

Request for Decision City Council




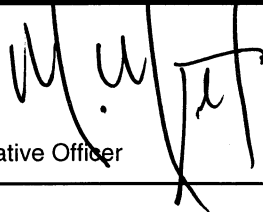
Type of Decision										
Meeting Date	March 10, 2005				Report Date	March 2, 2005				
Decision Requested		Yes	<input checked="" type="checkbox"/>	No	Priority	<input checked="" type="checkbox"/>	High		Low	
	Direction Only				Type of Meeting	<input checked="" type="checkbox"/>	Open		Closed	

Report Title
Unbilled Potable Water

Policy Implication + Budget Impact	
<input checked="" type="checkbox"/>	This report and recommendation(s) have been reviewed by the Finance Division and the funding source has been identified.
<p>Sufficient capital funds have been identified to begin this project. Any additional funding required will be approved through future Capital Budgets.</p>	
<input checked="" type="checkbox"/>	Background Attached

Recommendation
FOR INFORMATION ONLY
Recommendation Continued

Recommended by the Department Head
 Alan Stephen General Manager of Infrastructure & Emergency Services

Recommended by the C.A.O.
 Mark Mieto Chief Administrative Officer


Date: March 2, 2005

Report Prepared By



J. P. Graham, P. Eng.
Manager of Environmental Innovation & Energy Initiatives

Division Review



R.G. (Greg) Clausen, P. Eng.
Director of Engineering Services

Background

The topic of unbilled water and the operations that contribute to it has been the subject of review by a working group from Operations and Engineering over the past several months. More recently, the topic was discussed at a Public Meeting dealing with water and waste water rates.

The EarthCare Sudbury Local Action Plan entitled "Becoming a Sustainable Community" recognizes that this was a significant topic. The Plan indicates that a comprehensive community-based water efficiency program is a necessary component of community sustainability. This comprehensive approach requires that we ultimately bring together the issues around unbilled potable water, water conservation and energy efficiency. The topics of community-based water conservation and energy efficiency will be dealt with as we roll out programs through the One-Tonne Challenge. The matter of unbilled potable water is mostly about municipal operations and is the focus of this report.

Based on 2003 water supply information, 22% of our potable water comes from groundwater sources and 78% from surface water supplies. The total water production in that year was approximately 27.8 Million m³. Based upon our water metering records and water revenues, total billed water was approximately 16.4 Million m³ that year. Thus the average system-wide unbilled water is approximately 41% of the total production. Not all distribution systems are equal in terms of the amount of unbilled water. In fact, the Sudbury Water Distribution System stands out with unbilled water equal to approximately 47.4% as compared to the Dowling System at 8.3% and the Valley/Capreol System at 31.4%.

By way of further comparison, the Sudbury System shows that, based upon production numbers, the average consumption per capita is approximately 570 litres per capita per day versus the Dowling System where the consumption is approximately 270 litres per capita per day and the Valley/Capreol System with a consumption of approximately 355 litres per capita per day. Based on the consumption rates and the profile of unbilled water, early action is required in the Sudbury System.

There are numerous operations and issues that contribute to the unbilled water in our systems and they are outlined below:

1. Frozen water services
2. Watermain breaks and leaks
3. Water Quality Management in Distribution Systems
4. Watermain cleaning and swabbing
5. Sanitary/Storm Sewer Maintenance Programs
6. Potable water used in Waste Water Treatment Plants and Lift Stations
7. Contractor uses
8. Fire Flows – fighting and practices
9. Free flowing stand pipes

Date: March 2, 2005

Some of these items above can be managed more effectively than others. It is normal in all municipal water distribution systems to have unbilled potable water. Best practices would indicate that this should be in the range of 15% of the total potable water produced.

We submit the following information and action plans for each of the areas of operation that contribute to unbilled water.

Frozen Water Services

The City has a master list of addresses for water services that have frozen in the past. This list totals approximately 740 locations. Of those, 510 are the result of freezing problems on municipal property. Based on that list, last Fall 510 property owners were requested to let their water run from the second Monday in December to the last Monday in April. During this period of time they were charged a flat rate for their water. This program obviously contributes to unbilled water.

We propose the following actions:

- Accelerate the program to lower/insulate water services
- Review the decision-making process on running water
- Meter, record and report on total water utilized each winter

Watermain Breaks and Leaks

A watermain break history confirms that there is an increasing number of breaks and leaks in our water distribution systems each year. This trend will continue as the infrastructure ages. Only accelerated replacement of watermains will reverse this trend. It is extremely difficult to quantify the amount of lost water. Our geology contributes to the problem. In various locations like the sand areas in Capreol and the Valley and rock trenches in Sudbury, it is extremely difficult to track down these leaks.

We propose the following action:

- Continue the search for an economically feasible "leak detection program"
- Water Plant Control Room staff to advise of increased flows

Water Quality Management in Distribution Systems

The continued challenges of guaranteeing high quality water in the water distribution systems requires significant amount of flushing to manage localized quality issues such as:

- Red water complaints
- Black water complaints
- Low chlorine residuals

While we will continue to require flushing water, it is possible to quantify and manage these operations and we propose the following action:

- Meter, record and report on total flushing water annually
- Institute a tracking system to reduce flushing water through the timely termination of the flush.

Date: March 2, 2005

Watermain Cleaning & Swabbing

These operations are required to reduce sediment and products of corrosion from the various watermains throughout the City. In some Water Distribution Systems, corrosion inhibitors have been installed to facilitate this work.

There is a need to increase the amount of cleaning and swabbing in our systems which may in fact contribute to additional unbilled water for this service.

We do propose the following action:

- Meter, record and report on total annual water usage during cleaning programs

Sanitary/Storm Sewer Maintenance

Unbilled water arises from routine cleaning/flushing of sewers and catchbasins. There is also emergency response dealing with sluggish flowing sewers and blockages. There is little opportunity to save water in this area as more activity will be required over time.

We propose the following action:

- Track/estimate total annual water consumption

Waste Water Treatment Plants and Lift Stations

The City operates 10 Waste Water Treatment Plants. The majority of the process waters is final plant effluent. There is some potable water used in restricted areas required by legislation/health and safety.

The City also operates 75 sewage lift stations. Almost all of these lift stations have water services to the facilities for flushing and cleaning.

We propose the following action:

- Meter, record and report on annual potable water usage at each facility
- Continue with a comprehensive backflow prevention maintenance/replacement program to eliminate cross connections

Contractor Uses and Fire Flows

Currently contractors draw water from designated hydrants as do firefighters during their practice sessions. In neither case is the water usage metered or billed. Obviously emergency firefighting events are random and can require large quantities of water.

We propose the following action:

- Firstly, meter, record and report on annual water usage by contractors and firefighters during their practice sessions
- After the usage is quantified, consider the appropriateness of a user fee

Date: March 2, 2005

Free Flowing Stand Pipes

There are free flowing stand pipes on Long Lake Road, Bancroft Drive and Spruce Street in Garson which run continuously. These stand pipes exist to allow the general public to collect potable water for their use. We have measured these flows and on an annual basis, 55,000 m³ of water is discharged from these stand pipes. This water at our current billing rates is valued at \$43,505.

We propose the following action:

- Develop a plan to eliminate these free flowing stand pipes while continuing to provide water to the public but on a "User Fee Basis".

As an overarching program, we intend to develop a Water Use Inventory System that will track water usage in all areas of consumption, as part of a future Eco Budget Program. More details of this future Eco Budget Program will be developed and brought back to Council.

We know that you cannot effectively manage what you do not measure. Therefore, more metering is an obvious first step.

The benefits of a comprehensive approach will include:

- Effective decision-making tool
- Bench marking and performance evaluation
- Operating cost avoidance
- Capital expansion cost deferral

There is funding available in both the water and waste water capital budgets to begin this work immediately. In the 2002 and 2005 water capital budgets, there are funds totalling approximately \$140,000 for Water Conservation. In the 2005 waste water capital budget, there are funds totalling approximately \$300,000 for Lift Station Upgrades and Contingency Cost that can be utilized to increase metering in the waste water facilities. The longer term needs will be determined and included in future capital budgets.

As Phase II of the work, we will come back to Council in the Spring with a proposal to develop a "Master Water Plan". The Plan will include:

- Source Protection
- Future Growth – New Supplies
- Water Use Inventory System
- Integrating Existing System
- Water Conservation

City of Greater Sudbury

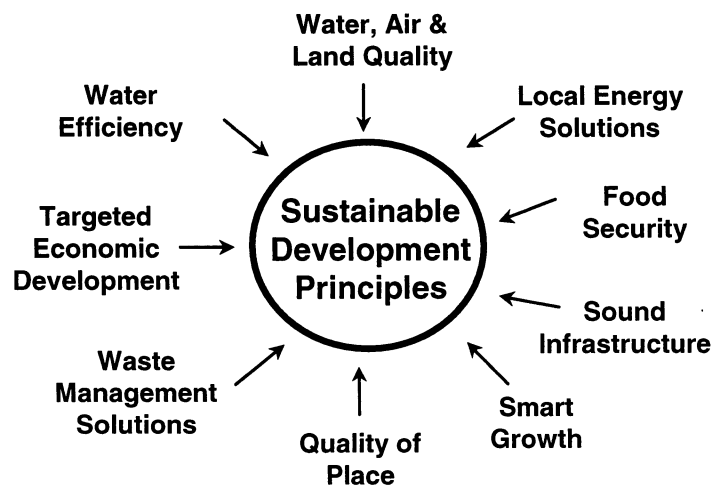
Unbilled Potable Water Update

**Council Meeting
March 10, 2005**

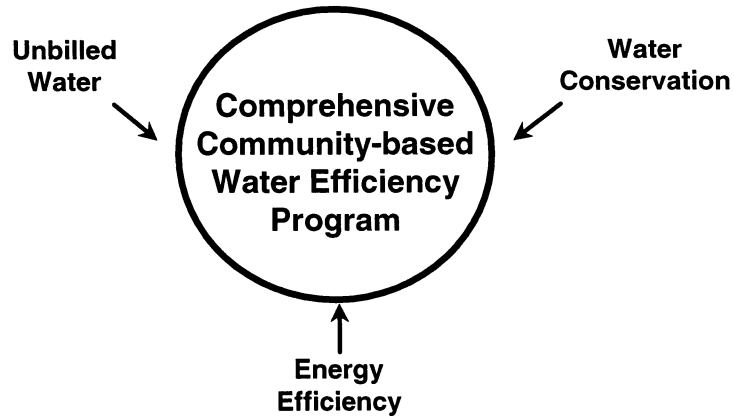
Presented by **Paul Graham, P. Eng.
Manager of Environmental Innovation
& Energy Initiatives**



Becoming a Sustainable Community



EarthCare Sudbury Action Plan

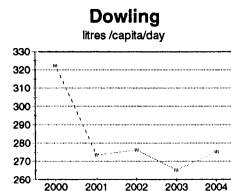


2003 Water Supply Facts

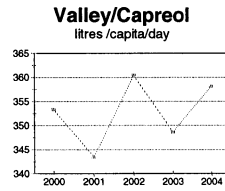
Groundwater Supply	-	22%
Surface Water Supply	-	78%
Total Water Production	-	27,760,598 m³
Total Billed Water	-	16,420,976 m³ (59%)
Total Unbilled Water	-	11,339,622 m³ (41%)



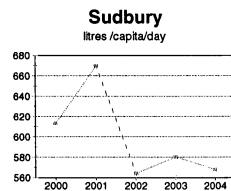
Typical Water Consumption Profiles



Unbilled – 8.3%



Unbilled – 31.4%



Unbilled – 47.4%

Sudbury's Water Consumption Rates confirm that early action is required.



Components of Unbilled Water

- Frozen water services
- Watermain breaks & leaks
- Water Quality Management in Distribution System
- Watermain cleaning & swabbing
- Sanitary/Storm Sewer Maintenance Programs
- Potable water use in Waste Water Treatment Plants & Lift Stations
- Contractor uses
- Fire Flows – fighting and practices
- Free flowing stand pipes



Frozen Water Services

Frozen on Private Property	230
Frozen on Municipal Property	510
TOTAL	740

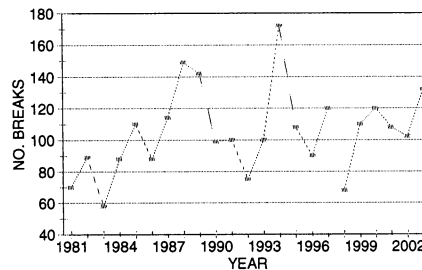
Last Fall 510 property owners were requested to let water run from the second Monday in December to the last Monday in April and were charged a flat rate.

ACTION

- Accelerate the program to lower/insulate water services
- Review the decision-making process on running water
- Meter, record and report on total water consumed each winter from this procedure



Watermain Break History



ACTION

- Continue the search for an economically feasible "leak detection program"
- Water Plant Control Room staff to advise of increased flows



Water Quality Management in Distribution Systems

Flushing water to manage localized quality issues

- Red water complaints
- Black water complaints
- Low chlorine residuals

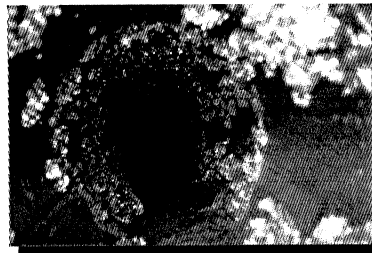
ACTION

- Meter, record and report on total flushing water used annually
- Institute a tracking system aimed at reducing flushing water



Watermain Cleaning & Swabbing

- Removal of sediments and products of corrosion
- Significant increase of cleaning & swabbing required
- Introduction of corrosion inhibitors facilitate this cleaning work



ACTION

- Meter, record and report on total annual water usage during cleaning programs



Sanitary / Storm Sewer Maintenance

- Routine cleaning/flushing of sewers and catchbasins
- Emergency response to sluggish flowing sewers or blockages
- Little opportunity to save water; more activity is required in this area

ACTION

- Track/estimate total annual water consumption



Waste Water Treatment Plants & Lift Stations

10 Waste Water Treatment Plants

- Most process water is final plant effluent
- Potable water usage restricted to area required by legislation/health & safety

75 Sewage Lift Stations

- Flushing/cleaning water is potable

ACTION

- Meter, record and report on annual potable water usage at each facility
- Continue with a comprehensive backflow prevention maintenance/replacement program



Contractor Uses & Fire Flows

- Currently contractors draw water from designated hydrants as do fire fighters during their practice sessions
- In neither case is the water usage metered or billed
- Obviously emergency fire fighting events are random and can require large quantities of water

ACTION

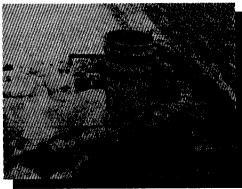
- Firstly, meter, record and report on annual water usage by contractors and fire fighters
- After the usage is quantified, consider the appropriateness of a user fee



Free Flowing Stand Pipes



Long Lake Rd.



Bancroft Dr.



Spruce St.

Water consumed annually – 55,000 m³ valued at \$43,505

ACTION:

Develop a plan to eliminate these Free Flow Stand Pipes while continuing to provide water to the public but on a “User Fee Basis”.



General Observations

What you do not measure you cannot manage.

First step is more metering.

A good Tracking System – Water Use Inventory System will reduce waste and facilitate reporting as part of a future Eco Budget Program

Funding is available in both the Water and Waste Water Capital Budgets to begin this work.



Benefits of Comprehensive Water Use Inventory Program

- **Effective Decision-making Tool**
- **Benchmarking and Performance Evaluation**
- **Operating Cost Avoidance**
- **Capital Expansion Cost Deferral**



Develop Master Water Plan

- **Source Protection**
- **Future Growth – New Supplies**
- **Water Use Inventory System**
- **Integrating Existing System**
- **Water Conservation**



THANK YOU

*Discussion
Period*

