MEMORANDUM

City of Kitchener
City Hall, 200 King St. West
P.O. Box 1118
Kitchener, ON N2G 4G7

Date:	October 19, 2011
To:	Steering Committee Members
From:	Nick Gollan and Nancy Corbett
cc:	Working Group Members
Subject:	**Credit Policy Development – Memorandum #4 Evaluation Criteria and Methodology and Selection Of Preferred Alternative**

INTRODUCTION

Subsequent to presenting these five alternatives, listed below, to the public during a public information centre on September 29, 2011 (City of Kitchener) and October 4, 2011 (City of Waterloo) evaluation criteria were developed by the Steering Committee.

1. Do nothing
2. Multi-residential and non-residential credits
3. Residential credits
4. Residential rebate program
5. Combination of alternatives (Option 2 & 3, Option 2 & 4)

The purpose of this memo is to outline the steps taken in the evaluation process.

EVALUATION CRITERIA

The Steering Committee drafted project specific evaluation criteria that addressed four broad categories: the technical, natural, social and economic environments. This is consistent with the broad categories utilized in an environmental assessment process. Within each category, a subset of criteria was developed and the selection of these criteria was influenced by discussing the opportunities and challenges associated with developing and implementing this new stormwater policy. Each criteria was defined along with three measures which were translated into numerical scores (1, 5, 10). In each case, the higher score of 10 meant that the particular alternative excelled in this category whereas a score of 1 meant that the alternative did not meet the criteria. Table 1 outlines the evaluation criteria as well as what the numerical scores represent.

TABLE 1 – Evaluation criteria

Criterion	Description	Measure
Technical Environment		
Administrative Process and Resource Requirements	The ability of the alternative to be administered over the long term including the application process, QA/QC and billing account administration	High - the alternative is easy to administer and does not require close monitoring (10)
		Moderate - the alternative is somewhat easy to administer (5)
		Low - the alternative is administratively challenging and there may be difficulties to ensure compliance (1)
Ease of Implementation	The ability of the alternative to be easily implemented based on existing systems and processes	High - the alternative is very easy to implement with respect to programming and data storage (10)
		Moderate - the alternative is somewhat easy to implement (some constraints) (5)
		Low - the alternative has many difficulties with respect to implementation (1)
Flood Protection	The ability of the alternative to increase the existing level of flood protection	High - the alternative will maintain and may improve the level of flood protection - flood risk is minimized (10)
		Moderate - the alternative will provide the required level of flood protection, except in severe conditions - flood risk is reduced (5)
		Low - the alternative will provide no benefit to flood protection - flood mitigation required (1)
Erosion Control	The ability of the alternative to minimize streambank/shoreline erosion	High - the alternative will provide the most potential for erosion control - risk of streambank/shoreline erosion is minimized (10)
		Moderate - the alternative will provide an adequate level of erosion control - risk of streambank/shoreline erosion is reduced (5)
		Low - the alternative will provide no benefit to streambank/shoreline erosion issues - risk of erosion will remain (1)

Natural Environment		
Ability to meet local goals	The potential for the alternative to improve water quality and quantity control	High - the alternative will have the most potential for improving quality and quantity controls (10)
		Moderate - the alternative will have moderate potential to improve quality and quantity controls (5)
		Low - the alternative will have minor or no quality and quantity control improvements (1)
Sediment loading	The potential for the alternative to minimize sediment loads in municipal SWM infrastructure	High - the alternative will have the most potential to reduce sediment accumulation (10)
		Moderate - the alternative will have moderate potential to reduce sediment accumulation (5)
		Low - the alternative will not reduce sediment accumulation (1)
Aquatic habitat	The potential for the alternative to enhance aquatic habitat	High - the alternative will have the most potential to enhance the existing aquatic habitat (10)
		Moderate - the alternative will have moderate potential to enhance the existing aquatic habitat (5)
		Low - the alternative will not enhance the existing aquatic habitat (1)
Tree canopy	The potential for the alternative to maintain or enhance existing tree canopy	High - the alternative will have the the most potential for enhancing the existing tree canopy (10)
		Moderate - the alternative will have moderate potential to enhance the existing tree canopy (5)
		Low - the alternative will not enhance the existing tree canopy (1)
Groundwater resources	The potential for the alternative to maintain groundwater resources	High - the alternative will have the the most potential for recharging local aquifers (10)
		Moderate - the alternative will have moderate potential to increase groundwater recharge (5)
		Low - the alternative will not enhance groundwater recharge (1)

Economic Environment		
Capital Costs	Estimated potential of the alternative to defer municipal capital costs to upgrade SWM infrastructure	High - the alternative will have the most potential to defer capital costs (10)
		Moderate - the alternative will have moderate potential to defer capital costs (5)
		Low - the alternative will not defer capital costs (1)
O&M Costs	Estimated potential of the alternative to reduce O&M costs for municipal infrastructure	High - the alternative will have the most potential to reduce O&M costs (10)
		Moderate - the alternative will have moderate potential to reduce O&M costs (5)
		Low - the alternative will not reduce O&M costs (1)
Effect on property owner	The ability of the alternative to enable a property owner to reduce their stormwater costs	High - the alternative offers the greatest potential to reduce stormwater costs (10)
		Moderate - the alternative offers a moderate potential to reduce stormwater costs (5)
		Low - the alternative offers no potential to reduce stormwater costs (1)
Social/Cultural Environment		
Public Education Opportunity	The ability of the alternative to engage the community in public education	High - the alternative has the greatest opportunity for public education (10)
		Moderate - the alternative has some opportunity for public education (5)
		Low - the alternative has no opportunity for public education (1)
Public Participation Opportunity	The ability of the alternative to encourage the community to participate in the program	High - the alternative has the greatest opportunity for public participation (10)
		Moderate - the alternative has some opportunity for public participation (5)
		Low - the alternative has no opportunity for public participation(1)
Public Recognition Opportunity	The ability of the alternative to recognize members in the community for leadership	High - the alternative has the greatest opportunity for public recognition (10)
		Moderate - the alternative has some opportunity for public recognition (5)
		Low - the alternative has no opportunity for public recognition (1)

Visual Aesthetics	The ability of the alternative to enhance the visual appeal of the municipal SWM system including watercourses and ponds	High - the alternative has the greatest potential for increasing visual appeal (10)
		Moderate - the alternative has some potential for increasing visual appeal (5)
		Low - the alternative has no potential for increasing visual appeal (1)
Fairness and Equity	The ability of the alternative to reward individual property owners that act as good stewards for stormwater management	High - the alternative has the greatest potential for rewarding property owners (10)
		Moderate - the alternative has some potential for rewarding property owners (5)
		Low - the alternative has limited potential for rewarding property owners (1)

EVALUATION METHODOLOGY

The evaluation for the six options was discussed at a Steering Committee meeting held on October 17, 2011. The relative scores that were agreed upon at the meeting represent the Steering Committee's expert opinion regarding how each alternative will perform according to the established criteria. A summary of the evaluation of alternatives can be found in Appendix H.

The scores generated by alternatives in each category were totaled and then normalized so that each of the 4 categories were equally weighted, even if each category had a different number of individual criteria. The normalization process involved dividing a category's raw score by the total possible score for that category. The normalized score for each of the four categories (technical, social, natural and economic environment) were then added together to give each alternative a final score. The measures were designed such that an alternative that scores higher than another is a better alternative.

SENSITIVITY ANALYSIS

Following the evaluation process, a sensitivity analysis was carried out to verify the robustness of the evaluation methodology. To conduct the sensitivity analysis a total of three scenarios were compared to the evaluation scores. The first scenario used the equal weighting methodology prescribed by the *Municipal Class Environmental Assessment* (Municipal Engineers Association, October 2000, as amended in 2007. The second scenario considered the weighting scheme agreed upon by the Steering Committee. The third scenario considered the average suggested weighting scheme provided by the public stakeholder group at the first Kitchener public information centre held on September 29, 2011. The first Waterloo public information centre, held on October 4, 2011, did not receive any suggested alternative weighting scheme. Table 2 provides the different category weighting for each scenario.

TABLE 2: Sensitivity Analysis Scenarios

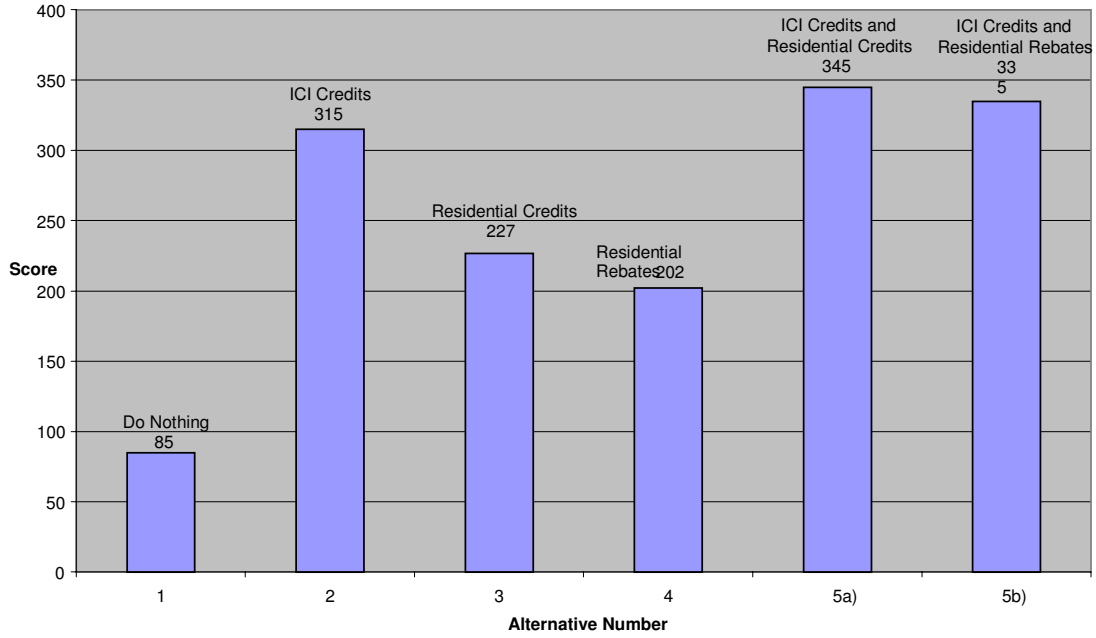
	Technical %	Natural %	Economic %	Social/Cultural %
Equal Weighting	25	25	25	25
Steering Committee Weighting	29	31	20	20
Public Stakeholder Weighting	21	34	26	19

Scenario 1: Equal Weighting

This first scenario demonstrates the scoring for each alternative using the prescribed EA method of equally weighting each of the 4 categories and these are shown as a total score for each in Figure 1.

Based on this weighting, the preferred option is Alternative 5a), combination of "ICI Credits and Residential Credits". Closely following is Alternative 5b), which is a combination of "ICI Credits and Residential Rebates". Both of the top two scoring alternatives provide a significant improvement versus the least desirable alternative to follow which is the "Do Nothing" option.

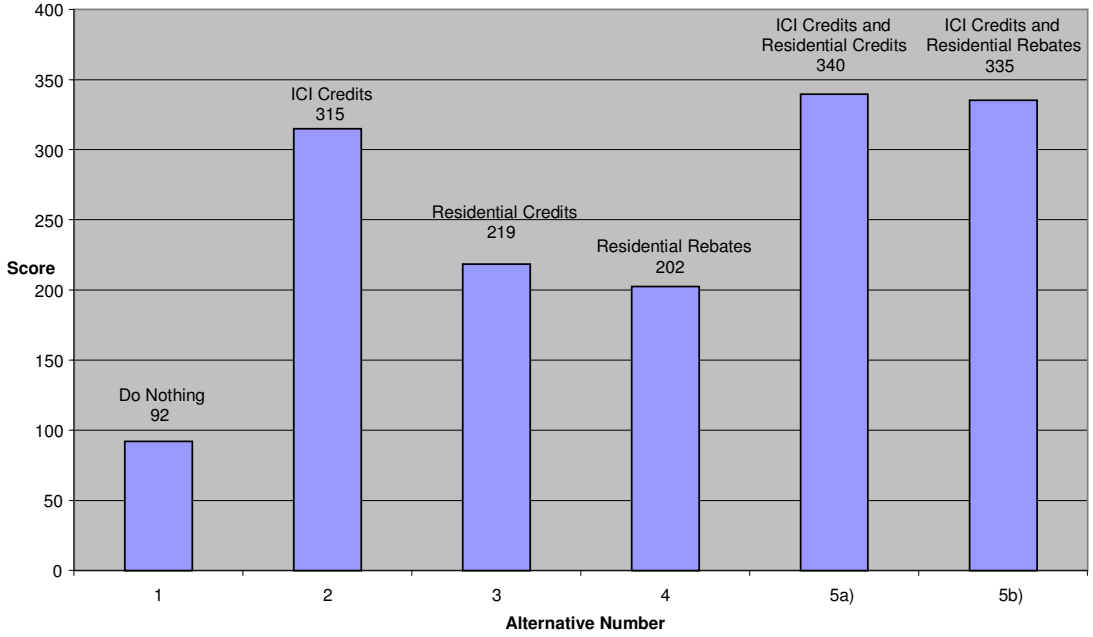
Figure 1: Evaluation of Alternatives Using Equal Weighting for the Four Criteria Categories



Scenario 2: Steering Committee Weighting

The second scenario demonstrates the scoring for each of the alternatives using the weighting scheme agreed upon by the Steering Committee. As seen in Figure 2, the highest ranked alternatives remain the combinations of "ICI Credits and Residential Credits" (Alternative 5a) and "ICI Credits and Residential Rebates" (Alternative 5b) respectively.

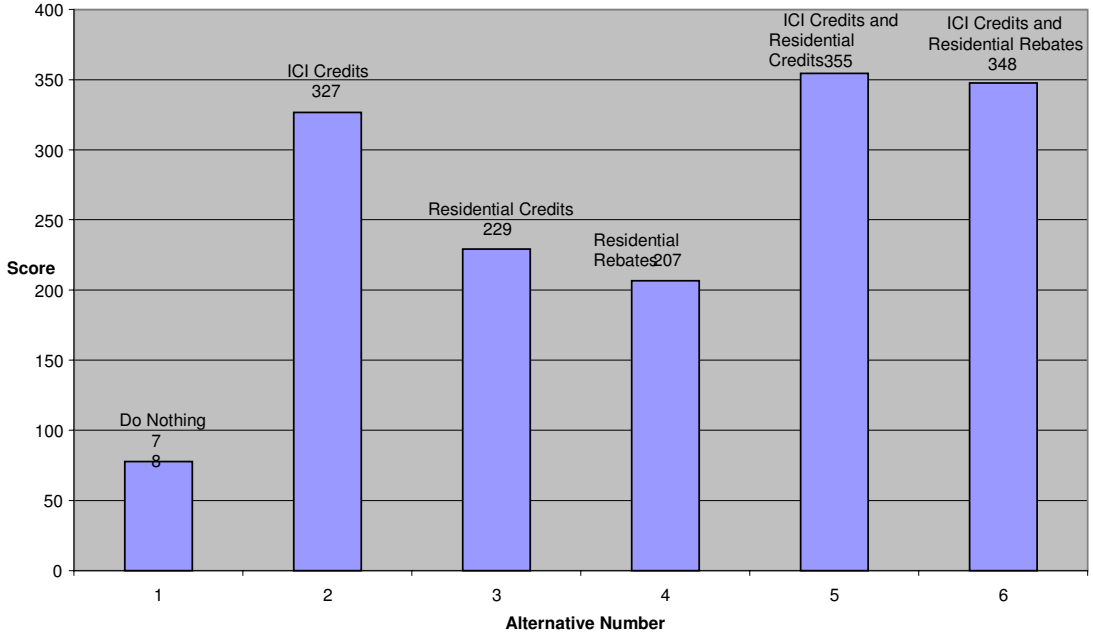
Figure 2: Evaluation of Alternatives Using Steering Committee Weighting of Four Criteria Categories



Scenario 3: Public Stakeholder Weighting

The third scenario utilized the scoring for each alternative using the average weighting scheme submitted by public stakeholders at the first Kitchener public information centre on September 29, 2011. As seen in Figure 3, the highest ranked alternatives remain the combinations of "ICI Credits and Residential Credits" and "ICI Credits and Residential Rebates", respectively. .

Figure 3: Evaluation of Alternatives Using Public Stakeholder Weighting of Four Criteria Categories



SENSITIVITY ANALYSIS CONCLUSION

The agreement in results between Scenario 1, 2 and 3 demonstrates the evaluation methodology used in selecting the preferred alternative was robust and the outcome reflected the stakeholders' views. Therefore the preferred alternative to implement is Alternative 5a), an ICI Credit and Residential Credit policy.