



STORMWATER UTILITY FEE CREDIT AND INCENTIVE MANUAL

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TABLE OF CONTENTS

1	Background.....	1
2	Definitions.....	1
3	Stormwater Utility Fee.....	3
3.1	Single Family Residential and Duplex Properties.....	4
3.2	Other Properties	4
3.3	Example Fee Calculations For Other Properties	4
4	Credit and Incentive Policies.....	5
4.1	Incentives	5
4.2	Credits	6
4.3	General Administrative Policies.....	7
4.3.1	Eligibility for Credits and Incentives.....	7
4.3.2	Credit / Incentive Determination.....	7
4.3.3	Maintenance Required.....	7
4.3.4	Term of Credit.....	8
4.3.5	Indemnification.....	Error! Bookmark not defined.
4.3.6	Suspended / Terminated Credits.....	9
4.3.7	Credit Limit	9
4.3.8	Rainfall Proration	9
5	Incentive Criteria.....	9
5.1	Incentive Application Process	10
5.2	Rain Gardens.....	10
5.3	Rain Barrels.....	11
5.4	Other Incentives.....	11
6	Credit Criteria.....	12
6.1	Credit Application Process.....	13
6.2	Private Detention Basin Maintenance Credit (Maximum 15%)	13
6.3	Rate Reduction Credit (Maximum 15%).....	14
6.3.1	Rate Reduction Credit Application Process.....	15
6.4	Volume Reduction Credit (Maximum 15%)	15
6.4.1	Cisterns	16
6.4.2	Green Roofs	16
6.4.3	Permeable Pavement	17

6.4.4	Volume Reduction Credit Application Process	17
6.5	Water Quality and NPDES Permit Credit (Maximum 15%).....	18
6.5.1	Water Quality / BMP Credit (Maximum 10%)	18
6.5.2	NPDES Permit Credit (5%)	20
6.6	Educational Credits.....	21
6.7	Direct Discharge Credit (up to 100%).....	21
7	Examples	23
7.1	Example 1. Rain Garden Incentive.....	23
7.2	Example 2. Runoff Volume Reduction Incentive	24
7.3	Example 3. Private Detention Basin Maintenance Credit	25
7.4	Example 4. Runoff Rate Reduction Credit.....	25
7.5	Example 5. Volume Reduction Credit.....	26
7.6	Example 6. Water Quality Credit	28
7.7	Example 7. Direct Discharge Credit	29
8	Forms	30

LIST OF TABLES

Table 1	Stormwater Utility Fee for Single Family Residential and Duplex Properties.....	4
Table 2	Maximum Available Stormwater Management Incentives.....	6
Table 3	Stormwater Utility Fee Credits.....	6
Table 4	Rainfall Proration.....	9
Table 5	Other Stormwater Features That Qualify for Incentives	12

CITY OF CHAMPAIGN STORMWATER UTILITY FEE CREDIT AND INCENTIVE MANUAL

1 BACKGROUND

For the purposes of the stormwater utility a developed property is defined as having a minimum of 500 or more square feet of impervious area. In determining the fee, properties are assigned to one of two categories, 1) single family residential or duplex properties, or 2) other properties that are not single family residential and duplex. The amount of a ratepayer's stormwater utility fee is based on the amount of impervious surface that exists on the property and the category assigned to the property.

Ratepayers have an opportunity to reduce their stormwater utility fee amount by applying for the incentives and credits that are outlined in this manual. Incentives and credits are available to ratepayers who reduce the impact of the runoff from their properties by such methods as installing sustainable stormwater practices that allow stormwater to infiltrate into the ground. These practices offset the impact of some of the impervious surface on the property by reducing the rate and volume of runoff, and by improving water quality.

This manual provides details on the basis of the fee and for the incentives and credits.

2 DEFINITIONS

The following definitions will assist the applicant understand the references in this manual.

Applicant - The owner (or his agent or his legal representative) of land requesting a stormwater user fee credit or incentive.

Best Management Practice (BMP) - A stormwater control which, when properly installed and maintained, reduces the concentration of typical stormwater pollutants discharged from a particular property.

City - The City of Champaign, Illinois.

Credit - A conditional, recurring reduction in the amount of a stormwater user fee to an individual property based on approved on-site stormwater runoff controls, a NPDES industrial stormwater discharge permit, or proof of direct discharge outside of the corporate limits.

Detention Basin (Dry Bottom) - Privately-owned and maintained stormwater detention basin, constructed for the purpose of mitigating stormwater runoff from a developed site to control the peak discharge rates that is normally a dry basin between storms. Maintained by the property owner.

Detention Basin (Wet Bottom) - Privately-owned and maintained stormwater detention basin, constructed for the purpose of mitigating stormwater runoff from a developed site to control the peak discharge rates that normally has a permanent pool of water between storms. Maintained by the property owner.

Ditch - An open drainage channel with either natural (grassed) or paved (concrete) banks which may have continuous flow of stormwater. Open ditches are outlets for surface and subsurface storm sewer drainage systems.

Drainage Easement - The land required for the installation and maintenance of storm drainage facilities.

Drainage Facilities - All ditches, channels, conduits, retention-detention systems, tiles, swales, sewers, and other natural or artificial means of draining stormwater from land.

Drainage System - Any combination of surface and/or subsurface drainage components that collect, convey, store or treat stormwater runoff. This may include parking lots, streets, driveways and yards that convey storm runoff to a drainage swale, open ditch, or a storm sewer.

ERU - Equivalent Residential Unit, used as the basis for determining the stormwater service charge to a parcel. Three thousand four hundred and seventy-eight (3,478) square feet of impervious area shall be one ERU. The number of ERU's attributed to a parcel is determined by dividing the total impervious area (square feet) of the parcel by three thousand four hundred and seventy-eight (3,478) and rounding the result to the nearest integer, based on the following: For parcels with total ERU values from 0.14 (500 square feet) to 0.50, the ERU value will be rounded up to 1.0. For parcels with total ERU values greater than 0.50, the ERU will be rounded to the nearest integer; rounded down for fractional ERUs 0.50 or less and rounded up for fractional ERUs greater than 0.50.

Impervious Area - Areas that prevent or impede the infiltration of stormwater into the soil. Common impervious areas include, but are not limited to; rooftops, sidewalks, walkways, patio areas, driveways, parking lots, storage areas, and awnings.

Incentive - Stormwater management program incentives are one time disbursements that compensate a property owner for "partnering" with the city to achieve a stormwater management objective, such as the installation of a rain garden or rain barrel.

Maintenance - Cleaning, spraying, removal of obstructions or debris or sediment from, and making minor repairs in a drainage facility or BMP so that it will perform the function for which it was designed and constructed.

Municipal Separate Storm Sewer System (MS4) – The City owned and/or operated storm sewer system, including all drainage system components and that eventually discharge to local creeks and tributary streams.

NPDES - National Pollutant Discharge Elimination System, a United States Environmental Protection Agency program (delegated to the Illinois Environmental Protection Agency) initiated to reduce and eliminate pollutants reaching water bodies of all types.

Owner - The owner of land subject to the stormwater user fee or his agent.

Parcel – Any designated lot, tract, or area of land, established by plat or other legal means and to be used, developed or built upon as a unit.

Property – Any delineated parcel within the City of Champaign.

Public Works Department - The Public Works Department of the City of Champaign, the department that manages the stormwater utility.

Qualified Professional – a licensed professional authorized to submit drainage plans to the City of Champaign, such as an Illinois-registered Professional Engineer.

Ratepayer - The owner of land subject to the stormwater user fee or his agent.

Stormwater Utility Fee - Fee charged to owners of all developed residential and non-residential properties within the City, based on impervious area, to fund the management of the stormwater program.

Swale - A natural or constructed waterway, usually broad and shallow, covered with erosion - resistant grasses, used to conduct surface water from a lawn, field, diversion, or other site feature to a stream, lake, detention basin or other conveyance.

Underdrain - A drainage system below or near the bottom of a stormwater infiltration unit whose purpose is to dewater the device by providing access to the local drainage system.

3 STORMWATER UTILITY FEE

A stormwater utility is different than other utilities in that there is no direct way to measure the “utility use” for each property, such as with a water or electric meter. Under a stormwater utility, the amount of utility use for each property is estimated based on the demand for service of the property. Due to the widely-documented relationship between intensity of development and stormwater runoff, the amount of impervious surfaces that exist on a property are used to estimate runoff potential of the developed property. The rationale behind this is that impervious surfaces don’t allow stormwater to penetrate into the ground and thereby generate more stormwater runoff that drains into the City’s stormwater infrastructure. The larger the impervious area on a property the more stormwater runoff may be generated by the property, which in turn increases demand on the City’s stormwater infrastructure. Examples of impervious surfaces include roof tops, driveways, pavements, walkways or any other hard surface that prevents the infiltration of stormwater into the ground.

The stormwater utility fee will be charged to all parcels wholly or partially in the City that have at least 500 square feet (0.14 ERUs) of impervious area.

It has been determined that the average single family residential property in Champaign has 3,478 square feet of impervious surface on it. This amount is known as an Equivalent Residential Unit (ERU), which becomes the base unit for calculating stormwater utility fees for all properties. A property with one (1) ERU has an equivalent amount of impervious area as the average single family residential property in Champaign.

In determining how the fee amount is calculated, the stormwater utility rate structure classifies properties into two general categories. The first category is “single family residential and duplex properties”. The second category includes all “other properties” that are not single family and duplex. Details for each category are provided below.

3.1 Single Family Residential and Duplex Properties

For single family residential and duplex properties, the stormwater utility fee structure is based on a three-tiered flat fee system, as shown in Table 1. The tiered flat rate structure was chosen based on the distribution of sampled properties and the small degree of variation when computing ERUs. The tiers reflect the increased impervious area on the small percent of properties in this category that actually would have more than one billing unit (ERU).

Table 1 Stormwater Utility Fee for Single Family Residential and Duplex Properties

Tier	Amount
Tier 1 (500-6,000 square feet of impervious area)	\$4.94 per month
Tier 2 (6,001-8,000 square feet of impervious area)	\$10.55 per month
Tier 3 (over 8,000 square feet of impervious area)	\$13.64 per month

3.2 Other Properties

For all properties in the City that are not single family residential or duplex properties, the amount of the stormwater utility fee is \$5.24 per month per ERU. ERUs are rounded according to the criteria established in the definitions section.

3.3 Example Fee Calculations For Other Properties

- 1) A corner convenience store is determined to have 10,000 square feet of impervious area on its lot. The number of billable ERUs on the property is calculated as follows:

$$\text{No. of ERUs} = 10,000 \text{ square feet} \div 3,478 \text{ square feet} = 2.9 \text{ ERUs} \Rightarrow 3.0 \text{ ERUs}$$

The stormwater utility fee is computed as follows:

$$\text{Fee Amount} = 3.0 \text{ ERU} \times \$5.24/\text{ERU}/\text{month} = \$15.72/\text{month}$$

- 2) A small commercial lot has 1,000 square feet of impervious area on it. The number of billable ERUs on the property is calculated as follows:

No. of ERUs = 1,000 square feet ÷ 3,478 square feet = 0.29 ERUs ⇒ 1.0 ERUs

The stormwater utility fee is computed as follows:

Fee Amount = 1.0 ERU X \$5.24/ERU/month = \$5.24/month

4 CREDIT AND INCENTIVE POLICIES

Each property in the City of Champaign places a demand on the City's stormwater infrastructure. Depending on the amount of development and the stormwater features in place, some properties place heavy demands on the City infrastructure while others actually lessen the demands. Properties that lower the demand on City systems help to lower the City's cost of providing stormwater services, while properties with unmitigated heavy demands drive up the City's costs. To acknowledge the impact that these activities or facilities have on the City's stormwater management program costs, the City has developed a system of credits and incentives through which a ratepayer can reduce their stormwater utility fee or whereby an incentive, is available to help defray costs associated with the construction of on-site stormwater management practices. Qualifying stormwater management activities that are eligible for either credits or incentives must provide either a reduction in peak discharge, a reduction in stormwater runoff volume, a water quality benefit, or some combination of the three.

The following goals were established for the development of the City's Credit and Incentive Policy:

- The policy should encourage property owners to incorporate sustainable stormwater management practices on their property.
- The policy should be easy for the property owner to use and should not overly complicate the stormwater utility fee billing system.
- The policy should enhance the equity of the stormwater utility fee's rate structure.

The following sections provide policies regarding incentives, credits, and the general administration of the City of Champaign's stormwater utility fee credit and incentive program.

4.1 Incentives

Incentives are available to any property owner in the City of Champaign that pays a stormwater utility fee on their property and installs specific types of sustainable stormwater management features on that property. It should be noted that both the credits and incentives programs are mutually exclusive and that credits and incentives will not be awarded to the same property, with the exception of the Private Detention Basin Maintenance Credit, which can be earned in conjunction with either credits or incentives. Those properties that are eligible for credits will have to choose between the two programs. Table 2 summarizes the types of stormwater management features that qualify for incentives and the maximum incentive amounts available in each category.

Table 2 Maximum Available Stormwater Management Incentives

Incentive Type	Maximum Amount
Rain Garden	\$250
Runoff Rate Reduction	\$250
Runoff Volume Reduction	\$250
Runoff Water Quality	\$250
Total Incentive Available	\$1,000
Rain Barrel	\$25 per barrel (no maximum limit)

The maximum lifetime incentive amount available per property for the combination of rain gardens, rate reduction, volume reduction and water quality items is \$1,000. Once a property reaches \$1,000 in incentive payments for these items, no more incentives will be issued to the property regardless of the ownership. Rain barrels are not subject to any maximum lifetime incentive amount.

4.2 Credits

The City of Champaign has adopted a credit program policy that has identified a total of 6 categories of credits. These categories include: 1) private detention basin maintenance credits; 2) rate reduction credits; 3) volume reduction credits; 4) water quality/BMP credits; 5) direct discharge credits, and 6) education credits. Table 3 summarizes the credits and the applicable credit limit for each category. It should be noted that single family residential and duplex properties are eligible for only the private detention basin maintenance credit category.

Table 3 Stormwater Utility Fee Credits

Credit Type	Credit Amount	
	Single Family / Duplex	Other Properties
Private Detention Basin Maintenance	15% max.	15% max.
Runoff Rate Reduction	NA	15% max.
Runoff Volume Reduction	NA	15% max.
Runoff Water Quality/NPDES Permit	NA	15% max.
Direct Discharge	NA	100% max.
Education	NA	\$5/student

4.3 General Administrative Policies

4.3.1 Eligibility for Credits and Incentives

The following policies apply to eligibility for participation in the City of Champaign Credit and Incentive programs:

- a) To be eligible for credits and/or incentives, a property owner must pay a stormwater utility fee for their property and payment on their account(s) must be up to date.
- b) The incentive program is available to any property owner in the City of Champaign that is not participating in the rate reduction, volume reduction, water quality, or direct discharge credit programs.
- c) Any property whose stormwater runoff discharges to a privately maintained detention basin may be eligible to receive a private detention basin maintenance credit. To qualify the property must participate in the maintenance of the facility and proof must be provided that maintenance is indeed being performed as required by Chapter 23 of the City of Champaign Manual of Practice. For single family residential developments, application must be made by either a homeowner or lake owner association on behalf of its members. Individual homeowners may not apply. Upstream properties do not qualify unless capacity in the detention basin is specifically designed to accommodate their runoff and the upstream property is responsible for its share of the detention basin's maintenance.
- d) Owners of properties other than single family residential or duplex are eligible to apply for rate reduction, volume reduction, or water quality credits for qualifying activities.
- e) Credits will not be granted for any stormwater management control built or maintained using funds provided by the City of Champaign.

4.3.2 Credit / Incentive Determination

It is the intent of the City to process applications within thirty (30) working days of submittal of a complete and correct application package. Billing adjustments required to implement credits shall be applied retroactively to the date of receipt of the customer's complete application. A pending application for credit shall not constitute a valid reason for non-payment of the currently assessed stormwater utility fee by the customer. If an application is denied, a letter explaining reason(s) for the denial will be provided to the applicant. The applicant has the right to appeal this decision in accord with the procedures outlined in Article VI of Chapter 29.5 of the City Code.

4.3.3 Maintenance Required

All stormwater management facilities require maintenance in order to perform as designed. Stormwater detention facilities are required to be maintained as prescribed in Chapter 23 of the City of Champaign Manual of Practice. Proof of maintenance is

required annually in the form of an annual report. Failure to maintain stormwater management facilities will result in the loss of stormwater utility fee credits.

4.3.4 Term of Credit

All stormwater utility fee credits must be reapplied for every 5 years. In the case of stormwater detention maintenance credits the owner should consider reapplication coincident with the 5 year cycle of reporting required by Chapter 23 of the City of Champaign Manual of Practice.

4.3.5 Conditions of Grant of Stormwater Utility Fee Credit

In consideration for any grant by the City of a stormwater utility fee credit based upon the applicant's operation and maintenance of a private stormwater management facility or BMP, the applicant is hereby legally acknowledging and agreeing to the following:

- a) That the stormwater management facility or BMP is a privately constructed, maintained and operated facility, and the City's grant of said utility fee credit shall not be deemed to in any manner create or impose any duty or responsibility upon the City for the operation or maintenance of said privately owned stormwater management facility or BMP.
- b) That the City's grant of said utility fee credit shall not be deemed to in any manner create or impose any liability for the City, its officers, agents and employees for any and all claims, actions, causes of action, judgments, damages, losses, costs, and expenses arising out of or resulting from the construction, modification, installation, maintenance, or operation of the stormwater management facility/BMP.
- c) Owners of the stormwater management facility/BMP, their personal representatives, heirs, grantees, successors and assigns acknowledge that any credits granted by the City are not perpetual and that both maintenance of stormwater management facilities and annual reporting of maintenance activities are required in order to maintain all approved credits, and that credits must be re-applied for every 5 years.
- d) That the City and its representatives shall have the right to enter upon the premises of the stormwater management facility/BMP for the purpose of inspecting and/or monitoring the performance of said stormwater management facilities.
- e) This Agreement shall run with the real estate upon which the stormwater management facility/BMP has been constructed and shall be binding upon the Owners of said real estate, their personal representatives, heirs, grantees, successors and assigns so long as the stormwater management facility and/or improvement or any part of it shall be used by them. This

Agreement shall be disclosed upon transfer of the real estate upon which said stormwater management facility/BMP has been constructed.

- f) At such time as the stormwater management facility/BMP shall cease to be so used, this Agreement shall immediately terminate.

4.3.6 Suspended / Terminated Credits

If the terms of the credit are not met, particularly in regard to annual reporting and maintenance when required and non-payment of bills, the property owner will be notified and will have 30 days to come into compliance before the credit will be terminated. Once a credit is terminated, a complete application must be submitted in order to restore the credit.

4.3.7 Credit Limit

Credits are limited to a maximum of 50 percent of a property's total stormwater utility fees, except in the case of the Direct Discharge Credit, which could be up to 100 percent, as outlined in Section 6.7.

4.3.8 Rainfall Proration

For volume reduction credits where rainfall prorations will be applicable, the following table shall be used:

Table 4 Rainfall Proration

Rainfall Depth (inches)	Credit Proration Factor
0.50 to 0.74	50%
0.75 to 0.99	75%
1.00 or more	100%

5 INCENTIVE CRITERIA

Incentives are available for any property in the City of Champaign that installs specific types of sustainable stormwater management features. It should be noted that credits and incentives programs are mutually exclusive and that credits and incentives will not be awarded to the same property. Those properties that are eligible for credits will have to choose between the two programs. The only exception to this is single family and duplex properties are eligible for a 15 percent Detention Basin Maintenance credit.

The following sections describe the requirements for participation in the City of Champaign's stormwater management incentive program.

5.1 Incentive Application Process

The following process should be followed to submit an application for a stormwater management incentive.

- a) Download current Incentive Application Form from the City website (www.ci.champaign.il.us/swuf) or obtain the form from the City of Champaign Public Works Department (702 Edgebrook Drive).
- b) Prepare the Incentive Application Form.
- c) Submit the form and attachments (if required) to the address on the Incentive Application Form.
- d) City will check to insure submittal is complete and notify the applicant.
- e) City will review the application within 30 working days and notify the applicant of incentive determination, including identification of deficiencies if the application is not approved.
- f) If the incentive is denied, the applicant may address identified deficiencies and resubmit a revised application.
- g) If an incentive is denied applicant may appeal the determination following guidelines in Article VI of Chapter 29.5 of the City Code.

5.2 Rain Gardens

Rain gardens are shallow depressions planted with native perennial plants that are either located near a downspout or that are in an area that sheds noticeable amounts of rainwater. Rain gardens reduce runoff, absorb pollutants, and sustain some wildlife.

The City will reimburse property owners \$250 for a rain garden that has a minimum surface area of 100 square feet and has at least 500 square feet of impervious area draining into it. Smaller rain gardens shall be prorated based on the square footage of the rain garden. The minimum rain garden eligible for an incentive shall be 50 square feet.

The rain garden should be designed with a ponding area to capture and infiltrate the runoff from one inch of rainfall on the contributory impervious area within 24 hours.

The property owner is required to submit their rain garden plan to the City for review and approval. The City will pay the incentive to the property owner after construction has been completed and the construction has been inspected and approved by the City.

There would be only one reimbursement rain garden per property. Rain gardens in excess of 100 square feet may also be eligible to qualify for volume, rate reduction and water quality incentives as outlined in Section 5.4.

5.3 Rain Barrels

Rain barrels are structures designed to intercept and store runoff from rooftops. Typically, a rain barrel is a 55-gallon drum connected to a downspout. The stored water can provide irrigation for a garden or can be released slowly to a lawn.

The City provides an incentive of \$25 to the property owner for the purchase of a rain barrel. The incentive payment is made after the property owner provides proof of rain barrel purchase to the City.

There is no limit to the number of rain barrel incentives a property owner can obtain under this program.

5.4 Other Incentives

All properties in the City are eligible for incentives for installing and/or implementing activities that provide either a reduction in peak discharge, a reduction in stormwater runoff volume, a water quality benefit, or some combination of the three. The property owner is required to submit a plan to the City for review and approval prior to construction or installation of the stormwater management practice or facility. The amount of the incentive would be 25% of the construction cost for the activity up to a maximum incentive of \$250 for each category. The City would pay the incentive to the property owner after construction has been completed and the installation has been inspected and approved by the City. All costs for the construction of the stormwater management feature(s) must be documented and submitted to the City before payment of the incentive. Table 5 lists some typical stormwater features that would qualify for incentive payments under this section.

These incentives could be earned individually, i.e., one \$250 maximum incentive for installing a water quality management activity or one \$250 maximum incentive for installing a volume reduction management activity. It would also be possible to combine activities, i.e., installing one management activity that accomplishes a combination of rate reduction, volume reduction and/or water quality improvement. In the case of combination, it would be possible to achieve \$750 in maximum incentive payment for installing one single stormwater management activity valued at \$3,000, if it achieves all three categories. \$750 is the maximum incentive amount that a property owner is eligible for under this section.

Table 5 Other Stormwater Features That Qualify for Incentives

Incentive Type	Category
Permeable Pavement	Peak Discharge/Volume Reduction/Water Quality
Cistern	Volume Reduction
Green Roof	Peak Discharge/Volume Reduction/Water Quality
Bioswale	Peak Discharge/Volume Reduction/Water Quality
Rain Garden	Peak Discharge/Volume Reduction/Water Quality
Detention Basins	Peak Discharge/Volume Reduction/Water Quality
Vegetated Swales	Peak Discharge/Volume Reduction/Water Quality
Manufactured BMPs	Peak Discharge/Volume Reduction/Water Quality

These incentives are subject to three rules: 1) the stormwater management feature must capture, store and/or treat a 1-inch rainfall from a minimum of 500 square feet of impervious area; 2) the amount of the incentive is 25% of the construction cost, up to a maximum incentive of \$250 per incentive category, and; 3) each property is eligible to receive no more than one incentive disbursement for each of the three categories (Runoff Rate Reduction, Runoff Volume Reduction, and Water Quality Control) in a lifetime.

Eligible construction costs for calculation of the incentive payment must be directly related to the costs associated with the stormwater management feature. Stormwater features constructed for new homes would be eligible for the incentives.

6 CREDIT CRITERIA

The City of Champaign has adopted a credit program policy that includes a total of six categories of credits. These categories include: 1) private detention basin maintenance credits; 2) rate reduction credits; 3) volume reduction credits; 4) water quality/BMP credits; 5) direct discharge credits, and 6) education credits. Single family residential and duplex properties are eligible for only the private detention basin maintenance credit category. In the following sections the credits available to properties in Champaign are discussed, including the specifics of how to apply for the credits.

6.1 Credit Application Process

The following process should be followed to submit an application for a stormwater utility fee credit.

- a) Download current credit application forms from City website (www.ci.champaign.il.us/swuf) or obtain the form from the City of Champaign Public Works Department (702 Edgebrook Drive).
- b) Prepare the General Credit Application Form.
- c) Prepare the credit-specific application form(s).
- d) Prepare or locate the required site drainage plan showing topography, drainage patterns, and contributing area to each stormwater management structure.
- e) Prepare the technical calculations required to determine applicability of credit(s).
- f) Obtain the appropriate signatures on forms.
- g) Submit the forms and required attachments to the address on the General Application Form.
- h) City will check to insure submittal is complete and notify the applicant.
- i) City will review the application within 30 working days and notify the applicant of credit determination, including identification of deficiencies if the application is not approved.
- j) If credit is denied, the applicant may address identified deficiencies and resubmit the revised application.
- k) If credit is denied, the applicant may appeal the determination following guidelines in Article VI of Chapter 29.5 of the City Code.

The process may vary depending on the type of credit being applied for. Specific criteria are provided in the following sections.

6.2 Private Detention Basin Maintenance Credit (Maximum 15%)

Property owners that discharge a portion or all of their impervious area runoff into a private detention basin that was: 1) required by the City's stormwater management regulations; 2) built to those standards; and 3) are complying with Chapter 23 of the City's Manual of Practice for Detention Basins Standards for Maintenance and Repair Responsibilities, are eligible for up to a 15 percent credit. The credit will be renewed each year upon receipt of the detention basin annual condition report and its review and approval by the City. The credit will be renewed on the fifth year upon receipt of the professional engineer's condition report and its review and approval by the City. The 5-year submittal of the professional engineer's condition report is a requirement of Chapter 23 of the City's Manual of Practice.

Properties that are in the tributary area of qualifying detention basins and whose owners contribute to the maintenance of the basins are eligible to apply for this credit. For detention basins that accept the direct runoff from subdivision developments that include individual single family residential or duplex properties, the credit must be applied for by a homeowner or lakeowner association on behalf of its members.

Individual single family residential or duplex properties may not apply. Upstream properties may not receive credit unless the detention basin was designed specifically to provide detention for their runoff and upstream property owners participate in the maintenance expense.

Partial credit is not available for incomplete maintenance.

To receive this credit the applicant must provide the following information:

- a) A completed General Credit Application Form.
- b) A completed Private Detention Basin Maintenance Credit Application Form.
- c) A copy of the most recent maintenance report as required in Chapter 23 of the City's Manual of Practice.
- d) A copy of the site drainage plan with lots and addresses, showing drainage areas tributary to the detention basin.
- e) A copy of any calculations that help support and/or determine credit eligibility of the impervious area of the site and of the contributing drainage area.

6.3 Rate Reduction Credit (Maximum 15%)

A rate reduction credit is available to properties that install and maintain stormwater rate reduction devices that control stormwater flow rates from sites to a level that is lower than what is required by the City stormwater management regulations. This type of credit is typically applied to properties that oversize detention basins to account for offsite upstream stormwater flows that enter the site. The property owner would be required to submit their plan for the rate reduction stormwater management device to the City for review and approval. The property owner's plan must be prepared and certified by a professional qualified to submit stormwater management plans. A professional engineer registered in the State of Illinois would satisfy this requirement. The rate reduction achieved by the stormwater management device must meet or exceed the requirements of the City's stormwater management regulations. The rate reduction device can earn up to a maximum credit of 15 percent depending on the reduction of flow rate and the amount of detention storage in excess of that required by the City stormwater management regulations.

The City will apply the credit after the City approved rate reduction plan has been constructed and inspected by the City. Every five years, the City will consider renewal of the credit upon receipt of a report from the property owner prepared by a certified professional indicating the rate reduction stormwater management practice is functioning as designed and is being maintained.

The Rate Reduction Credit is available to all developed properties that install and maintain a stormwater rate reduction device that results in oversizing a detention basin by at least 20 percent over that which is required by the City stormwater management regulations. This credit is not available for single family residential and duplex properties.

To qualify to receive the maximum 15 percent Rate Reduction Credit, the detention basin must have at least 20 percent more volume than is required by the City stormwater management regulations for a 100-year rainfall event. The property owner's designer must show that the detention basin is properly designed to detain the runoff for the 100-year rainfall event for the entire contributing drainage area, including any offsite areas. To confirm that this criteria was met for an existing detention basin, calculations, based on the criteria in Chapter 23 of the City's Manual of Practice, must be provided that show that the as-built storage volume of the detention basin is at least 20 percent larger than what was required for the property owner's property alone. Built out conditions must be assumed for the entire contributing areas.

Prorated credit will be considered for design storms less than the 100-year rainfall event. However, the excess storage volume of the detention basin must be at least 20 percent larger for any design storm to qualify for any credit. Example; a detention basin that has 20 percent more capacity than what is required by the City stormwater management regulations for a 50-year rainfall event would qualify for a 7.5 percent credit.

6.3.1 Rate Reduction Credit Application Process

To receive this credit the applicant must provide the following information:

- a) A completed General Credit Application Form.
- b) A completed Rate Reduction Credit Application Form.
- c) A copy of the site drainage plan, showing drainage areas tributary to the detention basin.
- d) Copies of technical calculations showing the computation of the design capacity of the detention basin.
- e) Copies of detention basin modeling output for the appropriate runoff volumes and retention times.

6.4 Volume Reduction Credit (Maximum 15%)

Volume reduction credits are available for those activities that reduce the total volume of runoff from a property. A volume reduction credit requires the implementation of a stormwater infiltration or reuse practice. Many of these practices are also referred to as rainfall or stormwater harvesting practices, rather than allowing the rainfall to simply runoff into a drainage system or receiving water body, the rainfall or runoff is intercepted and stored for a beneficial use, such as irrigation of lawns or plantings, or for non-potable uses such as toilet flushing.

Volume reduction practices can earn up to a 15 percent credit, depending on the fraction of the total impervious area served and the equivalent depth of rainwater or runoff that is either infiltrated or reused. The full 15 percent credit will be issued to all volume reduction practices that capture and store a 1-inch rainfall from the entire

impervious area present on a property. For volume reduction practices that capture and store less than a 1-inch of rainfall from the entire impervious area on a property, credit will be prorated based on the fraction of rainfall, as shown on Table 4, and the fraction of the total impervious area on the property that drains into the volume reduction device.

Volume reduction practices also provide a water quality benefit. A practice designed to capture a 1.0 inch of rainfall in Champaign, Illinois will capture almost all of the runoff for 90 percent of the annual rainfall events, meaning 100 percent capture of suspended and many dissolved stormwater pollutants for most events, and a significant capture and removal for events exceeding 1.0 inches of rainfall. Therefore, a Volume Reduction Credit in all likelihood will also qualify for at least a partial Water Quality Credit, as outlined in Section 6.5.1.

Stormwater controls that are constructed with underdrains do not qualify for this credit.

Stormwater controls must be drained within 72 hours to qualify for a Volume Reduction Credit.

The following sections define a variety of rainfall harvesting and reuse techniques that would qualify for a Volume Reduction Credit. The City is willing to consider other techniques not listed here for Volume Reduction Credits.

6.4.1 Cisterns

A cistern is a watertight receptacle for holding rainwater. Cisterns range in capacity from a few hundred gallons to thousands of gallons, effectively forming covered reservoirs. The water in cisterns can be used for irrigation or other types of reuse and infiltration practices. Cisterns are typically gravity fed and capture runoff from surfaces at the same level or higher than the storage, typically from rooftops. The Volume Reduction Credit for a cistern requires that the cistern capture and store 1 inch of rainfall from the impervious area contributing runoff. The credit may be prorated based on the fraction of the total impervious area of the property that provides water to the cistern and the fraction of rainfall depth that can be stored. The volume reduction plan must explain how the captured rainwater will be used so as to empty the stored water within 72 hours.

6.4.2 Green Roofs

A green roof is a roof of a building that is partially or completely covered with vegetation and a growing medium, planted over a waterproof membrane.

Green roofs serve several purposes for a building, such as absorbing rainwater, providing insulation, creating a habitat for wildlife, and helping to lower urban air temperatures and combat the heat island effect. There are two types of green roofs: intensive roofs, which are thicker and can support a wider variety of plants but are

heavier and require more maintenance, and extensive roofs, which are covered in a light layer of vegetation and are lighter than an intensive green roof.

The Volume Reduction Credit for a green roof requires the roof to capture and infiltrate 1 inch of rainfall. The credit may be prorated based on the fraction of 1 inch of rainfall that is retained and on the fraction of the total impervious area of the property that the green roof represents.

6.4.3 Permeable Pavement

Pervious and permeable pavements are pavements with open pore spaces that allow stormwater to infiltrate into the subsurface and into the ground. Permeable pavements are typically used on low traffic streets or parking lots. Permeable pavements can be asphalt, concrete or brick pavement systems. Although some permeable paving materials appear nearly indistinguishable from traditional nonporous materials, their environmental effects are qualitatively different. Whether pervious concrete, porous asphalt, paving stones or bricks, all these pervious materials allow precipitation to percolate through areas that would traditionally be impervious.

To qualify for the Volume Reduction Credit the impervious area calculations must include the area of the Permeable Pavement surface in the storage volume computations, and the storage must be based on 1.0 inches of rainfall on the impervious areas.

The credit may be prorated based on the fraction of 1 inch of rainfall that moves through the pavement and on the fraction of the total impervious area of the property.

6.4.4 Volume Reduction Credit Application Process

To qualify for the Volume Reduction Credit, the property owner would need to submit their volume reduction plan to the City for review and approval. The property owner's plan must be prepared and certified by a professional qualified to submit stormwater management plans. A professional engineer registered in the State of Illinois would satisfy this requirement. The City would apply the credit after the approved volume reduction plan has been constructed and inspected by the City. Every five years, the City would consider renewal of the credit upon receipt of a report from the property owner prepared by a certified professional indicating the volume reduction stormwater management practice is functioning as designed and is being maintained properly. Credit renewal would take place after the City has reviewed and approved the report.

To receive this credit the applicant must provide the following information:

- a) A completed General Credit Application Form.
- b) A completed Volume Reduction Credit Application Form.
- c) A copy of the site drainage plan, showing drainage areas tributary to the volume reduction control(s).

- d) A copy of calculations of the impervious areas of the site and of the contributing drainage area to each volume reduction control.
- e) Copies of technical calculations showing the computation of the design capacity of the volume reduction control(s).
- f) Design drawings.

6.5 Water Quality and NPDES Permit Credit (Maximum 15%)

Properties that provide measures to improve the quality of stormwater runoff that leaves the property may be eligible to receive a Water Quality Credit. For those properties that are granted either a rate or volume reduction credit, the Water Quality Credit may be added to those credits.

Credit is also available to industrial sites or other municipalities or agencies that are required to have a NPDES permit that is issued by the Illinois Environmental Protection Agency.

6.5.1 Water Quality / BMP Credit (Maximum 10%)

A credit may be provided to those applicants' properties that discharge a portion or all of their impervious area runoff to structural or non-structural best management practices (BMPs). The water quality credit will be granted if the applicant can demonstrate that the BMPs are designed to provide a minimum of 75 percent reduction in total suspended solids (TSS) in the stormwater runoff, as measured on an annual basis. Engineering calculations and, if applicable, vendor specifications for manufactured BMPs shall be submitted to demonstrate the minimum 75 percent TSS removal efficiency of the BMPs.

The maximum amount of Water Quality/BMP credit that will be provided is 10 percent. The final credit can be prorated based on the fraction of the total impervious surfaces on site that flows through the BMP.

To qualify for the Water Quality Credit, the property owner is required to submit their water quality plan to the City for review and approval. The property owner's plan must be prepared and certified by a professional qualified to submit stormwater management plans. A professional engineer registered in the State of Illinois satisfies this requirement. The City will apply the credit after the approved water quality plan has been constructed and inspected by the City. Every five years the City will consider renewal of the credit upon receipt of a report from the property owner prepared by a certified professional indicating the water quality stormwater management practice is functioning as designed and is being maintained properly. Credit renewal will take place after the City has reviewed and approved the report.

The following sections define a variety of BMP's that qualify for Water Quality Credits. The City is willing to consider other techniques that are not listed that can demonstrate the ability to achieve 75 percent total suspended solids removal from the runoff.

- a) *Water Quality Detention Basins.* Water quality detention basins are extended wet bottom detention basins that are designed with two control volumes; one control volume is for flood management for the 100-year event as required by City stormwater management regulations and Chapter 23 of the City's Manual of Practice, and the other is the water quality volume that is used to treat stormwater runoff prior to discharge from the detention basin. Water quality detention basins are efficient at sediment removal and for that reason their design often includes a pretreatment area (forebay) or device that promotes sediment removal in an area of the detention basin that can easily be cleaned. The water quality storage volume is typically computed based on the volume of runoff generated by the "first flush" depth of runoff, assumed to be 1.0 inches in Champaign. The water quality, or first flush volume can be computed by the following equation

$$V_{ff} = 3,630 * C * A$$

Where:

V_{ff} = First flush volume, post-development (in cubic feet)

C = Post-development runoff coefficient

A = Drainage area tributary to detention basin (in acres)

In order to qualify for the maximum 10 percent credit, water quality detention basins must be designed to the V_{ff} volume for the entire property and must demonstrate a 75 percent removal of TSS. Partial credits are available based on the fraction of total impervious area on the property served by the detention basin.

- b) *Vegetated swales.* Vegetated swales, or "bioswales", are landscape elements designed to remove silt and pollution from surface runoff. They consist of a swaled drainage course with gently sloped sides and filled with vegetation, compost and/or riprap. The water's flow path, along with the wide and shallow ditch, is designed to maximize the time water spends in the swale, which aids the trapping of pollutants and silt. Biological factors also contribute to the breakdown of certain pollutants. A common application of vegetated swales is around parking lots, where substantial automotive pollution is collected by the paving and then flushed by rain. The bioswale, or other type of biofilter, wraps around the parking lot and treats the runoff before releasing it to the storm sewer.

In order to qualify for the maximum 10 percent credit, vegetated swales must be designed to collect and treat a 1-inch rainfall from at least 20 percent of the total impervious area on a property. Partial credits are available based on the fraction of total impervious area on the property served by the vegetated swales.

- c) *Manufactured BMPs.* Manufactured BMPs are a family of BMPs that can be installed as standalone water quality treatments or can be used in conjunction

with detention basins to pre-treat the inflow. Some of these devices are considered hydro-dynamic separation units, others use micro-screening techniques, and others provide biofiltration in a closed environment. Manufactured BMPs qualify for the Water Quality Credit if properly sized to remove 75 percent TSS.

In order to qualify for the maximum 10 percent credit, a manufactured BMP must be designed to collect and treat a 1-inch rainfall from at least 20 percent of the total impervious area on a property. Partial credits are available based on the fraction of total impervious area on the property served by the manufactured BMP.

To receive this credit the applicant must provide the following information:

- a) A completed General Credit Application Form
- b) A completed Water Quality Application Form
- c) A copy of the site drainage plan, showing drainage areas tributary to the water quality BMP
- d) Copies of technical calculations showing the computation of the water quality storage required
- e) A copy of calculations of the impervious areas of the site and of the contributing drainage area
- f) Copies of detention basin modeling output for the appropriate runoff volumes and retention times for water quality detention basins
- g) Design drawings if retrofit or new construction

6.5.2 NPDES Permit Credit (5%)

This credit will apply only to property owners who are subject to either an industrial or municipal NPDES Stormwater Permit issued by the Illinois Environmental Protection Agency. This credit is conditional upon the proof of permit coverage and continuing compliance. The applicant shall submit her/his most recent annual site compliance inspection/audit update to prove compliance with an industrial NPDES stormwater permit, or the last annual report for a municipal NPDES stormwater permit in order to remain eligible for this credit. Similar information will be submitted annually in order to continue to receive the credit.

This credit will be in the amount of 5 percent for the entire area covered under the NPDES permit inside the City of Champaign corporate limits.

To receive this credit the applicant must provide the following information:

- a) A completed General Credit Application Form.
- b) A completed NPDES Credit Form.
- c) A copy of the permittee's Notice of Intent.

- d) A copy of the permittee's latest annual site compliance report (industrial permit) or annual report (municipal permit).

6.6 Educational Credits

This credit is only applicable to local K-12 education institutions. National studies have shown that programs targeted at these students can be very effective at spreading the messages throughout a household.

The City will provide a credit to educational institutions on an annual basis at a rate of \$5.00 per student for providing instruction in accordance with an approved curriculum. Education credits are based on the number of students actually participating in the education curriculum in a school year. There are numerous water quality-based education programs that may be adopted by local school systems. The curricula for which credit applications are to be submitted must be approved by the City, whether it is a nationally accepted program or a program written by the institution. Examples of qualifying curricula are available at the websites of the United States Environmental Protection Agency (<http://cfpub.epa.gov/npdes/stormwater/menuofbmps/>) under "Public Education" and in the "Classroom Education on Stormwater" subarea, and the Water Environment Federation (www.wef.org) website under "Public Information" and the subarea "Students & Teachers K-12".

To remain eligible for this credit, the applicant shall, on an annual basis, provide a copy of the lesson plan(s), demonstrate that the lesson plan(s) is (are) consistent with the educational content deemed appropriate by the U.S. EPA for stormwater education, and provide documentation of the number of students taught that year. This credit is limited to the number of children enrolled in the applicant's school and in the target audience grade at the time of the application. This credit is also limited to the 50 percent credit limit indicated in Section 4.3.7.

To receive this credit the applicant must provide the following information:

- a) A completed General Credit Application Form.
- b) A completed Education Credit Application Form.
- c) A copy of the proposed curriculum and identifying the target audience (i.e.; 5th graders).

6.7 Direct Discharge Credit (up to 100%)

Properties that discharge directly to stormwater facilities or conveyances that are not maintained by the City and that do not eventually re-enter City-maintained drainage systems or streams, exert a lower demand for service on the City's stormwater program than do properties whose runoff must be accommodated by drainage system capacity, planning, and floodplain management. In recognition of that reduction in demand, the City will provide up to a 100 percent credit to those qualifying properties.

Credit amounts are based on the amount of area that does not directly discharge into City stormwater infrastructure. 100 percent credit is given to properties that do not have any area draining into City infrastructure. For properties that partially drain into City infrastructure, a prorated credit amount will be determined based the area that does not directly discharge into City stormwater infrastructure.

To receive this credit, the applicant must submit site plans for the property demonstrating which portion(s) of the parcel qualify for this credit and the credit will be prorated accordingly. This credit is not available for single family or duplex properties.

To receive this credit the applicant must provide the following information:

- a) A completed General Credit Application Form.
- b) A completed Direct Discharge Credit Application Form.
- c) A copy of the site drainage plan, showing delineated drainage areas that discharge to receiving waters outside the City of Campaign and all of the impervious area on the property.
- d) A copy of calculations of the impervious areas of the entire property and of the non-contributing drainage area.

7 EXAMPLES

The following example applications of the City of Champaign Stormwater Utility Credit and Incentive Manual are intended to provide guidance on the process of determining and applying for credits and incentives. The examples are not intended to cover all possibilities for credit applications. Any questions or uncertainties should be addressed to the Stormwater Coordinator at the City of Champaign Public Works Department for answers. These examples are fictitious and any resemblance to actual situations is merely coincidental. The following credit and incentive scenarios are reviewed:

- Rain Garden Incentive – single family residential property.
- Runoff Volume Reduction Incentive – single family residential property.
- Private Detention Basin Maintenance Credit – subdivision.
- Runoff Rate Reduction – commercial site.
- Water Quality / BMP Credit - big box site.
- Direct Discharge Credit – mini-storage facility.

7.1 Example 1. Rain Garden Incentive

A homeowner decides to build a rain garden as part of a front yard landscaping project. The house has 2,000 square feet of roof evenly distributed between front and back. There is a downspout on each corner of the house. The homeowner can build either a single rain garden to capture the runoff from one downspout, thus having a contributing area of 500 square feet (1/4 of the roof area), or may have a rain garden for each of the front yard downspouts fed by the runoff from 1,000 square feet of roof top, or she may have a single rain garden that captures the runoff from both downspouts. She decides to build a single rain garden that will capture the runoff from the entire front side of the house.

At a minimum, the rain garden must capture and store a 1-inch rainfall from a 500 square foot impervious area. This translates into a 100 square foot rain garden that is approximately 5-inches deep. In the design the homeowner reports that she has evaluated the soils and determined that she will have to amend them to increase the infiltration in the rain garden. The homeowner decides that she will design the rain garden to have a 5-inch ponding depth. She calculates the size of the rain garden to be:

$$\text{Rain Garden Area} = \text{Contributing Area} / \text{Ponding Depth}$$

$$\text{Rain Garden Area} = 1,000 / 5$$

$$= 200$$

Where: Areas are in square feet
Ponding depth is in inches

On a drawing of her front yard she approximates the shape of the garden as 10 feet wide by 20 feet long, running parallel to the house and located slightly further from the foundation of the house than the minimum distance of 10 feet. She develops a planting plan with the assistance of a local nursery utilizing predominantly native plants.

The Incentive Application Form, including the Rain Garden Incentive section is completed and submitted along with the rain garden plan for consideration by the City of Champaign Public Works Department. Once approval is received from Public Works the homeowner can install the rain garden. When the rain garden is complete the homeowner should notify the Public Works Department and supply her receipts. After the installation is confirmed the incentive disbursement will be approved.

Because the rain garden has enough capacity to capture and store a 1-inch rainfall from 1,000 square feet of impervious area, it exceeds the minimum size requirements. In addition, because this garden is over 100 square feet, it would qualify for the rate reduction, volume reduction and water quality incentives. The homeowner would qualify for 25 percent of the cost to install the rain garden up to a maximum of \$750 (\$250 for each incentive category).

7.2 Example 2. Runoff Volume Reduction Incentive

The homeowner in Example 1 decides that she wants to capture and reuse rainwater from the roof on the back side of the house to water plants around her patio. To do this she decides to install a cistern. By sizing the cistern to capture the first inch of runoff in a storm she will qualify for an incentive payment of up to \$250.

The homeowner determines, as above, that half of the roof top on the back of the house is an area of 500 square feet. Capturing the runoff from 1 inch of rainfall from that area will require a storage volume of approximately 310 gallons as calculated by the following:

$$\begin{aligned}\text{Volume} &= 7.48 \times \text{Contributing Area} \times \text{Rainfall Depth} / 12 \\ &= 7.48 \times 500 \times 1 / 12 \\ &= 312\end{aligned}$$

Where: Areas are in square feet
Rainfall depth is in inches
7.48 = conversion factor for cubic feet to gallons
1 / 12 = conversion factor for inches to feet

In order to insure availability of extra water when needed she decides to install a 500 gallon cistern. The volume reduction plan details how she will utilize the captured water volume within a 72 hour period so as to maximize the rainfall harvesting capacity of the

cistern. In the Other Incentive Information section of her Incentive Application Form she shows the required size and the proposed actual size of the cistern. She obtains an estimate for her project: the tank will cost \$400; a soaker hose and valves will cost \$80; a stand will cost \$80, and; delivery and setup will cost \$80. The total cost of the cistern, installed, is estimated to be \$640. The estimate is provided to the City of Champaign Public Works Department along with the volume reduction plan and the Incentive Application Form. If the application is approved the incentive payout upon proof of installation of the cistern would be 25% of \$640, or \$160.

7.3 Example 3. Private Detention Basin Maintenance Credit

A small subdivision on the west side of Champaign has 24 lots. The subdivision was built in 2001 and has a wet bottom detention basin that was built to meet the City's current standards. A lakeowners' association was formed and the maintenance and reporting that are required in Chapter 23 of the City's Manual of Practice have been performed on time each year. The association intends to apply for a Private Detention Basin Maintenance Credit on behalf of the members.

To qualify for this credit the lakeowners' association must retain a qualified professional to complete the General Credit Application Form and the Private Detention Basin Maintenance Credit Form. This credit requires that the qualified professional compute the fraction of the total area of the member properties that drains to the detention basin. For this example the entire impervious area is captured and directed to the detention basin, therefore the credit applied for is for 15% for each of the lakeowner association member properties. The address and parcel identification number for each of the 24 member properties and for the common lot where the pond is located are recorded on the Private Detention Basin Maintenance Credit Form.

When the forms are completed and certified they are submitted to the City of Champaign Public Works Department with a copy of the required maintenance report. Once approved, the credit will be applied to each of the indicated properties.

7.4 Example 4. Runoff Rate Reduction Credit

A local property management firm is the owner / operator of a large commercial development in North Champaign. When the property was first developed a large detention basin was built to comply with local regulations. Because of the amount of impervious area that would be built on the site and the proximity of the site to a portion of the City's stormwater drainage system that is already at or near capacity, the developer designed and built the basin with excess storage that would provide control of events larger than the design rainfall. The property owner believes that he provided more than 20 percent excess storage volume in the detention basin and has decided to retain a qualified professional and apply for the Rate Reduction Credit.

To qualify for this credit the qualified professional must review the detention basin's design and determine the volume of detention storage that is required to meet the City's

standards and the amount of detention storage that was actually provided in the basin. If the total storage volume of the basin is at least 20 percent more than what is required for the site then the development would qualify for the Rate Reduction Credit. It is also determined that the detention basin maintenance has been performed regularly as required by the City and therefore qualifies for the Private Detention Basin Maintenance Credit.

When the General Credit Application, Private Detention Basin Maintenance Credit Application, and Rate Reduction Credit Application Forms are completed and certified they will be submitted to the City of Champaign Public Works Department accompanied by a copy of the required maintenance report.

7.5 Example 5. Volume Reduction Credit

A local business decides it likes the idea of using an underground cistern to provide irrigation to some of their site landscaping. The property has a total of 1 acre with approximately 0.33 acres (14,375 ft²) of impervious area. The business owner is currently paying the following stormwater utility bill:

$$\text{Stormwater ERUs} = \frac{14,375}{3,478} = 4.1 \Rightarrow 4.0 \text{ ERUs}$$

$$\text{Stormwater Utility Fee} = 4.0 \text{ ERUs} \times \frac{\$5.24}{\text{ERU}} \text{ per month} = \frac{\$20.96}{\text{month}} \Rightarrow \$251.52/\text{year}$$

The business owner has looked at three cistern options that range from capturing all of the 1-inch rainfall from the entire 0.33 acres of impervious areas to capturing a portion of the 1-inch rainfall from part of the 0.33 acres of impervious area. The following options were considered by the business owner:

Cistern #1 (8,961 gallons):

Impervious area captured = 0.33 acres or 14,375 ft²

Rainfall captured = 1-inch or 0.0833 ft.

Cistern size = 14,375 ft² x 0.0833 ft = 1,198 ft³

Cistern size = 1,198 ft³ x 7.48 gal/ft³ = 8,961 gallons

Construction Cost = \$10,000

City Determination. The cistern is sized to capture and hold a 1-inch rainfall from all the 0.33 acres of impervious area on the property. This cistern would qualify for the maximum 15 percent volume reduction credit.

Installation of this cistern would qualify the property owner for a 15 percent credit on their stormwater utility bill as shown below.

$$\text{Adjusted Stormwater Utility Fee} = \$251.52 - (0.15 \times \$251.52) = \$213.79$$

Cistern #2 (4,073 gallons):

Impervious area captured = 0.20 acres or 8,712 ft²

Rainfall captured = 0.75-inch or 0.0625 ft.

Cistern size = (8,712 ft² × 0.0625 ft) = 544.5 ft³

Cistern size = 544.5 ft³ × 7.48 $\frac{gal}{ft^3}$ = 4,073 gallons

Construction Cost = \$5,000

City Determination. The cistern is sized to capture and hold a 0.75-inch rainfall from 0.20 acres of impervious area on the property. The cistern would not qualify for the full 15 percent credit since it doesn't capture and hold a 1-inch rainfall from the entire 0.33 acres of impervious area. However, the cistern does qualify for prorated credit based on the fraction of rainfall less than 1-inch and the fraction of the impervious area less than 0.33 acres. The rainfall proration factor is based on the rainfall depth as shown on Table 4, which, in this case, would be 0.75 for a rainfall of 0.75-inches. The area proration is based on the fractional percentage of impervious area that is captured by the cistern, which, in this case, would be about 60 percent (0.20 acres divided by 0.33 acres). The prorated credit amount would be calculated as follows:

Credit Amount

$$= \left(\frac{\text{Rainfall Credit}}{\text{Proration Factor} - \text{Table 4}} \right) \times \left(\frac{\text{Area Credit}}{\text{Proration Factor}} \right) \times (15\% \text{ Maximum Credit})$$

$$\text{Credit Amount} = (0.75) \times \left(\frac{0.20}{0.33} \right) \times (15)$$

$$\text{Credit Amount} = (0.75) \times (0.606) \times (15) = 6.82\%$$

Installation of a 4,073 gallon cistern would qualify the property owner for a 6.82 percent credit on their stormwater utility bill.

$$\text{Adjusted Stormwater Utility Fee} = \$251.52 - (0.0682 \times \$251.52) = \$234.37/\text{year}$$

Cistern #3 (1,358 gallons):

Impervious area captured = 0.10 acres or 4,356 ft²

Rainfall captured = 0.50-inch or 0.0417 ft.

Cistern size = (4,356 ft² × 0.0417 ft) = 181.6 ft³

Cistern size = 181.6 ft³ × 7.48 $\frac{gal}{ft^3}$ = 1,358 gallons

Construction Cost = \$5,000

City Determination. The cistern is sized to capture and hold a 0.50-inch rainfall from 0.10 acres of impervious area on the property. The cistern would not qualify for the full 15 percent credit since it doesn't capture and hold a 1-inch rainfall from the entire 0.33 acres of impervious area. However, the cistern does qualify for prorated credit based on the fraction of rainfall less than 1-inch and the fraction of the impervious area less

than 0.33 acres. The rainfall proration factor is based on the rainfall depth as shown on Table 4, which, in this case, would be 0.50 for a rainfall of 0.50-inches. The area proration is based on the fractional percentage of impervious area that is captured by the cistern, which, in this case, would be about 30 percent (0.10 acres divided by 0.33 acres). The prorated credit amount would be calculated as follows:

$$\text{Credit Amount} = \left(\frac{\text{Rainfall Credit}}{\text{Proration Factor} - \text{Table 4}} \right) \times \left(\frac{\text{Area Credit}}{\text{Proration Factor}} \right) \times (15\% \text{ Maximum Credit})$$

$$\text{Credit Amount} = (0.50) \times \left(\frac{0.10}{0.33} \right) \times (15)$$

$$\text{Credit Amount} = (0.50) \times (0.303) \times (15) = 2.27\%$$

Installation of a 1,358 gallon cistern would qualify the property owner for a 2.27 percent credit on their stormwater utility bill.

$$\text{Adjusted Stormwater Utility Fee} = \$251.52 - (0.0227 \times \$251.52) = \$245.81$$

7.6 Example 6. Water Quality Credit

A big box development on North Prospect Avenue has a detention basin that was built to the City's current standards. The basin captures the runoff from 20 acres of building rooftop and pavement. The basin has a surface area of 1 acre and was not designed to provide any storage above that required for permitting. The detention basin currently qualifies for the Private Detention Basin Maintenance Credit. The owner is interested in finding out whether the basin can cost effectively be modified to qualify for additional credits. A qualified professional has been retained to evaluate the feasibility of retrofitting the basin so that it would qualify for the Water Quality / BMP Credit.

After reviewing the information from the design and construction of the existing detention basin the evaluation for the Water Quality Credit is performed. With the entire 20 acres of impervious surface on the site contributing runoff to the detention basin, the water quality storage volume, or first flush storage volume that would need to be added to the detention basin is calculated as:

$$\begin{aligned} V_{ff} &= 3,630 * C * A \\ &= 3,630 * 0.95 * 20 \\ &= 68,970 \text{ cubic feet} \end{aligned}$$

where the runoff coefficient, "C", is assumed as 0.95

In order to accommodate the addition of 69,000 cubic feet of storage the pond would need to be enlarged by:

- a) increasing its footprint,

- b) by increasing the depth – in this case by 1.6 feet, or
- c) some combination of a & b.

In addition, the outlet would need to be modified to insure the proper retention time for the water quality volume and a maintenance plan would need to be developed for periodic removal of accumulated sediment. The qualified professional next prepares a cost/benefit analysis of the retrofit costs and the cost recovery through credits.

An alternative method of total suspended solids control could be provided by installing flow-through manufactured BMPs at the inlet(s) to the basin. As in the example above, the appropriate sized unit must be determined for each detention basin inlet and the total retrofit cost calculated and compared to the cost recovery through credits to determine the feasibility of this option.

If the owner elects to retrofit the detention basin as described in the two options above it would qualify for the entire 10 percent Water Quality / BMP Credit because all of the site's impervious areas discharge to the detention basin.

The submittal for this credit based on the detention basin retrofit includes the completed and certified General Credit Application and Water Quality / BMP Credit Forms, the model results, and the design for the outlet retrofit. If the manufactured BMP alternative is proposed the submittal would require the completed and certified General Credit Application and Water Quality / BMP Credit Forms, the BMP sizing results, and the design for the inlet retrofit(s).

7.7 Example 7. Direct Discharge Credit

XYZ Mini Storage has built a facility in southwest Champaign that discharges directly out of the city and into Copper Slough. The facility has a 20,000 square foot building and approximately 16,000 square feet of paved area and sidewalks.

After examining topographic maps the owners feel that they may be eligible for a Direct Discharge Credit of up to 100% for a portion of their property and decide to hire a qualified professional to prepare a Direct Discharge Credit Application.

The first step for the qualified professional is to confirm that the property qualifies for the credit. The professional reviews maps showing the topography, drainage, and the City's corporate boundaries in the immediate vicinity and downstream of the owners' property. It is determined that the runoff from a portion of the property does indeed discharge outside the city limits without entering any city owned or operated drainage infrastructure.

The qualified professional next delineates the impervious surface areas on the site and determines which portions of those areas directly discharge away from the city's drainage infrastructure. The qualified professional should obtain the impervious surface coverage from the City and update the information to reflect any recent changes. The

impervious surfaces should then be overlaid on the topographic map of the site to determine which surfaces drain to / away from the city's storm drainage infrastructure. This information may already exist in a site drainage plan. Upon completion of the map investigations the qualified professional determines that 17,000 square feet of the building and 8,000 square feet of the paved areas discharge directly to Copper Slough. The available credit would be calculated as 25,000 square feet divided by 36,000 square feet (69.4 percent) times the maximum available credit of 50 percent, or an available credit of 34.7 percent.

The submittal for this credit includes the completed and certified General Credit Application and Direct Discharge Credit Forms, and the delineated impervious areas on topographic maps.

8 FORMS

Application forms for participation in the City of Champaign's Stormwater Utility Fee Credit and Incentive Program are provided on the following pages. If there are any questions related to the content of the forms or process for completion and submittal to the City please call the City of Champaign Public Works Department (217-403-4710) and ask for the Stormwater Coordinator.