



CITY OF GUELPH

2006 to 2014 IWA Water Audit and Water Balance Results

Final Report

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Summary of Gathered Data

IWA Water Balance Totals	2006	2007	2008	2009	2010	2011	2012	2013	2014
Annual Water Pumped (m ³)	18,756,338	18,616,944	17,772,368	17,739,851	17,677,837	17,378,451	16,559,330	16,220,762	16,695,678
				Propellor meter pumpages were replaced with the more accurate magnetic meters' pumpages for Woods Station.					
Source Meter Inaccuracies (m ³)	174,434	173,138	+ 358,292	- 117,693	- 94,206	- 49,086	+ 35,119	- 122,526	+ 5,924
Bulk Water Supply Export and Import (m ³)	0	0	0	0	0	0	0	0	0
Billed Metered Consumption (m ³)	15,923,355	15,763,551	14,783,455	14,171,873	14,088,084	14,410,948	14,168,469	13,919,074	14,440,136*
				(Data grossly adjusted from billed use to actual use; seasonal meters included)					
Billed Unmetered Consumption (m ³)	15,912	20,800	0	0	38,555	29,615	0	0	0
					Ice rinks billed.				
Unbilled Metered Consumption (m ³)	0	44,652	94,920	111,767	59,673	1,872	0	0	17,302
Unbilled Unmetered Consumption (m ³)	53,973	71,930	49,775	73,098	56,120	101,957	178,489	169,756	212,874
Unauthorised Consumption (m ³)	94,653	93,950	45,327	44,055	43,959	43,323	41,486	40,246	41,754
				Formula was corrected.					
Number of Customer Meters	35,400	36,500	37,706	38,364	39,208	40,052	40,603	41,233	41,644

Customer Meter Inaccuracies (under registering)	4.63%	4.63%	4.30%	4.30%	4.30%	4.30%	4.30%	4.30%	4.30%
Length of Network – Mains (km)	506.1	517	532	531.5	531.6	547	544.6	539.2	548.3
			Aquaduct excluded and Gazor-Mooney is included.						
Avg. Length of Services (Curb Stop - Customer Meter)	9.8 m	9.8 m	9.8 m	9.8 m	9.8 m	9.8 m	9.8 m	9.8 m	9.8 m
Pressure in Distribution System	42 m	42 m	42 m	42 m	42 m	42 m	42 m	42 m	42 m
Financial Data - Customer Rate per m ³ water only; per m ³ water and wastewater	\$0.690	\$0.75	\$0.82 \$1.70	\$0.97 \$2.02	\$1.07 \$2.22	\$1.17 \$2.43	\$1.30 \$2.71	\$1.38 \$2.90	\$1.43 \$3.02
Water Production Cost per m ³		\$0.1316	\$0.142	\$0.144	\$0.1775	\$0.1727	\$0.1803	\$0.1788	\$0.2066
<i>Variable Production Cost per m³ of water</i>	\$0.0612	\$0.0612	\$0.0608	\$0.0629	\$0.0660	\$0.0691	\$0.0689	\$0.0766	\$0.0896
<i>Fixed Production Cost per m³ of water</i>	\$0.1277	\$0.1277	\$0.0812	\$0.0821	\$0.1115	\$0.1036	\$0.1113	\$0.1022	\$0.1169

IWA Software Analysis

Parameter	Value								
	2006	2007	2008	2009	2010	2011	2012	2013	2014
Current Annual Real Losses (CARL) (ML)	2,030	1,988	2,488	2,580	2,661	2,058	1,534	1,309	1,304
Unavoidable Annual Real Losses (UARL) (ML)	707	727	755	765	778	796	805	813	822
Infrastructure Leakage Index (ILI)	2.87	2.73	3.3	3.37	3.42	2.58	1.91	1.61	1.59
System Input Volume (ML)	18,931	18,790	18,130	17,622	17,584	17,329	16,594	16,098	16,702
Revenue Water (ML)	15,939	15,784	14,783	14,172	14,127	14,440	14,169	13,919	14,440
Non-Revenue Water (ML)	2,992	3,006	3,347	3,450	3,457	2,888	2,426	2,179	2,262
Volume of Non-Revenue Water - % of System Input Volume	15.8%	16.0%	18.5%	19.6%	19.7%	16.9%	14.6%	13.5%	13.5%

NOTES:

Data from 2008 to 2012 was reviewed and updated entirely in March 2014.

DEFINITIONS:

- Source Meter Inaccuracy – positive numbers indicate an under-registry; negative numbers indicate over-registry.
- Billed Metered Consumption – 2006 to 2013 all values determined by converting revenue dollars to volume. Therefore, any back-billing for meters not registering is included, however, rate changes that occurred in March within years of new Council were not incorporated.
*2014 value determined using the consumption as indicated in the Hydro Meter Reading Database, as this value is more accurate due to the unbilled metered water use resulting from Frozen Services in 2014. This value does not include any back-billing for meters not registering as the volume of water associated with this is not available.
- Current Annual Real Losses includes Water Supplied - Authorized Consumption – Unauthorized Consumption – Customer metering inaccuracies – Systematic data handling errors. The last three components of this equation make up the “Apparent Losses”.

- Unavoidable Annual Real Losses comes from the AWWA software. It is a theoretical reference value representing the technical low limit of leakage that could be achieved if all of today's best technology could be successfully applied. It takes into consideration length of mains, number of service connections, total length of customer service lines, and pressure in the system.
- System Input Volume = Annual Water Pumped – Source Meter Inaccuracies
- Revenue Water = Billed Metered Consumption + Billed Unmetered Consumption
- Non-Revenue Water = Unbilled Metered Consumption + Unbilled Unmetered Consumption + Unauthorized Consumption + Customer Metering Inaccuracies + Systematic Data Handling Errors + Real Losses
- Volume of Non-Revenue Water - % of System Input Volume = Non-Revenue Water / System Input Volume