Stormwater Utility Credit Policy

Policy Purpose
A City goal is to reduce stormwater run-off to prevent the pollution of area water bodies. The City is also obligated to meet stormwater requirements as the holder of an MS4 permit. Therefore, the City Council asked the city engineer to design a stormwater utility (SWU) credit program / policy to reduce stormwater fees for sites that meet stormwater management best management practices (BMP).

Stormwater utility credit requests will be evaluated based on the following order of preference: volume control, water quality, and water quantity.

Volume Control
For sites that provide volume control an adjustment will be made to the SWU residential equivalency factor (REF). This adjustment is made by relating the volume of runoff generated by one acre of typical single family residential land, during a standard 1-year rainfall event, to the runoff generated by one acre for the site in question, during a standard 1-year rainfall event (SWU Ordinance REF definition). The adjustment will then be made by subtracting out the volume captured using infiltration practices and relating it to the single family residential REF. The methodology for adjusting REFs is supported by city ordinance language.

Water Quality Credit
The water quality credit will be provided when sites reduce phosphorous loads from that of existing. A maximum 50 percent credit is available for sites that achieve a 50 percent phosphorous load reduction or greater from predevelopment conditions and can be adjusted according to Figure 1. It will be required for an applicant to submit appropriate documentation to demonstrate their percent phosphorous removal through approved modeling techniques and manufacturers data for proprietary devices. (ie: William Walkers PondNet Model and data from the Minnesota Stormwater Manual for infiltration BMPs). The percent reduction in the SWU fee applied to a site is defined in Figure 1. The credit will be determined by applying the percent credit available to the site by the total SWU fee and reducing that amount from the SWU fee.

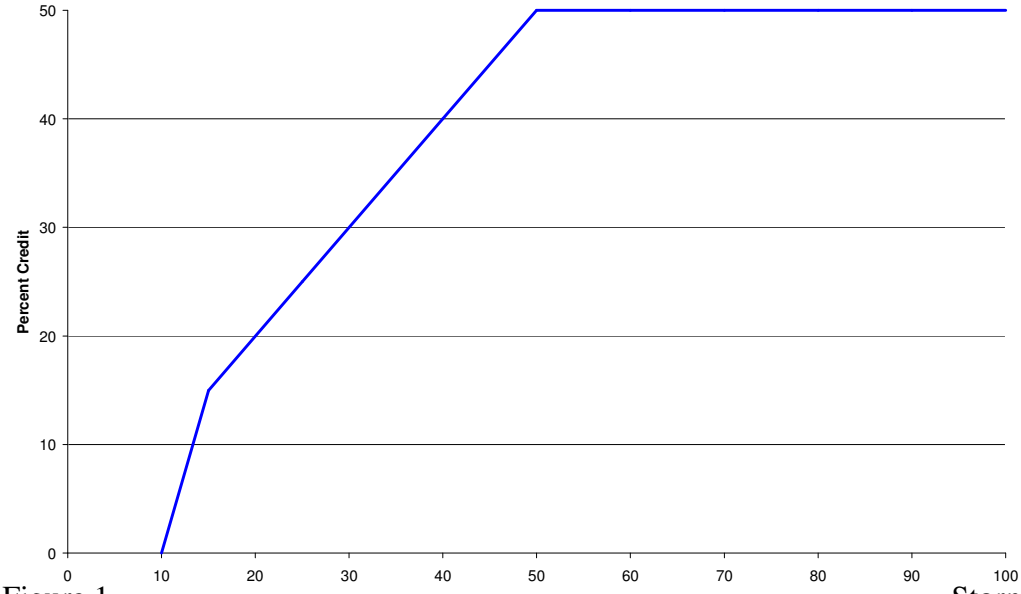

Figure 1. Stormwater Utility Water Quality Credit

Water Quantity Credit

Sites that are able to provide rate control that is less than or equal to existing for the 10-year storm event and provide infiltration qualify for a water quantity credit. The credit will be calculated by determining the percent reduction in runoff volume attributed to the infiltration BMP for the 10-year storm event. The percent reduction in runoff volume using infiltration will be the percent credit up to a maximum amount of 50 percent.

Maintenance

Upon request, property owners must provide appropriate documentation to illustrate that a stormwater BMP is still functioning as designed. This can either be done by providing up-to-date as-built information on a constructed stormwater pond, percolation rates of infiltration BMPs, or other methods as approved by the city engineer.

The following examples illustrate how to calculate the stormwater utility credit in a couple of different scenarios.

<u>Example 1:</u>

Eligibility for a volume control REF adjustment, water quality credit, and water quantity credit.

REF Adjustment

Adjustment applies if a site captures 0.09 acre-ft of runoff to meet the 0.34 inches of runoff imposed by the Rice Creek Watershed District during development.

Step1: Determine runoff generated for a 1-year runoff event (2.4 inches).
CN = 90, for c soils and 67% impervious
Site acres = 3.12
3.12 acres * 1.33 inches of runoff (Minnesota Hydrology Guide) * 1 foot/12 inches = 0.39 acre-ft

Step 2: Reduce runoff volume by percent captured through infiltration BMP:
0.09 acre-feet infiltrated/0.39 acre-ft runoff volume = 25% reduction in runoff

Step 3: Reduce the REF by the percent of runoff volume reduced through infiltration BMP.
5 REFs * 25% reduction in runoff = 1.25 REFs reduction
5 REFs - 1.25 REFs reduction = 3.75 REFs

Water Quality Adjustment

Step 1: Determine the existing phosphorous load.
1.79 lbs/year (Load assessment, see appendix A)

Step 2: Determine the post-development phosphorous load.
3.23 lbs/year (Load assessment, see appendix A)

Step 3: Determine load reduced using infiltration.
80% infiltration BMP effectiveness for a 0.34 rainfall event
3.23 lbs/year * 80% effective = 2.58 lbs/year reduced
3.23 lbs/year - 2.58 lbs/year = 0.65 lbs/year new phosphorous load

Step 4: Determine additional load reduced through the water quality pond
53.7% (Determined using PondNet Model)
0.65 lbs/year (Load from previous reduction)
0.65 lbs/year *53.7% = 0.35 lbs/year load reduction
0.65 lbs/year - 0.35 lbs/year load reduction = 0.3 lbs/year new phosphorous load

Step 5: Determine the water quality credit.
1.79 lbs/year - 0.3 lbs/year = 1.49 lbs/year
1.49lbs/year/1.79lbs/year = 83% reduction in phosphorous load
From Figure 1 we determine the site is eligible for a 50% credit.

Step 6: Calculate the revised stormwater fee.
3.12 acres * 3.75 REFs *current SWU rate/acre (was $7.50 in 2009) = $87.75
$87.75 *50% = $43.88
$87.75-$43.88 = $43.88/quarter reduced SWU fee

Water Quantity Adjustment:

Step 1: Review rates to ensure they have matched existing runoff rates for existing conditions for the 10-year storm-event.
Existing 10-year rates: 7.34 cfs

Proposed 10-year rates: 5.02 cfs

Step 2: Review the runoff volume reduced for the 10-year event due to infiltration.
Proposed runoff volume: 0.85 acre-ft
Runoff volume captured due to infiltration: 0.09 acre-ft
Runoff volume reduced due to infiltration: 0.09 acre-ft/0.85 acre-ft = 11% reduction.

Step 3: Apply credit to SWU fee calculated using the water quality credit.
$43.88 *11% = $4.83
$43.88 - $4.83 = $39.05/quarter revised SWU fee

Example 2:
Eligibility for a volume control REF adjustment, water quality credit, and water quantity reduction credit.

REF Adjustment
Adjustment applies if the site captures 0.09 acre-ft of runoff to meet the 0.34 inches of runoff imposed by the Rice Creek Watershed District during development.

Step1: Determine runoff generated for a 1-year Runoff Event (2.4 inches).
CN = 97, for c soils and 95% impervious
Site acres = 3.69
3.69 acres * 2.08 inches of runoff (Minnesota Hydrology Guide) * 1 foot/12 inches = 0.64 acre-ft

Step 2: Reduce runoff volume by percent captured through infiltration BMP:
0.098 acre-ft infiltrated/0.64 acre-ft runoff volume = 15% reduction in runoff

Step 3: Reduce the REF by the percent of runoff volume reduce through their infiltration BMP.
5 REFs * 15% reduction in runoff = 0.75 REFs reduction
5 REFs - 0.75 REFs reduction = 4.25 REFs

Water Quality Adjustment
Step 1: Determine the existing phosphorous load.
1.24 lbs/year (Load assessment see appendix A)

Step 2: Determine the post-development phosphorous load.
5.31 lbs/year (Load assessment, see appendix A)

Step 3: Determine load reduced using infiltration.
80% infiltration BMP effectiveness for a 0.34 rainfall event.
5.31 lbs/year * 80% effective = 4.25 lbs/year reduced
5.31 lbs/year - 4.25 lbs/year = 1.06 lbs/year

Step 4: Determine additional load reduced through the water quality pond.
53.7% (Determined using PondNet Model)
1.06 lbs/year (Load from previous reduction)
1.06 lbs/year * 53.7% = 0.569 lbs/year load reduction
1.06 lbs/year - 0.569 lbs/year load reduction = 0.491 lbs/year new phosphorous load

Step 5: Determine the water quality credit.
1.24 lbs/year - 0.49 lbs/year = 0.75 lbs/year
0.75 lbs/year/1.24 lbs/year = 60% reduction in phosphorous load
From Figure 1 we determine the site is eligible for a 50% credit

Step 6: Calculate the revised stormwater fee.
3.69 acres * 4.25 REFs * current SWU rate/acre (was $7.50 in 2009) = $117.62
$117.62 *50% = $58.81
$117.62-$58.81 = $58.81/quarter reduced SWU fee

Water Quantity Adjustment:

Step 1: Review rates to ensure they have matched existing runoff rates for existing conditions for the 10-year storm-event.
Existing 10-year rates: 7.34
Proposed 10-year rates: 5.02

Step 2: Review the runoff volume reduced for the 10-year event due to infiltration.

Proposed runoff volume: 0.85 acre-ft
Runoff volume captured due to infiltration: 0.1 acre-ft
Runoff volume reduced due to infiltration: 0.1 acre-ft/0.85 acre-ft = 12% reduction

Step 3: Apply credit to SWU using the water quality credit.
$58.81 * 12% = $7.06
$58.81 -$7.06 = $51.75/quarter revised SWU fee

Example 3:

Eligibility for a water quality credit if there is no infiltration of stormwater runoff.

Water Quality Adjustment

Step 1: Determine the existing phosphorous load.
2.71 lbs/year (Load assessment see appendix A)

Step 2: Determine the post-development phosphorous load.
2.81 lbs/year (Load assessment, see appendix A)

Step 3: Determine load reduced by their Stormceptor.

25% (From previously submitted documentation)
2.81 lbs/year *25% = 0.7 lbs/year load reduction
2.81 lbs/year - 0.7 lbs/year load reduction = 2.11 lbs/year

Step 4: Determine the water quality credit.
2.71 lbs/year - 2.11 lbs/year = 0.6 lbs/year
0.6 lbs/year/2.71 lbs/year = 29% reduction in phosphorous load
From Figure 1 we determine the site is eligible for a 28% credit.

Step 5: Calculate the revised stormwater fee.
3.2 acres * 5 REFs * current SWU rate/acre (was $7.50 in 2009) = $120.00
$ 120.00*28% = $33.60
$120-$33.60 = $86.40/quarter reduced SWU fee

Appendix A: Stormwater Data Summary

Table 1. Summary of BMPs Provided

Site	BMPs Provided		
	Water Quality	Rate Control	Infiltration
Example 1	53.7% Phosphorous Removal - PondNet Model	2, 10, and100-year rate control provided - reviewed Hydrocad model results	- Infiltration of 0.34 inches of runoff required (0.050 acre feet) - 0.090 acre feet provided
Example 2	53.7% Phosphorous Removal - PondNet Model	2, 10, and 100-year rate control provided - reviewed HydroCad model results - ponding provided at neighboring parcel	Infiltration of 0.34 inches of runoff required (0.088 acre feet) - 0.098 acre feet provided
Example 3	Stormceptor: 25% phosphorous removal, no dead storage	2, 10, 100-year rate control provided - reviewed Hydrocad model results	None

Table 2. Phosphorous Load Calculations

Existing Land Use	Impervious Coverage[1]	Rv	TP EMC	TP Loading Rate[2]	Area	Pollutant Load
	(%)	(fraction)	(ppb)	(lbs/ac/yr)	(acres)	(lbs/yr)
Example 1 Open Space	0	0.07	250	0.12	2.24	0.27
Example 1 Pavement	100	0.64	400	1.73	0.88	1.52
Example 2 Open space	0	0.07	250	0.12	3.19	0.38
Example 2 Pavement	100	0.64	400	1.73	0.50	0.86
Example 3	54	0.36	350	0.85	3.20	2.71

Proposed Land Use	Impervious Coverage[1]	Rv	TP EMC	TP Loading Rate[2]	Area	Pollutant Load
	(%)	(fraction)	(ppb)	(lbs/ac/yr)	(acres)	(lbs/yr)
Example 1	67	0.44	350	1.04	3.12	3.23
Example 2	95	0.61	350	1.44	3.69	5.31

Example 3	56	0.37	350	0.88	3.2	2.81

*[1] Non-urban land uses with "n/a" for impervious coverage signify the absence of the following relationship between impervious coverage and runoff coefficient: Rv=[0.607*Impervious Fraction]+0.03*
[2]All loading rates are based on average annual precipitation depth of 30 inches/year.
Source: National Weather Service

Signed: _____ Date: _____
Mayor / Mayor Pro Tem