



## MEMORANDUM

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**Date:** December 23, 2011  
**To:** Steering Committee Members  
**From:** Nick Gollan and Nancy Corbett  
**cc:** Working Group Members  
**Subject:** **Credit Policy Development – Memorandum #6  
Recommended Stormwater Credit Option**

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### INTRODUCTION

The purpose of this technical memo is to establish the framework for the preferred alternative. The process of selecting a preferred alternative involved defining the opportunity statement as well as establishing a list of alternatives. These are outlined in Memo #2. Memo #3 outlined the impact analysis of each of the alternatives and Memo #4 provided the evaluation methodology for selecting a preferred alternative. Based on the evaluation, the preferred credit program would involve providing a maximum of 45% credit on the monthly stormwater charge for all eligible property owners.

The justification for the maximum credit of 45% of the monthly charge was outlined in Memo #3. Essentially, even if all privately owned sites provided stormwater management measures, funding would still be required for costs associated with replacing and maintaining the municipal stormwater management infrastructure.

Therefore, the preferred alternative consists of providing credits to non-residential and multi-residential sites using a particular approach and providing credits to residential sites using another approach. Both achieve the same goal of providing stormwater management and both provide a maximum of 45% credit. However, since these two types of properties vary in the manner in which they contribute to stormwater, a different approach for each was required to recognize their different contributions to the municipal infrastructure system. For instance, residential sites generally do not contribute greatly to water quality degradation whereas non-residential and multi-residential sites do. The following sections provide the details of the proposed credit program based on the two types of sites.

### NON-RESIDENTIAL AND MULTI-RESIDENTIAL CREDITS

The typical properties that would fit into this category include public and private schools, universities, colleges, government buildings, commercial plazas, industrial facilities, places of worship and apartment buildings with more than 5 dwelling units.

Both water quantity (flood prevention) and water quality (pollution reduction) control credits will be provided to eligible non-residential and multi-residential property owners based on stormwater management controls on their property. An upset limit of 45% of the stormwater rate would be available to all customers who currently pay the stormwater rate. Out of this maximum credit, 25% would be granted for quantity controls (flood prevention), 15% would be

granted for quality controls (pollution reduction), and 5% would be granted for educational programs related to stormwater management. These various credits could be additive up to 45% of the stormwater fee.

### **Flood Prevention Credit Rationale:**

The credit for quantity control will be based on the percentage of impervious area that is directed to the control infrastructure. Examples of control infrastructure include super-pipe storage, orifice controls, parking lot storage, flood control ponds and roof-top storage. Ultimately the type of control that is implemented would need to conform to the MOE Design Guidelines for Stormwater Management and/or the Toronto Region and Credit Valley Conservation Authority Design Guidelines for Low Impact Development. As such, if only a portion of the impervious area is directed to flood prevention infrastructure, this percentage would be multiplied by the maximum 25% credit available for this type of control.

Eg. Calculation 1: 60% of impervious area is directed to quantity control infrastructure  
 $0.60 \times 25\% = 15\%$  monthly stormwater utility credit.

### **Pollution Reduction Credit Rationale:**

The credit for quality control will be based on the percentage of impervious area that is directed to the control infrastructure and also the degree of enhancement. Examples of quality control infrastructure include stormwater quality control ponds, oil/grit separators, green infrastructure (low impact development techniques) and spill control devices such as snouts and goss traps. Ultimately the type of control that is implemented would need to conform to the MOE Design Guidelines for Stormwater Management and/or the Toronto Region and Credit Valley Conservation Authority Design Guidelines for Low Impact Development.

The federal *Fisheries Act* prohibits “the deposit of a deleterious substance of any type in water frequented by fish or in any place under any conditions where the deleterious substance or any other deleterious substance that results from the deposit of the deleterious substance may enter any such water” (subsection 36(3)). Any substance with a potentially harmful chemical, physical (including temperature) or biological effect on fish or fish habitat is considered to be deleterious. The primary indicator of a deleterious substance in stormwater runoff is total suspended solids (TSS). As such the MOE has established three (3) levels of protection with the goal of maintaining or enhancing the existing aquatic habitat, based on the suspended solids removal of different stormwater management facilities:

1. Enhanced Protection
2. Normal Protection
3. Basic Protection

The level of quality control credits is determined as follows:

1. Enhanced quality corresponds to the long term average removal of 80% of suspended solids. Therefore, maximum credit available for quality control would be based on the percentage of impervious area receiving enhanced quality control multiplied by 15%.
2. Normal quality corresponds to the long term average removal of 70% of suspended solids. Therefore, maximum credit available for quality control would be based on the percentage of impervious area receiving normal quality control multiplied by 10%.
3. Basic quality control corresponds to the long term average removal of 60% of suspended solids. Therefore, maximum credit available for quality control would be based on the percentage of impervious area receiving enhanced quality control

multiplied by 5%. In addition to the TSS removal criteria, properties would be eligible for the basic pollution reduction credits if they have implemented non-structural BMPs such as paved area sweeping programs and salt management plans.

Eg. Calculation 2: 20% of impervious area is directed to enhanced quality control,  
60% of impervious area is directed to normal quality control,  
 $0.20 \times 15\% + 0.60 \times 10\% = 9\%$  monthly stormwater utility credit

### **Education Credit Rationale**

Research was conducted to identify best practices used by other municipalities in developing a stormwater credit policy as well as to share lessons learned. In addition to researching other municipalities, the City of Kitchener and City of Waterloo partnered with the University of Waterloo to take part in the 2011 Waterloo Regional Area Survey. One component of the survey was to ask residents in each respective municipality questions about their existing behaviours regarding stormwater management practices as well as to gauge their preference of an incentive program to encourage stormwater management practices. The results of the research and survey that were conducted helped identify the value of having an educational program to increase general knowledge in the area of stormwater. For example, 59% of respondents said they would be somewhat or very likely to use best management practices that cost from \$100 to \$1000 to implement.

A current stormwater education program operating in Kitchener and Waterloo (2011-2013) is the ¡RAIN! program. ¡RAIN!: An Ecological Approach to Stormwater Management is a comprehensive outreach and action project designed to motivate residents to reduce stormwater quantity and improve stormwater quality before it flows into our streams and the Grand River. The ¡RAIN! program, funded by the City of Kitchener's Local Environmental Action Fund (LEAF), the Ontario Trillium Foundation, Sobeys' Earth Day Canada, Walmart Evergreen and Green Communities Canada, is delivered by Waterloo Region Green Solutions (operating as REEP), a non-profit environmental organization established in 1999.

Hands-on workshops, expert seminars, best practices tours, and special events motivate action by city residents through the ¡RAIN! program, supported by a growing web resource from REEP, and excellent local press coverage. Follow-up with REEP House visitors and program participants documents the quantities of water diverted from storm sewers as a result of participation in the program. Providing stormwater credits for educational programs further augments the objectives of the ¡RAIN! program described above.

A monthly stormwater utility credit is available for properties with an ongoing stormwater education program. To receive a 5% credit adjustment applied to the monthly stormwater utility rate, documentation must be provided to verify that the education program is being implemented. Eligible education programs include educating employees, the stormwater customer base and students about flood prevention and pollution reduction.

### **Non-residential and Multi-residential Rate Impact**

The combined rate change being recommended as part of the annual budget process and the recommended non-residential and multi-residential stormwater credit program means that property owners will have the ability to reduce the stormwater portion of their monthly utility bill. For example, if a property installed an oil/grit separator for pollution reduction, used parking lot storage and roof top storage for flood prevention and provided water quality educational

materials their employees they may receive stormwater credits up to 45%. Table 2 provides an example of what the non-residential and multi-residential stormwater rate difference could be in 2012.

Table 2: 2012 Non-residential and Multi-residential Rate Comparisons

<u>Property Description</u>	<u>2012 Annual Rate</u>	<u>2012 Rate With 45% Credit</u>
Non-Residential Medium Low	\$1,557.56	<b>\$856.67</b>

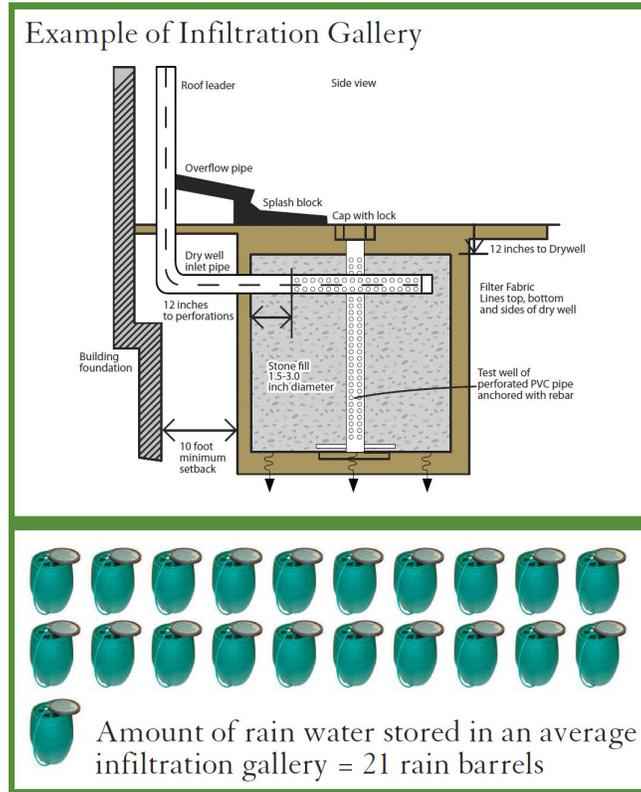
**RESIDENTIAL CREDITS**

The stormwater control credits will be provided to eligible residential property owners based on the volume of stormwater which is diverted from being discharged to the municipal stormwater management system. There is no quality or education component of the residential credit since the volume of runoff water from individual residential properties is much less than that from larger industrial/commercial/institutional properties. Consequently, there is little opportunity for these properties to provide quality control on an individual basis. For the same reasons as the non-residential and multi-residential stormwater credit program, residential properties will also have a maximum potential credit eligibility of 45% based on the volume of runoff diverted.

In order to establish the credit percentage breakdown for residential properties, a review of existing stormwater diversion techniques was conducted to identify the most effective method of reducing runoff from residential properties from entering the municipal SWM system. Infiltration galleries were determined to be the most effective at capturing the largest volume of rainwater at the point where it falls and reintroducing it to groundwater aquifers without using municipal infrastructure. Infiltration of clean stormwater into the ground can be beneficial to maintaining the natural hydrologic cycle.

Through the study it was determined the average residential infiltration gallery has been sized to accommodate 4,200 L of clean roof water to infiltrate back into the ground (to capture a 2 year storm event or 25mm of rainfall). The volume of rainwater that goes into these infiltration galleries is equivalent to 21 rain barrels as illustrated in Figure 1.

Figure 1: Illustration on an Infiltration Gallery (profile view) as Compared to Equivalent Storage Volume in Rain Barrels



In addition to rain barrels, other common practices employed on residential properties include rain water cisterns (above or below ground), rain gardens, and other landscaping techniques that minimize the potential amount of runoff leaving a property. For example, a resident may direct runoff to a depressed area of their property where the runoff would collect and naturally infiltrate into the ground or evaporate over an extended period of time. Such depressed areas where stormwater collects could be measured and factored into the volumetric approach as outlined in Table 3.

It was determined that the most appropriate method of allocating residential credits would be based on the volume of storage capacity designed to accommodate stormwater (rainwater/snowmelt), while not being prescriptive in how that storage capacity is achieved. Using infiltration galleries as the most effective best management practice, methods that capture less stormwater would also be awarded incrementally less credits. The resulting credit weighting for different volumes of captured stormwater are provided in Table 3.

Table 3: Residential Volumetric Credit Values

Volume Captured	Examples	Credit
200 – 400 L	<ul style="list-style-type: none"> <li>• 1-2 rain barrels</li> </ul>	9%
401 – 800 L	<ul style="list-style-type: none"> <li>• 3-4 rain barrels</li> <li>• small cistern</li> </ul>	18%

801 – 2400 L	<ul style="list-style-type: none"> <li>• small cistern</li> <li>• combination of small cistern and rain barrels</li> </ul>	27%
2401 – 3200 L	<ul style="list-style-type: none"> <li>• large cistern</li> <li>• combination of cistern and rain barrels</li> </ul>	36%
3201 L or more	<ul style="list-style-type: none"> <li>• large cistern</li> <li>• infiltration gallery</li> </ul>	45%

Eg. Calculation 4: Residential Property has 3 rain barrels (200 L each).  
 $3 \times 200 = 600\text{L} = 18\%$  monthly stormwater utility credit.

### Residential Rate Impact

The combined rate change being recommended as part of the annual budget process and the recommended residential stormwater credit program means that property owners will have the ability to reduce the stormwater portion of their monthly utility bill. For example, if a property installed an infiltration gallery or a large cistern they may receive stormwater credits up to 45%. Table 4 provides a comparison of what the residential stormwater rate difference could be in 2012.

Table 4: 2012 Residential Rate Comparisons

<u>Property Description</u>	<u>2012 Annual Rate</u>	<u>2012 Rate With 45% Credit</u>
Residential Single Detached Medium	\$116.20	<b>\$63.91</b>

### NEXT STEPS

Following approval by Council on January 9, 2012 and January 16, 2012, staff will need to work on the implementation of the credit program. This will require a significant level of effort given that it has been projected that approximately 8,500 properties could be eligible to receive a credit. The projected credit payments are located in Appendix K. The implementation will require some changes to the billing system as well as the development of an application form and an internal procedure to process this number of applications. It is anticipated that during the first year of implementation, the review may take several months as a result of the volume of submissions.

### Summary

The process to establish a preferred alternative followed the Environmental Assessment process and therefore ensured that there was public consultation as well as a review of broad impacts of implementing the program. The preferred alternative is to provide all eligible property types with a maximum of 45% credit off of the monthly stormwater charge provided that the criteria outlined in this memo are met. In keeping with Council's recommendation in June 2010, it is recommended that the credits be made retroactive to January 1, 2011. The report to

Council, INS-12-001, including the amendment to the by-law outlining the credit program is enclosed in Appendix K.