwater supply system serving the City of Guelph rated at a maximum daily volume of 3,100 m<sup>3</sup>/d consisting of the following:
  - a 457 mm diameter, 47.2 m deep drilled groundwater production well (Well P W1/31) located at 93 Emma Street, between Metcalfe Street and Delhi Street in the City of Guelph, (NAD27: UTM Zone 17: 559490.00 m E, 4823947.00 m N), rated for 35.9 L/s and a maximum daily flow of 3,100 m<sup>3</sup>/d currently equipped with a submersible well pump rated at 34.8 L/s at a TDH of 47.2 m, with a 100 mm diameter discharge piping, flowmeter, valving and appurtenances;
  - a sodium hypochlorite disinfection system, consisting of one (1) 500 L capacity sodium hypochlorite storage tank and two (2) chemical metering pumps (one duty and one standby) with a feed line discharging to the well discharge line and a chlorine residual analyzer.

#### Helmar Well

- a groundwater supply system serving the City of Guelph, rated at a maximum daily volume of 3,273 m<sup>3</sup>/d, consisting of the following:
  - a 305 mm diameter , 77.7 m deep drilled groundwater production well (Well PW6/66) located at 673 Woodlawn Road between Muskoka Drive and the entrance to Guelph Lake Conservation Area in the City of Guelph, (NAD27: UTM Zone 17: 560206.00 m E, 4826731.00 m N), rated for 37.9 L/s to a maximum volume of 3,273 m<sup>3</sup>/d, equipped with a submersible well pump rated at 37.8 L/s at a TDH of 42.6 m, with a 200 mm diameter discharge line, discharging through a Trevi fountain to an on-site underground reservoir;
  - raw water aeration system consisting of 1.2 kW air blower and vent hood;
  - underground reservoir approximately 8.8 m x 6.7 m x 2.3 m S.W.D. with a useable storage volume of 124.5 m<sup>3</sup>;
  - pumphouse building located above the reservoir, housing the well pump and vertical turbine high lift pump rated at approximately 37.8 L/s at a TDH of 53 m, equipped with 150 mm diameter discharge piping, flowmeter, valving and appurtenances;
  - a sodium hypochlorite disinfection system, consisting of a 750 L capacity sodium hypochlorite solution storage tank and two (2) chemical metering pumps (one duty, one standby) with a feed line discharging into the reservoir inlet and chlorine residual analyzer;

- a sodium silicate system for iron sequestration, consisting of a 200 L capacity sodium silicate solution storage tank and one (1) chemical metering pump with a feed line to the well pump discharge line.

#### Membro Well

- a groundwater supply system serving the City of Guelph, rated at a maximum daily volume of 6,050 m<sup>3</sup>/d, consisting of the following:
  - a 200 mm diameter , 75.0 m deep drilled groundwater production well (Well PW1/53) located at 290 Water Street in the City of Guelph, approximately 67.0 m east of Denver Road, (NAD27: UTM Zone 17: 560059.00 m E, 4820590.00 m N), rated for 70 L/s to a maximum volume of 6,050 m<sup>3</sup>/d, equipped with a submersible well pump rated at 70 L/s at a TDH of 36.6 m, with a 200 mm diameter discharge line, discharging to an on-site underground reservoir;
  - underground reservoir approximately 9.15 m x 6.15 m x 1.6 m S.W.D. with a useable storage volume of 78.73 m<sup>3</sup>, complete with reservoir vent;
  - pumphouse building located above the reservoir, housing the well pump and vertical turbine high lift pump rated at approximately 70 L/s at a TDH of 85.3 m, equipped with 200 mm diameter discharge piping, flowmeter, valving and appurtenances;
  - a sodium hypochlorite disinfection system, consisting of a 500 L capacity sodium hypochlorite solution storage tank and two (2) chemical metering pumps (one duty, one standby) with a feed line discharging into the reservoir inlet and a chlorine residual analyzer;
  - a 250 mm diameter watermain from the pumphouse to the watermain on Water Street.

#### Paisley Well and Booster Pumping Station

- a groundwater supply system serving the City of Guelph, and a booster pumping station with a firm capacity of 13,738 m<sup>3</sup>/d, consisting of the following:
  - a 305 mm diameter, 71.9 m deep drilled groundwater production well (Well P W4/59) located at 810 Paisley Road in the City of Guelph, (NAD27: UTM Zone 17: 557346.00 m E, 4820196.00 m N) rated for 37.0 L/s and a maximum daily flow of 3,200 m<sup>3</sup>/d, currently equipped with a submersible well pump rated at 32.7 L/s at a TDH of 61.0 m, with a 150 mm diameter discharge line, discharging to an on-site underground reservoir;

- underground reservoir consisting of two cells approximately 48 m x 36 m x 4.2 m S.W.D. enclosing chlorine contact chambers and a high lift wet well with a 5.8 m S.W.D, with a useable storage volume of 13,608 m<sup>3</sup>;
- a 250 mm diameter magnetic flow meter on the inlet line to the reservoir from the distribution system;
- pumphouse building located above the reservoir;
- 250 mm diameter reservoir fill line from the distribution system;
- three (3) centrifugal in-line booster pumps: two rated at 53 L/s at a TDH of 36.6 m, one rated at 75.8 L/s at a TDH of 36.6 m, one (1) vertical turbine in-line booster pump, drawing from the high lift wet well, rated at 53 L/s at a TDH of 62.2 m, discharging into a 450 mm diameter discharge line with valving and appurtenances;
- four (4) vertical turbine high lift booster pumps, drawing from the high lift wet well, three rated at 53 L/s at a TDH of 82.3 m and one rated at 75.4 L/s at a TDH of 82.3 m, discharging into a 450 mm diameter discharge line with valving and appurtenances;
- a sodium hypochlorite disinfection system, consisting of a two (2) 700 L capacity sodium hypochlorite solution storage tanks and two (2) chemical metering pumps (one duty, one standby) with a feed line discharging into the reservoir inlet and a chlorine residual analyzer;
- a 379 kW Diesel Engine Stand-by Power Generator set located in the pumphouse.

#### Park Wells

- a groundwater supply system serving the City of Guelph rated at a maximum daily volume of 10,300 m<sup>3</sup>/d consisting of the following:
- two groundwater production wells housed in a pumphouse at 183 Metcalfe Street south of Pleasant Road in the City of Guelph, (NAD27: UTM Zone 17: 560300.00 m E, 4823708.00 m N);
- Park Well No. 1 (Well PW1/37) is a 508 mm diameter drilled well, 56.3 m deep, currently equipped with a vertical turbine well pump rated at 50.8 L/s at a TDH of 85.3 m, with a 200 mm diameter discharge line;
- Park Well No. 2 (Well PW1/47) is a 508 mm diameter drilled well, 57.9 m deep, currently equipped with a submersible well pump rated at 50.8 L/s at a TDH of 85.3 m, with a 200 mm diameter discharge line;
- 200 mm diameter discharge piping, flow meters, valving and appurtenances;

- a sodium hypochlorite disinfection system, consisting of two (2) 300 L capacity sodium hypochlorite solution storage tanks and four (4) chemical metering pumps (two duty, two standby) with a feed line discharging into the well discharge lines;
- a 150 kW Diesel Engine Stand-by Power Generator set located in the separate room in the pumphouse.

#### Queensdale Well

- a groundwater supply system serving the City of Guelph, rated at a maximum daily volume of 5,237 m<sup>3</sup>/d, consisting of the following:
  - a 305 mm diameter 64 m deep drilled groundwater production well (Well PW1/70) located at 69 Queensdale Crescent in the City of Guelph, (NAD27: UTM Zone 17: 557938.00 m E, 4819214.00 m N), rated for 60.7 L/s to a maximum of 5,237 m<sup>3</sup>/d, equipped with a submersible well pump rated at 60.7 L/s at a TDH of 32 m, with a 200 mm diameter discharge line, discharging to an on-site underground reservoir;
  - underground reservoir approximately 12.5 m x 6.9 m x 2.74 m S.W.D. with a useable storage volume of 225 m<sup>3</sup> complete with reservoir vent;
  - pumphouse building located above the reservoir, housing the well pump and vertical turbine high lift pump rated at approximately 60.7 L/s at a TDH of 64 m, equipped with 200 mm diameter discharge piping, flowmeter, valving and appurtenances;
  - a sodium hypochlorite disinfection system, consisting of a 500 L capacity sodium hypochlorite solution storage tank and two (2) chemical metering pumps (one duty, one standby) with a feed line discharging into the reservoir inlet and chlorine residual analyzer;
  - a sodium silicate system for iron sequestration, consisting of a 200 L capacity sodium silicate solution storage tank and one (1) chemical metering pumps with a feed line to the well pump discharge line.

#### University of Guelph Well and Booster Pumping Station

- a groundwater supply system and booster pumping station with a capacity of 5,108 m<sup>3</sup>/d serving the City of Guelph, consisting of the following:

- a 305 mm diameter, 64 m deep drilled groundwater production well (Well PW1/73) located at 420 Edinburgh Road in the City of Guelph, (NAD27: UTM Zone 17: 560572.00 m E, 4820903.00 m N), rated for 38.2 L/s and a maximum daily flow of 3,300 m<sup>3</sup>/d; currently equipped with a submersible well pump rated at 30.3 L/s at a TDH of 77.1 m, with a 200 mm diameter discharge line, discharging to an on-site underground reservoir;
- 200 mm reservoir fill line from the distribution system;
- underground reservoir approximately 25.6 m x 25.6 m x 3.6 m S.W.D. with a useable storage volume of 2,287 m<sup>3</sup>;
- pumphouse building located above the reservoir, housing the well pump and two vertical turbine high lift pumps one rated at approximately 25.3 L/s at a TDH of 82.3 m and one rated at approximately 47.3 L/s at a TDH of 82.3 m, equipped with 200 mm diameter discharge piping, flowmeter, valving and appurtenances;
- a sodium hypochlorite disinfection system, consisting of a 500 L capacity sodium hypochlorite solution storage tank and two (2) chemical metering pumps (one duty, one standby) with a feed line discharging into the reservoir inlet and chlorine residual analyzer;
- a 120 kW Diesel Engine Stand-by Power Generator set located in the pumphouse.

#### Robertson Booster Pumping Station

- a booster station located at 14 Robertson Street (NAD27, 559050 m E, 4822400 m N) with a firm capacity of 7,200 m<sup>3</sup>/d consisting of three (3) centrifugal in-line booster pumps rated at 38 L/s at a TDH of 29 m, 45 L/s at a TDH of 29.6 m, and 79 L/s at a TDH of 29 m respectively discharging into a 305 mm discharge line with valving and appurtenances;

#### Water Street Well

- a groundwater supply system serving the City of Guelph rated at a maximum daily volume of 3,400 m<sup>3</sup>/d consisting of the following:
- a 305 mm diameter 64 m deep drilled groundwater production well (Well PW3/53) located at 200 Water Street in the City of Guelph, (NAD27: UTM Zone 17: 560354.00 m E, 4820160.00 m N), rated for 39.4 L/s and a maximum daily flow of 3,400 m<sup>3</sup>/d; currently equipped with a vertical turbine well pump rated at 37.71 L/s at a TDH of 106.7 m, with a 100 mm diameter discharge line, flowmeter, valving and appurtenances;

- a sodium hypochlorite disinfection system, consisting of a 500 L capacity sodium hypochlorite solution storage tank and two (2) chemical metering pumps (one duty, one standby) with a feed line discharging into the well discharge line and a chlorine residual analyzer.
- 1.2 all in accordance with the applications and plans and other supporting documents listed in Schedule "A", and all other Schedules, which are attached to, and form part of this approval, except as specified in the conditions contained herein.

## PART 2 - DEFINITIONS AND INFORMATION

2.1 Words and phrases not defined in this approval shall be given the same meaning as those set out in the *Safe Drinking Water Act, 2002*, S.O. 2002, c. 32 and any regulations made in accordance with that act, unless the context requires otherwise.

2.2 In this approval

"approval" means this entire approval document, issued in accordance with section 36 of the SDWA, and includes any schedules to it

"approved drinking-water system" means the part of the drinking-water system to which this approval applies

"Director" means a director appointed pursuant to s. 6 of the SDWA for the purposes of Part V of the SDWA

"operating authority" and "owner" mean, in addition to the respective meanings given in the Act, the Corporation of the City of Guelph

"provincial officer" means a provincial officer appointed pursuant to s. 8 of the SDWA

"rated capacity" means the maximum flow rate of water which can be treated when operating the drinking-water system under design conditions;

"SDWA" means the *Safe Drinking Water Act, 2002*, S.O. 2002, c. 32, as amended

"adverse effect", "contaminant", "impairment" and "natural environment" shall have the same meanings as in the *Environmental Protection Act*, R.S.O.1990, c. E.19 and the *Ontario Water Resources Act*, R.S.O.1990, c. O.40

## PART 3 - GENERAL

### **Compliance**

- 3.1 The owner and operating authority shall operate the approved drinking-water system in accordance with the SDWA, any applicable regulations made there under, and this approval.
- 3.2 Despite any condition of this approval to the contrary, the owner and operating authority set out in Part 2 are jointly and severally liable to comply with all conditions of this approval.
- 3.3 The owner and operating authority shall ensure that any person authorized to carry out work on or operate any aspect of the approved drinking-water system has been informed of the SDWA, all applicable regulations made in accordance with that act, and this approval and shall take all reasonable measures to ensure any such person complies with the same.
- 3.4 A copy of this approval shall be kept in a conspicuous place so that it is available for reference by all persons responsible for all or part of the operation of the approved drinking-water system.

### **Build, etc. in Accordance**

- 3.5 Except as otherwise provided by this approval, the approved drinking-water system shall be designed, developed, built, operated and maintained in accordance with Part 1 above and the documentation listed in Schedule "A".

### **Interpretation**

- 3.6 Where there is a conflict between the provisions of this approval and any other document, the following hierarchy shall be used to determine the provision that takes precedence:
  - i. The SDWA;
  - ii. a condition imposed in this approval in accordance with s. 38 of the SDWA;
  - iii. any regulation made under the SDWA;
  - iv. this approval;
  - v. any application documents listed in Schedule "A" from most recent to earliest; and
  - vi. all other documents listed in Schedule "A" from most recent to earliest.
- 3.7 The requirements of this approval are severable. If any requirement of this approval, or the application of any requirement of this approval to any circumstance, is held invalid or

unenforceable, the application of such requirement to other circumstances and the remainder of this approval shall not be affected thereby.

- 3.8 Nothing in this approval shall be read to provide relief from the need for strict compliance with the *Environmental Assessment Act*, R.S.O. 1990, c E.18.

### **Other Legal Obligations**

- 3.9 The issuance of, and compliance with the conditions of, this approval does not:
- i. relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement; or
  - ii. limit in any way the authority of the ministry to require certain steps be taken or to require the owner to furnish any further information related to compliance with this approval.
- 3.10 For greater clarity, nothing in this approval shall be read to provide relief from regulatory requirements in accordance with section 38 of the SDWA, except as provided in Part 9.

### **Adverse Effects**

- 3.11 Nothing in this approval shall be read as to permit: i) the discharge of a contaminant into the natural environment that causes or is likely to cause an adverse effect; or ii) the discharge of any material of any kind into or in any waters or on any shore or bank thereof or into or in any place that may impair the quality of the water of any waters.
- 3.12 All reasonable steps shall be taken to minimize and ameliorate any adverse effect on the natural environment or impairment of the quality of water of any waters resulting from the operation of the approved drinking-water system including such accelerated or additional monitoring as may be necessary to determine the nature and extent of the effect or impairment.
- 3.13 Fulfillment of one or more conditions imposed by this approval does not eliminate the requirement to fulfill any other condition of this approval or the requirements of any applicable statute, regulation, or other legal requirement resulting from any act or omission that causes or is likely to cause an adverse effect on the natural environment or the impairment of water quality.

### **Change of Owner**

- 3.14 The owner or the operating authority, as the case may be, shall notify the director, in writing, of any of the following changes within 30 days of the change occurring:
- i. change of owner or operating authority;
  - ii. change of address;

- iii. change of partners where the owner is or at any time becomes a partnership, and a copy of the most recent declaration filed under the Business Names Act, R.S.O. 1990, c. B17; or
- iv. change of name of the corporation where the owner or operating authority is or at any time becomes a corporation, and a copy of the most current information filed under the Corporations Information Act, R.S.O. 1990, c. C.39.

3.15 In the event of any change in ownership of the approved drinking-water system, other than change to a successor municipality, the owner shall notify the successor of and provide the successor with a copy of this approval, and the owner shall provide a copy of the notification to the district manager of the local office of the ministry and the director.

### Inspections

3.16 No person shall hinder or obstruct a provincial officer in the performance of their duties under the SDWA, including any and all inspections authorized by the SDWA.

### Information

3.17 Any information requested, by the Ministry, concerning the approved drinking-water system and its operation under this approval, including but not limited to any records required to be kept by this approval, shall be provided to the Ministry upon request.

3.18 Records required by or created in accordance with this approval, unless specifically referenced in s. 12 of O. Reg. 170/03, shall be retained for at least 5 years in a location where a provincial officer who is inspecting the approved drinking-water system can conveniently view them.

## PART 4 - PERFORMANCE

### Rated Capacity

4.1 The drinking-water system shall not be operated to exceed the rated capacity for the maximum flow rates into the treatment systems, trains, or stages set out below:

**Table 4.1: Rated Capacity**

Treatment System	Maximum Flow Rate (L/sec)	Maximum Daily Volume (m <sup>3</sup> )
Burke Well Pumphouse	114	6,546
Calico Well Pumphouse	91	5,237
Clythe Creek Well and Booster Pumping Station	189	5,443
Dean Well Pumphouse	40	2,300
Downey Road Well Pumphouse	91	5,237
Emma Street Well Pumphouse	54	3,100
Helmar Well Pumphouse	57	3,273

Membro Well Pumphouse	105	6,050
Paisley Well and Booster Pumping Station	511	13,738
Park Well Pumphouse	179	10,300
Queensdale Well Pumphouse	91	5,237
University of Guelph Well and Booster Pumping Station	109	5,108
Water Street Well Pumphouse	59	3,400
F.M. Woods Station (treating water from Arkell Wells #1,#6,#7 and #8; Carter Wells #1 and #2; Arkell Spring Collector system; and Arkell Artificial Recharge System)	1592	65,000

### **Increase to Rated Capacity**

- 4.2 Despite condition 4.1, the drinking water system may be operated at a rate above the rated capacity set out in condition 4.1 where necessary for:
- i. fighting a large fire; or
  - ii. the maintenance of the drinking-water system.
- 4.3 Condition 4.2 shall not be construed to allow drinking-water to be supplied that does not meet all other applicable standards and legal requirements.

### **Performance of UV Disinfection Equipment**

- 4.4 The UV disinfection equipment shall be installed and operated such that a continuous pass-through UV dose of at least 40 mJ/cm<sup>2</sup> is maintained throughout the life time of the UV lamp(s).

## **PART 5 - MONITORING AND RECORDING**

### **Flow measuring devices**

- 5.1 Install a sufficient number of flow-measuring devices within the drinking-water system to permit continuous measurement and recording of:
- i. the flow rates of water conveyed into the individual treatment systems, trains, and stages identified in Part 4, and the daily volumes of water conveyed into the individual treatment systems identified in Part 4; and
  - ii. the flow rates and daily volumes of water conveyed to the distribution system from each treatment system that has a separate line feeding the distribution system.

- 5.2 Records shall be maintained that set out the parameters recorded in accordance with condition 5.1, and where a measured flow rate into a treatment system, train, or stage exceeds the maximum flow rate set out for that treatment system, train, or stage in Part 4, the amount, date, time and duration of the exceedence shall also be recorded.

#### **Calibration of flow measuring devices**

- 5.3 All flow measuring devices must be checked and calibrated in accordance with the manufacturer's instructions.
- 5.4 If the manufacturer's instructions do not indicate how often to check and calibrate the flow measuring devices, the equipment must be checked and calibrated at least once every year during which the approved drinking-water system is in operation.

#### **Additional Sampling where UV treatment is provided**

- 5.5 In addition to any other sampling, analysis and recording that may be required, continuous monitoring and recording with a minimum testing/reading and recording frequency of every four (4) hours shall be carried out for the following parameters related to the performance of the UV disinfection equipment:

- i. Calculated UV dose
- ii. Flow rate
- iii. UV lamp status

Note: UV transmittance, once a week

- 5.6 In addition to any other sampling and analysis that may be required, sampling and analysis shall be undertaken as follows:
- i. Long Term Monitoring program for Glen Collector System and Arkell Artificial recharge Pit, as described in letter dated March 19, 2004, prepared by Associated Engineering; and
  - ii. Downey Supply Well Water Level Monitoring program described in letter dated January 10, 2005, prepared by Stantec Consulting Ltd.

### **PART 6 - OPERATIONS AND MAINTENANCE**

#### **Chemical standards**

- 6.1 All chemicals and materials used in the operation of the approved drinking-water system that come into contact with water within the system shall meet all applicable standards set by both the American Water Works Association ("AWWA") and the American National Standards Institute ("ANSI") safety criteria standards NSF/60 and NSF/61.

- 6.2 The most current chemical and material product registration documentation from a testing institution accredited by either the Standards Council of Canada or by the American National Standards Institution shall be available at all times for each chemical and material used in the operation of the approved drinking-water system that comes into contact with water within the system.
- 6.3 Condition 6.2 does not apply in the context of any particular chemical or material where the Owner has written documentation signed by the director that indicates that the Ministry is satisfied that the chemical or material is acceptable for use within the approved drinking-water system and that chemical or material is only used as permitted by the documentation.

### **Operations manual**

- 6.4 An up-to-date operations manual shall be maintained and available for reference by all persons responsible for all or part of the operation of the approved drinking-water system.
- 6.5 The operations manual shall include at a minimum:
- i. the requirements of this approval and associated procedures;
  - ii. the operation and maintenance recommendations from the most recent engineers' report;
  - iii. procedures for the monitoring and recording of in-process parameters necessary for the control of the treatment system or systems and assessing the performance of the approved drinking-water system;
  - iv. procedures for the operation and maintenance of monitoring equipment;
  - v. contingency plans and procedures for the provision of adequate equipment and material to deal with emergencies, upset and equipment breakdown;
  - vi. procedures for the dealing with complaints related to the approved drinking-water system, including the recording of the nature of the complaint and any investigation and corrective action taken that in respect of the complaint.
  - vii. scheduled inspections of all production wells, standby wells, test wells and monitoring wells;
  - viii. procedures for the inspection and maintenance of all above grade and below grade well structures and appurtenances; and
  - ix. a remedial action plan to be implemented where an inspection reveals that the status of a well or well component does not meet regulatory requirements or presents a drinking water health hazard.

- 6.6 Procedures necessary to the operation of any physical alterations of the approved drinking-water system shall be incorporated into the operations manual prior to the alterations coming into operation.

### **Drawings**

- 6.7 An up-to-date Process and Instrumentation Diagram for the approved drinking-water system shall be kept on site at the drinking water system.
- 6.8 All drawings and diagrams in the possession of the owner or operating authority that show the approved drinking-water system as constructed shall be retained.
- 6.9 An alteration to the approved drinking-water system shall be incorporated into Process and Instrumentation Diagrams and record drawings and diagrams within one year of the substantial completion of the alteration and shall be retained and shall be made readily available for inspection by Ministry staff.

## **PART 7 - FUTURE ALTERATIONS**

### **Approved future alterations**

- 7.1 *Not Applicable*

### **Certificate of compliance**

- 7.2 *Not Applicable*

## **PART 8 - STUDIES AND UPGRADES REQUIRED**

- 8.1 For the purpose of this Part, the following upgrade lists shall apply:

### **Upgrade List A -Good Groundwater**

1. Provide primary disinfection appropriate for a ground water raw water supply in accordance with O. Reg. 170/03, Schedule 1, section 1-3.

### **Upgrade List B - GUDI with in-situ filtration**

1. Provide treatment appropriate for ground water supply that is under the direct influence of surface water and has effective "in-situ" filtration, in accordance with O. Reg. 170/03, Schedule 1, section 1-4;
2. Delineate all wellhead protection areas in accordance with the latest version of the Ministry protocol titled "*Delineation of Wellhead Protection Areas For Municipal Groundwater Supply Wells Under Direct Influence of Surface Water*" and provide copies of the resulting reports to the Director; and

3. Submit a report to the Director prepared in accordance with the latest version of the Ministry document titled "*Development of Microbial Contamination Control Plans for Municipal Groundwater Supply Wells under Direct Influence of Surface Water with Effective In-situ Filtration*".
- 8.2 In accordance with O. Reg. 170/03, the owner shall implement the upgrade requirements set out in Upgrade List A for Downey Road Well works by the date specified:
 

Downey Road Well: Upgrade list A by **March 31, 2006**
  - 8.2.1 deleted
  - 8.3 In accordance with O. Reg. 170/03, for each of Carter Well No. 1, Carter Well No. 2, the Arkell Springs Collector System (Glen Collector System) and the Arkell Artificial Recharge system, the owner shall implement the upgrade requirements set out in Upgrade List B by **June 30, 2006**:
  - 8.4 In accordance with O. Reg. 170/03, the owner shall implement the upgrade requirements set out in Upgrade List A for the following systems by the dates specified:
    - Water Street Well by **October 31, 2006**
    - Park Well Nos. 1 and 2 by **April 30, 2005**
    - Emma Street Well by **April 30, 2005**
  - 8.5 By date specified, the owner shall implement the following works and measures:
    - i. install backflow prevention devices on all existing reservoir overflow lines by **October 31, 2004**;
    - ii. install a re-chlorination system at the Paisley Road Well Pumping Station and Reservoir and the Robertson Booster Pumping Station by **November 30, 2004**;
    - iii. provide a control system at each supply and treatment system connected to the City of Guelph drinking-water distribution system to alarm operator staff when the level of free chlorine residual concentration in the treated water goes below a pre-set level by **June 30, 2006**;
    - iv. engage a Professional Geoscientist, a Professional Engineer who is exempt from the *Professional Geoscientists Act, 2000*, S.O. 2000, c. 13, by s. 3(3)2 of that act, or a Licensed Well Contractor to inspect the Burke, Downey and Carter Outside wells to investigate whether the wells are in a fit state of repair that is:
      - (a) equal to or better than the construction requirements, including casing, annular space, siting, pump installation and venting, that the person constructing the well was required to meet on the day that the well was constructed;

- (b) sufficient to prevent the entry of surface water or other foreign materials;
  - (c) secure against vandalism or sabotage; and
  - (d) remedy any deficiencies identified during the investigation required so that the well is brought into a fit state of repair that is in compliance with sub section (a), (b) and (c);
- v. Deleted
  - vi. Deleted
  - vii. Deleted
  - viii. Correct deficiencies outlined in the following documents, by **June 30, 2006** :
    - Letter dated March 10, 2004, signed by Raveendra Kandasamy, P.Eng., Associated Engineering, received in response to condition 8.5 (vi)
    - "Monitoring Wells and Observation Within The City of Guelph" prepared by S.D.Smith Drilling Co. Ltd. dated March 17, 2004 in response to condition 8.5 (vii)

### Interim Measures

8.6 For the Downey Road Well works, the owner shall implement the following interim measures:

- i. maintain a target free chlorine residual of at least 0.75 mg/L in the treated water entering the distribution system;
- ii. provide for the activation of a centralized alarm when the free chlorine residual in water entering the distribution system is below 0.5 mg/L;
- iii. provide continuous monitoring of free chlorine residual and turbidity in the treated water entering the distribution system; and
- iv. provide continuous monitoring of the level of water in the respective reservoirs.

8.6.1 For the Carter Well, Arkell Springs Collector System (Glen Collector System) and the Arkell Artificial Recharge system, the owner shall implement the following interim measures:

- i. maintain a target free chlorine residual of at least 0.85 mg/L in the treated water entering the distribution system;
- ii. provide for the activation of a centralized alarm when the free chlorine residual in water entering the distribution system is below 0.6 mg/L;

- iii. provide continuous monitoring of free chlorine residual and turbidity in the treated water entering the distribution system; and
  - iv. provide continuous monitoring of the level of water in the respective reservoirs.
- 8.6.2 The interim measures required by conditions 8.6 and 8.6.1 shall be maintained from the date the conditions come into force to the commencement of operation of the associated upgrades required by conditions 8.2 through 8.4.
- 8.7 In lieu of or more of the requirements of conditions 8.2 through 8.4, the owner may construct an alternative to one of more parts of the approved drinking-water system provided all necessary approvals are obtained and the alternative part is fully operational on or before the earliest applicable deadline from 8.2 to 8.4.
- 8.8 All reports required by this part shall be in a form and content satisfactory to the Director.

**Requirement not an approval**

- 8.9 The owner shall not construct any works required by this part until all associated approvals, licenses and permits have been obtained from the Ministry.

**PART 9 - RELIEF FROM REGULATORY REQUIREMENTS**

**Relief from regulatory requirements**

- 9.1 *Not Applicable*

**Conditions in exchange for relief from regulatory requirements**

- 9.2 *Not Applicable*

**SCHEDULE - A**

The following supporting documents form part of this approval.

1. Application dated August 31, 2005
  - Letter dated September 19, 2005, signed by James B. Etienne, P.Eng., Director of Engineering Services, the City of Guelph
  - report entitled "Water Street Well Facility Upgrade Design Brief" dated September 2005, prepared by Earth Tech Canada Inc.
  - E mail dated December 14 , 2005 from Patricia Quackenbush, P.Eng., Earth Tech Canada
  - Letter dated December 14 , 2005 from Patricia Quackenbush, P.Eng., Earth Tech Canada
2. - Application dated October 26 2004

- Letter dated October 26 2004, signed by James B. Etienne, P.Eng., Director of Engineering Services, the City of Guelph
  - Letter dated November 10 2004, signed by Patricia Quackenbush, P.Eng., Earth Tech Canada Inc.
  - Letter dated March 10 2004, signed by Raveendra Kandasamy, P.Eng., Associated Engineering, received in response to condition 8.5 (vi)
  - Letter dated March 19 2004, signed by Elia Edwards, M.A.Sc. P.Eng., Associated Engineering, received in response to condition 8.5 (v) regarding monitoring plan for Arkell Spring Collector and Arkell Artificial Recharge Systems
  - Letter dated March 26 2004, signed by Chris Gallant, Project Manager, the City of Guelph, received in response to condition 8.5 (vii) attaching a report prepared by S.D.Smith Drilling Co.Ltd.
  - letter dated March 30 2004, signed by Dennis Mutti, M.A.Sc., P.Eng., Stantec Consulting Ltd. attaching a report entitled "Hydrogeological Investigations at the Downey Road and Burks Supply Wells, City of Guelph" dated March 2004, prepared by Gartner Lee Limited, submitted in accordance with condition 8.2.1
- 
- Application dated November 18 2004
  - Letter dated November 11 2004, signed by James B. Etienne, P.Eng., Director of Engineering Services, the City of Guelph
  - Letter dated November 26 2004, signed by Grant Parkinson, P.Eng., Gamsby and Manerow Limited
  - a note dated December 9 2004, signed by Peter L. Busatto, Manager of Guelph Water Works
  - a report entitled "Final Design Report for Upgrades to Downey Road Reservoir City of Guelph" dated July 2004, prepared by Gamsby and Manerow Limited
  - engineering drawings dated December 2004, prepared by Gamsby and Manerow Limited
  - excerpts from Engineers Report prepared by Acres and Associated, dated January 2001
  - excerpts from Hydrogeological Investigations at the Downey Road and Burke Supply Wells, City of Guelph, dated March 2004, Gartner Lee Limited
- 
- Application dated November 23 2004
  - Letter dated November 23 2004, signed by James B. Etienne, P.Eng., Director of Engineering Services, the City of Guelph
  - letter dated January 10 2005, signed by Dennis Mutti, M.A.Sc., P.Eng., Stantec Consulting Ltd.
  - letter dated February 10 2005, signed by Marty Cote, M.A.Sc., EIT and Dennis Mutti, M.A.Sc., P.Eng., Stantec Consulting Ltd.
  - Letter dated February 14 2004, signed by Peter L. Busatto, P.Eng., Manager of Waterworks, the City of Guelph
  - letter dated February 23 2005, signed by Dennis Mutti, M.A.Sc., P.Eng., Stantec Consulting Ltd.
  - Emails dated December 16 2004 and January 9 2005 from Peter Busatto, P.Eng to Rane Mahalingam, P.Eng.,
  - Emails dated March 18 2005, from Dennis Mutti, P.Eng to Rane Mahalingam, P.Eng,
  - E mail dated March 30, 2005 from Dennis Mutti, P.Eng., Practice Area Leader, Environmental Infrastructure, Stantec.

3. Application for approval dated August 16 2004
4. Application for Approval dated May 31, 2004
5. Application for Approval dated January 6, 2004
  - Design brief, contract documents, and drawings received January 22, 2004 prepared by Gamsby and Mannerow Ltd.
6. Application for Approval dated December 23, 2003
  - Design brief entitled "Reservoir Overflows", dated December 2003 prepared by Associated Engineering.
7. Application for Approval dated December 10, 2003
  - Technical Memo entitled "Paisley Well and Booster Pumping Station - Addition of Re-chlorination Equipment", dated November 2003 prepared by Associated Engineering.
8. Application for Approval dated December 10, 2003
  - Technical Memo entitled "Robertson Booster Station - Addition of Re-chlorination Equipment", dated November 2003 prepared by Associated Engineering.
9. Application for Approval dated November 10, 2003
  - Design Briefs entitled "Emma Street Well Facility Upgrade" and "Park Wells Facility Upgrade", dated November 30, 2003 prepared by Earth Tech Canada Inc.
  - Contract Documents entitled "Park and Emma Wells Facilities Upgrades", dated January 2004 prepared by Earth Tech Canada Inc.
  - Drawings for upgrades to Emma and Park Wells Facilities, dated January 2004 (Revision: Issued for Tender) prepared by Earth Tech Canada Inc.
  - Correspondence dated February 17, 2004 from Earth Tech Canada Inc.
10. Application for Approval dated November 10, 2003
  - Technical Memo entitled "Application for Approval (Air) Burke Well Pumping Station", dated July 2003 prepared by Associated Engineering.
11. Appeal Negotiations initiated on June 19, 2003
  - Correspondence dated September 30, 2003 from James B. Etienne, P.Eng., Director of Environmental Services, The City of Guelph.
  - an E.mail dated October 20, 2003 from Iva Danilovic, Process Designer, Associated Engineering; attaching a copy of October 3rd 2003 minutes of meeting No.2 held at F.M. Woods Pumping Station.
  - an E.mail dated October 21 2003 from Elia Edwards, P.Eng., Process Engineer, Associated Engineering attaching a table dated October 21 2003, demonstrating "CT" assessment of drinking water systems in the City of Guelph.
  - a CD detailing photographs of wells confirming upgrade items described in condition

5.1.b. (i), (ii), (iii), (iv) and (v) of certificate 6306-5MXHLN dated May 29, 2003.

- an E.mail dated October 27, 2003 from Dennis Mutti, P.Eng., Practice Area Leader, Environmental Infrastructure, Stantec.
- an E.mail dated October 27, 2003 from Iva Danilovic, Process Designer, Associated Engineering, attaching a spread sheet describing "Guelph Water Works South End Free Chlorine Residual".
- an E.mail dated October 27, 2003 from Iva Danilovic, Process Designer, Associated Engineering, attaching a letter dated October 29, 2003 from Elia Edwards, M.A.S.S., P.Eng., Process Engineer – Water Division, Associated Engineering, addressed to Rane Mahalingam, P.Eng., Ministry of the Environment.
- an E.mail dated October 29, 2003 from Dennis Mutti, P.Eng., Practice Area Leader, Environmental Infrastructure, Stantec.
- an E.mail dated October 31, 2003 from Dennis Mutti, P.Eng., Practice Area Leader, Environmental Infrastructure, Stantec.

12. The original applications for approval, including design calculations, engineering drawings and reports, and other supporting documents prepared in support of any previous certificate(s) of approval issued for any works now approved and replaced by this approval, unless this approval states otherwise.

**This Certificate of Approval revokes and replaces Certificate(s) of Approval No. 5379-67PKWY issued on April 25, 2005**

*All or part of this decision may be reviewable in accordance with the provisions of Part X of the SDWA. In accordance with Section 129(1) of the Safe Drinking Water Act, Chapter 32 Statutes of Ontario, 2002, as amended, you may by written notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this notice, require a hearing by the Tribunal. Section 129(2) sets out a procedure upon which the 15 days may be extended by the Tribunal. Section 129(3) of the Safe Drinking Water Act, Chapter 32 Statutes of Ontario, 2002, provides that the Notice requiring the hearing shall state:*

1. The aspect of the decision, including the portion of the permit, licence, approval, order or notice of administrative penalty in respect of which the hearing is required; and
2. The grounds for review to be relied on by the person at the hearing.

Except with leave of the Tribunal, a person requiring a hearing in relation to a reviewable decision is not entitled to,

- (a) a review of an aspect of the decision other than that stated in the notice requiring the hearing; or
- (b) a review of the decision other than on the grounds stated in the notice

*The Notice should also include:*

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;

8. The municipality within which the works are located;

*And the Notice should be signed and dated by the appellant.*

*This Notice must be served upon:*

The Secretary\*  
Environmental Review Tribunal  
2300 Yonge St., 12th Floor  
P.O. Box 2382  
Toronto, Ontario  
M4P 1E4

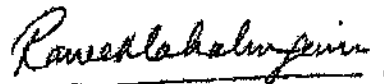
AND

The Director  
Part V, *Safe Drinking Water Act, 2002*  
Ministry of Environment  
2 St. Clair Avenue West, Floor 12A  
Toronto, Ontario  
M4V 1L5

\* Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or [www.ert.gov.on.ca](http://www.ert.gov.on.ca)

*The above noted water works are approved under Part V of the Safe Drinking Water Act.*

DATED AT TORONTO this 21st day of December, 2005



\_\_\_\_\_  
Ranee Mahalingam, P.Eng.  
Director  
Part V of the *Safe Drinking Water Act, 2002*

RM/

c: District Manager, MOE Guelph  
Joseph Gemin, P.Eng. and/or Patricia Quackenbush, P.Eng., Earth Tech Inc.  
Manager, Drinking Water, Wastewater and Watershed Standards Section, Standards Development Branch.

APPENDIX B  
2005 MONTHLY PUMPAGE SUMMARIES



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**TABLE L - Monthly Pumpage Summary, January 2005****Daily Pumpages**

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Organization: **City of Guelph Waterworks**  
Water System: **Guelph Waterworks**  
Facility: **F. M. Woods Station**  
Sampling Point: **Daily Pumpages (10-WDP-IT, CC99)**  
**01/01/2005 to 01/31/2005 (mm/dd/yyyy)**

**01 Woods Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 17,380  
**# detects:** 31                   **max:** 29,730 cu.m  
**# non-detects:** 0                **avg:** 25,580 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 792,970 cu.m

**02 Park Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 2,420  
**# detects:** 31                   **max:** 3,470 cu.m  
**# non-detects:** 0                **avg:** 3,104 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 96,210 cu.m

**03 Calico Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 953  
**# detects:** 31                   **max:** 1,029 cu.m  
**# non-detects:** 0                **avg:** 980 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 30,371 cu.m

**04 Downey Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 4,143  
**# detects:** 31                   **max:** 4,240 cu.m  
**# non-detects:** 0                **avg:** 4,184 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 129,710 cu.m

Daily Pumpages (10-WDP-IT, CC99) (Continued)

**05 Burkes Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 4,079
<b># detects:</b> 31	<b>max:</b> 5,614 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 5,453 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 169,049 cu.m

**06 University Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 1,694
<b># detects:</b> 31	<b>max:</b> 1,758 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,723 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 53,424 cu.m

**07 Dean Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 1,345
<b># detects:</b> 31	<b>max:</b> 1,397 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,371 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 42,498 cu.m

**08 Queensdale Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 0
<b># detects:</b> 29	<b>max:</b> 1,482 cu.m
<b># non-detects:</b> 2	<b>avg:</b> 1,122 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 34,772 cu.m

**09 Water Street Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 0
<b># detects:</b> 28	<b>max:</b> 1,912 cu.m
<b># non-detects:</b> 3	<b>avg:</b> 1,592 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 49,337 cu.m

**10 Emma Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 0
<b># detects:</b> 0	<b>max:</b> 0 cu.m
<b># non-detects:</b> 31	<b>avg:</b> 0 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 0 cu.m

**11 Membro Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 1,725
<b># detects:</b> 31	<b>max:</b> 4,092 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 3,749 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 116,211 cu.m

**12 Helmar Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 1,040
<b># detects:</b> 31	<b>max:</b> 1,277 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,229 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 38,085 cu.m

**13 Paisley Well Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 1,333  
**# detects:** 31                   **max:** 1,338 cu.m  
**# non-detects:** 0               **avg:** 1,336 cu.m (based on 31 numerical results)  
**# exceedances:** 0              **total:** 41,408 cu.m

**13a Paisley Discharge Volume (Inline Instrument)**

**# samples:** 31                    **min:** 6,330  
**# detects:** 31                   **max:** 8,010 cu.m  
**# non-detects:** 0               **avg:** 7,608 cu.m (based on 31 numerical results)  
**# exceedances:** 0              **total:** 235,860 cu.m

**14 Clythe Well Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 0  
**# detects:** 0                    **max:** 0 cu.m  
**# non-detects:** 31               **avg:** 0 cu.m (based on 31 numerical results)  
**# exceedances:** 0              **total:** 0 cu.m

**14a Clythe Discharge Volume (Inline Instrument)**

**# samples:** 31                    **min:** 0  
**# detects:** 0                    **max:** 0 cu.m  
**# non-detects:** 31               **avg:** 0 cu.m (based on 31 numerical results)  
**# exceedances:** 0              **total:** 0 cu.m

**17 Carter Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 2,810  
**# detects:** 31                   **max:** 5,210 cu.m  
**# non-detects:** 0                **avg:** 4,858 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 150,600 cu.m

**18 Arkell No. 1 Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 610  
**# detects:** 31                   **max:** 1,739 cu.m  
**# non-detects:** 0                **avg:** 1,665 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 51,605 cu.m

**19 Arkell No. 6 Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 3,505  
**# detects:** 31                   **max:** 6,095 cu.m  
**# non-detects:** 0                **avg:** 5,394 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 167,226 cu.m

**20 Arkell No. 7 Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 2,766  
**# detects:** 31                   **max:** 6,155 cu.m  
**# non-detects:** 0                **avg:** 5,290 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 163,994 cu.m

**21 Arkell No. 8 Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 2,520  
**# detects:** 31                   **max:** 6,230 cu.m  
**# non-detects:** 0                **avg:** 4,910 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 152,210 cu.m

**24 Arkell Collector Daily Total Volume (23-22) (Inline Instrument)**

**# samples:** 31                    **min:** 3,969  
**# detects:** 31                   **max:** 5,051 cu.m  
**# non-detects:** 0                **avg:** 4,486 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 139,059 cu.m

**25 Recharge Pump Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 0  
**# detects:** 0                    **max:** 0 cu.m  
**# non-detects:** 31               **avg:** 0 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 0 cu.m

**26 Robertson Discharge Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 3,029  
**# detects:** 31                   **max:** 5,244 cu.m  
**# non-detects:** 0                **avg:** 4,371 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 135,489 cu.m

**Notes:**

*Result: P=present, A=absent, PR=presumptive, ND=not detected, OR=over range, OG=overgrown, NR=no result, NT=not tested  
"<" = less than detection limit shown*

">" = greater than upper range limit shown

"«" = less than number shown (Detected)

"»" = greater than number shown (Detected)

\* Criteria Exceeded

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**TABLE M - Monthly Pumpage Summary, February 2005****Daily Pumpages**

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Organization: **City of Guelph Waterworks**  
Water System: **Guelph Waterworks**  
Facility: **F. M. Woods Station**  
Sampling Point: **Daily Pumpages (10-WDP-IT, CC99)**  
**02/01/2005 to 02/28/2005 (mm/dd/yyyy)**

**01 Woods Daily Total Volume (Inline Instrument)**

**# samples:** 28                    **min:** 21,190  
**# detects:** 28                   **max:** 30,480 cu.m  
**# non-detects:** 0                **avg:** 26,461 cu.m (based on 28 numerical results)  
**# exceedances:** 0               **total:** 740,910 cu.m

**02 Park Daily Total Volume (Inline Instrument)**

**# samples:** 28                    **min:** 1,050  
**# detects:** 28                   **max:** 3,456 cu.m  
**# non-detects:** 0                **avg:** 2,910 cu.m (based on 28 numerical results)  
**# exceedances:** 0               **total:** 81,476 cu.m

**03 Calico Daily Total Volume (Inline Instrument)**

**# samples:** 28                    **min:** 721  
**# detects:** 28                   **max:** 1,060 cu.m  
**# non-detects:** 0                **avg:** 1,017 cu.m (based on 28 numerical results)  
**# exceedances:** 0               **total:** 28,478 cu.m

**04 Downey Daily Total Volume (Inline Instrument)**

**# samples:** 28                    **min:** 4,161  
**# detects:** 28                   **max:** 4,241 cu.m  
**# non-detects:** 0                **avg:** 4,187 cu.m (based on 28 numerical results)  
**# exceedances:** 0               **total:** 117,236 cu.m

Daily Pumpages (10-WDP-IT, CC99) (Continued)

**05 Burkes Daily Total Volume (Inline Instrument)**

<b># samples:</b> 28	<b>min:</b> 5,531
<b># detects:</b> 28	<b>max:</b> 5,884 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 5,788 cu.m (based on 28 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 162,067 cu.m

**06 University Daily Total Volume (Inline Instrument)**

<b># samples:</b> 28	<b>min:</b> 1,188
<b># detects:</b> 28	<b>max:</b> 1,740 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,656 cu.m (based on 28 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 46,378 cu.m

**07 Dean Daily Total Volume (Inline Instrument)**

<b># samples:</b> 28	<b>min:</b> 978
<b># detects:</b> 28	<b>max:</b> 1,403 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,355 cu.m (based on 28 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 37,929 cu.m

**08 Queensdale Daily Total Volume (Inline Instrument)**

<b># samples:</b> 28	<b>min:</b> 852
<b># detects:</b> 28	<b>max:</b> 1,251 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,197 cu.m (based on 28 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 33,510 cu.m

**09 Water Street Daily Total Volume (Inline Instrument)**

<b># samples:</b> 28	<b>min:</b> 0
<b># detects:</b> 27	<b>max:</b> 1,932 cu.m
<b># non-detects:</b> 1	<b>avg:</b> 1,527 cu.m (based on 28 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 42,743 cu.m

**10 Emma Daily Total Volume (Inline Instrument)**

<b># samples:</b> 28	<b>min:</b> 0
<b># detects:</b> 0	<b>max:</b> 0 cu.m
<b># non-detects:</b> 28	<b>avg:</b> 0 cu.m (based on 28 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 0 cu.m

**11 Membro Daily Total Volume (Inline Instrument)**

<b># samples:</b> 28	<b>min:</b> 3,811
<b># detects:</b> 28	<b>max:</b> 4,757 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 4,264 cu.m (based on 28 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 119,389 cu.m

**12 Helmar Daily Total Volume (Inline Instrument)**

<b># samples:</b> 28	<b>min:</b> 1,228
<b># detects:</b> 28	<b>max:</b> 1,323 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,276 cu.m (based on 28 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 35,717 cu.m

**13 Paisley Well Daily Total Volume (Inline Instrument)**

**# samples:** 28                    **min:** 1,286  
**# detects:** 28                    **max:** 1,346 cu.m  
**# non-detects:** 0                **avg:** 1,339 cu.m (based on 28 numerical results)  
**# exceedances:** 0                **total:** 37,485 cu.m

**13a Paisley Discharge Volume (Inline Instrument)**

**# samples:** 28                    **min:** 5,830  
**# detects:** 28                    **max:** 7,940 cu.m  
**# non-detects:** 0                **avg:** 6,743 cu.m (based on 28 numerical results)  
**# exceedances:** 0                **total:** 188,790 cu.m

**14 Clythe Well Daily Total Volume (Inline Instrument)**

**# samples:** 28                    **min:** 0  
**# detects:** 0                    **max:** 0 cu.m  
**# non-detects:** 28                **avg:** 0 cu.m (based on 28 numerical results)  
**# exceedances:** 0                **total:** 0 cu.m

**14a Clythe Discharge Volume (Inline Instrument)**

**# samples:** 28                    **min:** 0  
**# detects:** 0                    **max:** 0 cu.m  
**# non-detects:** 28                **avg:** 0 cu.m (based on 28 numerical results)  
**# exceedances:** 0                **total:** 0 cu.m

**17 Carter Daily Total Volume (Inline Instrument)**

**# samples:** 28                    **min:** 3,580  
**# detects:** 28                   **max:** 6,230 cu.m  
**# non-detects:** 0               **avg:** 5,741 cu.m (based on 28 numerical results)  
**# exceedances:** 0               **total:** 160,748 cu.m

**18 Arkell No. 1 Daily Total Volume (Inline Instrument)**

**# samples:** 28                    **min:** 0  
**# detects:** 24                   **max:** 1,856 cu.m  
**# non-detects:** 4               **avg:** 1,458 cu.m (based on 28 numerical results)  
**# exceedances:** 0               **total:** 40,831 cu.m

**19 Arkell No. 6 Daily Total Volume (Inline Instrument)**

**# samples:** 28                    **min:** 3,553  
**# detects:** 28                   **max:** 6,315 cu.m  
**# non-detects:** 0               **avg:** 5,231 cu.m (based on 28 numerical results)  
**# exceedances:** 0               **total:** 146,456 cu.m

**20 Arkell No. 7 Daily Total Volume (Inline Instrument)**

**# samples:** 28                    **min:** 4,040  
**# detects:** 28                   **max:** 6,336 cu.m  
**# non-detects:** 0               **avg:** 5,573 cu.m (based on 28 numerical results)  
**# exceedances:** 0               **total:** 156,049 cu.m

**21 Arkell No. 8 Daily Total Volume (Inline Instrument)**

**# samples:** 28                    **min:** 3,130  
**# detects:** 28                   **max:** 6,370 cu.m  
**# non-detects:** 0                **avg:** 5,018 cu.m (based on 28 numerical results)  
**# exceedances:** 0               **total:** 140,510 cu.m

**24 Arkell Collector Daily Total Volume (23-22) (Inline Instrument)**

**# samples:** 28                    **min:** 2,333  
**# detects:** 28                   **max:** 6,503 cu.m  
**# non-detects:** 0                **avg:** 4,468 cu.m (based on 28 numerical results)  
**# exceedances:** 0               **total:** 125,115 cu.m

**25 Recharge Pump Daily Total Volume (Inline Instrument)**

**# samples:** 28                    **min:** 0  
**# detects:** 0                    **max:** 0 cu.m  
**# non-detects:** 28               **avg:** 0 cu.m (based on 28 numerical results)  
**# exceedances:** 0               **total:** 0 cu.m

**26 Robertson Discharge Daily Total Volume (Inline Instrument)**

**# samples:** 28                    **min:** 4,110  
**# detects:** 28                   **max:** 7,920 cu.m  
**# non-detects:** 0                **avg:** 5,487 cu.m (based on 28 numerical results)  
**# exceedances:** 1               **total:** 153,622 cu.m

**Notes:**

*Result: P=present, A=absent, PR=presumptive, ND=not detected, OR=over range, OG=overgrown, NR=no result, NT=not tested*  
*"<" = less than detection limit shown*



">" = greater than upper range limit shown

"«" = less than number shown (Detected)

"»" = greater than number shown (Detected)

\* Criteria Exceeded

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**Table N - Monthly Pumpage Summary, March 2005****Daily Pumpages**

---

Organization: **City of Guelph Waterworks**  
Water System: **Guelph Waterworks**  
Facility: **F. M. Woods Station**  
Sampling Point: **Daily Pumpages (10-WDP-IT, CC99)**  
**03/01/2005 to 03/31/2005 (mm/dd/yyyy)**

**01 Woods Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 18,180  
**# detects:** 31                   **max:** 30,350 cu.m  
**# non-detects:** 0               **avg:** 24,309 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 753,590 cu.m

**02 Park Daily Total Volume (Inline Instrument)**

**# samples:** 31                   **min:** 2,770  
**# detects:** 31                   **max:** 5,393 cu.m  
**# non-detects:** 0               **avg:** 3,994 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 123,805 cu.m

**03 Calico Daily Total Volume (Inline Instrument)**

**# samples:** 31                   **min:** 573  
**# detects:** 31                   **max:** 1,055 cu.m  
**# non-detects:** 0               **avg:** 984 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 30,501 cu.m

**04 Downey Daily Total Volume (Inline Instrument)**

**# samples:** 31                   **min:** 4,156  
**# detects:** 31                   **max:** 4,535 cu.m  
**# non-detects:** 0               **avg:** 4,271 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 132,409 cu.m

Daily Pumpages (10-WDP-IT, CC99) (Continued)

**05 Burkes Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 5,695
<b># detects:</b> 31	<b>max:</b> 5,738 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 5,712 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 177,083 cu.m

**06 University Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 1,596
<b># detects:</b> 31	<b>max:</b> 1,747 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,667 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 51,670 cu.m

**07 Dean Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 915
<b># detects:</b> 31	<b>max:</b> 1,425 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,335 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 41,373 cu.m

**08 Queensdale Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 1,131
<b># detects:</b> 31	<b>max:</b> 1,281 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,229 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 38,107 cu.m

**09 Water Street Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 0
<b># detects:</b> 28	<b>max:</b> 1,775 cu.m
<b># non-detects:</b> 3	<b>avg:</b> 1,323 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 41,003 cu.m

**10 Emma Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 0
<b># detects:</b> 23	<b>max:</b> 2,648 cu.m
<b># non-detects:</b> 8	<b>avg:</b> 1,843 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 57,138 cu.m

**11 Membro Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 4,059
<b># detects:</b> 31	<b>max:</b> 4,761 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 4,406 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 136,590 cu.m

**12 Helmar Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 0
<b># detects:</b> 24	<b>max:</b> 1,344 cu.m
<b># non-detects:</b> 7	<b>avg:</b> 891 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 27,618 cu.m

**13 Paisley Well Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 1,207  
**# detects:** 31                    **max:** 1,335 cu.m  
**# non-detects:** 0                **avg:** 1,280 cu.m (based on 31 numerical results)  
**# exceedances:** 0                **total:** 39,668 cu.m

**13a Paisley Discharge Volume (Inline Instrument)**

**# samples:** 31                    **min:** 3,570  
**# detects:** 31                    **max:** 8,040 cu.m  
**# non-detects:** 0                **avg:** 5,934 cu.m (based on 31 numerical results)  
**# exceedances:** 0                **total:** 183,960 cu.m

**14 Clythe Well Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 0  
**# detects:** 0                    **max:** 0 cu.m  
**# non-detects:** 31                **avg:** 0 cu.m (based on 31 numerical results)  
**# exceedances:** 0                **total:** 0 cu.m

**14a Clythe Discharge Volume (Inline Instrument)**

**# samples:** 31                    **min:** 0  
**# detects:** 1                    **max:** 155 cu.m  
**# non-detects:** 30                **avg:** 5 cu.m (based on 31 numerical results)  
**# exceedances:** 0                **total:** 155 cu.m

**17 Carter Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 1,670  
**# detects:** 31                   **max:** 6,912 cu.m  
**# non-detects:** 0                **avg:** 5,727 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 177,526 cu.m

**18 Arkell No. 1 Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 0  
**# detects:** 29                   **max:** 1,861 cu.m  
**# non-detects:** 2                **avg:** 1,575 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 48,815 cu.m

**19 Arkell No. 6 Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 524  
**# detects:** 31                   **max:** 6,063 cu.m  
**# non-detects:** 0                **avg:** 4,211 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 130,530 cu.m

**20 Arkell No. 7 Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 2,980  
**# detects:** 31                   **max:** 6,163 cu.m  
**# non-detects:** 0                **avg:** 4,726 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 146,506 cu.m

**21 Arkell No. 8 Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 0
<b># detects:</b> 30	<b>max:</b> 6,360 cu.m
<b># non-detects:</b> 1	<b>avg:</b> 3,567 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 110,570 cu.m

**24 Arkell Collector Daily Total Volume (23-22) (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 2,974
<b># detects:</b> 31	<b>max:</b> 9,736 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 5,407 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 167,614 cu.m

**25 Recharge Pump Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 0
<b># detects:</b> 0	<b>max:</b> 0 cu.m
<b># non-detects:</b> 31	<b>avg:</b> 0 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 0 cu.m

**26 Robertson Discharge Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 4,928
<b># detects:</b> 31	<b>max:</b> 8,745 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 6,646 cu.m (based on 31 numerical results)
<b># exceedances:</b> 4	<b>total:</b> 206,035 cu.m

**Notes:**

Result: P=present, A=absent, PR=presumptive, ND=not detected, OR=over range, OG=overgrown, NR=no result, NT=not tested  
"<" = less than detection limit shown

">" = greater than upper range limit shown

"«" = less than number shown (Detected)

"»" = greater than number shown (Detected)

\* Criteria Exceeded

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**TABLE O - Monthly Pumpage Summary, April 2005****Daily Pumpages**

---

Organization: **City of Guelph Waterworks**  
Water System: **Guelph Waterworks**  
Facility: **F. M. Woods Station**  
Sampling Point: **Daily Pumpages (10-WDP-IT, CC99)**  
**04/01/2005 to 04/30/2005 (mm/dd/yyyy)**

**01 Woods Daily Total Volume (Inline Instrument)**

**# samples:** 30                    **min:** 19,200  
**# detects:** 30                   **max:** 28,600 cu.m  
**# non-detects:** 0                **avg:** 24,146 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 724,390 cu.m

**02 Park Daily Total Volume (Inline Instrument)**

**# samples:** 30                    **min:** 5,064  
**# detects:** 30                   **max:** 5,403 cu.m  
**# non-detects:** 0                **avg:** 5,308 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 159,242 cu.m

**03 Calico Daily Total Volume (Inline Instrument)**

**# samples:** 30                    **min:** 842  
**# detects:** 30                   **max:** 1,066 cu.m  
**# non-detects:** 0                **avg:** 929 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 27,882 cu.m

**04 Downey Daily Total Volume (Inline Instrument)**

**# samples:** 30                    **min:** 3,566  
**# detects:** 30                   **max:** 4,276 cu.m  
**# non-detects:** 0                **avg:** 4,217 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 126,499 cu.m

Daily Pumpages (10-WDP-IT, CC99) (Continued)

**05 Burkes Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 5,484
<b># detects:</b> 30	<b>max:</b> 5,769 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 5,734 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 172,017 cu.m

**06 University Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 694
<b># detects:</b> 30	<b>max:</b> 1,725 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,647 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 49,410 cu.m

**07 Dean Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 0
<b># detects:</b> 28	<b>max:</b> 1,375 cu.m
<b># non-detects:</b> 2	<b>avg:</b> 1,174 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 35,221 cu.m

**08 Queensdale Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 1,141
<b># detects:</b> 30	<b>max:</b> 1,275 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,248 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 37,435 cu.m

**09 Water Street Daily Total Volume (Inline Instrument)**

**# samples:** 30                    **min:** 0  
**# detects:** 0                    **max:** 0 cu.m  
**# non-detects:** 30            **avg:** 0 cu.m (based on 30 numerical results)  
**# exceedances:** 0            **total:** 0 cu.m

**10 Emma Daily Total Volume (Inline Instrument)**

**# samples:** 30                    **min:** 1,576  
**# detects:** 30                    **max:** 2,577 cu.m  
**# non-detects:** 0                **avg:** 2,511 cu.m (based on 30 numerical results)  
**# exceedances:** 0                **total:** 75,338 cu.m

**11 Membro Daily Total Volume (Inline Instrument)**

**# samples:** 30                    **min:** 0  
**# detects:** 23                    **max:** 4,361 cu.m  
**# non-detects:** 7                **avg:** 3,190 cu.m (based on 30 numerical results)  
**# exceedances:** 0                **total:** 95,711 cu.m

**12 Helmar Daily Total Volume (Inline Instrument)**

**# samples:** 30                    **min:** 409  
**# detects:** 30                    **max:** 1,401 cu.m  
**# non-detects:** 0                **avg:** 1,159 cu.m (based on 30 numerical results)  
**# exceedances:** 0                **total:** 34,774 cu.m

**13 Paisley Well Daily Total Volume (Inline Instrument)**

**# samples:** 30                   **min:** 1,274  
**# detects:** 30                   **max:** 1,278 cu.m  
**# non-detects:** 0               **avg:** 1,276 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 38,291 cu.m

**13a Paisley Discharge Volume (Inline Instrument)**

**# samples:** 30                   **min:** 6,800  
**# detects:** 30                   **max:** 8,210 cu.m  
**# non-detects:** 0               **avg:** 7,703 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 231,100 cu.m

**14 Clythe Well Daily Total Volume (Inline Instrument)**

**# samples:** 30                   **min:** 0  
**# detects:** 0                   **max:** 0 cu.m  
**# non-detects:** 30               **avg:** 0 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 0 cu.m

**14a Clythe Discharge Volume (Inline Instrument)**

**# samples:** 30                   **min:** 0  
**# detects:** 1                   **max:** 90 cu.m  
**# non-detects:** 29               **avg:** 3 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 90 cu.m

**17 Carter Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 740
<b># detects:</b> 30	<b>max:</b> 6,530 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 4,595 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 137,840 cu.m

**18 Arkell No. 1 Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 0
<b># detects:</b> 17	<b>max:</b> 1,854 cu.m
<b># non-detects:</b> 13	<b>avg:</b> 810 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 24,292 cu.m

**19 Arkell No. 6 Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 2,974
<b># detects:</b> 30	<b>max:</b> 6,183 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 4,469 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 134,057 cu.m

**20 Arkell No. 7 Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 0
<b># detects:</b> 24	<b>max:</b> 5,530 cu.m
<b># non-detects:</b> 6	<b>avg:</b> 3,032 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 90,949 cu.m

**21 Arkell No. 8 Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 30
<b># detects:</b> 30	<b>max:</b> 5,370 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 3,382 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 101,470 cu.m

**24 Arkell Collector Daily Total Volume (23-22) (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 1,810
<b># detects:</b> 30	<b>max:</b> 14,904 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 9,040 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 271,190 cu.m

**25 Recharge Pump Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 0
<b># detects:</b> 13	<b>max:</b> 8,596 cu.m
<b># non-detects:</b> 17	<b>avg:</b> 3,632 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 108,956 cu.m

**26 Robertson Discharge Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 3,766
<b># detects:</b> 30	<b>max:</b> 5,542 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 4,729 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 141,863 cu.m

**Notes:**

Result: P=present, A=absent, PR=presumptive, ND=not detected, OR=over range, OG=overgrown, NR=no result, NT=not tested  
"<" = less than detection limit shown

">" = greater than upper range limit shown

"«" = less than number shown (Detected)

"»" = greater than number shown (Detected)

\* Criteria Exceeded

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**TABLE P - Monthly Pumpage Summary, May 2005****Daily Pumpages**

---

Organization: **City of Guelph Waterworks**  
Water System: **Guelph Waterworks**  
Facility: **F. M. Woods Station**  
Sampling Point: **Daily Pumpages (10-WDP-IT, CC99)**  
**05/01/2005 to 05/31/2005 (mm/dd/yyyy)**

**01 Woods Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 21,330  
**# detects:** 31                   **max:** 31,860 cu.m  
**# non-detects:** 0               **avg:** 27,179 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 842,550 cu.m

**02 Park Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 755  
**# detects:** 31                   **max:** 5,657 cu.m  
**# non-detects:** 0               **avg:** 4,558 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 141,303 cu.m

**03 Calico Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 983  
**# detects:** 31                   **max:** 1,157 cu.m  
**# non-detects:** 0               **avg:** 1,074 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 33,299 cu.m

**04 Downey Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 345  
**# detects:** 31                   **max:** 4,604 cu.m  
**# non-detects:** 0               **avg:** 4,091 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 126,809 cu.m

Daily Pumpages (10-WDP-IT, CC99) (Continued)

**05 Burkes Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 5,544
<b># detects:</b> 31	<b>max:</b> 5,788 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 5,742 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 178,000 cu.m

**06 University Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 1,481
<b># detects:</b> 31	<b>max:</b> 1,764 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,684 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 52,195 cu.m

**07 Dean Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 1,263
<b># detects:</b> 31	<b>max:</b> 1,391 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,329 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 41,195 cu.m

**08 Queensdale Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 1,091
<b># detects:</b> 31	<b>max:</b> 1,305 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,202 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 37,273 cu.m

**09 Water Street Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 0
<b># detects:</b> 8	<b>max:</b> 1,588 cu.m
<b># non-detects:</b> 23	<b>avg:</b> 200 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 6,193 cu.m

**10 Emma Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 1,320
<b># detects:</b> 31	<b>max:</b> 2,652 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 2,512 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 77,863 cu.m

**11 Membro Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 0
<b># detects:</b> 9	<b>max:</b> 4,402 cu.m
<b># non-detects:</b> 22	<b>avg:</b> 759 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 23,538 cu.m

**12 Helmar Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 1,026
<b># detects:</b> 31	<b>max:</b> 1,200 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,128 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 34,960 cu.m

**13 Paisley Well Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 1,028
<b># detects:</b> 31	<b>max:</b> 1,275 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,250 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 38,762 cu.m

**13a Paisley Discharge Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 4,680
<b># detects:</b> 31	<b>max:</b> 7,990 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 6,169 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 191,250 cu.m

**14 Clythe Well Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 0
<b># detects:</b> 0	<b>max:</b> 0 cu.m
<b># non-detects:</b> 31	<b>avg:</b> 0 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 0 cu.m

**14a Clythe Discharge Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 0
<b># detects:</b> 28	<b>max:</b> 4,503 cu.m
<b># non-detects:</b> 3	<b>avg:</b> 3,493 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 108,287 cu.m

**17 Carter Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 0
<b># detects:</b> 22	<b>max:</b> 3,980 cu.m
<b># non-detects:</b> 9	<b>avg:</b> 883 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 27,360 cu.m

**18 Arkell No. 1 Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 0
<b># detects:</b> 6	<b>max:</b> 1,882 cu.m
<b># non-detects:</b> 25	<b>avg:</b> 109 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 3,375 cu.m

**19 Arkell No. 6 Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 1,281
<b># detects:</b> 31	<b>max:</b> 5,950 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 4,111 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 127,454 cu.m

**20 Arkell No. 7 Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 1,597
<b># detects:</b> 31	<b>max:</b> 5,683 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 3,895 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 120,755 cu.m

**21 Arkell No. 8 Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 1,170
<b># detects:</b> 31	<b>max:</b> 5,370 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 3,561 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 110,380 cu.m

**24 Arkell Collector Daily Total Volume (23-22) (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 14,506
<b># detects:</b> 31	<b>max:</b> 16,426 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 15,605 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 483,761 cu.m

**25 Recharge Pump Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 8,103
<b># detects:</b> 31	<b>max:</b> 8,541 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 8,289 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 256,962 cu.m

**26 Robertson Discharge Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 2,355
<b># detects:</b> 31	<b>max:</b> 4,886 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 3,294 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 102,116 cu.m

**Notes:**

Result: P=present, A=absent, PR=presumptive, ND=not detected, OR=over range, OG=overgrown, NR=no result, NT=not tested  
"<" = less than detection limit shown

">" = greater than upper range limit shown

"«" = less than number shown (Detected)

"»" = greater than number shown (Detected)

\* Criteria Exceeded

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**TABLE Q - Monthly Pumpage Summary, June 2005****Daily Pumpages**

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Organization: **City of Guelph Waterworks**  
Water System: **Guelph Waterworks**  
Facility: **F. M. Woods Station**  
Sampling Point: **Daily Pumpages (10-WDP-IT, CC99)**  
**06/01/2005 to 06/30/2005 (mm/dd/yyyy)**

**01 Woods Daily Total Volume (Inline Instrument)**

**# samples:** 30                    **min:** 21,220  
**# detects:** 30                   **max:** 34,210 cu.m  
**# non-detects:** 0                **avg:** 28,884 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 866,520 cu.m

**02 Park Daily Total Volume (Inline Instrument)**

**# samples:** 30                    **min:** 3,378  
**# detects:** 30                   **max:** 6,000 cu.m  
**# non-detects:** 0                **avg:** 4,699 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 140,979 cu.m

**03 Calico Daily Total Volume (Inline Instrument)**

**# samples:** 30                    **min:** 903  
**# detects:** 30                   **max:** 4,092 cu.m  
**# non-detects:** 0                **avg:** 1,098 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 32,941 cu.m

**04 Downey Daily Total Volume (Inline Instrument)**

**# samples:** 30                    **min:** 3,876  
**# detects:** 30                   **max:** 4,373 cu.m  
**# non-detects:** 0                **avg:** 4,214 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 126,422 cu.m

Daily Pumpages (10-WDP-IT, CC99) (Continued)

**05 Burkes Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 5,722
<b># detects:</b> 30	<b>max:</b> 6,191 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 5,847 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 175,417 cu.m

**06 University Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 1,622
<b># detects:</b> 30	<b>max:</b> 1,746 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,697 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 50,920 cu.m

**07 Dean Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 1,283
<b># detects:</b> 30	<b>max:</b> 1,391 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,325 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 39,750 cu.m

**08 Queensdale Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 1,087
<b># detects:</b> 30	<b>max:</b> 1,299 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,172 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 35,151 cu.m

**09 Water Street Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 0
<b># detects:</b> 29	<b>max:</b> 2,177 cu.m
<b># non-detects:</b> 1	<b>avg:</b> 1,601 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 48,038 cu.m

**10 Emma Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 2,149
<b># detects:</b> 30	<b>max:</b> 2,585 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 2,540 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 76,197 cu.m

**11 Membro Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 1,266
<b># detects:</b> 30	<b>max:</b> 4,460 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 3,919 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 117,583 cu.m

**12 Helmar Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 0
<b># detects:</b> 22	<b>max:</b> 1,155 cu.m
<b># non-detects:</b> 8	<b>avg:</b> 812 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 24,358 cu.m

**13 Paisley Well Daily Total Volume (Inline Instrument)**

**# samples:** 30                    **min:** 1,167  
**# detects:** 30                   **max:** 1,283 cu.m  
**# non-detects:** 0                **avg:** 1,248 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 37,433 cu.m

**13a Paisley Discharge Volume (Inline Instrument)**

**# samples:** 30                    **min:** 5,810  
**# detects:** 30                   **max:** 8,220 cu.m  
**# non-detects:** 0                **avg:** 7,111 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 213,330 cu.m

**14 Clythe Well Daily Total Volume (Inline Instrument)**

**# samples:** 30                    **min:** 0  
**# detects:** 0                    **max:** 0 cu.m  
**# non-detects:** 30                **avg:** 0 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 0 cu.m

**14a Clythe Discharge Volume (Inline Instrument)**

**# samples:** 30                    **min:** 3,745  
**# detects:** 30                   **max:** 5,098 cu.m  
**# non-detects:** 0                **avg:** 4,246 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 127,379 cu.m

**17 Carter Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 0
<b># detects:</b> 26	<b>max:</b> 6,460 cu.m
<b># non-detects:</b> 4	<b>avg:</b> 4,596 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 137,870 cu.m

**18 Arkell No. 1 Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 0
<b># detects:</b> 29	<b>max:</b> 1,895 cu.m
<b># non-detects:</b> 1	<b>avg:</b> 1,721 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 51,631 cu.m

**19 Arkell No. 6 Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 434
<b># detects:</b> 30	<b>max:</b> 5,608 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 4,016 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 120,482 cu.m

**20 Arkell No. 7 Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 2,187
<b># detects:</b> 30	<b>max:</b> 5,543 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 3,656 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 109,673 cu.m

**21 Arkell No. 8 Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 360
<b># detects:</b> 30	<b>max:</b> 5,070 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 2,953 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 88,600 cu.m

**24 Arkell Collector Daily Total Volume (23-22) (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 11,288
<b># detects:</b> 30	<b>max:</b> 17,150 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 13,275 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 398,248 cu.m

**25 Recharge Pump Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 2,683
<b># detects:</b> 30	<b>max:</b> 8,322 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 7,964 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 238,907 cu.m

**26 Robertson Discharge Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 2,200
<b># detects:</b> 30	<b>max:</b> 4,740 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 3,692 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 110,749 cu.m

**Notes:**

Result: P=present, A=absent, PR=presumptive, ND=not detected, OR=over range, OG=overgrown, NR=no result, NT=not tested  
"<" = less than detection limit shown

">" = greater than upper range limit shown

"«" = less than number shown (Detected)

"»" = greater than number shown (Detected)

\* Criteria Exceeded

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**TABLE R - Monthly Pumpage Summary, July 2005****Daily Pumpages**

---

Organization: **City of Guelph Waterworks**  
Water System: **Guelph Waterworks**  
Facility: **F. M. Woods Station**  
Sampling Point: **Daily Pumpages (10-WDP-IT, CC99)**  
**07/01/2005 to 07/31/2005 (mm/dd/yyyy)**

**01 Woods Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 18,540  
**# detects:** 31                   **max:** 35,710 cu.m  
**# non-detects:** 0                **avg:** 25,861 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 801,680 cu.m

**02 Park Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 1,751  
**# detects:** 31                   **max:** 5,602 cu.m  
**# non-detects:** 0                **avg:** 5,248 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 162,687 cu.m

**03 Calico Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 964  
**# detects:** 31                   **max:** 1,073 cu.m  
**# non-detects:** 0                **avg:** 1,017 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 31,539 cu.m

**04 Downey Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 4,035  
**# detects:** 31                   **max:** 4,232 cu.m  
**# non-detects:** 0                **avg:** 4,161 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 128,989 cu.m

Daily Pumpages (10-WDP-IT, CC99) (Continued)

**05 Burkes Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 4,111
<b># detects:</b> 31	<b>max:</b> 6,092 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 5,832 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 180,798 cu.m

**06 University Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 1,490
<b># detects:</b> 31	<b>max:</b> 1,753 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,691 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 52,409 cu.m

**07 Dean Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 1,221
<b># detects:</b> 31	<b>max:</b> 1,385 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,316 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 40,783 cu.m

**08 Queensdale Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 1,169
<b># detects:</b> 31	<b>max:</b> 1,304 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,228 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 38,067 cu.m

**09 Water Street Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 0
<b># detects:</b> 25	<b>max:</b> 1,870 cu.m
<b># non-detects:</b> 6	<b>avg:</b> 1,120 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 34,717 cu.m

**10 Emma Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 2,336
<b># detects:</b> 31	<b>max:</b> 2,554 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 2,521 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 78,166 cu.m

**11 Membro Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 1,364
<b># detects:</b> 31	<b>max:</b> 4,785 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 4,157 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 128,861 cu.m

**12 Helmar Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 886
<b># detects:</b> 31	<b>max:</b> 1,186 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,136 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 35,223 cu.m

**13 Paisley Well Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 1,025  
**# detects:** 31                   **max:** 1,265 cu.m  
**# non-detects:** 0                **avg:** 1,236 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 38,301 cu.m

**13a Paisley Discharge Volume (Inline Instrument)**

**# samples:** 31                    **min:** 4,960  
**# detects:** 31                   **max:** 7,670 cu.m  
**# non-detects:** 0                **avg:** 6,625 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 205,386 cu.m

**14 Clythe Well Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 0  
**# detects:** 0                    **max:** 0 cu.m  
**# non-detects:** 31                **avg:** 0 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 0 cu.m

**14a Clythe Discharge Volume (Inline Instrument)**

**# samples:** 31                    **min:** 3,587  
**# detects:** 31                   **max:** 4,852 cu.m  
**# non-detects:** 0                **avg:** 4,127 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 127,950 cu.m

**17 Carter Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 0
<b># detects:</b> 26	<b>max:</b> 6,430 cu.m
<b># non-detects:</b> 5	<b>avg:</b> 4,052 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 125,620 cu.m

**18 Arkell No. 1 Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 0
<b># detects:</b> 28	<b>max:</b> 1,891 cu.m
<b># non-detects:</b> 3	<b>avg:</b> 1,546 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 47,927 cu.m

**19 Arkell No. 6 Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 0
<b># detects:</b> 30	<b>max:</b> 6,301 cu.m
<b># non-detects:</b> 1	<b>avg:</b> 3,673 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 113,858 cu.m

**20 Arkell No. 7 Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 906
<b># detects:</b> 31	<b>max:</b> 6,262 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 3,351 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 103,874 cu.m

**21 Arkell No. 8 Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 370
<b># detects:</b> 31	<b>max:</b> 6,330 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 2,856 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 88,530 cu.m

**24 Arkell Collector Daily Total Volume (23-22) (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 9,311
<b># detects:</b> 31	<b>max:</b> 16,908 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 11,382 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 352,845 cu.m

**25 Recharge Pump Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 7,610
<b># detects:</b> 31	<b>max:</b> 8,289 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 8,174 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 253,390 cu.m

**26 Robertson Discharge Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 2,348
<b># detects:</b> 31	<b>max:</b> 4,784 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 3,345 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 103,693 cu.m

**Notes:**

Result: P=present, A=absent, PR=presumptive, ND=not detected, OR=over range, OG=overgrown, NR=no result, NT=not tested  
"<" = less than detection limit shown

">" = greater than upper range limit shown

"«" = less than number shown (Detected)

"»" = greater than number shown (Detected)

\* Criteria Exceeded

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**TABLE S - Monthly Pumpage Summary, August 2005****Daily Pumpages**

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Organization: **City of Guelph Waterworks**  
Water System: **Guelph Waterworks**  
Facility: **F. M. Woods Station**  
Sampling Point: **Daily Pumpages (10-WDP-IT, CC99)**  
**08/01/2005 to 08/31/2005 (mm/dd/yyyy)**

**01 Woods Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 17,158  
**# detects:** 31                   **max:** 33,370 cu.m  
**# non-detects:** 0                **avg:** 24,623 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 763,310 cu.m

**02 Park Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 4,837  
**# detects:** 31                   **max:** 5,316 cu.m  
**# non-detects:** 0                **avg:** 5,199 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 161,162 cu.m

**03 Calico Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 934  
**# detects:** 31                   **max:** 1,027 cu.m  
**# non-detects:** 0                **avg:** 966 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 29,960 cu.m

**04 Downey Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 4,041  
**# detects:** 31                   **max:** 4,164 cu.m  
**# non-detects:** 0                **avg:** 4,100 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 127,095 cu.m

Daily Pumpages (10-WDP-IT, CC99) (Continued)

**05 Burkes Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 3,875
<b># detects:</b> 31	<b>max:</b> 5,938 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 5,816 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 180,281 cu.m

**06 University Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 1,644
<b># detects:</b> 31	<b>max:</b> 1,767 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,695 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 52,544 cu.m

**07 Dean Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 1,272
<b># detects:</b> 31	<b>max:</b> 1,372 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,311 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 40,637 cu.m

**08 Queensdale Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 1,043
<b># detects:</b> 31	<b>max:</b> 1,272 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,144 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 35,452 cu.m

**09 Water Street Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 0
<b># detects:</b> 14	<b>max:</b> 2,033 cu.m
<b># non-detects:</b> 17	<b>avg:</b> 493 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 15,271 cu.m

**10 Emma Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 1,924
<b># detects:</b> 31	<b>max:</b> 2,524 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 2,494 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 77,305 cu.m

**11 Membro Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 0
<b># detects:</b> 30	<b>max:</b> 4,286 cu.m
<b># non-detects:</b> 1	<b>avg:</b> 3,850 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 119,349 cu.m

**12 Helmar Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 0
<b># detects:</b> 30	<b>max:</b> 1,181 cu.m
<b># non-detects:</b> 1	<b>avg:</b> 1,064 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 32,971 cu.m

**13 Paisley Well Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 439  
**# detects:** 31                   **max:** 1,256 cu.m  
**# non-detects:** 0               **avg:** 1,196 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 37,083 cu.m

**13a Paisley Discharge Volume (Inline Instrument)**

**# samples:** 31                    **min:** 5,400  
**# detects:** 31                   **max:** 7,430 cu.m  
**# non-detects:** 0               **avg:** 6,495 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 201,360 cu.m

**14 Clythe Well Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 0  
**# detects:** 0                    **max:** 0 cu.m  
**# non-detects:** 31               **avg:** 0 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 0 cu.m

**14a Clythe Discharge Volume (Inline Instrument)**

**# samples:** 31                    **min:** 3,418  
**# detects:** 31                   **max:** 4,644 cu.m  
**# non-detects:** 0               **avg:** 3,902 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 120,961 cu.m

**17 Carter Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 0  
**# detects:** 28                   **max:** 6,560 cu.m  
**# non-detects:** 3                **avg:** 4,634 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 143,648 cu.m

**18 Arkell No. 1 Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 0  
**# detects:** 26                   **max:** 1,891 cu.m  
**# non-detects:** 5                **avg:** 1,237 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 38,347 cu.m

**19 Arkell No. 6 Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 3,066  
**# detects:** 31                   **max:** 6,285 cu.m  
**# non-detects:** 0                **avg:** 4,318 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 133,846 cu.m

**20 Arkell No. 7 Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 2,370  
**# detects:** 31                   **max:** 6,066 cu.m  
**# non-detects:** 0                **avg:** 4,036 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 125,127 cu.m

**21 Arkell No. 8 Daily Total Volume (Inline Instrument)**

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**TABLE S - Monthly Pumpage Summary, August 2005**

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**Daily Pumpages**

**# samples:** 31                    **min:** 1,950  
**# detects:** 31                   **max:** 5,830 cu.m  
**# non-detects:** 0               **avg:** 3,719 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 115,280 cu.m

**24 Arkell Collector Daily Total Volume (23-22) (Inline Instrument)**

**# samples:** 31                    **min:** 5,284  
**# detects:** 31                   **max:** 10,563 cu.m  
**# non-detects:** 0               **avg:** 7,481 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 231,901 cu.m

**25 Recharge Pump Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 0  
**# detects:** 4                    **max:** 8,136 cu.m  
**# non-detects:** 27               **avg:** 801 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 24,846 cu.m

**26 Robertson Discharge Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 2,463  
**# detects:** 31                   **max:** 5,276 cu.m  
**# non-detects:** 0               **avg:** 3,637 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 112,757 cu.m

**Notes:**

*Result: P=present, A=absent, PR=presumptive, ND=not detected, OR=over range, OG=overgrown, NR=no result, NT=not tested  
"<" = less than detection limit shown*

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**TABLE S - Monthly Pumpage Summary, August 2005**

**Daily Pumpages**

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*">" = greater than upper range limit shown*

*"«" = less than number shown (Detected)*

*"»" = greater than number shown (Detected)*

*\* Criteria Exceeded*

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**TABLE T - Monthly Pumpage Summary, September 2005****Daily Pumpages**

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Organization: **City of Guelph Waterworks**  
Water System: **Guelph Waterworks**  
Facility: **F. M. Woods Station**  
Sampling Point: **Daily Pumpages (10-WDP-IT, CC99)**  
**09/01/2005 to 09/30/2005 (mm/dd/yyyy)**

**01 Woods Daily Total Volume (Inline Instrument)**

**# samples:** 30                    **min:** 15,050  
**# detects:** 30                   **max:** 27,770 cu.m  
**# non-detects:** 0                **avg:** 22,603 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 678,090 cu.m

**02 Park Daily Total Volume (Inline Instrument)**

**# samples:** 30                    **min:** 4,914  
**# detects:** 30                   **max:** 5,174 cu.m  
**# non-detects:** 0                **avg:** 5,052 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 151,551 cu.m

**03 Calico Daily Total Volume (Inline Instrument)**

**# samples:** 30                    **min:** 905  
**# detects:** 30                   **max:** 1,070 cu.m  
**# non-detects:** 0                **avg:** 963 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 28,886 cu.m

**04 Downey Daily Total Volume (Inline Instrument)**

**# samples:** 30                    **min:** 3,927  
**# detects:** 30                   **max:** 4,065 cu.m  
**# non-detects:** 0                **avg:** 4,019 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 120,562 cu.m

Daily Pumpages (10-WDP-IT, CC99) (Continued)

**05 Burkes Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 4,347
<b># detects:</b> 30	<b>max:</b> 5,888 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 5,703 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 171,087 cu.m

**06 University Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 1,606
<b># detects:</b> 30	<b>max:</b> 1,723 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,676 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 50,268 cu.m

**07 Dean Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 1,230
<b># detects:</b> 30	<b>max:</b> 1,313 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,281 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 38,435 cu.m

**08 Queensdale Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 996
<b># detects:</b> 30	<b>max:</b> 1,070 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,036 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 31,067 cu.m

**09 Water Street Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 0
<b># detects:</b> 18	<b>max:</b> 1,812 cu.m
<b># non-detects:</b> 12	<b>avg:</b> 832 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 24,973 cu.m

**10 Emma Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 2,325
<b># detects:</b> 30	<b>max:</b> 2,502 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 2,483 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 74,501 cu.m

**11 Membro Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 104
<b># detects:</b> 30	<b>max:</b> 4,439 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 4,028 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 120,840 cu.m

**12 Helmar Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 476
<b># detects:</b> 30	<b>max:</b> 1,259 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,066 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 31,993 cu.m

**13 Paisley Well Daily Total Volume (Inline Instrument)**

**# samples:** 30                    **min:** 1,080  
**# detects:** 30                   **max:** 1,221 cu.m  
**# non-detects:** 0               **avg:** 1,191 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 35,724 cu.m

**13a Paisley Discharge Volume (Inline Instrument)**

**# samples:** 30                    **min:** 4,260  
**# detects:** 30                   **max:** 6,700 cu.m  
**# non-detects:** 0               **avg:** 5,938 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 178,150 cu.m

**14 Clythe Well Daily Total Volume (Inline Instrument)**

**# samples:** 30                    **min:** 0  
**# detects:** 0                    **max:** 0 cu.m  
**# non-detects:** 30               **avg:** 0 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 0 cu.m

**14a Clythe Discharge Volume (Inline Instrument)**

**# samples:** 30                    **min:** 3,423  
**# detects:** 30                   **max:** 4,507 cu.m  
**# non-detects:** 0               **avg:** 3,738 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 112,125 cu.m

**17 Carter Daily Total Volume (Inline Instrument)**

**# samples:** 30                    **min:** 0  
**# detects:** 27                   **max:** 6,430 cu.m  
**# non-detects:** 3                **avg:** 3,708 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 111,247 cu.m

**18 Arkell No. 1 Daily Total Volume (Inline Instrument)**

**# samples:** 30                    **min:** 0  
**# detects:** 28                    **max:** 1,453 cu.m  
**# non-detects:** 2                **avg:** 1,117 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 33,516 cu.m

**19 Arkell No. 6 Daily Total Volume (Inline Instrument)**

**# samples:** 30                    **min:** 2,509  
**# detects:** 30                    **max:** 4,907 cu.m  
**# non-detects:** 0                **avg:** 3,908 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 117,241 cu.m

**20 Arkell No. 7 Daily Total Volume (Inline Instrument)**

**# samples:** 30                    **min:** 1,984  
**# detects:** 30                    **max:** 4,645 cu.m  
**# non-detects:** 0                **avg:** 3,522 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 105,654 cu.m

**21 Arkell No. 8 Daily Total Volume (Inline Instrument)**

**# samples:** 30                    **min:** 1,280  
**# detects:** 30                   **max:** 4,570 cu.m  
**# non-detects:** 0               **avg:** 3,049 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 91,480 cu.m

**24 Arkell Collector Daily Total Volume (23-22) (Inline Instrument)**

**# samples:** 30                    **min:** 6,272  
**# detects:** 30                   **max:** 12,857 cu.m  
**# non-detects:** 0               **avg:** 8,944 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 268,314 cu.m

**25 Recharge Pump Daily Total Volume (Inline Instrument)**

**# samples:** 30                    **min:** 0  
**# detects:** 14                   **max:** 8,519 cu.m  
**# non-detects:** 16              **avg:** 3,533 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 106,003 cu.m

**26 Robertson Discharge Daily Total Volume (Inline Instrument)**

**# samples:** 30                    **min:** 2,347  
**# detects:** 30                   **max:** 5,591 cu.m  
**# non-detects:** 0               **avg:** 3,318 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 99,535 cu.m

**Notes:**

*Result: P=present, A=absent, PR=presumptive, ND=not detected, OR=over range, OG=overgrown, NR=no result, NT=not tested  
"<" = less than detection limit shown*

">" = greater than upper range limit shown

"«" = less than number shown (Detected)

"»" = greater than number shown (Detected)

\* Criteria Exceeded

---

**TABLE U - Monthly Pumpage Summary, October 2005****Daily Pumpages**

---

Organization: **City of Guelph Waterworks**  
Water System: **Guelph Waterworks**  
Facility: **F. M. Woods Station**  
Sampling Point: **Daily Pumpages (10-WDP-IT, CC99)**  
**10/01/2005 to 10/31/2005 (mm/dd/yyyy)**

**01 Woods Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 13,910  
**# detects:** 31                   **max:** 25,790 cu.m  
**# non-detects:** 0               **avg:** 21,738 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 673,890 cu.m

**02 Park Daily Total Volume (Inline Instrument)**

**# samples:** 31                   **min:** 4,127  
**# detects:** 31                   **max:** 5,392 cu.m  
**# non-detects:** 0               **avg:** 5,073 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 157,271 cu.m

**03 Calico Daily Total Volume (Inline Instrument)**

**# samples:** 31                   **min:** 931  
**# detects:** 31                   **max:** 1,031 cu.m  
**# non-detects:** 0               **avg:** 988 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 30,642 cu.m

**04 Downey Daily Total Volume (Inline Instrument)**

**# samples:** 31                   **min:** 3,864  
**# detects:** 31                   **max:** 4,310 cu.m  
**# non-detects:** 0               **avg:** 3,974 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 123,194 cu.m

Daily Pumpages (10-WDP-IT, CC99) (Continued)

**05 Burkes Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 5,485
<b># detects:</b> 31	<b>max:</b> 5,988 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 5,769 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 178,830 cu.m

**06 University Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 1,644
<b># detects:</b> 31	<b>max:</b> 1,761 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,672 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 51,826 cu.m

**07 Dean Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 1,100
<b># detects:</b> 31	<b>max:</b> 1,288 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,228 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 38,070 cu.m

**08 Queensdale Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 120
<b># detects:</b> 31	<b>max:</b> 1,065 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 984 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 30,515 cu.m

**09 Water Street Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 0
<b># detects:</b> 19	<b>max:</b> 1,783 cu.m
<b># non-detects:</b> 12	<b>avg:</b> 842 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 26,097 cu.m

**10 Emma Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 2,206
<b># detects:</b> 31	<b>max:</b> 2,491 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 2,427 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 75,242 cu.m

**11 Membro Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 0
<b># detects:</b> 28	<b>max:</b> 4,342 cu.m
<b># non-detects:</b> 3	<b>avg:</b> 3,534 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 109,548 cu.m

**12 Helmar Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 0
<b># detects:</b> 30	<b>max:</b> 1,080 cu.m
<b># non-detects:</b> 1	<b>avg:</b> 928 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 28,753 cu.m

**13 Paisley Well Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 526  
**# detects:** 31                   **max:** 1,323 cu.m  
**# non-detects:** 0                **avg:** 1,238 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 38,365 cu.m

**13a Paisley Discharge Volume (Inline Instrument)**

**# samples:** 31                    **min:** 4,770  
**# detects:** 31                   **max:** 7,420 cu.m  
**# non-detects:** 0                **avg:** 6,271 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 194,400 cu.m

**14 Clythe Well Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 0  
**# detects:** 0                    **max:** 0 cu.m  
**# non-detects:** 31                **avg:** 0 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 0 cu.m

**14a Clythe Discharge Volume (Inline Instrument)**

**# samples:** 31                    **min:** 3,370  
**# detects:** 31                   **max:** 4,383 cu.m  
**# non-detects:** 0                **avg:** 3,721 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 115,354 cu.m

**17 Carter Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 0
<b># detects:</b> 13	<b>max:</b> 6,320 cu.m
<b># non-detects:</b> 18	<b>avg:</b> 1,105 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 34,260 cu.m

**18 Arkell No. 1 Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 0
<b># detects:</b> 9	<b>max:</b> 1,419 cu.m
<b># non-detects:</b> 22	<b>avg:</b> 195 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 6,059 cu.m

**19 Arkell No. 6 Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 0
<b># detects:</b> 30	<b>max:</b> 4,951 cu.m
<b># non-detects:</b> 1	<b>avg:</b> 3,703 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 114,783 cu.m

**20 Arkell No. 7 Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 1,658
<b># detects:</b> 31	<b>max:</b> 4,959 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 3,606 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 111,782 cu.m

**21 Arkell No. 8 Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 1,080
<b># detects:</b> 31	<b>max:</b> 4,870 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 3,188 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 98,830 cu.m

**24 Arkell Collector Daily Total Volume (23-22) (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 8,288
<b># detects:</b> 31	<b>max:</b> 11,948 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 11,100 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 344,103 cu.m

**25 Recharge Pump Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 7,440
<b># detects:</b> 31	<b>max:</b> 8,508 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 7,816 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 242,296 cu.m

**26 Robertson Discharge Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 1,675
<b># detects:</b> 31	<b>max:</b> 5,186 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 2,706 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 83,879 cu.m

**Notes:**

Result: P=present, A=absent, PR=presumptive, ND=not detected, OR=over range, OG=overgrown, NR=no result, NT=not tested  
"<" = less than detection limit shown

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**TABLE U - Monthly Pumpage Summary, October 2005**

**Daily Pumpages**

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">" = greater than upper range limit shown

"«" = less than number shown (Detected)

"»" = greater than number shown (Detected)

\* Criteria Exceeded

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**TABLE V - Monthly Pumpage Summary, November 2005****Daily Pumpages**

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Organization: **City of Guelph Waterworks**  
Water System: **Guelph Waterworks**  
Facility: **F. M. Woods Station**  
Sampling Point: **Daily Pumpages (10-WDP-IT, CC99)**  
**11/01/2005 to 11/30/2005 (mm/dd/yyyy)**

**01 Woods Daily Total Volume (Inline Instrument)**

**# samples:** 30                    **min:** 18,740  
**# detects:** 30                   **max:** 26,240 cu.m  
**# non-detects:** 0                **avg:** 23,368 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 701,050 cu.m

**02 Park Daily Total Volume (Inline Instrument)**

**# samples:** 30                    **min:** 4,826  
**# detects:** 30                   **max:** 5,510 cu.m  
**# non-detects:** 0                **avg:** 5,238 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 157,147 cu.m

**03 Calico Daily Total Volume (Inline Instrument)**

**# samples:** 30                    **min:** 813  
**# detects:** 30                   **max:** 1,064 cu.m  
**# non-detects:** 0                **avg:** 1,021 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 30,634 cu.m

**04 Downey Daily Total Volume (Inline Instrument)**

**# samples:** 30                    **min:** 0  
**# detects:** 7                    **max:** 4,143 cu.m  
**# non-detects:** 23               **avg:** 836 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 25,071 cu.m

Daily Pumpages (10-WDP-IT, CC99) (Continued)

**05 Burkes Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 5,694
<b># detects:</b> 30	<b>max:</b> 5,822 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 5,780 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 173,411 cu.m

**06 University Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 1,635
<b># detects:</b> 30	<b>max:</b> 1,710 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,681 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 50,416 cu.m

**07 Dean Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 1,110
<b># detects:</b> 30	<b>max:</b> 1,311 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,232 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 36,971 cu.m

**08 Queensdale Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 955
<b># detects:</b> 30	<b>max:</b> 1,026 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 979 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 29,378 cu.m

**09 Water Street Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 0
<b># detects:</b> 20	<b>max:</b> 1,832 cu.m
<b># non-detects:</b> 10	<b>avg:</b> 895 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 26,857 cu.m

**10 Emma Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 2,381
<b># detects:</b> 30	<b>max:</b> 2,505 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 2,463 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 73,904 cu.m

**11 Membro Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 1,217
<b># detects:</b> 30	<b>max:</b> 4,362 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 3,995 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 119,855 cu.m

**12 Helmar Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 960
<b># detects:</b> 30	<b>max:</b> 1,095 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,071 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 32,134 cu.m

**13 Paisley Well Daily Total Volume (Inline Instrument)**

**# samples:** 30                    **min:** 1,046  
**# detects:** 30                   **max:** 1,324 cu.m  
**# non-detects:** 0                **avg:** 1,258 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 37,729 cu.m

**13a Paisley Discharge Volume (Inline Instrument)**

**# samples:** 30                    **min:** 4,040  
**# detects:** 30                   **max:** 6,580 cu.m  
**# non-detects:** 0                **avg:** 5,326 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 159,793 cu.m

**14 Clythe Well Daily Total Volume (Inline Instrument)**

**# samples:** 30                    **min:** 0  
**# detects:** 0                    **max:** 0 cu.m  
**# non-detects:** 30               **avg:** 0 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 0 cu.m

**14a Clythe Discharge Volume (Inline Instrument)**

**# samples:** 30                    **min:** 2,201  
**# detects:** 30                   **max:** 4,046 cu.m  
**# non-detects:** 0                **avg:** 3,543 cu.m (based on 30 numerical results)  
**# exceedances:** 0               **total:** 106,290 cu.m

**17 Carter Daily Total Volume (Inline Instrument)**

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**TABLE V - Monthly Pumpage Summary, November 2005****Daily Pumpages**

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<b># samples:</b> 30	<b>min:</b> 0
<b># detects:</b> 23	<b>max:</b> 6,070 cu.m
<b># non-detects:</b> 7	<b>avg:</b> 2,241 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 67,221 cu.m

**18 Arkell No. 1 Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 0
<b># detects:</b> 10	<b>max:</b> 1,415 cu.m
<b># non-detects:</b> 20	<b>avg:</b> 231 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 6,942 cu.m

**19 Arkell No. 6 Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 0
<b># detects:</b> 29	<b>max:</b> 5,740 cu.m
<b># non-detects:</b> 1	<b>avg:</b> 4,367 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 131,013 cu.m

**20 Arkell No. 7 Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 2,485
<b># detects:</b> 30	<b>max:</b> 5,451 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 4,586 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 137,586 cu.m

**21 Arkell No. 8 Daily Total Volume (Inline Instrument)**

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**TABLE V - Monthly Pumpage Summary, November 2005****Daily Pumpages**

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<b># samples:</b> 30	<b>min:</b> 2,600
<b># detects:</b> 30	<b>max:</b> 5,340 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 4,277 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 128,310 cu.m

**24 Arkell Collector Daily Total Volume (23-22) (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 6,566
<b># detects:</b> 30	<b>max:</b> 11,958 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 9,148 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 274,444 cu.m

**25 Recharge Pump Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 0
<b># detects:</b> 15	<b>max:</b> 8,191 cu.m
<b># non-detects:</b> 15	<b>avg:</b> 3,271 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 98,124 cu.m

**26 Robertson Discharge Daily Total Volume (Inline Instrument)**

<b># samples:</b> 30	<b>min:</b> 2,644
<b># detects:</b> 30	<b>max:</b> 4,017 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 3,479 cu.m (based on 30 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 104,355 cu.m

**Notes:**

Result: P=present, A=absent, PR=presumptive, ND=not detected, OR=over range, OG=overgrown, NR=no result, NT=not tested  
"<" = less than detection limit shown

">" = greater than upper range limit shown

"«" = less than number shown (Detected)

"»" = greater than number shown (Detected)

\* Criteria Exceeded

Organization: **City of Guelph Waterworks**  
Water System: **Guelph Waterworks**  
Facility: **F. M. Woods Station**  
Sampling Point: **Daily Pumpages (10-WDP-IT, CC99)**  
**12/01/2005 to 12/31/2005 (mm/dd/yyyy)**

**01 Woods Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 13,300  
**# detects:** 31                   **max:** 26,400 cu.m  
**# non-detects:** 0                **avg:** 21,805 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 675,960 cu.m

**02 Park Daily Total Volume (Inline Instrument)**

**# samples:** 31                   **min:** 4,949  
**# detects:** 31                   **max:** 5,266 cu.m  
**# non-detects:** 0                **avg:** 5,209 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 161,467 cu.m

**03 Calico Daily Total Volume (Inline Instrument)**

**# samples:** 31                   **min:** 956  
**# detects:** 31                   **max:** 1,054 cu.m  
**# non-detects:** 0                **avg:** 1,004 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 31,139 cu.m

**04 Downey Daily Total Volume (Inline Instrument)**

**# samples:** 31                   **min:** 0  
**# detects:** 0                    **max:** 0 cu.m  
**# non-detects:** 31               **avg:** 0 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 0 cu.m

Daily Pumpages (10-WDP-IT, CC99) (Continued)

**05 Burkes Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 5,516
<b># detects:</b> 31	<b>max:</b> 5,831 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 5,775 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 179,019 cu.m

**06 University Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 1,639
<b># detects:</b> 31	<b>max:</b> 1,736 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,683 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 52,163 cu.m

**07 Dean Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 1,242
<b># detects:</b> 31	<b>max:</b> 1,311 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,278 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 39,611 cu.m

**08 Queensdale Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 933
<b># detects:</b> 31	<b>max:</b> 1,078 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 983 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 30,486 cu.m

**09 Water Street Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 0
<b># detects:</b> 23	<b>max:</b> 1,771 cu.m
<b># non-detects:</b> 8	<b>avg:</b> 1,176 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 36,456 cu.m

**10 Emma Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 2,480
<b># detects:</b> 31	<b>max:</b> 2,497 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 2,493 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 77,284 cu.m

**11 Membro Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 3,955
<b># detects:</b> 31	<b>max:</b> 4,334 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 4,208 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 130,441 cu.m

**12 Helmar Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 1,080
<b># detects:</b> 31	<b>max:</b> 1,104 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 1,093 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 33,894 cu.m

**13 Paisley Well Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 1,314  
**# detects:** 31                   **max:** 1,325 cu.m  
**# non-detects:** 0                **avg:** 1,322 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 40,969 cu.m

**13a Paisley Discharge Volume (Inline Instrument)**

**# samples:** 31                    **min:** 2,950  
**# detects:** 31                   **max:** 6,210 cu.m  
**# non-detects:** 0                **avg:** 4,717 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 146,230 cu.m

**14 Clythe Well Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 0  
**# detects:** 0                    **max:** 0 cu.m  
**# non-detects:** 31                **avg:** 0 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 0 cu.m

**14a Clythe Discharge Volume (Inline Instrument)**

**# samples:** 31                    **min:** 3,385  
**# detects:** 31                   **max:** 4,193 cu.m  
**# non-detects:** 0                **avg:** 3,656 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 113,346 cu.m

**17 Carter Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 0
<b># detects:</b> 20	<b>max:</b> 6,100 cu.m
<b># non-detects:</b> 11	<b>avg:</b> 2,158 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 66,887 cu.m

**18 Arkell No. 1 Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 0
<b># detects:</b> 22	<b>max:</b> 1,414 cu.m
<b># non-detects:</b> 9	<b>avg:</b> 614 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 19,031 cu.m

**19 Arkell No. 6 Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 0
<b># detects:</b> 26	<b>max:</b> 6,173 cu.m
<b># non-detects:</b> 5	<b>avg:</b> 4,089 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 126,753 cu.m

**20 Arkell No. 7 Daily Total Volume (Inline Instrument)**

<b># samples:</b> 31	<b>min:</b> 3,721
<b># detects:</b> 31	<b>max:</b> 6,234 cu.m
<b># non-detects:</b> 0	<b>avg:</b> 5,238 cu.m (based on 31 numerical results)
<b># exceedances:</b> 0	<b>total:</b> 162,388 cu.m

**21 Arkell No. 8 Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 3,330  
**# detects:** 31                   **max:** 6,390 cu.m  
**# non-detects:** 0                **avg:** 5,028 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 155,870 cu.m

**24 Arkell Collector Daily Total Volume (23-22) (Inline Instrument)**

**# samples:** 31                    **min:** 5,248  
**# detects:** 31                   **max:** 8,975 cu.m  
**# non-detects:** 0                **avg:** 6,040 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 187,242 cu.m

**25 Recharge Pump Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 0  
**# detects:** 0                    **max:** 0 cu.m  
**# non-detects:** 31                **avg:** 0 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 0 cu.m

**26 Robertson Discharge Daily Total Volume (Inline Instrument)**

**# samples:** 31                    **min:** 3,050  
**# detects:** 31                   **max:** 5,659 cu.m  
**# non-detects:** 0                **avg:** 3,749 cu.m (based on 31 numerical results)  
**# exceedances:** 0               **total:** 116,229 cu.m

**Notes:**

*Result: P=present, A=absent, PR=presumptive, ND=not detected, OR=over range, OG=overgrown, NR=no result, NT=not tested  
"<" = less than detection limit shown*

">" = greater than upper range limit shown

"«" = less than number shown (Detected)

"»" = greater than number shown (Detected)

\* Criteria Exceeded

APPENDIX C  
2005 MONTHLY MAXIMUM INSTANTANEOUS FLOW



**Table X - 2005 Guelph Well Supply (WW220000095) Monthly Maximum Flow Rate in Litres Per Second**

	<b>Arkell 1</b>	<b>Arkell 6</b>	<b>Arkell 7</b>	<b>Arkell 8</b>	<b>Arkell Collectors</b>	<b>Arkell Recharge</b>	<b>Carter</b>	<b>Robertson</b>
<b>Capacity (L/s)</b>	<b>56.8</b>	<b>113.7</b>	<b>113.7</b>	<b>113.7</b>	<b>433.3</b>	<b>N/A</b>	<b>136.4</b>	<b>83.3</b>
January 2005	20.3	74.1	73.6	72.9	133.0	0.0	60.0	88.9
February 2005	23.3	74.6	74.9	75.1	197.0	0.0	72.5	149.0
March 2005	21.8	74.6	72.4	73.9	129.0	0.0	80.0	95.5
April 2005	21.9	75.4	74.4	75.0	196.1	108.7	75.0	87.2
May 2005	22.3	74.0	74.0	73.7	205.8	99.0	43.3	86.2
June 2005	22.1	75.2	74.1	74.2	170.0	95.4	76.7	88.0
July 2005	21.2	75.6	73.8	74.8	158.0	104.5	76.7	87.4
August 2005	22.0	75.1	73.9	73.9	175.0	88.0	74.0	88.9
September 2005	17.0	74.6	74.7	74.6	182.3	141.0	84.0	88.2
October 2005	16.8	74.5	74.4	74.7	235.0	96.0	74.0	84.1
November 2005	16.7	73.6	74.4	74.6	199.0	120.0	76.0	84.6
December 2005	16.7	75.8	75.0	74.6	138.0	0.0	75.0	90.7
	<b>Burke</b>	<b>Calico</b>	<b>Clythe Well</b>	<b>Clythe Booster</b>	<b>Dean</b>	<b>Downey</b>	<b>Emma</b>	<b>Helmar</b>
<b>Capacity (L/s)</b>	<b>113.7</b>	<b>90.9</b>	<b>90.9</b>	<b>189</b>	<b>39.9</b>	<b>90.9</b>	<b>53.8</b>	<b>56.8</b>
January 2005	66.5	12.0	0.0	47.1	16.9	50.1	0.0	15.6
February 2005	69.1	12.3	0.0	0.0	16.9	50.1	0.0	16.4
March 2005	73.1	12.9	0.0	50.0	16.6	53.6	32.2	16.5
April 2005	72.0	12.3	0.0	0.0	16.5	50.8	30.4	19.8
May 2005	71.0	13.4	0.0	66.5	20.0	52.3	31.0	15.0
June 2005	74.0	12.9	0.0	66.6	16.4	60.8	30.2	13.7
July 2005	71.6	12.6	0.0	67.7	16.4	50.0	30.1	14.0
August 2005	70.0	11.8	0.0	67.0	16.6	49.4	29.9	19.0
September 2005	69.8	12.6	0.0	66.2	16.5	48.3	29.8	15.1
October 2005	71.6	11.9	0.0	63.3	15.2	49.6	30.0	12.9
November 2005	69.2	12.4	0.0	68.3	17.0	50.4	28.9	13.4
December 2005	69.5	13.0	0.0	67.1	17.8	0.0	28.9	13.5
	<b>Membro</b>	<b>Paisley Well</b>	<b>Paisley Booster</b>	<b>Park</b>	<b>Queensdale</b>	<b>University</b>	<b>Water</b>	<b>Woods</b>
<b>Capacity (L/s)</b>	<b>105</b>	<b>55.6</b>	<b>511</b>	<b>178.8</b>	<b>90.9</b>	<b>57.3</b>	<b>59</b>	<b>1,592</b>
January 2005	54.2	15.6	110.0	0.0	17.8	20.7	23.4	547.0
February 2005	61.5	15.6	120.0	0.0	15.7	20.5	25.8	601.0
March 2005	65.3	15.5	120.0	62.5	15.2	20.1	21.1	580.0
April 2005	64.9	14.9	160.0	107.9	15.6	20.3	0.0	586.0
May 2005	57.5	17.7	110.0	75.2	15.6	21.0	20.9	699.0
June 2005	61.3	16.2	110.0	69.6	14.5	21.2	25.3	669.0
July 2005	62.9	17.1	100.0	67.3	14.6	20.7	24.1	574.0
August 2005	59.2	14.9	100.0	73.4	17.8	20.2	23.7	470.0
September 2005	58.7	14.8	93.0	62.1	12.6	20.2	23.5	472.0
October 2005	59.2	19.6	110.0	65.0	17.2	20.3	23.2	459.0
November 2005	58.0	19.7	110.0	64.1	17.5	20.8	22.9	488.0
December 2005	58.8	13.4	110.0	62.5	13.4	25.3	22.8	463.0