

December 2010

Mayor Bratina and Members of Council,

For your consideration, enclosed is the 2011 Water, Wastewater and Storm Rate Budget and Services Overview.

As Hamilton endeavors to initiate a new phase in Water, Wastewater and Storm infrastructure investments, it is imperative that the approach considers and balances the financial ability of the community to continue to support safe and reliable services. Hamilton continues to proactively plan for the provision of water, wastewater and storm services, in an effort to facilitate economic prosperity, environmental stewardship, financial sustainability, and effective inter-governmental relationships.

This budget supports principles such as protecting key services, implementing efficiencies and cost avoidance, developing new revenue sources, and investing in infrastructure. In 2010, staff made efforts to manage a series of risks that continue to potentially impact the ability of the financing strategy to support the water, wastewater and storm programs.

The forecast 2010 actual water and wastewater revenues reflect negative trends that have been reported to Council for the third consecutive year. Projected 2010 metered and non-metered water and wastewater revenues are forecast to be approximately \$15 (which represents 7 million m<sup>3</sup>) below budget. Similarly, 2009 symbolized the impact of seasonal and economic influences resulting in actual water and wastewater revenues of approximately \$18 million lower than previously budgeted.

Today's economic crisis contributes to a series of risks in general. For instance, with respect to the pace of development in the short and medium term, Hamilton's current population growth is slower than projected in the Places to Grow Act. This may contribute to development charge shortfalls over the short term until such time as the development reaches budgeted levels.

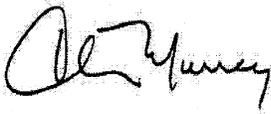
The City of Hamilton has been proactively working towards implementing reliable systems for future generations. The 2011 Rate Budget continues to support the priority of investing in capital improvements.

The remediation of Hamilton Harbour is crucial to the economic, environmental and social well-being of Hamilton. In 2011, we will be reinforcing our request for both levels of government to join us again and show their continued support and commitment to the wastewater system upgrades required to de-list the Harbour.

The 2011 Water, Wastewater and Storm Budget reflects Council's ongoing commitment and dedication over the past decade to implement a sustainable financing plan while bridging the divide between the funding shortfalls for necessary infrastructure with affordable water rates. This budget calls for a continued commitment through the adoption of a recommended rate increase of 4.25 per cent.

The Rate Budget and Services Overview is being distributed today to Council, the media and to the public. On Tuesday, January 11<sup>th</sup>, staff will provide Committee and the public with an information session including presentations from both Corporate Services and Public Works. First and foremost, this session will provide Committee members with the opportunity to ask questions concerning the 2011 Rate Budget and Services Overview.

We anticipate the budget presentations and deliberations will culminate in the approval of the 2011 Rate Budget by Council.



Chris Murray  
City Manager



Gerry Davis  
General Manager, CMA  
Public Works



Roberto Rossini  
General Manager  
Finance & Corporate Services

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# Water and Wastewater Overview

*Message from: Geoff Rae, Senior Director  
Environmental and Sustainable Infrastructure*

I am pleased to have joined the City of Hamilton in 2010, and look forward to serving the community over the coming years. While these prove to be challenging economic times, I am confident in the expertise of staff to create opportunities for success.

At the forefront of the Water and Wastewater portfolio is the expansion to the Woodward Avenue, Wastewater Treatment Plant. As a result of declining revenues, unexpected expenditures relating to wet weather and flooding, and the need to undertake a variety of other capital works on the water and wastewater system, the affordability of such a project remains a significant challenge. A number of energy retro-fits are well underway and staff continues to analyze traditional plant operation methods to identify opportunities to improve water quality in the drinking water system as well as wastewater effluent entering the Harbour.

Developing a sustainable level of funding for the stormwater system is a primary concern as the City works to mitigate flooding from wet weather events. As such, we will be moving forward in 2011 with the second phase of the Stormwater Rate Study to determine a potential method for fair and equitable funding of the City's stormwater management services.

The Public Works Department will continue its efforts to protect public health, property and the environment while providing sustainable water, wastewater and stormwater services to residents.

# Planning Strategically for Success

**Mandate:** *To Protect Public Health, Property and the Environment*

**Vision:** *To be recognized by our customers, stakeholders and peers as a “Centre of Environmental and Innovative Excellence” in the sustainable management of our water resources*

The City of Hamilton creates strategic plans to ensure the provision of its water and wastewater services for residents. In 2006, the Water and Wastewater Group created its first Strategic Business Plan. The Plan was recognized both internationally and provincially in 2010 for having particular strength in implementation and performance measures. While we are very proud of this success we understand the importance of continual improvement to further leverage our strategic planning process and areas of expertise as we move into the New Year.

Strategic Business Plans are essential as economic times dictate prudent decision making respecting capital investments. In addition, we must ensure that our water and wastewater operations are functioning in the most efficient and effective manner possible.

Our Operational Objectives are integral pieces of the plan and guide our efforts towards achieving our goals, vision and mandate.

## *A Year in Review*

2010 has provided a number of challenges for the Public Works Department and the City as a whole. It is through the strength of our planning processes that we have been able to successfully meet our obligations in the face of internal and external pressures. It is owing to the knowledge and professionalism of staff that we have been able to succeed.

In 2010 the City continued to deal with extreme weather conditions associated with climate change and successfully implemented the Protective Plumbing Program (3P) to assist over 1,800 property owners who suffered damage due to sewer back-ups. While this program was implemented over an extremely short time frame and was very well received by program participants, it did create a \$3.8 million pressure that was unexpected at the start of 2010. Program activity is directly related to the weather and ongoing expenditures for the program are difficult to predict. A report summarizing the program's first year will be presented to Council early in 2011.

Unusually favourable weather conditions throughout the winter of 2010 created an opportunity to substantially reduce the backlog of lead water service replacements. Over the course of 2010, the City replaced approximately 1,000 lead water services. The Sewer Lateral Maintenance Program also saw 988 investigations, resulting in over 455 replacements.

The economic environment continues to impact rate supported operations as 2010 witnessed a significant decline in water revenues through the departure of large water customers from the City as well as continued conservation efforts in the commercial, industrial, institutional and residential sectors. Progressive thinking is required to strategically balance the demands of an ageing infrastructure, expected service levels, our commitment to Hamilton Harbour, and affordability of water and wastewater rates.

Working closely with both Provincial and Federal levels of government to ensure a heightened awareness of the water and wastewater issues facing Hamilton has placed us in the fortunate position of receiving a \$116 million funding agreement through the Infrastructure Stimulus Fund to be used for capital upgrades. In addition, earlier this year Hamilton secured \$200 million in Federal and Provincial grants for the Woodward Wastewater Treatment Plant Upgrade under the Green Infrastructure Fund.

We are very proud of our performance in 2010 with respect to providing reliable water services amid an unprecedented amount of capital upgrades being conducted. Projects were initiated at the following facilities: Ferguson pumping station, Hillcrest reservoir, Woodward Water Filtration building and the Highlift and Lowlift pump stations. Protecting the safety and quality of tap water is an integral component of our business and in 2010; we successfully launched the drinking water Backflow Prevention Bylaw and Program. This program protects the City's drinking water from potential contamination from industry and other sources on private property.

In 2010, the City successfully initiated an external audit of its provincially mandated Drinking Water Quality Management System. With this step completed, the on-site Verification Audit will occur early 2011. Successful completion of this Verification Audit; will result in the City receiving full accreditation under the Safe Drinking Water Act.

While 2011 is expected to provide a variety of new challenges the staff and management of the Water and Wastewater Group are confident that the long history of excellent service will continue. Building on the success of 2010 will help to position the City in a more strategic and sustainable position for years to come.

# Achievements & Highlights

- Delivered approximately \$100 million in capital upgrades
- Managed a \$116 million funding arrangement through the Infrastructure Stimulus Fund for upgrades to water and wastewater infrastructure
- Secured \$200 million in Federal and Provincial Grants for the Woodward Wastewater Treatment Plant Upgrade/Expansion under the Green Infrastructure Fund
- Produced 13,435 MWH of electricity through the methane-powered cogeneration facility
- Established a Woodward Expansion Community Liaison Committee (CLC)
- Received Partial Scope Accreditation for all Drinking Water Systems through Canadian General Accreditation Body
- Successfully continued with the implementation and maintenance of the Drinking Water Quality Management System
- Received new Drinking Water Systems' licences and permits
- Completed over 179,000 analytical tests with respect to water quality, sewer use and landfills
- Responded to 141 spills and collected 1,244 samples from industrial sites, waste haulers, and other projects
- Completed 211 Facility Inspections for the Pollution Prevention Program
- Replacement of over 997 lead water services including eliminating a substantial backlog
- Implemented the Protective Plumbing Program (3P) processing over 1,800 grant payments
- Successfully launched the drinking water Backflow Prevention Bylaw and Program
- Continued progress on large meter/revenue recovery initiatives
- Responded to 34,000 customer service requests and inquiries
- Provided outreach contact to over 7,000 students about the importance of water

- Successfully hosted Hamilton's 3rd Children's Water Festival
- Successfully raised \$24,300 at the 2010 World Water Day Walkathon benefiting the "Water for Haiti" Program
- Successfully raised \$108,000 to-date for the "Water for Haiti" Program installing 22 wells, providing people with clean, safe drinking water
- Successfully hosted a one-day rain barrel event selling over 1,300 barrels
- Continued participation in Source Water Protection Planning and Implementation, and responsible for representation on the City's three Source Water Protection Areas Committees under the Provincial Clean Water Act
- Continued implementation of Real Time Control for the Wastewater Collection System for improved wet weather control
- Completed Phase 1 of the Stormwater Rate Feasibility Study

# Awards, Presentations and Publications

## Awards

### Geoff Rae

- Ontario Public Works Association, 2010 Project of the Year Award  
*Awarded in the Management Innovation Category for the Water and Wastewater Strategic Business Plan*

### Janet Vandelaar and Peter Bromley

- International Association of Business Communicators, Ovation Award of Excellence  
*Awarded in the Publications Category for the Water and Wastewater 2010 Rate Book and Services Overview*

## Presentations

### Shane McCauley

- Water Environment Association of Ontario  
*Successfully selecting and implementing web-based training software*

### Mark Bainbridge

- Remedial Action Plan - Hamilton Harbour Monitoring and Research Workshop  
*Woodward Avenue Wastewater Treatment Plant Progress*

### Carol Dunn

- EnviroAnalysis  
*Microscopic Examination of Activated Sludge as a Tool in the Monitoring of Wastewater Treatment*

### Dave Alberton

- Canadian Pollution Prevention Roundtable  
*Hamilton's Pollution Prevention Program*

### **Dan Chauvin**

- Water Environment Federation  
*Energy Efficiency Drives the Selection of Tertiary Nitrifying MBR (T-MBR) for the World's Largest Membrane Facility*

### **John Helka**

- International Association of Great Lakes Research 53rd Annual Conference  
*The Enhancement of Windermere Basin - Sediment Management, Habitat Restoration and Aesthetic Improvement within the City of Hamilton and Event-Based and Long-Term Sediment Transport Modelling in a Restored River Channel (Red Hill Creek)*

### **Dan Chauvin and Plamen Nikolov**

- Water Environment Association of Ontario  
*Finding Performance Improvements for the City of Hamilton's Primary Clarifiers through Computational Fluid Dynamic (CFD) Modeling*

## **Articles**

### **Chris Gainham and Patrick Delaney**

- Underground Infrastructure Management  
*Minimizing Combined Sewer Overflows Using Hydraulic Modeling with Real-Time Controls and Optimization Technology at the City of Hamilton*

### **Dan Chauvin, Dan McKinnon and Mark Bainbridge**

- The Canadian Business Journal  
*Improving wastewater treatment infrastructure in Hamilton*

# Sectional Facts

## *Water and Wastewater Engineering*

- Annual capital upgrades are approximately \$100 million
- Management of over 40 engineering assignments and studies
- Management of over 20 construction contracts

## *Plant Operations*

- 86,274 ML of drinking water treated and distributed
- 115,688 ML of wastewater collected and treated
- 38,940 wet tonnes of biosolids produced, stabilized and land applied
- 7,900 preventative and corrective maintenance work tasks completed
- 13,435 MWH of electricity produced through the methane-powered cogeneration facility

## *Water Distribution & Wastewater Collection*

- 262 watermain breaks repaired
- 400 fire hydrants replaced or repaired
- 11,793 fire hydrants code inspected
- 5,778 fire hydrants flow inspected
- 6,477 valves exercised
- 1,128 km of sanitary sewers cleaned/inspected
- 1,067 km of storm sewers cleaned/inspected
- 988 sewer laterals inspected
- 455 sewer laterals replaced
- 997 water services replaced
- 1,743 water service size and type inspections

## *Customer Service & Community Outreach*

- Responded to 34,000 customer calls
- Processed 18,621 Service Requests
- Processed 8,079 Work orders
- Outreach contact to over 7,000 students about the importance of water
- Successfully hosted Hamilton's 3rd Children's Water Festival
- Over 1,300 rebated rain barrels sold in a 1 day event
- 12,000 industrial and commercial water meters managed
- 124,000 residential water meters managed
- 1,800 residents participated in the Protective Plumbing Program
- Implemented the City's drinking water Backflow Prevention Program

## *Compliance & Regulations*

- Maintained Laboratory Accreditation through Canadian Association for Laboratory Accreditation for specific water and wastewater analysis listed on their Scope of Accreditation
- Maintained MOE Laboratory Licensing for Drinking Water Testing
- Over 179,000 analytical tests completed
- 1,957 water samples collected for field and laboratory analysis
- 141 spill reports received, managed and cleaned up
- 1,244 samples collected from Industrial sites, Waste haulers, and other projects
- Uploaded and managed over 8,500 regulatory documents in Beyond Compliance Operating System database
- Led the implementation and maintenance of the Drinking Water Quality Management System
- Received Partial Scope Accreditation for all Drinking Water Systems through Canadian General Accreditation Body
- Received new Drinking water systems' licenses and permits
- 211 Facility Inspections for the Pollution Prevention Program

## *Infrastructure and Source Water Planning*

- Responsible for the implementation of the Departmental Asset Management System for all Vertical Infrastructure
- Responsible for Biosolids Master Plan
- City Lead for Source Water Protection Planning and Implementation, and responsible for representation on the City's three Source Water Protection Areas Committees under the Provincial Clean Water Act
- Implementation of Real Time Control (RTC) for the Wastewater Collection System for improved wet weather control
- Responsible for management of Capital Grant Funding of \$105M in partnership with senior levels of government
- Lead the development and application of the City's Water Distribution, Wastewater Collection and Groundwater computer modeling applications

## 2011 Looking Forward

Without question, 2011 will continue to present significant challenges for the Water and Wastewater Group. Adjusting to declining revenues, responding to increasing customer and stakeholder expectations as well as managing pressures created by growth, climate change and an inherent need to close the infrastructure deficit will all combine to create challenging times. The staff and management of Water and Wastewater remain committed to the successful delivery of these important services.

Moving into 2011, our focus continues to be the search for operational efficiencies and the planned capital upgrades to the Woodward Avenue Wastewater Treatment Plant. Replacement of the main pump house and electrical supply continue to be a high priority while construction is underway for the new influent channel and primary clarifier expansion. These projects are critical to ensure that the plant is protected from overflow as well as to provide the capacity necessary for wet weather treatment and protection of the harbour. Currently a review of the entire water and wastewater program is under way to establish an appropriate financial strategy for the City to complete the planned upgrades at Woodward.

Efforts remain ongoing to find ways to better operate the plant to reduce costs and improve quality. A number of energy retro-fits are well under way and staff continues to analyze traditional plant operation methods to determine if there are new opportunities to improve water quality in the drinking water system as well as wastewater effluent entering the Harbour.

Throughout 2011 staff will continue with the second phase of the Stormwater Rate Study to review options for fair and equitable funding of the City's stormwater management services. The study seeks to identify equitable mechanisms of funding for the services provided to manage stormwater throughout the City. The next step includes additional public consultation, financial analysis and consideration of rate options. It is expected that a final report will be presented in time for implementation in 2012.

# Water and Wastewater Program Highlights

## Hamilton's Drinking Water Quality Management System - An Operational Success

Hamilton residents and neighbouring communities benefit from the City's ability to provide safe, high quality drinking water. Developed two years ago, the Drinking Water Quality Management System has enabled staff to implement continual improvements to its quality management processes.

### Accountability

Multiple checks and balances are in place as the Ministry of the Environment's Drinking Water Quality Management System Standard and water legislation places a focus on responsibility and accountability at all political and bureaucratic levels across the City.

### Communication

Education and awareness are integral parts of the enhanced internal and external communication networks that have been created. We maintain a transparent communication process that continuously informs politicians, staff, suppliers and customers about the Drinking Water Quality Management System to keep them better informed regarding their water system.

### Streamlined Approvals Process

The new water permits process is streamlined and places increased accountability and resource requirements on our internal planning, engineering and compliance staff. The consolidation of treatment and distribution infrastructure within one permit has been a positive experience.

### Performance Measurement

A key measurement process of the DWQMS is the external and internal audits of our core business processes. This year, Hamilton will be assessed by the Ministry of the Environment's Accreditation Body or Canadian General Standards Board. Success in this audit is required to achieve full accreditation as an Operating Authority for our water systems.

### Continual Improvement

The annual review of procedures and the audit of processes results in continual change, improvements and updates to our Drinking Water Quality Management System. It is a living system that adapts to organizational and regulatory process changes.

## *Drinking Water Programs*

### **Corrosion Control Program**

Over the last several years Hamilton has proactively tested tap water to better understand the incidence of elevated lead levels in drinking water. Continuous testing has shown that lead levels in the municipal water system are below the Provincial standard. However, test results that are specific to older homes confirm that lead levels exceed the Provincial standard. Efforts to mitigate this situation are ongoing and Hamilton is currently developing a Corrosion Control Program to reduce the potential for lead to be absorbed into tap water in affected older homes.

### **Lead Pipe Service Replacement**

Hamilton's Lead Pipe Service Replacement program helps interested residents to replace and possibly finance the replacement of lead pipe water services between the municipal watermain and their home. Lead services are most likely found in homes built prior to 1955. Residents who are interested in the program, but are unsure whether they have a lead pipe water service, are able to contact the City for a size and type inspection to determine if they are eligible.

### **Backflow Prevention Program**

Hamilton continuously strives to protect the integrity of its drinking water. An example of this is the recently approved Backflow Prevention By-law. The By-law ensures the normal flow of water from the City's distribution system into the private water systems of its customers is protected. Industrial, commercial and institutional properties and multi-residential (four stories or higher) that meet certain criteria are required to install devices that prevent water flowing from an owner's building back into the City's water distribution system and potentially contaminating Hamilton's drinking water.

## **Wastewater & Stormwater Programs**

### **Protective Plumbing Program – (3P)**

Initiated in 2009, the Protective Plumbing Program was created in response to severe wet weather events experienced in Hamilton. The program provides guidance and financial assistance to residential property owners who have experienced flood damage due to sewer surcharge or property owners in areas of the City where there is a history of flooding. This program assists residents who are proactively making improvements to their homes to prevent a reoccurrence. To-date the program has assisted more than 1,800 residents.

### **Sewer Lateral Management Program**

The sewer lateral management program provides guidance and grants to property owners experiencing sewer related problems. The program was established in 2006 and has been very successful. This past year over 988 sewer laterals were inspected with 455 being either repaired or replaced.

### **Pollution Prevention Program**

Over the past year this program has gained momentum as 211 visits were made to businesses in Hamilton to educate, identify and implement pollution prevention strategies to minimize or avoid the creation of pollutants or waste flowing to the sewer system. The program targets contaminants that can contribute to corroding or blocking sewer lines or are untreatable by conventional treatment methods. Of the 211 businesses visited, 54 took active roles in the implementation of best management practices within their specific sector. The remaining 157 took steps to incorporate improvements such as installing grease traps that prevent the grease from entering the sanitary sewer system.

# *Sustainable Management of Water and Wastewater Infrastructure*

## **Optimization of Woodward Avenue, Wastewater Treatment Plant**

Hamilton has recently initiated a review of operational practices at the Woodward Avenue Wastewater Treatment Plant. While the effluent quality has been in compliance for many years, staff are utilizing techniques that have been documented in the US EPA Composite Correction Program Protocol to further improve performance from the plant. Staff are committed to maximizing performance of the existing facility as a means to extend its life as far as possible before capital improvements are implemented and to further improve effluent quality to Hamilton Harbour.

## **Real Time Control**

Protecting the environment and supporting the recovery of Hamilton Harbour remains a key objective of this project. Real Time Control is a strategy that capitalizes on existing capacity within the collection system to reduce unnecessary overflow to the natural environment. The use of infrastructure such as flow control gates, chambers, pump stations, and sensors used to measure parameters such as flow, level, pressure, and rainfall all provide improved monitoring and control at strategic locations throughout the wastewater collection system and will optimize retention and conveyance within the sewer system. By maximizing treatment and conveyance capacity this strategy minimizes untreated overflows to Hamilton Harbour.

The project began in 2008 and has identified approximately \$35M of infrastructure required in the short term to meet its defined goals. Construction of a major component of the heavy civil infrastructure is slated for Spring/Summer 2011. This project is funded by Infrastructure Canada - Canada Strategic Infrastructure Fund with a construction deadline of September 2012. Upon completion of this work operator training on the new system will begin and continue out to 2014.

## **Bio-Gas**

Historically viewed as a nuisance waste product, Biogas has become an environmentally friendly, sustainable fuel source for a variety of purposes. Hamilton led the way in 2006 with the completion of its Cogeneration Facility which currently

uses bio-gas as fuel for a combined heat and power plant at Woodward Avenue. The Cogen reduces greenhouse gas emissions by approximately 6,500 tonnes annually. Hamilton is proactive in its efforts to use renewable green-energy technologies and protect its natural environment. Once again Hamilton has embarked upon a new project that will increase bio-gas production allowing the surplus gas to be purified and used as a vehicle fuel. Utilizing this exciting renewable green-energy technology to produce bio-gas to run vehicles is leading edge and positions Hamilton as a leader in this area.

### **High Lift Pumping Station**

Hamilton's Woodward Avenue High Lift Pumping Station located adjacent to the Water Treatment Plant takes water after it has completed the treatment process at the plant and pumps it out to the reservoirs and pumping stations throughout the City's water distribution system. This facility is currently undergoing upgrades to become more energy efficient while ensuring the City's continuous supply of safe drinking water. The installation of new pumps and motors will provide better control and energy savings. This project is eligible for a grant of approximately \$2.25 million under the Electricity Retrofit Incentive Program and has a potential energy savings of approximately \$500,000 annually. This saving represents a 17% reduction in current energy costs for this process. In addition, Greenhouse Gas emissions will be reduced by approximately 2,250 tonnes annually.

### **Water Filtration Building**

Hamilton's Water Filtration Building was originally built in the 1930's with an expansion in the 1950's. Currently under way is a structural and architectural rehabilitation of the facility returning it to its original grandeur. Through a funding partnership of all levels of government Hamilton is able to maintain the historical and architectural elements of the building and extend the life of the facility for another 60 to 80 years. The plant has the capacity to treat 909 million litres of water daily and currently supplies treated drinking water to approximately 480,000 customers. The upgrade provides a healthy and safe environment for staff as they continue to provide Hamilton residents with clean, safe drinking water. It is anticipated that an official opening will be held in the spring of 2011.

### **Low Lift Pumping Station**

The Hamilton beach Low Lift Pump Station that draws water from Lake Ontario and sends it to the water treatment plant is also undergoing significant mechanical and electrical upgrades. This unique facility, noted for its parabolic design roof and architectural heritage, is critical to the reliable operation of the water system and will be refitted over the next several months. Esthetic upgrades will take place that will provide the community and passersby with a more visually appealing waterfront facility. With work expected to be complete in the spring of 2011, the new equipment installed at this location will help reduce operating costs with use of more energy efficient pumps and motors.

### **Ferguson Pumping Station**

At almost 100 years old and one of the earliest elements of Hamilton's municipal water system, the current 1912 Ferguson Pumping Station represents the heart of the distribution system in one of the most populated areas in downtown Hamilton. This building has seen many changes over the years but is now being completely replaced with modern technology and a new station house through joint government funding. Anticipated to be commissioned in 2011, this critical station replacement will position Hamilton well to serve its growing population for the next 50 years while ensuring the integrity of our water distribution system.

# Financial Review

The Water, Wastewater and Storm Program is a distinctly separate budgeting process. Its revenues come from billed charges which are based on water consumed<sup>1</sup>. Water consumption is based on metered consumption, meters are read and the ratepayers are billed by the City's billing agent, Horizon Utilities Corporation. Both Operating and Capital costs for the water, wastewater and storm programs are fully funded from rates and therefore, do not affect municipal property taxes.

The 2011 Rate Budget is submitted for Council's consideration. The 2011 Rate Budget balances the need to invest in infrastructure with changing trends in demand for water and a lower pace of development relative to "Places to Grow". Over the period 2011 to 2020, water, wastewater and stormwater capital investment is forecast at over \$1.7 billion. This represents a decrease of \$0.4 billion from last year's 10-year forecast. The current 10-year capital plan requires higher than average levels of investments in the next two years though less sizeable than forecast in last year's financing strategy.

Last year's 10-year forecast identified significant risks related to a variety of conditions which may impact ratepayers, and more significantly, in combination may place significant financial pressures on ratepayers. Last year's report illustrated the potential impact the risks listed below may have on users. This report identifies the steps staff have incorporated in the current 10-year forecast which are further identified in later sections of this report.

- Declining consumption
- Pace of development
- Future development charges and the level of debt to be recovered from growth
- Reserve capacity

Staff pursued a variety of measures in an effort to control the impact of the above risks in order to maintain a safe and reliable service at a reasonable cost.

As part of the City's financial sustainability initiative, the Environment & Sustainable Infrastructure (ESI) Division completed a Phase 1 Stormwater Rate Feasibility Study in January, 2010. The overall goal of this study was to evaluate the feasibility of

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<sup>1</sup> The City of Hamilton is almost entirely metered. The remaining unmetered accounts are charged based on a flat annual charge.

implementing an equitable, self-supporting and dedicated funding mechanism that will support the City's current and future anticipated Stormwater Management (SWM) Services program expenditures.

A Stormwater Rate is an alternative financing mechanism to the City's existing processes, which offers a fair and equitable method for allocating the costs of a municipal SWM Services program. This preferred rate system would reallocate storm system related costs to property owners based on the measured area of impervious ground cover (e.g. rooftops, driveways, and parking lots). This approach quantifies the relative contribution of stormwater runoff from each property to the municipal SWM system. This runoff is a function of the land use practices and surface treatment decisions of property owners. A Stormwater Rate would be administered in a similar fashion as the City's current water and wastewater rate.

In October 2010, AMEC was hired to complete a Phase 2 Stormwater Rate Study. This Phase 2 Study will be broken down into two stages. Stage 1 will entail further public consultation, financial calculations and analysis of rate options. After Stage 1 is completed, the City will present their findings to the General Issues Committee (GIC) in June, 2011 whereby the Committee will decide whether or not to move forward with Stage 2, the implementation of a "Turn-key" Stormwater Rate.

The 2011 requested operating budget for water, wastewater and storm is approximately \$159.3 million, which represents a decrease over the 2010 Budget of approximately \$6.8 million, or 4.1%. The 2011 recommended water and wastewater rate increase is 4.25%, or approximately \$22 per household. Other water and wastewater user fees have generally been increased by an inflationary factor.

The ten-year Rate Supported Capital Budget (excluding growth which is funded from Development Charges) amounts to \$ 1.1 billion, of which \$104 million or 9.5% is being financed through rate supported debt. This capital program supports the rehabilitation of aging infrastructure (including significant capital increases to support storm related flood mitigation (SERG)), and supports the wastewater and storm water environmental improvements to meet the Hamilton Harbour Remedial Action sewage effluent targets. As a result, the 3-year gross capital program, 2011 to 2013, incorporates over \$531 million in rate supported funding and development charges. The following steps have been taken to try to lower the debt requirements in the initial years:

- a) utilizing in excess of \$42 million of funding from previously approved projects (WIPs) to support capital;
- b) \$200 million in Provincial and Federal subsidies;
- c) funding growth-related costs from development charge recoveries;

d) the revision of major capital project costs and timing.

In addition to subsidies, the ten-year Rate Supported Capital Budget incorporates in excess of \$540 million in development charge recoveries. Additionally, there is \$84 million in Development Charge exemptions which the city is legislatively required to fund from rate revenues. In the 2010 financing strategy, development charge supported debt was forecast to peak at \$668 million in 2017; in contrast, the 2011 forecast assumes development charge debt will peak at \$558 million in 2019. Although the DC funded debt forecast has improved from the 2010 forecast, the levels of debt supported by development charges represent a significant risk if future growth does not materialize as planned, and will be required to be monitored closely over the next few years.

As requested by Council, a third party review was conducted by Watson & Associates Economists Limited and the results will be presented to Council along with the 2011 Rate Budget.

Finally, as stated above, the assumptions surrounding subsidies and revenues translates into considerable risk, particularly given the reliance on water and wastewater reserves as a means of managing rate supported debt requirements. Hamilton's water, wastewater and stormwater budget highlights the need for incremental infrastructure funding from higher levels of government, which if not realized, will translate into rates which will negatively impact ratepayers.

# 2011 – 2020 Water, Wastewater and Storm (Rate) Operating and Capital Forecast

## Financial Sustainability Peer Review

During the 2010 Rate Budget process, staff had identified significant risk with their 10-year financial forecast. The 2010 – 2019 Rate-Supported Capital Plan at \$2.1 billion was very aggressive and once implemented would require a significant revenue stream to meet the annual debt charge obligations. At risk was the growth infrastructure at \$705 million and the accompanying development required to meet the revenues necessary for debt charge obligations.

At the conclusion of the 2010 City of Hamilton Rate Budget, Council directed staff the following “that staff be directed to have an independent review conducted of the financial implications of the phased-in approach to the Sewage Treatment Plan”.

Subsequently, Council approved the appointment (May 10, 2010 COW and report FCS10035) of consultants Watson & Associates Economists Limited to provide a peer review of staff’s 10-year Operating and Capital Forecast. The main purpose of the review is to provide an analysis of staff’s revenue and expense assumptions.

At the conclusion of the 2010 Rate Budget, staff reviewed all the revenue and expense assumptions associated with the 10-year Financial Plan. The following changes were made to minimize the financial risk;

1. Rate Revenue Forecasts were revised downwards by 4% to reflect the emerging trends of conservation.
2. Major infrastructure (wastewater plant expansion) was deferred for 5 years for further wastewater capacity and needs analysis.
3. Staff reduced growth infrastructure by \$160 million over the 10-year period while still insuring that the required capital for the forecast development was in place.
4. Staff looked at several unit development scenarios which ranged from 100% of the Province’s Places To Grow development forecast to a more conservative 75%. The 75% scenario is more reflective of historical development patterns for our City.

Staff has forwarded the revised Rate Financial Plans to the Consultant for review. The consultant will have a completed report to staff by January 5<sup>th</sup>, 2011. This will immediately be forwarded to Councilors. There is a General Issues Committee meeting

scheduled for January 11 to discuss the proposed Rate Budget and Financial Forecast. The Consultant will also present his report on this date.

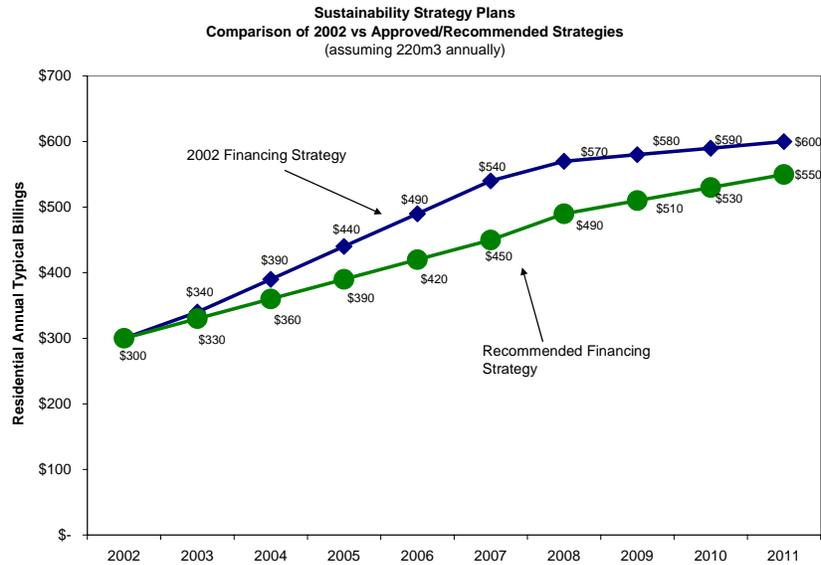
### **Sustainable Rate Strategy**

The recommended 2011 Rate Supported strategy endeavors to achieve a balance between capital investment and rate stability. The 2011 Rate Supported Strategy links the change in demand for water with a staged approach to necessary capital investments at the Woodward wastewater treatment plant. The current financing strategy includes \$200 million in Provincial and Federal subsidies to support the wastewater treatment plant rehab and upgrades. As reported earlier, staff have attempted to identifying mitigating measures including the deferral of capital investments in an effort to alleviate the reliance on both debt and reserves.

While it is true that the Rate Supported Strategy has changed from time to time, the overall goal, of achieving a sustainable level of funding to support the necessary infrastructure investments, has not. The Strategy has been in place since 1997, which at that time, called for water rates to increase by three to seven percent after adjusting for inflation over a 15-year period.

In 2001, staff recommended an amended Strategy based on achieving a target funding level of \$140 million (2000\$) by 2006 (TOE01017/FCS01017). The amended Strategy called for a 15% rate increase in each year up to and including 2006.

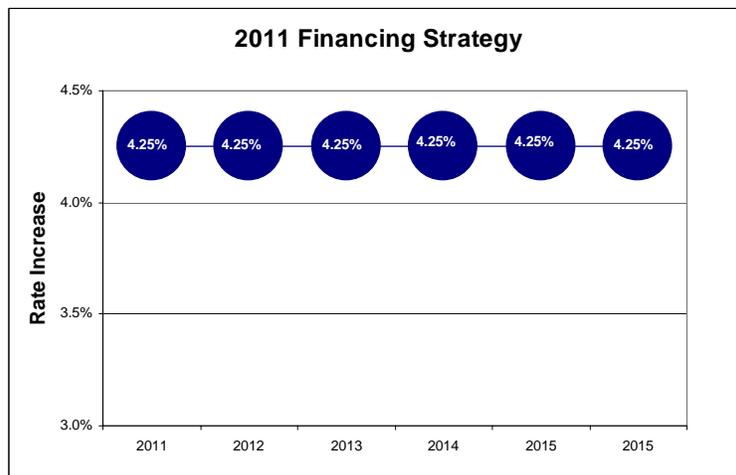
Since 2001, staff have recommended further amendments, for reasons including changing economic conditions, which in effect resulted in lower rate increases in the short-term and extending the period for rate increases in excess of inflation. When comparing the 2002 strategy versus the 2011 strategy, annual water and wastewater billings based on the 2011 strategy continue to be lower than had staff and Council continued based on the 2002 strategy.



In general, the goal of the Strategy has been to support the water, wastewater and storm programs through a sustainable level of funding. While revenue forecasts have been adjusted from time to time, for a variety of reasons, so too have expenditure forecasts, and the need for additional financial resources. It should be noted that the intention of the 2001 Strategy was to provide approximately \$92.5 million (2000\$) in support to the capital program. The current Strategy calls for capital funding in 2011 of approximately \$93 million (2010\$) and climbing to \$122 million (2010\$) by 2020.

The 2011 Strategy includes financing from the Federal and Provincial governments with respect to the wastewater treatment plant rehab and upgrades, specifically in support of the Hamilton Harbour Remedial Action Plan.

The following chart highlights the recommended rate strategy:



# Proposed 2011 Water and Wastewater Rates

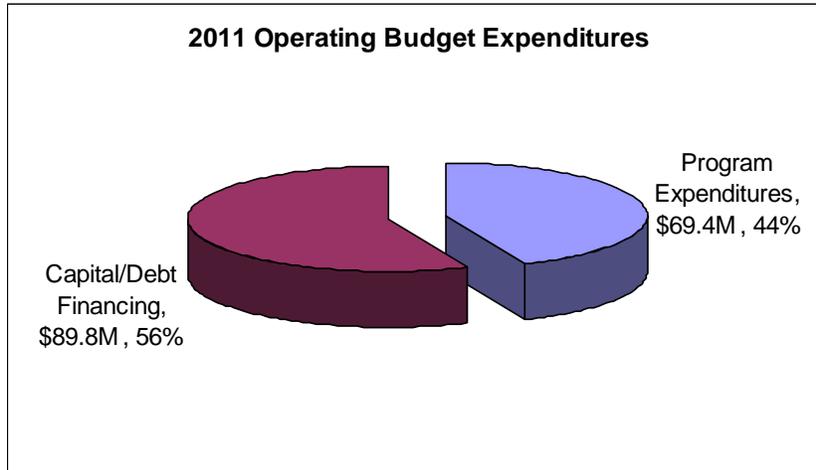
Municipal financial management is fundamentally different from the financial management of either the federal or provincial government. Revenue sources for the municipal order of government are limited to: (1) taxation on property assessment, (2) development charges, (3) user fees, (4) license fees, (5) fines and (6) transfers from the Provincial and Federal governments.

Unlike the tax (levy) budget which is funded through taxation on property assessment, the water, wastewater and storm budget is principally funded through user fees. Water/Wastewater rates are a form of user fee charged by the City to its residential, commercial, institutional and industrial water consumers, as well as, water sales to Haldimand County and Halton Region. In the City of Hamilton, its metered consumers are charged based on volume of water consumed (i.e. the more you consume the greater the cost).

Since 1999, Council has been committed to making progress in an effort of achieving a sustainable water and wastewater system by adopting the principle of sustainable pricing. While the financing strategy has deviated in previous years from an accelerated sustainable pricing strategy (previously required a 15% rate increase), opportunities and initiatives have been taken to achieve the requested level of investment through lower than anticipated rate increases. For instance, the funding partnership of \$75 million announced in the fall of 2005, by all three levels of government, allowed for an increase in capital spending, within the previously forecast rate strategy.

The 2011 Water, Wastewater and Storm Budget continues to support the objective of sustainable water and wastewater systems. The recommended 10-year pricing accommodates an increase in the level of capital investment, principally associated with the expansion of the wastewater treatment plant to accommodate future population growth, as well as, to meet Hamilton Harbour Remedial Action Plan effluent targets.

The 2011 Rate Budget with total operating expenditures of \$69.4 million will require a 4.25% increase in water and wastewater rates, as well as, an inflationary increase for most other water and wastewater user fees. As illustrated below, of the \$159.3 million requested budget, approximately \$89.8 million pays for the capital program and approximately \$69.4 million is for operating expenditures.



### Proposed Rate Structure

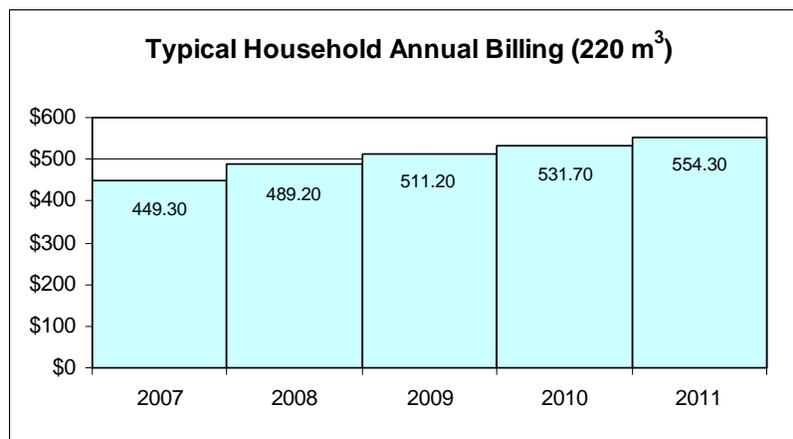
The impact of the recommended 4.25% rate increase on the basic monthly charge and the consumption rate are identified in the table below.

<b>Impact of Recommended 4.25% Rate Increase on Water and Wastewater Rates</b>		
	<b>2010 Rates</b>	<b>2011 Requested Rates</b>
Basic Monthly Charge	\$7.75	\$8.08
Consumption Rate* ( per cubic metre)	\$1.080	\$1.126
*Note: the consumption rate applies to water consumed beyond the first 5m <sup>3</sup> per month, as the first 5m <sup>3</sup> of consumption per month is included in the monthly basic charge at no additional charge.		

The following table identifies the impact of the proposed rate increase on a residential customer:

<b>IMPACT OF RECOMMENDED 2011 WATER AND WASTEWATER RATE INCREASE ON A TYPICAL RESIDENTIAL BILL</b>		
<i>(based on annual water consumption of 220m<sup>3</sup>)</i>		
2010 Residential Bill		\$532
<b>2011 Residential Bill</b>		<b>\$554</b>
<i>Recommended Change (\$)</i>		\$22
<i>Recommended Change (%)</i>		<b>4.25%</b>

Over the past few years, there has been a decline in water consumption on a per household basis. Annual water consumption per household, over the period 2007 to 2010, has averaged approximately 224 m<sup>3</sup>. In general, residential consumption has exhibited a downward trend for a number of reasons including higher than average summer precipitation, as well as, conservation efforts. Prior to 2007, forecasted average water consumption per household was assumed at 291m<sup>3</sup>. In 2007, this assumption was revised to 275m<sup>3</sup>, and reduced further to 260m<sup>3</sup> in 2008. For 2011, the forecasted average water consumption is assumed to be at 220m<sup>3</sup>. It should be noted that while the volumetric rate has increased by 29% since 2007, the typical household annual billings have increased by about 23%. Over this period residential property owners have been able to mitigate 6% of the rate increases over this period through conservation and demand management.



## Affordability

In 2002, Council made a commitment to address potential hardship issues as a result of the need to increase water and wastewater rates to achieve a sustainable system, and the impact of these increases to the more vulnerable water users in the City of Hamilton. The 2011 Budget incorporates funding of \$500,000 towards the City's Utility Arrears Program. This program targets three main groups, Ontario Works (OW) participants, Ontario Disability Support Program (ODSP) participants and 'low-income' residents that are not on social assistance (i.e. seniors on fixed incomes or low-income single individuals and families).

Under the City's Utility Arrears Program, \$350,000 has been deemed eligible under the Public Health and Community Services Program to obtain 80:20 cost sharing with the Ministry of Community & Social Services; consequently \$350,000 can leverage up to \$1,400,000 in funding through the Ministry of Community and Social Services. The balance of up to \$150,000 will continue to be earmarked to assist low income singles and couples with no children, administered through the City Community Services Department, Benefit Eligibility Division, and Special Supports Program.

The table below summarizes the sources of funding and the target groups the assistance is meant to aid.

Target Group	Rate Budget (Cost Share 20%)	Ministry of Community & Social Services (Cost Share 80%)	Total Available in 2011	
	Ontario Works	\$306,250	\$1,225,000	\$1,531,250
Ontario Disability Support Program	\$43,750	\$175,000	\$218,750	
Low Income (working poor and seniors)	\$150,000	\$0	\$150,000	
<b>Totals</b>	<b>\$500,000</b>	<b>\$1,400,000</b>	<b>\$1,900,000</b>	
	HYDRO (includes Water)*	HEAT	TOTAL	
			\$	Recipients
<b>Internal Program</b>	\$504,103	\$187,548	<b>\$691,651</b>	<b>1,629</b>

<i>(OW/ODSP)</i>				
<b>External Program</b> <i>(Special Supports)</i>	\$68,406	\$27,006	<b>\$ 95,412</b>	<b>158</b>
<b>2010 YTD SEPT</b> <b>TOTAL</b>	<b>\$572,509</b>	<b>\$214,554</b>	<b>\$787,063</b>	<b>1,787</b>
2009 YTD SEPT TOTAL	\$612,056	\$318,865	\$930,921	2,011
<b>2010/09</b> <b>Increase/(Decrease)</b>	<b>\$39,547</b>	<b>\$104,311</b>	<b>\$143,858</b>	<b>(224)</b>
<p>Source: City of Hamilton, Community Services Department quarterly reporting.</p> <p>* Unable to track water arrears since included in hydro arrears.</p> <p>Historically, water represents 3% of the hydro arrears expenditures.</p>				

## Operating Budget Highlights

Exclusive of the 2011 recommended 4.25% rate increase, support for total operating expenditures are forecast to decline by approximately \$6.7 million, bringing the total operating budget request to approximately \$159.3 million, compared with \$166.0 million for 2010.

It should be noted, while the recommended rate increase is 4.25%, metered revenues are forecast to decrease by 3.6%, impart due to a forecast decline in both residential and ICI consumption.

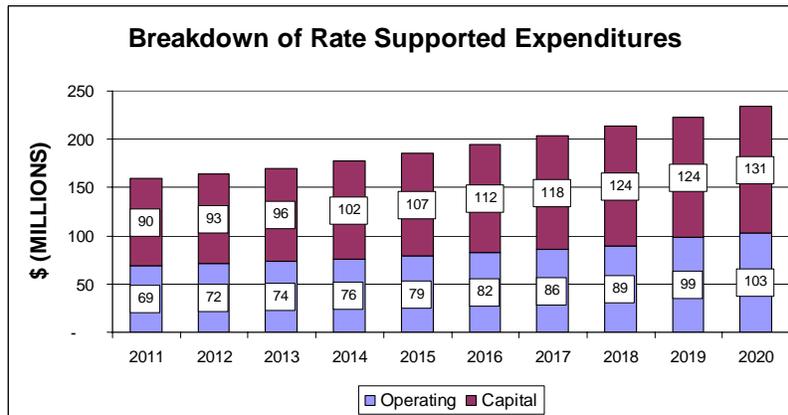
The following table summarizes the budget changes for the 2011 Requested budget:

<i>Summary of the 2011 Operating Budget</i>				
(\$ million's)	2010 Restated Budget	2011 Requested Budget	2011 Requested /2010 Restated Change	
			\$	%
<u>Expenditures</u>				
Program Expenditures	\$68.8	\$69.5	\$0.7	1.0%
Capital/Debt Financing	\$97.2	\$89.8	(\$7.4)	(7.6%)
<b>Total Expenditures</b>	<b>\$166.0</b>	<b>\$159.3</b>	<b>(\$6.7)</b>	<b>(4.0%)</b>
<u>Revenues</u>				
Rate Revenue	\$162.6	\$156.7	(\$5.9)	(3.6%)
Non-Rate Revenue	\$3.4	\$2.6	(\$0.8)	(23.5%)
<b>Total Revenue</b>	<b>\$166.0</b>	<b>\$159.3</b>	<b>(\$6.7)</b>	<b>(4.0%)</b>

### 10-Year Operating Budget

The 10-year operating budget highlights the commitment of a rate strategy as a means of achieving sustainable water and wastewater systems. Beyond 2011, program expenditures are forecast to increase on average by approximately 3% annually, reflecting a continued commitment to try to identify additional savings and efficiencies. Also, over the next 10-years, the financing for the capital program will increase on average by approximately 2.7% per annum.

Over the period 2011 to 2020, total financing for capital is forecast to increase from \$90 million to \$131 million, an increase of 46%, or 5% annually.



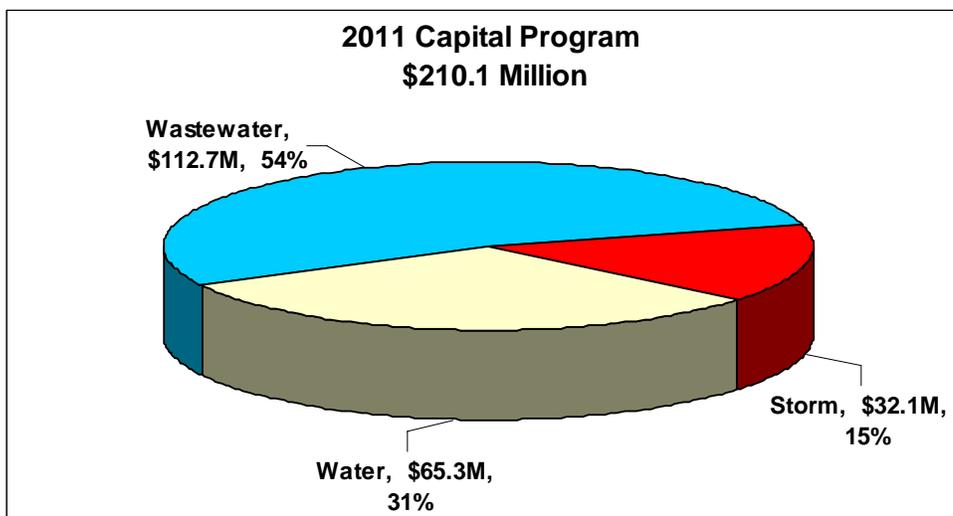
The need for sustainable pricing as a method of providing sustainable infrastructure means that, over the period 2011 to 2020, the typical residential annual metered bill will increase by an average \$25 per year.

### Provincial/Federal Subsidy Programs

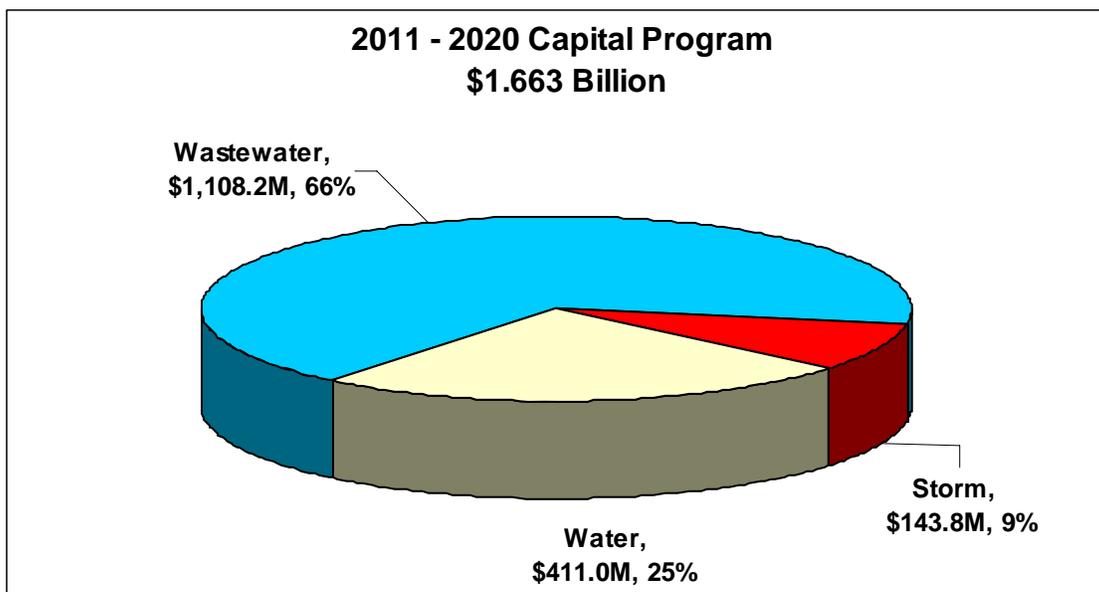
It should be noted that the forecast includes \$200 million of Federal and Provincial Infrastructure Funding, in addition to the \$50 million of subsidy committed by the Federal and Provincial governments in 2005. The City received \$100 million from the Province in June 2010, with the \$100 million Federal commitment to be funded from the Green Infrastructure Fund on a claim reimbursement basis.

### 2011-2020 Rate Capital Budget

The chart below illustrates the capital investments to be undertaken in 2011 in water, wastewater and storm infrastructure.



The charts and table below summarizes the \$1.663 billion capital program and the financing requirement for the 2011 – 2020 water, wastewater and storm capital budget. Of this amount, \$1.108 billion or 66.6% is for wastewater, \$411 million or 24.7% is for water and \$144 million or 8.7% for the storm program. A total \$531.5 million or 32% of the 10 year capital program is required in the first three years (2011 – 2013). The capital program also includes \$540 million for growth infrastructure related to GRIDS which will be funded from Development Charges, except for \$84 million in Development Charge exemptions which the city is legislatively required to fund from rates revenues if Council chooses to discount its DC's or recover less than 100% of growth-related capital costs.

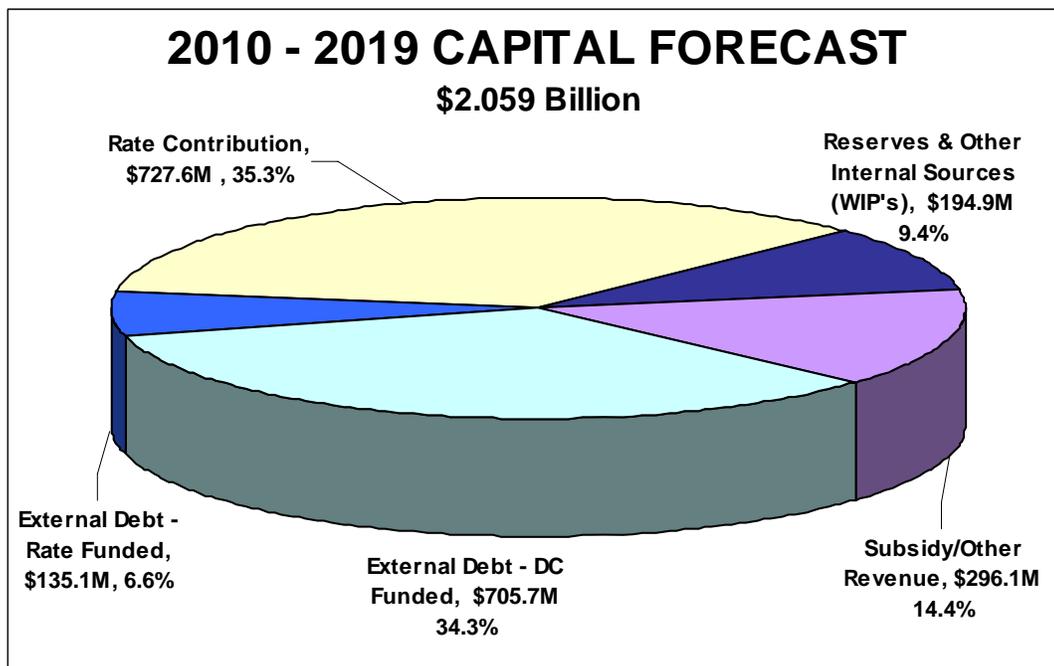
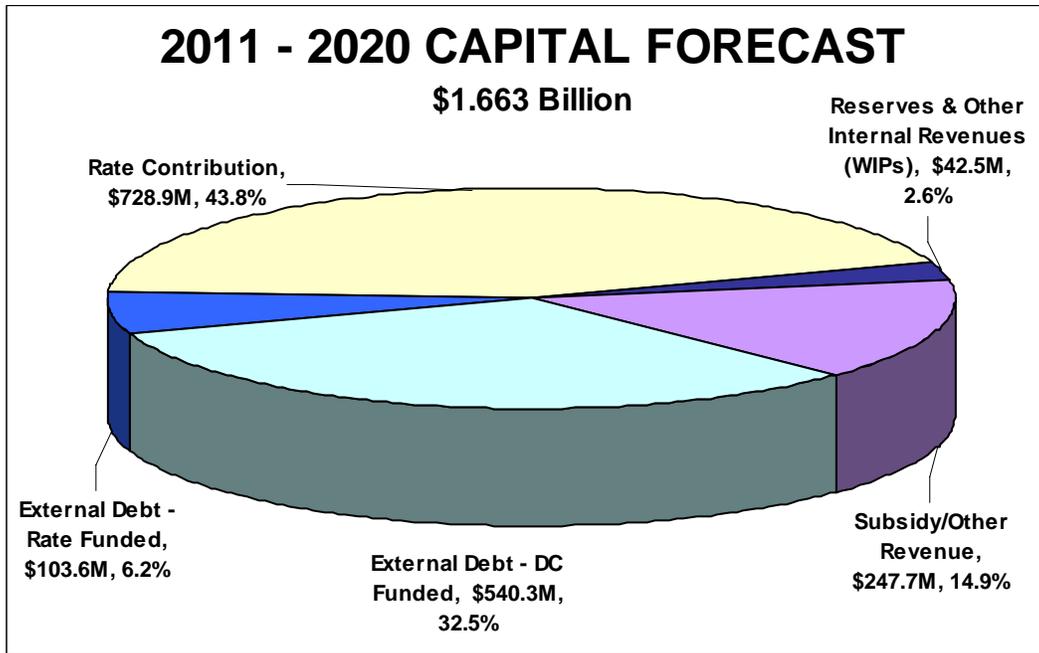


**SOURCE OF CAPITAL FINANCING**  
**2011 -2020 RATE PROGRAM CAPITAL BUDGET**  
**(000'S)**

	2011	2012	2013	2014 to 2020	Total 2011 to 2020
<b>WATERWORKS</b>					
<b>Capital Program</b>	<b>65,255</b>	<b>69,630</b>	<b>81,280</b>	<b>194,780</b>	<b>410,945</b>
<b>Source of Funding</b>					
Subsidy/Other Revenue	-	-	-	-	-
Development Charges	6,150	33,675	21,890	39,310	101,025
Reserves & Other Internal Sources	28,510	-	-	-	28,510
Contribution from Operating	30,595	31,800	33,215	149,502	245,112
External Debt	-	4,155	26,175	5,968	36,298
<b>Total</b>	<b>65,255</b>	<b>69,630</b>	<b>81,280</b>	<b>194,780</b>	<b>410,945</b>
<b>WASTEWATER</b>					
<b>Capital Program</b>	<b>112,730</b>	<b>67,560</b>	<b>64,590</b>	<b>863,340</b>	<b>1,108,220</b>
<b>Source of Funding</b>					
Subsidy/Other Revenue	49,620	19,500	13,500	164,400	247,020
Development Charges	10,646	15,690	21,980	335,080	383,396
Reserves & Other Internal Sources	13,370	-	-	-	13,370
Contribution from Operating	39,094	32,370	29,110	321,745	422,319
External Debt	-	-	-	42,115	42,115
<b>Total</b>	<b>112,730</b>	<b>67,560</b>	<b>64,590</b>	<b>863,340</b>	<b>1,108,220</b>
<b>STORM SEWERS</b>					
<b>Capital Program</b>	<b>32,090</b>	<b>25,597</b>	<b>12,747</b>	<b>73,360</b>	<b>143,794</b>
<b>Source of Funding</b>					
Subsidy/Other Revenue	-	75	75	525	675
Development Charges	13,660	6,407	5,007	30,790	55,864
Reserves & Other Internal Sources	610	-	-	-	610
Contribution from Operating	7,771	5,476	6,175	42,045	61,467
External Debt	10,049	13,639	1,490	-	25,178
<b>Total</b>	<b>32,090</b>	<b>25,597</b>	<b>12,747</b>	<b>73,360</b>	<b>143,794</b>
<b>TOTAL RATE PROGRAM</b>					
<b>Capital Program</b>	<b>210,075</b>	<b>162,787</b>	<b>158,617</b>	<b>1,131,480</b>	<b>1,662,959</b>
<b>Source of Funding</b>					
Subsidy/Other Revenue	49,620	19,575	13,575	164,925	247,695
Development Charges	30,456	55,772	48,877	405,180	540,285
Reserves & Other Internal Sources	42,490	-	-	-	42,490
Contribution from Operating	77,460	69,646	68,500	513,292	728,898
External Debt	10,049	17,794	27,665	48,083	103,591
<b>Total</b>	<b>210,075</b>	<b>162,787</b>	<b>158,617</b>	<b>1,131,480</b>	<b>1,662,959</b>

The charts below provide a comparison of the sources of capital financing between the 2010 and the proposed 2011 Capital Budget. The growth related infrastructure investment included in this budget to accommodate for growth is \$540 million which will be funded from debt, with the associated debt charges recovered from development charges over the next 20 years.

### Sources of Capital Financing



## Projected Water / Wastewater / Storm Debt

The 2011 Water and Wastewater Budget incorporates a significant reliance on both rate supported debt and growth related debt supported from development charges over the 10 year period. However the 2011 Budget debt forecast for the 2011 – 2020 period is significantly reduced from the 2010 Budget debt forecast, especially in the first 7 years (2011 -2017) of the of the 10 year period, primarily due to the phasing of the Wastewater Treatment Plant Expansion project over a longer period than what was reflected in the 2010 Rate Capital Budget.

The rate supported debt is projected to peak at \$276 million in 2013, consistent with the 2010 budget forecasted debt peak at \$278 million in 2013. The debt funded from DC's is projected to peak at \$558 million in 2019, whereas, the 2010 forecast was \$668 million in 2017. These levels of debt supported by development charges represent a significant risk if future growth does not materialize as planned, however the risk has been mitigated considerably from the 2010 Budget, as the growth component of the Wastewater Plant Expansion is now planned in the later years (2017 – 2019) of the 10 year period. This will allow an opportunity to monitor growth and DC Revenues over the earlier years (2011 – 2016) and make adjustments to the plant expansion project and associated financing plan to align with growth requirements.

A total of \$540 million in debt will be issued over the 10 year period to fund growth related projects included in the 2011 – 2020 Capital forecast, for which the debt charges will be recovered from Development Charges (DC's) and therefore, will have no impact on rates providing development occurs at staffs' forecasted rate of 1,825 single detached equivalent units and 2.1 million square feet of non-residential construction on average annually from 2012 – 2031. Staffs' residential growth forecast of 1,825 units is significantly less than Places To Grow forecast of 2,500 single detached equivalent units annually.

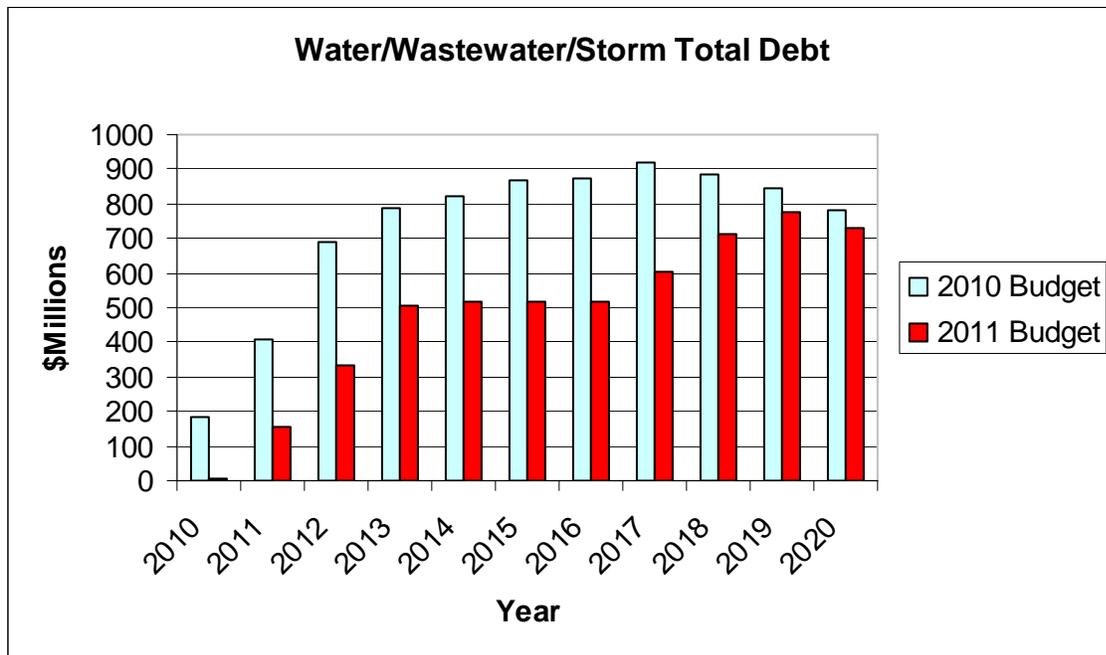
An additional \$103 million in debt will be required to be issued for growth related projects approved in previous years' capital budgets, for which debt has not been issued to date. The 10 year financing plan assumes \$238 million of the \$643 million growth related debt will be issued in the first 3 years (2011 – 2013) and \$328 million issued in the last 4 years (2017 – 2020).

The table below provides the ten year debt forecast compared to the 2010 Budget forecast.

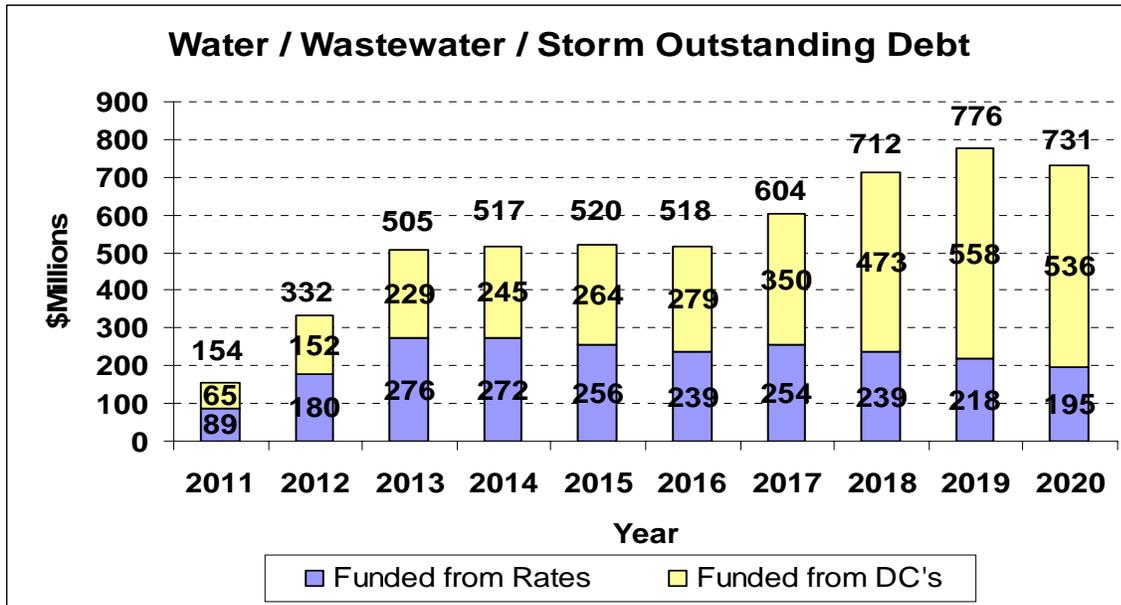
<b>Projected Rate &amp; DC Supported Outstanding Debt (Millions)</b>										
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>2010 Rate Budget</b>										
Funded from Rates (15 Yr)	177	265	278	264	247	234	254	232	209	184
Funded from DC's (20 Yr)	230	427	512	556	620	641	668	651	633	599
<b>Total</b>	<b>407</b>	<b>692</b>	<b>790</b>	<b>820</b>	<b>867</b>	<b>875</b>	<b>922</b>	<b>883</b>	<b>842</b>	<b>783</b>
<b>2011 Rate Budget</b>										
Funded from Rates (15 Yr)	89	180	276	272	256	239	254	239	218	195
Funded from DC's (20 Yr)	65	152	229	245	264	279	350	473	558	536
<b>Total</b>	<b>154</b>	<b>332</b>	<b>505</b>	<b>517</b>	<b>520</b>	<b>518</b>	<b>604</b>	<b>712</b>	<b>776</b>	<b>731</b>
<b>Increase (Decrease)</b>	<b>(253)</b>	<b>(360)</b>	<b>(285)</b>	<b>(303)</b>	<b>(347)</b>	<b>(357)</b>	<b>(318)</b>	<b>(171)</b>	<b>(66)</b>	<b>(52)</b>

Consistent with the 2010 Rate Budget, and in an effort to more accurately forecast debt levels and the associated debt charges, the major multi-year Wastewater Treatment Plant projects are budgeted based on the projected cash flow of expenditures for the 2011 Rate Capital Budget, versus full commitment based budgeting.

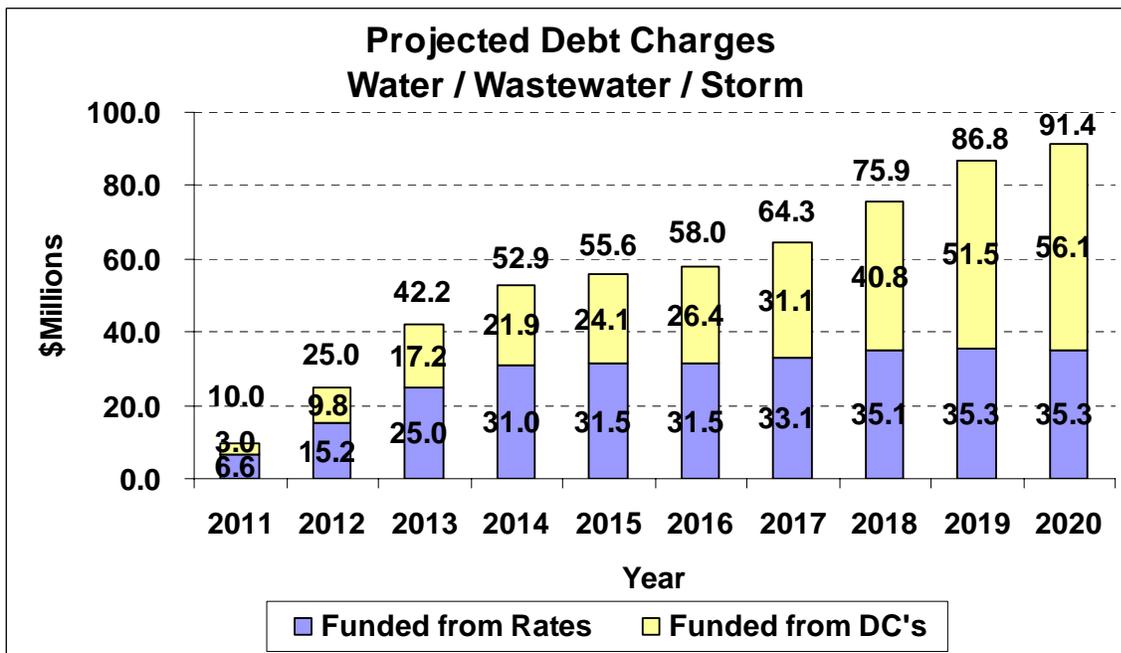
The graph below compares the total outstanding debt (Rate & DC Funded) from the 2010 Budget forecast to the 2011 Budget forecast. The graph illustrates the reduction of the forecasted debt issuance from the 2010 Rate Budget.



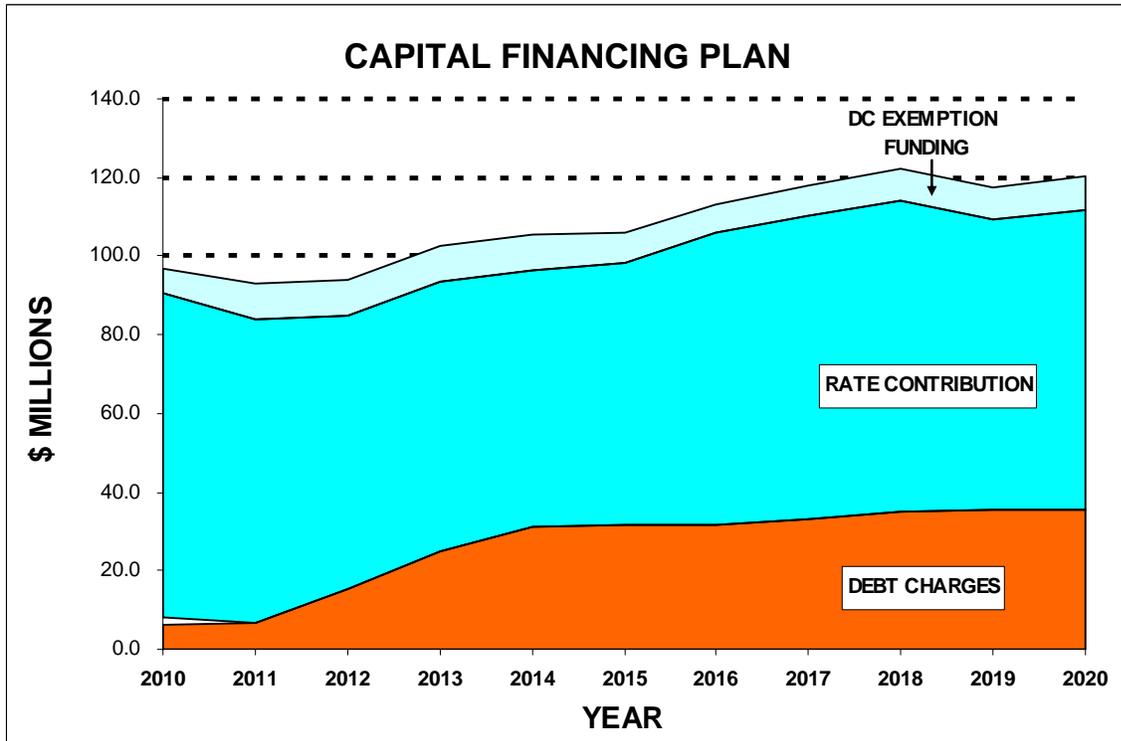
The graph below illustrates the projected outstanding debt for the 10 year period (2011 – 2020) and the funding source of the associated debt charges.



The graph below shows the forecasted debt charges funded by water / sewer rates and by Development Charges.



The graph below highlights the annual requirement required to pay for the Rate Supported Capital program. Capital financing costs are projected to increase from \$93.0 million in 2010 to \$122.2 million in 2018. Rate supported debt charges are expected to increase from 4.1% of total water/wastewater revenues in 2010 to 17.5% in 2014 and then decline to 15.1% in 2020.



# Development Charges (DC) Wastewater, Water and Storm

## Risk Assessment of DC Revenues Meeting Debt Obligations

Once the City goes forward with its growth infrastructure plans, current policies must sustain the “Places to Grow” growth patterns. The City is basing its growth planning on Provincial forecasts which peg Hamilton’s population at 660,000 by 2031. To date, the City is falling short of those projections. The tables below will illustrate the shortfalls in residential and non-residential growth and short-term City estimates going forward.

**Average Single Detached Unit Equivalent Construction Versus Provincial Forecast**

	2001-2008	2009	2010	2011	2012-2031
Staff Budget/Act	1,800	1,000	1,250	1,500	1,825
Places To Grow	2,500	2,500	2,500	2,500	2,500

**Average Square Footage Non-Residential Construction versus Provincial Forecast**

	2001-2008	2009	2010	2011	2012-2031
Staff Budget/Act	1,796,000	1,000,000	1,250,000	1,500,000	2,112,500
Places To Grow	2,008,588	2,008,588	2,008,588	2,008,588	2,008,588

The Provinces “Places to Grow” population and employment forecast (to the year 2031) and its relationship to the infrastructure required to service this forecast (wastewater plant expansion is the most costly and critical component). The Province’s Growth Plan for the Greater Golden Horseshoe (Places to Grow) released in June 2006, directs that by 2031, the City of Hamilton plan for a population of 660,000 and employment of 300,000. As required under the “Places to Grow Act” 2005, the City of Hamilton must bring its Official Plan into conformity and use the population targets to plan for the infrastructure required to service same. However, census data has shown that Hamilton (as well as other municipalities) is not keeping pace with the projected growth. For example, Hamilton over the last 5 years has averaged approximately 1,750 single-detached unit equivalents for its residential construction activity. Places to Grow, in its forecast to 2031, requires Hamilton to average approximately 2,500 units annually. That forecast is what staff must plan for in expanding for example, its wastewater capacity. If the growth does not occur, the City would still have to meet its debt obligations which funded the growth infrastructure. The City does not have the

financial capacity to meet these obligations from non-rate sources. Accordingly, if growth projections do not materialize, the debt becomes unaffordable and will further impact water and wastewater rates.

The Woodward Avenue wastewater treatment plant, water, wastewater linear and storm growth infrastructure represent a significant part of the City’s Development Charges (Refer Table below). The increase in water and wastewater DC’s is happening across municipalities in southern Ontario as a consequence of growth and more stringent Provincial and Federal water and wastewater regulations regarding water quality and the quality of wastewater effluent.

**DC SERVICE QUANTUM DETAIL**

	Current	Full July 6/10
Urban Area Charges		
WasteWater Plant	\$ 3,727	\$ 5,082
Linear WasteWater	\$ 3,006	\$ 4,098
Water	\$ 2,783	\$ 3,795
Storm Water	\$ 2,714	\$ 3,700
<b>Total Urban Rate DC Charges</b>	<b>\$ 12,230</b>	<b>\$ 16,675</b>
Municipal Wide Charges	\$ 7,343	\$ 10,014
<b>Total</b>	<b>\$ 19,573</b>	<b>\$ 26,689</b>

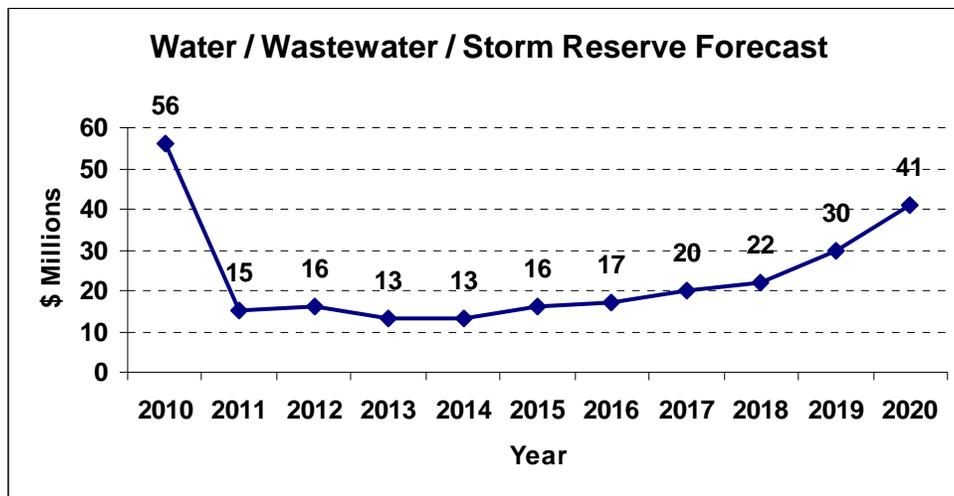
In order to address the excess wastewater flow and the forecasted growth potential for the City, a substantial plant expansion is required. During the 2009 and 2010 Rate Budget deliberations, staff indicated to Council that there is significant risk attached to the current Wastewater plant expansion as it relates to meeting the Provinces “Places to Grow” development forecasts and generating enough growth revenue to pay for the approximately 50% of capital costs attributed to growth. This is especially significant, as it relates to current recessionary economic conditions and the corresponding decrease in residential construction activity. In response, Council directed staff to investigate phasing options for the plant expansion in order to smooth out the cash flow requirements.

The 2011 Capital Budget and 10 year forecast reflect the phasing of the Wastewater plant expansion with the large expenditures occurring in 2017 – 2019. The DC Reserve forecast projects a positive reserve balance based on meeting staff’s growth forecast and the phasing of the plant expansion.

## Projected Water / Wastewater / Storm Reserves

The graph below provides the projected reserve balances for the Water, Wastewater and Storm programs. The reserve forecast reflects utilizing \$40 million in reserve funds to fund previously approved capital in 2011, to reduce reliance on debt. As well, the reserve forecast reflects a total of \$18.6 million in contributions to the reserve from projected revenue surpluses over the 10 year period, of which \$18 million is attributed to surpluses in 2019 & 2020. However the \$18.6 million in contributions to the reserve is offset by \$13 million in reserve funding to the operating budget in 2011 – 2013 to offset the 3 year phase-in of budgeted revenue reductions in the ICI sector. The reserve forecast also reflects utilizing \$5.6 million in total from the reserve in years 2011 to 2013 to provide future compassionate flood relief to residential property owners in addition to contributions to support previous flooding commitments.

Reserves are essential to assist the City in mitigating unanticipated events such as consumption fluctuations, unforeseen increase in capital costs and potentially to decrease future debt issuance. The current reserve forecast indicates the reserve balance will decrease from \$56 million in 2010 to \$15 million in 2011 (primarily due to funding \$40 million in capital) and remain fairly constant till 2018, and then increase in 2019 and 2020 to \$41 million due to the projected operating surpluses in those years.



## Impact of Capital Budget on Operating Budget

As summarized below, the 2011 Rate Budget incorporates \$1.7 million less capital financing costs than in 2010, attributable to a decrease in Contribution to Capital of \$4.9 million which is partially offset by an increase in DC Exemption Funding of \$2.7 million and an increase in Debt Charges of \$0.5 million.

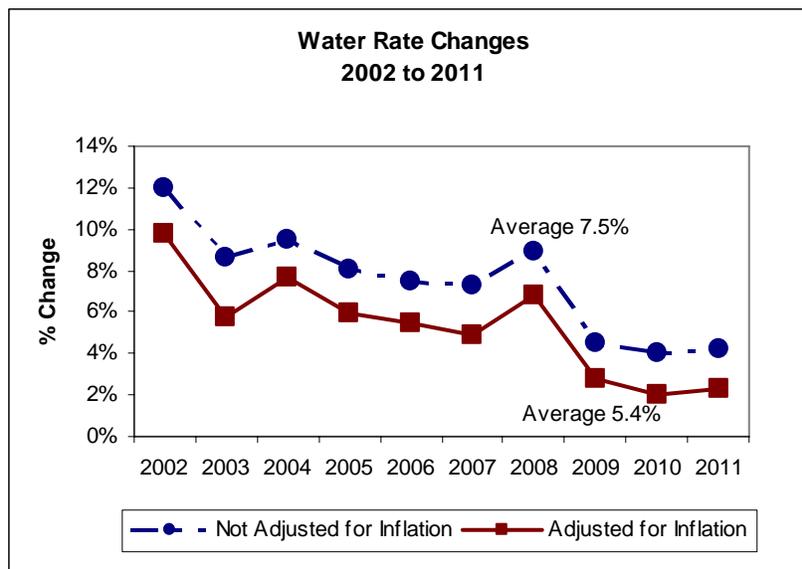
<b>WATER, WASTEWATER &amp; STORM</b>					
<b>IMPACT OF CAPITAL ON OPERATING BUDGET</b>					
<b>(000's)</b>					
	<b>2010 APPROVED</b>	<b>2011 PROPOSED</b>	<b>CHANGE</b>		<b>2011 - 2020 FORECAST</b>
			<b>\$</b>	<b>%</b>	
<b>Debt to be Issued</b>	<b>6,666</b>	<b>10,049</b>	<b>3,383</b>	<b>50.8%</b>	<b>103,591</b>
<b>Debt Charges</b>	<b>6,090</b>	<b>6,572</b>	<b>482</b>	<b>7.9%</b>	<b>279,609</b>
<b>Contribution to Capital</b>	<b>82,329</b>	<b>77,460</b>	<b>(4,869)</b>	<b>-5.9%</b>	<b>728,898</b>
<b>DC Exemption Funding</b>	<b>6,295</b>	<b>9,000</b>	<b>2,705</b>	<b>43.0%</b>	<b>83,815</b>
<b>Impact on Operating Budget</b>	<b>94,714</b>	<b>93,032</b>	<b>(1,682)</b>	<b>-1.8%</b>	<b>1,092,322</b>

# User Fees

## Trends in Water Rate Charges 2002-2011

Over the 10 year period 2002 to 2011, Hamilton's overall average annual water rate increased by 7.5%, before adjusting for inflation. When inflation is taken into account, the overall average annual rate increase over the same period amounts to 5.4%.

The chart below shows the trend in Hamilton's water rates for the period 2002 to 2011:



## Comparative Rates

In recent years, staff reported that Hamilton's water and wastewater rates have remained competitive, inclusive of the fact that annual rate increases over the past decade averaged 7.5%, before adjusting for inflation.

An updated review of 2010 annual water and wastewater charges places Hamilton, in the case of residential users, within the mid to low range of a 14 municipality comparator group.

Over the past decade, Hamilton's ability to maintain competitive water and wastewater rates, given the magnitude of the rate increases approved over this same period, is a reflection of the fact that similar to Hamilton, other municipalities are addressing many of the same investment requirements identified above. Also, it should be noted, that

other municipalities, like Hamilton, have adjusted consumption forecasts as a result of conservation efforts.

Over the period 2002 to 2010, Hamilton’s residential annual water and wastewater bill has ranged from 8<sup>th</sup> to the current ranking of 12<sup>th</sup>. Other municipalities within the comparator group are facing similar infrastructure investment requirements as Hamilton.

A review of average annual residential water and wastewater charges of comparator municipalities indicates that Hamilton’s average charges are within the lower range in terms of total annual charges. In the case of commercial and industrial ratepayers, the comparison of average annual charges indicates that Hamilton ranks in the mid range which is consistent with last year.

<b>2010 COMBINED METERED WATER/WASTEWATER CHARGE COMPARISON WITH OTHER MUNICIPALITIES</b>				
<b>MUNICIPALITY</b>	<b>AVERAGE RESIDENTIAL 220 M<sup>3</sup></b>		<b>SMALL COMM/IND 325 M<sup>3</sup></b>	
	<b>Annual Charge</b>	<b>Ranking</b>	<b>Annual Charge</b>	<b>Ranking</b>
Norfolk	\$1,142	1	\$1,499	1
London	\$ 940	2	\$1,095	2
St. Catharines	\$ 759	3	\$1,017	4
Kitchener	\$ 716	4	\$1,058	3
Cambridge	\$ 688	5	\$ 953	6
Waterloo	\$ 661	6	\$ 993	5
Guelph	\$ 656	7	\$ 889	9
Halton	\$ 630	8	\$ 813	10
Brantford	\$ 616	9	\$ 910	7
Durham	\$ 614	10	\$ 813	11
Ottawa	\$ 606	11	\$ 896	8
<b>Hamilton</b>	<b>\$ 535</b>	<b>12</b>	<b>\$ 769</b>	<b>12</b>
Toronto	\$ 482	13	\$ 615	13
Peel	\$ 307	14	\$ 454	14

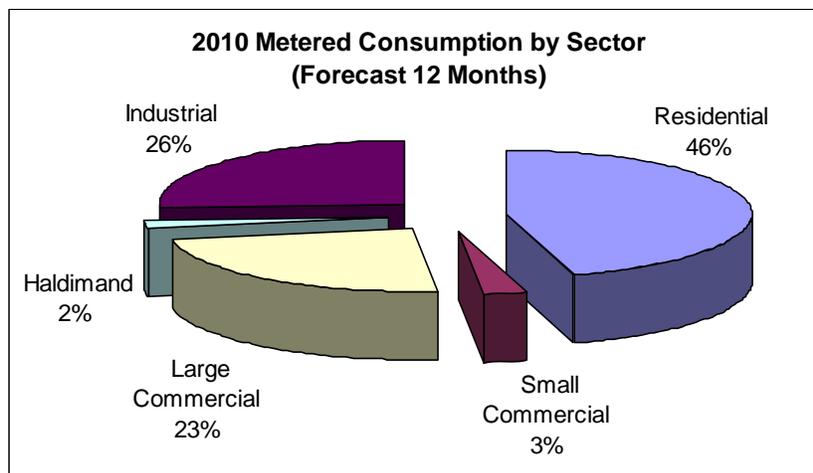
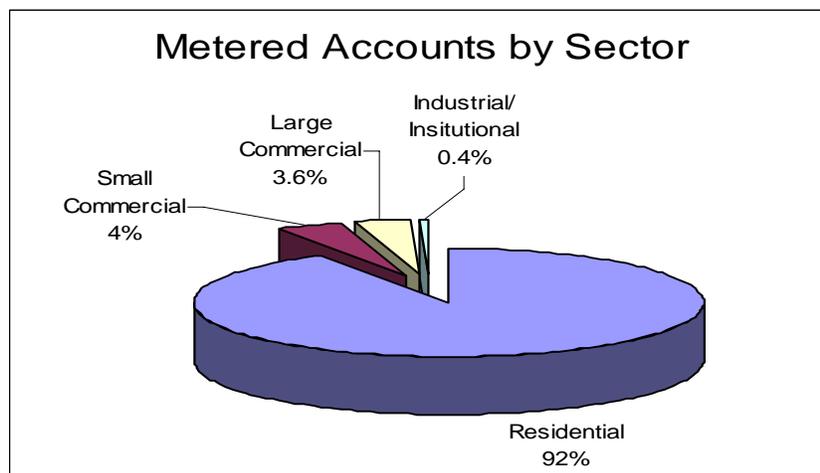
**2010 COMBINED METERED WATER/WASTEWATER  
CHARGE COMPARISON WITH OTHER  
MUNICIPALITIES**

MUNICIPALITY	MID-SIZE COMM/IND 2,272 M <sup>3</sup>		LARGE COMM/IND 22,727 M <sup>3</sup>	
	Annual Charge	Ranking	Annual Charge	Ranking
Norfolk	\$8,377	1	\$77,915	1
Kitchener	\$7,399	2	\$74,013	2
Waterloo	\$6,643	3	\$65,443	3
Brantford	\$6,362	4	\$63,636	4
Ottawa	\$6,262	5	\$62,639	5
Cambridge	\$5,869	6	\$57,509	6
St. Catharines	\$5,797	7	\$56,014	7
Guelph	\$5,212	8	\$50,622	9
<b>Hamilton</b>	<b>\$5,101</b>	<b>9</b>	<b>\$51,118</b>	<b>8</b>
London	\$4,493	10	\$38,886	10
Toronto	\$4,297	11	\$35,263	12
Durham	\$4,204	12	\$37,709	11
Halton	\$3,675	13	\$20,889	14
Peel	\$3,174	14	\$31,748	13

# Consumption and Rate-Generated Revenues

## Metered Water Consumption

Currently, the City of Hamilton has approximately 138,200 metered water accounts, approximately 92% of which are residential accounts. While industrial/institutional accounts make up less than 1% of total metered accounts, industrial/institutional water consumption accounts for 25% of total consumption. In 2010 (year to date), residential users account for 46% of total water consumption, the balance 53% is attributed to commercial demand.

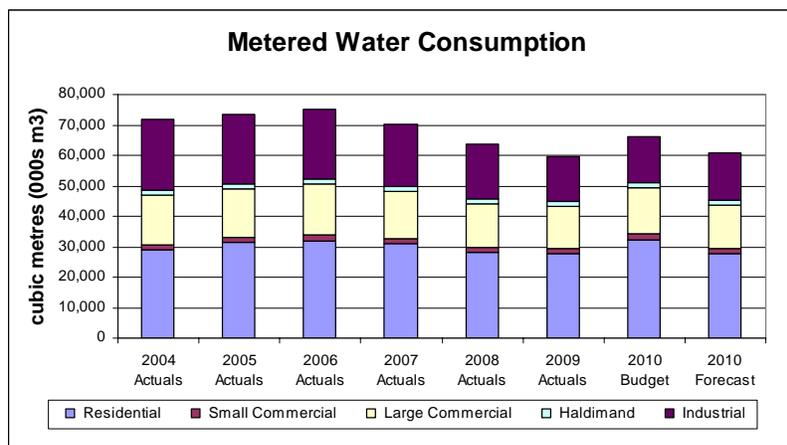


## 2010 Projected Consumption

Over the past number of years, staff recommended varying degrees of adjustment to the consumption assumptions in recognition of changing demand for water across all sectors.

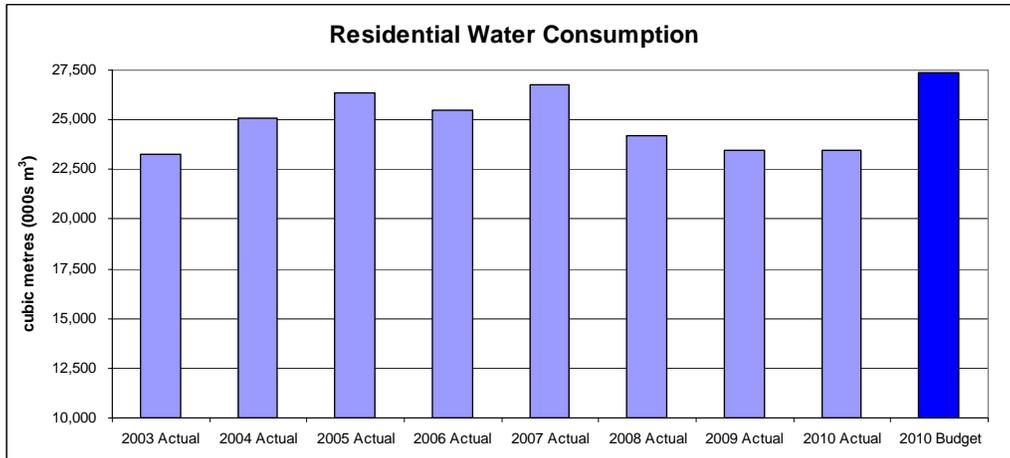
For the 2010 budget, staff recommended reducing the Large ICI consumption levels by 4.2%. For 2006 to 2009, staff recommended adjusting the forecast consumption for each year in the large commercial sector as the historical consumption in this sector had been declining.

For 2010, total water and wastewater revenues are projected to amount to \$143 million, based on flat rate revenues, and metered sales of approximately 61 million cubic meters. Projected 2010 metered and non-metered water and wastewater revenues are forecast to be approximately \$15.2 million below budget.

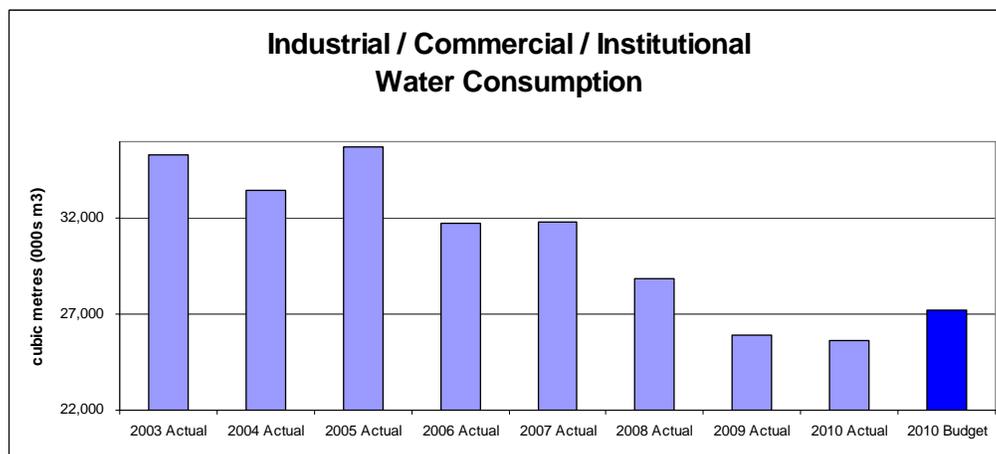


The figure below highlights consumption trends in the residential sector.

The average water consumption, per household, during the last three years was approximately 232m<sup>3</sup>, and for the purpose of the 2011 forecast 220m<sup>3</sup> was assumed.



For the period January to October 2010, total ICI consumption accounts for approximately 25.6 million cubic metres or 51% of total water consumed, versus 25.9 million cubic meters over the same period in 2009.



A significant 2010 budget variance has been identified in the ICI sector. Similar to the residential sector, the ICI sector is recording declining consumption relative to previous years.

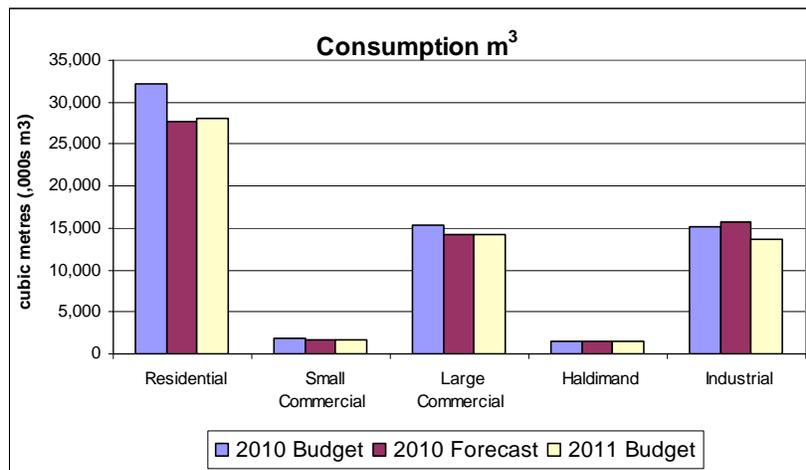
As the institutional sector undertakes energy conservation initiatives, similarly they are realizing water conservation benefits. In 2008, staff reported one institutional ratepayer who implemented a number of conservation investments which resulted in reduced consumption in excess of 50%, relative to the previous 3-year average. This decline in consumption of this one user is equivalent to approximately \$500,000 annually in unrealized revenue, the equivalent to the addition of approximately 880 new residential users. Similar results have been recorded relating to City Housing Hamilton, as well as, the Education sector.

Recently, staff has surveyed the largest Industrial users which confirmed that water conservation initiatives are continuing in this sector with significant impacts. One major food producer reported that an investment in a cooling tower to allow the recycling of water in their operations has resulted in 432,000 m<sup>3</sup> annually being reused which equates to over \$900,000 in foregone combined water and wastewater revenues. Similarly, one steel fabrication company implemented a valve control plan to shut off water during non-production periods resulting in savings of approximately \$100,000 annually, in addition to recycling water within their operations amounting to 340,000 m<sup>3</sup> annually equating to approximately \$650,000 in foregone combined water and wastewater revenues.

The economic crisis has negatively impacted the Commercial and Industrial sector. Staff will continue to monitor consumption across all sectors and take efforts to ensure that the City of Hamilton is maximizing its full revenue potential with respect to metered water and wastewater. Similarly, staff will be monitoring changes in consumption in year and reporting through the Budget Variance Reports and Information Reports to Council.

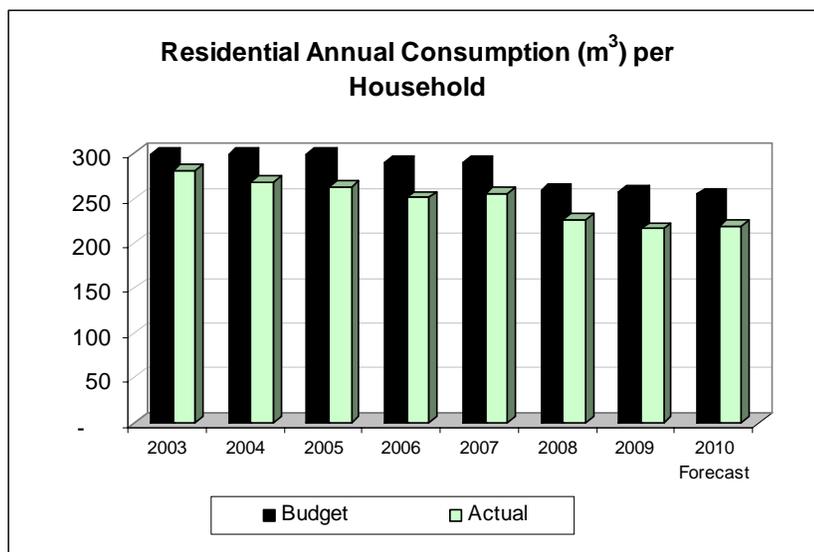
### 2011 Consumption Forecast

For 2011, total metered water consumption is forecast at approximately 63 million cubic meters, a reduction of approximately 8% relative to 2010 budget. The following chart compares forecast budgeted consumption in the years 2010 and 2011. Reductions, relative to 2010 budgeted, are forecasted in the residential and ICI sectors for reasons identified above.



A recent survey of Ontario municipalities conducted by the Region of Peel, found that all survey respondents including Hamilton have observed a downward trend on water consumption per household over the last decade.

Based on the review of residential consumption patterns, residential consumption, on average, has been declining over the past decade. The declining consumption reflects ongoing conservation efforts associated with fixture/appliance obsolescence such as the installation of water efficient toilets and washer machines. For 2011, staff is recommending that the forecast for average residential consumption be reduced to 220m<sup>3</sup> to reflect consumption trends observed in 2008 – 2010 as seen in the table below:



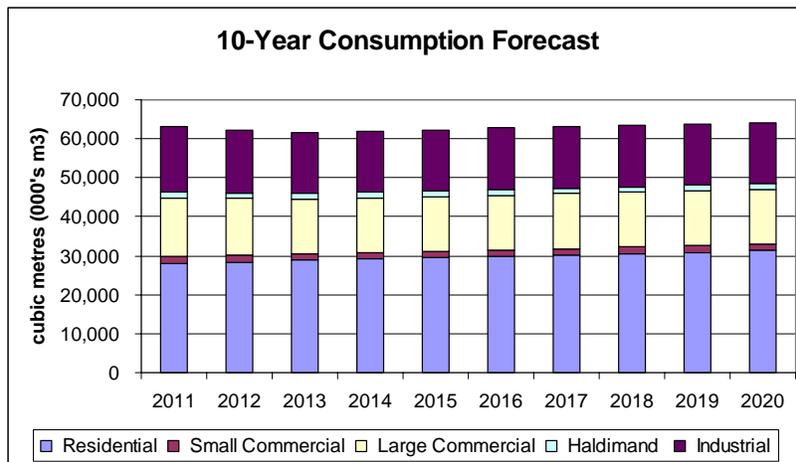
It is not clear how much further average residential consumption can decline, but there exists the potential for further declines, principally due to conservation efforts and the associated regulations. The Water Opportunities and Water Conservation Act passed by the Ontario government in November 2010, includes measures to mandate specific water efficiency standards for consumer products such as toilets whereby only toilets of 6L per flush or less will be allowed for retail sale.

For the 2011 ICI sector consumption forecast, staff are recommending reducing budgeting consumption over a three year period to the 2010 forecasted consumption levels as there has been some level of recovery in this sector from the levels seen in 2009.

## 10-Year Consumption Forecast

Total water consumption over the 10-year forecast is projected to increase by approximately 2%. This relatively conservative forecast reflects the following:

- uncertainty surrounding growth/decline of consumption in the ICI sector
  - loss of 1 of the top ICI users is equivalent to approximately 4,500 new residential accounts
- price elasticity in the ICI sector
- conservation impacts
  - e.g. residential toilet consumption = 30% of indoor consumption
  - low-flow toilets use 1/3 of conventional toilet
  - 5% reduction in residential use = reduction of 1.6M m<sup>3</sup>
  - energy conservation initiatives in the ICI sector usually include water impacts
- Haldimand water agreement that expires in 2014
- New Halton water agreement to be executed in 2011



# Pricing Strategy and Water Demand

The cost of supplying clean water for residential use is influenced by demand and the cost of production. In addition to the cost of production, many municipalities, like Hamilton, have had to introduce financing strategies that incorporate the cost of replacement and remediation of aging infrastructure. All water service providers are mindful of the increasing costs of production, especially with respect to energy. This has undoubtedly spurred the increasing attention that the study of water demand seems to receive from water supply and environmental authorities.

The basic premise of conservation water rates is that the demand for water falls as the volumetric price of water increases. The volumetric price is used to give the water customer an incentive to conserve water. The strength of the relationship between the price of water and the demand for water is measured using a value called the price elasticity of demand or just elasticity<sup>2</sup>.

Elasticity varies by type of customer. Large industrial water users may be very sensitive to the price of water, while commercial customers and residential customers in individually metered dwellings will be less sensitive. Zero elasticity is generally appropriate for flat rate customers or water users who are not individually metered (e.g. tenants in a bulk-metered building)

Elasticity of residential demand will vary by type of use - indoor demand is generally less elastic than outdoor demand for lawn and garden irrigation.

Elasticity may vary as price increases. Initially, at very low prices, the cost of water is negligible for most customers and elasticity is low. As the price increases, the water bill becomes more prominent and elasticity increases (i.e. demand becomes more responsive to price).

Over time, the cost of water to customers will fall in terms of real or non-inflating dollar values if increases in the price of water do not keep up with inflation. If this has been

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<sup>2</sup> There are also elasticities to measure the response of demand to increases in household income, population growth, etc. Here, the term is only used to refer to price elasticity.

happening, then demand may not respond as expected to increases in the price of water since the increases just serve to offset inflation.

As price becomes very high, water demand may “harden” or become less responsive to subsequent price increases. This can happen when customers have exhausted all of their cost-effective options for reducing water demand. For example, discretionary demand may be minimized while basic needs must continue to be met.