

Water Production & Metered Consumption History 2006 - 2014

Background

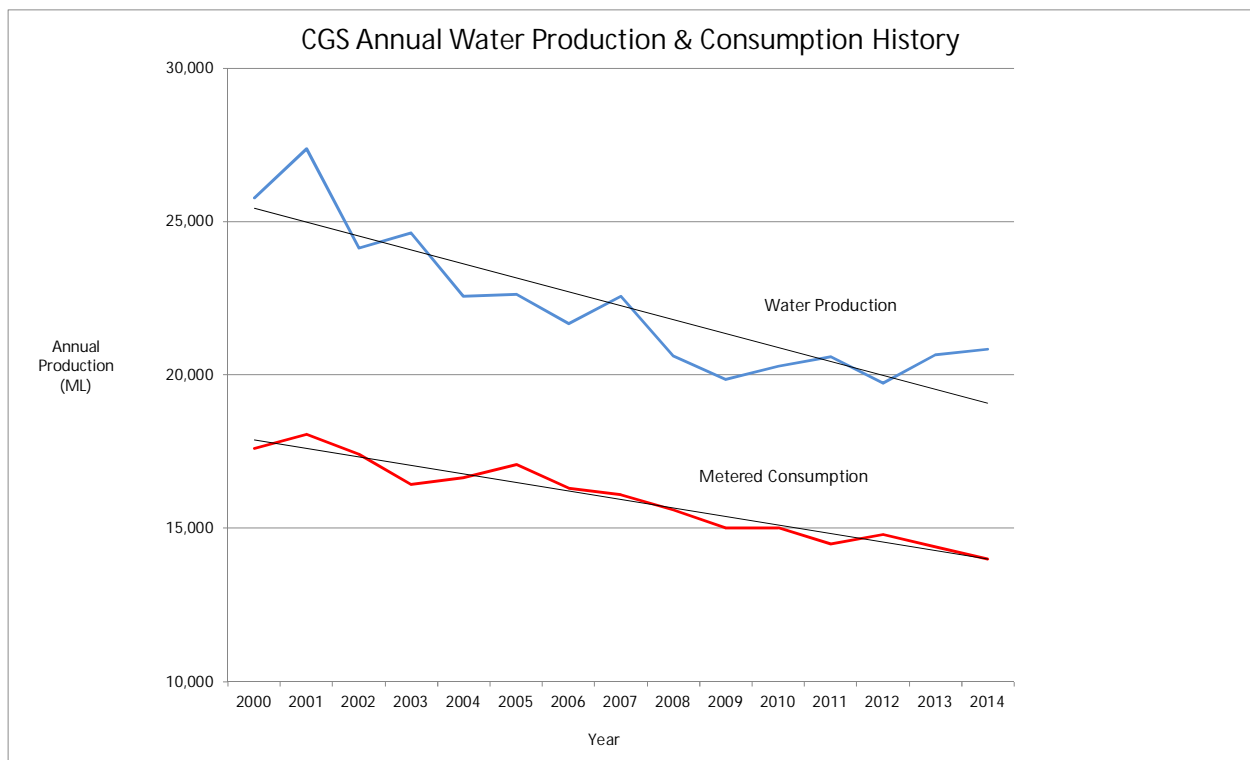
The purpose of this report is to address a budget 'parking lot' request to update Council on the historical pattern of water production and metered consumption recorded in CGS' 8 potable water systems.

Differences between Plant production and metered consumption is often referenced as non-revenue water. Some of that water difference is a necessary cost of operating the water system, such as fighting fires or maintaining high quality water through flushing pipes. Some differences are less desirable, such as watermain breaks and are referred to as "water loss"

Gaps between water production and consumption are a common problem observed in most public water supply systems in Ontario. It is desirable to reduce the volume of loss because the costs for variable resources such as energy and chemicals used to produce the water still need to be covered by the overall water rates. It is not possible to accurately determine the volumes of water within the various categories of non-revenue water.

Production & Consumption Trends

The trends for the period 2000 – 2014 are depicted in the graph below:



The data in Table 1 below indicates that during this period the values range from a low of 24% to a high of 34% with an average difference between production and metered consumption of 28%.

Table 1 – CGS Water Production & Consumption Data

Year	Production (ML)	Metered Consumption (ML)	Difference (%)
2000	25,780	17,604	32
2001	27,374	18,073	34
2002	24,135	17,416	28
2003	24,624	16,421	33
2004	22,566	16,636	26
2005	22,626	17,092	24
2006	21,654	16,300	25
2007	22,566	16,100	29
2008	20,621	15,600	24
2009	19,857	15,000	24
2010	20,274	15,000	26
2011	20,594	14,500	30
2012	19,726	14,800	25
2013	20,646	14,400	30
2014	20,834	14,000	33

Reasons for Differences between Production and Metered Consumption:

The American Water Works Association defines & lists several categories of production water losses that form non-revenue water including:

- Unbilled Authorized Consumption – the volume taken by registered customers, the water supplier, and others authorized to do so;
 - Unbilled Metered Consumption – ie. system flushing & maintenance activities, maintaining minimum chlorine residuals and reducing frequency of brown water events.
 - Unbilled Unmetered Consumption – ie. fire fighting & practice
- Apparent Losses
 - Unauthorized Consumption – theft, unauthorized use of hydrants
 - Customer Metering Inaccuracies – ie. meter errors
 - Systemic Data Handling Errors
- Real Losses
 - Leakage on Transmission & Distribution Mains
 - Leakage and overflows on water storage facilities
 - Leakage on service connections prior to the meter

Factors Influencing Losses:

- Age & condition of linear public infrastructure – The average age of CGS infrastructure is 48 years and as infrastructure ages more resources including flushing water are required for maintenance activities such as flushing hydrants to maintain compliance with regulations & quality parameters. Also, leaks and water main breaks tend to become more frequent occurrences as systems age.
- Age & condition of private service connections – Aging private infrastructure is also more prone to leaks and losses occur when leaks occur before the water is metered;
- Extreme Weather Events – Extreme weather events mean that many customers run water to prevent freezing service lines and although much of that water is authorized a portion of is unbilled. Extreme weather also correlates to increased breaks where water is lost as well.

Loss Control:

Reducing the gap between production and consumption is an ongoing task for CGS Water & Wastewater Services. Staff plans to continue loss reduction programs in the future. Ultimately reinvestment in infrastructure renewal will be the key tool in making significant long term and sustained gains in loss control.