

**REPORT TO CORE AREA LIQUID WASTE MANAGEMENT COMMITTEE
MEETING OF WEDNESDAY, NOVEMBER 8, 2017**

SUBJECT **Low-Flow Household Appliances**

ISSUE

To present options for programs to encourage the installation of low-flow household appliances.

BACKGROUND

At the September 13, 2017 meeting of the Core Area Liquid Waste Management Committee, the five-year update on the Core Area Inflow and Infiltration Management Plan was presented. Overall sewer flow rates were discussed and it was debated whether further reductions can be achieved through some form of an incentive program to replace high-flow household appliances. Staff were directed to prepare a report to present options to encourage the installation of low-flow household appliances. To provide a technical perspective on the current and historical sewer flow rates and the potential for reductions through appliance replacements, staff requested the consulting firm Kerr Wood Leidal (KWL) provide a technical memo to analyze the local conditions and compare to other jurisdictions' experiences with incentive programs. The technical memo by KWL is attached as Appendix A.

In the CRD, between 1995 and 2017, per capita water use has been reduced by 27%. These significant efforts to reduce water consumption have resulted in the overall household usage being reduced by 21% despite the population increasing during that time. The reductions are primarily the result of the replacement of old water fixtures and appliances. This trend was driven by public education, changing building codes and incentive programs through the CRD's water conservation efforts. In particular, toilet flushing has historically been the largest residential end use of municipal water, accounting for roughly one quarter of indoor household water use. Changes in the building code have reduced toilet flush volumes from historical levels of 15 to 25 litres per flush, to 6 litres in 2005, and to 4.8 litres in 2012. Other low-flow fixtures (faucets, shower heads) and high-efficiency appliances (washing machines, dishwashers) have also contributed to significant reductions in water use.

It is estimated that between 1999 and 2016, the percentage of toilets classified as efficient increased from 5% to 60% in the CRD. For the same time period, the prevalence of efficient washing machines increased from 6% to approximately 50%. In some catchments, it's estimated that almost 100% of homes have converted to low-flow fixtures, as their per capita water use is similar to that of new construction. Looking forward, a significant number of toilets and washing machines continue to get replaced each year. This is based on the fact that the average lifespans of toilets and washing machines are 30 years and 15 years, respectively, and that replacements must meet plumbing code requirements for low-flow plumbing fixtures.

Under the Regional Water Supply service, the CRD offered rebates for the replacement of residential toilets with water-efficient fixtures between 1994 and 2009. A similar program for residential washing machines was offered between 2002 and 2009. The programs involved rebates of \$75 per toilet and \$125 per washing machine for those homes supplied with water from

the regional water supply. Rebate programs targeting non-residential fixtures, appliances and once-through cooling were offered between 2007 and 2015. In total, approximately 27,500 toilets and 14,000 residential washing machines were replaced under the CRD rebate programs. The total value of rebates issued was approximately \$2.1 million for toilets, and \$1.75 million for washing machines. Demand management program delivery cost was estimated at approximately \$1.1 million over the 15 years of the program, which also included public education and outreach initiatives that have continued since the rebate programs were discontinued.

Tied to decreasing water demand, wastewater flows have also decreased throughout the region, with some areas achieving significant reductions. For example, the Arbutus catchment, a large residential area in Saanich East that was an early adopter of low-flow fixtures, had per capita sewer volumes reduced from 260 to 160 litres per capita per day between 2000 and 2017. Given enough time, the entire region's residential sewer flows will reduce to similar levels as old appliances are replaced with low-flow versions.

ALTERNATIVES

That the Core Area Liquid Waste Management Committee recommend to the CRD Board:

Alternative 1

That staff be directed to continue with existing educational efforts that encourage the installation of low-flow household appliances.

Alternative 2

That the Board refer the consideration of re-instating incentive programming to encourage installation of low-flow household appliances to the Regional Water Supply Commission.

FINANCIAL IMPLICATIONS

There is no additional cost associated with the first alternative, as the costs of the ongoing educational efforts are covered by the Inflow and Infiltration and Demand Management Program budgets. For the second alternative, based on the previous incentive program, a similar program with similar uptake would be expected to cost approximately \$500,000 per year. However, the program cost could vary significantly based on the incentive details and the number of appliances replaced.

ENVIRONMENTAL IMPLICATIONS

Any reduction in water consumption and related sewer flows due to the installation of low-flow appliances would have a positive impact on the environment. Changes in the last 12 years to the building code and plumbing regulations will result in all "natural" appliance replacements having low-flow characteristics. This will result in all older high-flow appliances being replaced with low-flow versions over time. However, from a private property perspective, only minor improvements have been made to Inflow and Infiltration rates to date, whereas it has been identified that significant reductions are possible.

LEGAL IMPLICATIONS

With the exception of the City of Vancouver, local governments in BC do not have legal authority to impose more stringent requirements for building construction than those set out in the BC Building Code and the CRD has no legal means to regulate or enforce changes to the water efficiency of existing plumbing fixtures or appliances. Options for encouraging the installation of low-flow household appliances are considered limited to incentives (i.e., rebates) or through education.

SOCIAL IMPLICATIONS

Promotion of low-flow appliances would increase general awareness of the importance to reduce water consumption in the broader scope. However, given the efforts to date, including previous rebate programs, the relatively low average per capita sewer flows and the relatively high degree of conversion of existing stock to efficient fixtures and appliances, new rebate programs would be much less effective than the previous programs. The CRD is significantly ahead of the North American rate of conversion of existing building stock to water efficient fixtures due in part to past incentive programs and ongoing education and awareness programs.

CONCLUSION

Over recent decades, the efforts of the CRD, the core municipalities and the general population have resulted in a significant reduction in the sewer flows in the region. Further per capita reductions are expected to occur due to the various code requirements, educational efforts and the overall environmental approach of the population. It is thought that a new incentive program to replace high-flow appliances would be much less effective than the initial incentive program, but that a more engaged effort on reducing Inflow and Infiltration on private property can result in significant reductions in sewer flows.

RECOMMENDATION

That the Core Area Liquid Waste Management Committee recommend to the Capital Regional District Board:

That staff be directed to continue with existing educational efforts that encourage the installation of low-flow household appliances.

Submitted by:	Stephen May, P.Eng., Senior Manager, Facilities Management & Engineering Services
Concurrence:	Larisa Hutcheson, P.Eng., General Manager, Parks & Environmental Services
Concurrence:	Robert Lapham, MCIP, RPP, Chief Administrative Officer

Attachment: Appendix A – Technical Memorandum re Options to Encourage Installation of Low-Flow Household Appliances

SM:mr