

Reducing Peak Water Use in Guelph

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The challenge faced by municipal water providers during a drought involves the balancing of peak water demand with water supply capacity, while at the same time complying with related provincial legislation. In response to drought conditions in the late 1990s, the Province of Ontario enacted the Ontario Low Water Response Plan (OLWRP) in 2000. The OLWRP is triggered by local drought conditions and provides a tiered framework of voluntary and mandatory water use restrictions for major water users. The OLWRP was implemented in Ontario during the dry summers of 2001 and 2002.

Issues raised by Guelph's watering ban in 2001 and the directives of the OLWRP led Guelph Waterworks to re-evaluate the City's approach to managing outside water use and create a comprehensive Outside Water Use Program (OWUP) in 2002. The OWUP consists of colour coded levels of water use restrictions that correspond with levels defined in the OLWRP. The following is a brief summary outlining project development and implementation.

The Guelph Water Supply

The City of Guelph, with a population of 110,000, is located within the Grand River watershed. Although two rivers – the Speed and the Eramosa – run through the city, Guelph relies wholly on groundwater as the source of municipal water supply. This supply consists of 23 groundwater wells, a shallow groundwater collector system, and an artificial recharge system drawing water from the Eramosa River. The collector and recharge systems and a number of wells draw water from shal-

lower aquifers. The capacity of these shallow aquifers is reduced by the lack of recharge that occurs during times of drought.

The water system rated capacity is 75,000 cubic metres per day; however, with quality degradation and the last six years of drought, effective capacity is approximately 63,000 cubic metres per day.

The Recent Drought

Portions of the Grand River watershed have experienced severe drought over the last six years. These drought conditions are similar to those experienced in the 1930s. The precipitation deficit in the Guelph area is almost 500 millimetres. 2002 was the second consecutive year of historic low flows in the Speed and Eramosa Rivers. In 2002, levels in the Upper Speed and Eramosa Rivers met the Level III streamflow triggers of the OLWRP (Figure 1). These levels were

the lowest recorded since monitoring began in the 1960s.

Customer Water Demand

Guelph average day water demand is approximately 54,000 cubic metres per day, with about half of this demand generated by residential customers. In the last few years, peak demand has reached 74,000 cubic metres per day prior to the implementation of watering bans. Without watering bans, and based on the experience of municipal neighbours, it is anticipated that peak demands might double average day demands.



2001 Response to the OLWRP

Guelph Waterworks currently holds 23 provincial Permits To Take Water. Most permits contain conditions allowing the province to reduce the amount of water taken during times of drought. Guelph received a provincial request to reduce water use by 20% in August 2001 and subse-

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quently implemented a lawn watering ban as part of the outside use program at the time (Alternate Day Lawn Watering with Time Restrictions). Although peak water use was reduced, municipal politicians and customers were dissatisfied with the implementation and enforcement of the ban.

Demand Management

With continued drought driving an increase in customer outside water use, a solution was needed to help balance peak demand with available supply capacity. Guelph Waterworks believes peak demand management through a comprehensive OWUP is the solution. Although demand management programs have the potential to create customer discontent and lower water sales revenue, they are an effective, efficient, and environmentally sustainable means to match water demand with supply. Unlike past programs, the new OWUP would provide a long term, goal driven solution.

The following four goals were confirmed for the OWUP:

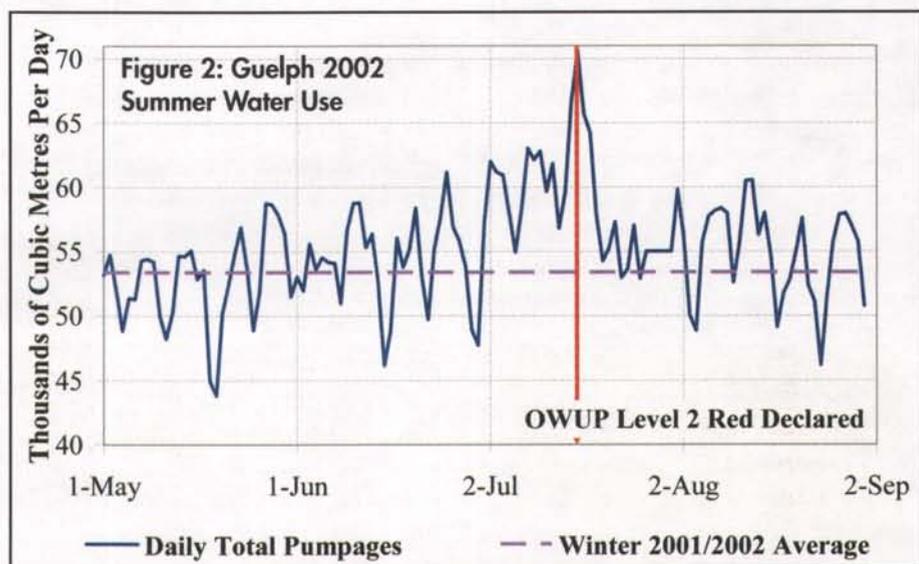
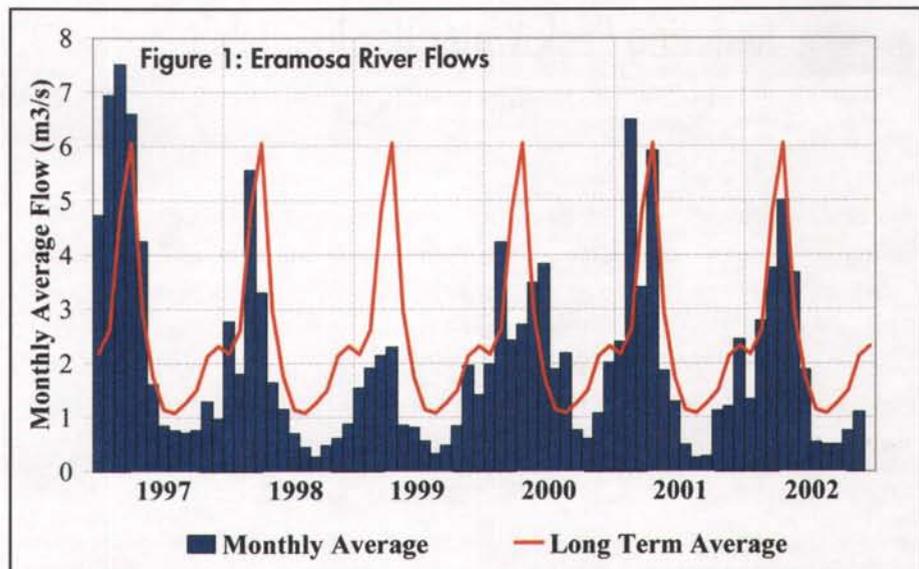
- Focus on non-essential water use;
- Support environmental sustainability through the OLWRP;
- Support program effectiveness, fairness, and practicality; and
- Minimize regulating commercially driven outside water use.

Program Enforcement

The most controversial aspect of previous watering bans in Guelph was the lack of program enforcement. Some customers who voluntarily comply with watering bans will not tolerate the non-compliance of one of their neighbours. Lax enforcement of the program was perceived as part of the problem.

Under the enhanced OWUP and supporting by-law, customers can be charged for the following, most frequent water wasting activities:

- Over watering;
- Irrigating and needless washing of paved surfaces;
- Watering in the rain;
- Leaking ponds and fountains;
- Non-recirculation of fill water in pools and fountains; and
- Vehicle washing with a running hose.



Program Success

In 2002, the OWUP was successful in reducing overall water use by more than 25% below historic peak levels and average day demands by 13% (Figure 2). The program kept over two hundred and fifty thousand cubic metres of groundwater in local groundwater aquifers; some of this water is buoying a stressed ecosystem and may be available for future municipal use. The OWUP also helped the City comply with a provincial requirement to reduce water use and avoid mandatory water use restrictions imposed under the OLWRP.

Future Improvements

Any program with the customer impact and complexity of the OWUP is best improved on a gradual basis. Planned improvements to the 2003 program in-

clude the addition of the ability to ticket for program non-compliance, tighter regulation of bulk water sales, the investigation of peak period pricing, piloting of residential cisterns, and piloting the use of wastewater effluent for irrigation.

Future improvements may address encouraging the development of more efficient irrigation systems; the installation of low water use grass and plants; efficiencies in recreational water use including private swimming pools; and applying the OWUP to river and private well takings. ♦

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