



# **STORMWATER UTILITY**

## **SERVICE CHARGE CREDIT TECHNICAL MANUAL**

Revised March 2017

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## **SECTION 1.0 OVERVIEW AND GENERAL INSTRUCTIONS**

Columbia County's Stormwater Utility provides a stable and adequate source of revenue for the County's stormwater management program that allocates the costs of stormwater services across every stormwater "user" in the County through a stormwater utility service fee. Each property that discharges stormwater to the County's stormwater system is charged a fee based on the amount of impervious surface area on the property. The stormwater utility service fee that a property owner pays is directly proportional to the impervious area found on the property.

The intent of the Stormwater Service Charge Credit Technical Manual is to recognize on-site systems, facilities, or other actions that mitigate the impact and/or improve the quality of stormwater runoff. Stormwater service charge credits may be achieved through the use of one or more activities as outlined in this manual. The maximum amount of credit available is 70% of the total stormwater utility monthly service fee.

## **SECTION 1.1 DEFINITIONS**

**Best Management Practice (BMP)** means schedules of activities, prohibitions of practices, general good housekeeping practices, pollution prevention and educational practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants directly or indirectly to stormwater, receiving waters, or stormwater conveyance systems.

**Credit** means a reduction in a customer's stormwater service fee given for certain qualifying activities which reduce or mitigate the runoff impact that the property improvements have on Columbia County's stormwater management systems and facilities.

**Detention Facility** means a system which provides temporary storage of stormwater runoff with a designed release of the stored runoff over time to manage the discharge volume, rate, pollutant loading and/or velocity and mitigate the property's impact on the County's stormwater management system.

**Engineered Pond** means a detention or retention facility, which has been designed to control the release rate of stormwater discharge from such facility.

**Georgia Stormwater Management Manual (GSMM)** is the document governing stormwater management activities in Georgia. This document serves as a comprehensive technical handbook for stormwater management design, construction and long-term maintenance.

**Non-Engineered Pond** means any natural or artificial body of water, which may or may not have a man-made outlet that contains water and was constructed for agricultural or aesthetic purposes.

**Non-Residential** means a developed property that contains structures utilized for purposes other than a residential dwelling unit. Non-Residential properties include those classified as commercial, industrial, institutional, educational, religious, municipal, or recreational. For the purposes of the manual, BMPs owned and operated by a property owner's association, as they must be registered as a corporation, will qualify for credit as a non-residential property.

**Residential** means a developed property that contains a main dwelling by means of a roof and/or interior wall, with each dwelling unit occupying its own parcel. Residential property shall be classified as residential and shall not be commercial, industrial, institutional, educational, religious, municipal, recreational, or property owned and maintained by a property owner's association.

**Retention Facility** means a facility which provides storage of stormwater runoff preventing release of a certain volume to a surface water body.

**Routing** means an engineering technique described as computation of the movement and attenuation of an inflow hydrograph as it passes through the stormwater system, resulting in a discharge hydrograph at the downstream end of the element such as a pipe, channel, or detention basin, and accounts mathematically for the effects of storage on flow through the element. "Level pool routing" assumes that a retention/detention facility maintains an "even" or "level" surface water elevation.

**Stormwater** means stormwater runoff, snow melt runoff, and surface runoff and drainage.

## **SECTION 1.2 GENERAL POLICIES**

General credit policies are listed below:

1. Credit is given to eligible properties as described in the credit policies presented in this manual.
2. A Property Owner's Association (POA), which has its own properly designed, constructed and maintained stormwater BMP(s) may be eligible for credit as outlined in Section 2.2.1 for Engineered Ponds on Non-Residential properties. For the purposes of the credit, the BMP(s) must be located on a parcel that is platted within the subdivision and owned by the POA. BMPs located within County-owned property to include rights-of-way and greenspace or BMPs maintained by the County through a dedicated maintenance easement or other legal agreement are ineligible.
3. It is the responsibility of the property owner or agent to apply for stormwater credits and provide the necessary substantiating information with the Credit Application, as described herein.

4. Stormwater Utility staff shall not be responsible for initiating applications, performing engineering calculations or otherwise assisting with the preparation of credit applications.
5. Credit applications for existing facilities may be submitted at any time. Approved credits will be applied to the billing cycle following the date on which a complete application has been approved by Columbia County. Stormwater Utility accounts must be current and paid in full for a credit application to be considered.
6. Credit applications for new construction may be submitted once the BMP is in place and stormwater billing begins, whichever is later.
7. During the credit term, Columbia County has the right to inspect the BMP to insure it is functioning and being properly maintained.

### **SECTION 1.3 BASIC PROCEDURES**

The procedure for filing a credit application includes the following tasks:

1. Obtain a copy of the Stormwater Utility Service Charge Credit Technical Manual from the Columbia County Stormwater Utility Department located in Building A of the Columbia County Government Complex at 630 Ronald Reagan Drive, Evans, GA or via the Columbia County website at [www.columbiacountyga.gov](http://www.columbiacountyga.gov).
2. Submit complete credit applications, including all supporting documentation, via U.S. Mail to the Columbia County Stormwater Utility Department, PO Box 498, Evans, GA 30809 or in person to Building A of the Columbia County Government Complex located at 630 Ronald Regan Drive in Evans, Georgia.
3. Columbia County will review the application package for completeness and accuracy within 30 days of the receipt of the application form. If the application package is complete and accurate, a letter will be sent to the applicant notifying them of approval of the credit. If deficiencies are found during the review, a deficiency letter will be sent to the applicant. Upon receipt of additional information from the applicant to constitute a complete application, the review will resume and be completed within 30 days of receipt of the additional information. If an application is denied, a letter explaining the reasons for the denial will be provided to the applicant.
4. Upon the successful application for a stormwater service charge credit, Columbia County will update the billing database to issue the credit, starting with the next billing cycle.
5. All credit terms expire on June 1<sup>st</sup>. It is the property owner's responsibility to submit the appropriate Operation and Maintenance Inspection Report (Appendix C-1 or C-2) annually to continue receiving credit. Failure to submit the required information will result in discontinuation of the credit on the next billing cycle.

## **SECTION 2.0 CREDIT POLICIES AND PROCEDURES**

The purpose of this section is to explain the procedures involved in applying for a stormwater service fee credit. The procedures include step by step instructions and eligibility requirements for obtaining the credit.

### **SECTION 2.1 RESIDENTIAL**

Listed below are the stormwater credits for which residential customers are eligible to apply. The residential customer shall follow the credit application procedures as outlined herein for credit. **PLEASE NOTE:** A Property Owner's Associations shall apply for credit as outlined in Section 2.2.1 for Engineered Ponds on Non-Residential properties.

#### **SECTION 2.1.1 Non-Engineered Ponds**

Residential customers, who have a non-engineered pond that is either individually or jointly owned, can apply for and receive a twenty percent (20%) credit of their monthly stormwater service fee by following the instructions of this section. Only the owner(s) of the pond can apply for and receive the credit, and only toward the stormwater utility service fee for the property(ies) which include the pond.

Additional credit may be available as described in Section 2.2.1, but requires some engineering calculations to be performed by a registered professional engineer. The vast majority of residential ponds located within the Stormwater Utility Service Area were designed to collect and maintain a water surface elevation, and not specifically engineered to reduce the peak stormwater discharge rate for a 50 year, 24-hour storm event. Therefore, the vast majority of these residential ponds will not meet the criteria to obtain the additional credit reduction above the 20% specified in this section. Please note that the cost of conducting an engineering evaluation, to determine if the additional percent of credit reduction is applicable for the property, may far exceed the cost savings, if any, to be obtained in the near future for the additional credit reduction.

To apply for this credit, the property owner(s) must complete the following forms and submit them to the Stormwater Utility Department:

1. **Appendix A** - Stormwater Utility Credit Application Form including a sketch of the property(ies) showing the location of the pond on the property(ies),
2. **Appendix B** - Permanent Stormwater System Maintenance and Inspection Agreement, including Maintenance and Inspection Plan, and
3. **Appendix C-1** - Operation and Maintenance Inspection Report for Non-Engineered Residential Ponds.

### *SECTION 2.1.2 Rain Barrels*

Rain barrels reduce the amount of runoff leaving residential properties via interception and storage. Rain barrels not only reduces the demand on the downstream drainage network but also reduces the need for irrigation water from the potable water system. Residential customers, who can provide documentation that a minimum of one-half of the downspouts from their roof gutter system are connected to rain barrels of at least 40 gallons in size, can apply for and receive a twenty percent (20%) credit of their monthly stormwater service fee by following the instructions of this section.

To apply for this credit, the property owner must submit the following information to the Stormwater Utility Department:

1. **Appendix A** - Stormwater Utility Credit Application Form including a sketch of the property showing the location of the rain barrels,
2. **Appendix B** - Permanent Stormwater System Maintenance and Inspection Agreement, including Maintenance and Inspection Plan,
3. Documentation showing each rain barrel consists of a water tight barrel with a capacity of 40 gallons or more to allow interception of rain water from a downspout. Additionally, the rain barrel must have a spigot such that stored runoff water can be drained in a controlled manner at a later time.
4. Photographs of each rain barrel showing each downspout connection.

### *SECTION 2.1.3 Environmental Technologies*

Residential customers are eligible for a stormwater credit if the customer participates in an eligible residential environmental technology. These stormwater management practices may include but are not limited to such items as cisterns, rain gardens, pervious pavements and infiltration areas. The County will use the GSMM standards to evaluate the BMP and its eligibility. Residential customers, who can prove that their property has successfully installed residential environmental technology, can apply for and receive a twenty percent (20%) credit of their monthly stormwater service fee by following the instructions of this section.

To apply for this credit, the property owner must submit the following information to the Stormwater Utility Department:

1. **Appendix A** - Stormwater Utility Credit Application Form including a sketch of the property showing the location of each residential environmental technology,
2. **Appendix B** - Permanent Stormwater System Maintenance and Inspection Agreement, including Maintenance and Inspection Plan,
3. Documentation as required in the GSMM for each residential environmental technology, and
4. Photographs of each residential environmental technology as installed.

## **SECTION 2.2 NON-RESIDENTIAL**

Listed below are the stormwater credits for which non-residential customers, to include Property Owner's Associations, are eligible to apply. The non-residential customer shall follow the credit application procedures as outlined herein for credit.

### **SECTION 2.2.1 Engineered Ponds**

Non-residential customers, which have a constructed onsite or off-site stormwater retention or detention facility, can apply for and receive a maximum of fifty percent (50%) credit of their monthly stormwater service fee by following the instructions of this section. Only the owner of the pond can apply for the credit and the credit shall only apply to that portion of the property served by the retention or detention basin.

To apply for this credit, the property owner must complete the following forms and submit them to the Stormwater Utility Department:

1. **Appendix A** - Stormwater Utility Credit Application Form including a sketch of the property(ies) showing the location of the pond on the property(ies). If a Property Owner's Association (POA) is seeking credit, a list of the properties which are included in the POA must be attached to the application,
2. **Appendix B** - Permanent Stormwater System Maintenance and Inspection Agreement, including Maintenance and Inspection Plan,
3. **Appendix C-2** - Operation and Maintenance Inspection Report for Engineered Stormwater Management Ponds, and
4. **Appendix D** - Credit Calculation Form.

### **SECTION 2.2.2 NPDES Water Quality**

Non-residential customers, which have applied for and received an NPDES discharge permit, can apply for and receive a twenty percent (20%) credit of their monthly stormwater service fee by following the instructions of this section. The credit shall only be applied to that portion of the property covered by the permit.

To apply for this credit, the property owner must submit the following information to the Stormwater Utility Department:

1. **Appendix A** - Stormwater Utility Credit Application Form including a sketch of the property showing the area covered by the NPDES permit,
2. Copy of the current NPDES Industrial Stormwater Permit NOI,
3. Copy of the summary annual report of compliance, and
4. Copy of the Stormwater Pollution Prevention Plan.

*SECTION 2.2.3 Education Programs*

Public and private school customers that educate and inform their students about the importance of our surface and groundwater resources can apply for and receive a twenty percent (20%) credit of their monthly stormwater service fee by following the instructions of this section.

To apply for this credit, the person responsible for the property must submit the following information to the Stormwater Utility Department:

1. **Appendix A** - Stormwater Utility Credit Application Form, and
2. Documentation that a water resources based curriculum is taught at the facility/property and the extent to which such curriculum is taught.

## **SECTION 3.0 MAINTENANCE STANDARDS**

Although the actual time that a retention or detention facility performs its design function is relatively brief (during and immediately following a storm event), it must constantly be ready to do so. This is due to the random nature of rainfall events and the impracticality of inspecting the facility and performing maintenance immediately prior to them. Additionally, pollutant removal efficiencies will decline over time if adequate maintenance is not performed. To maintain maximum pollutant removal, it is important to have the retention or detention facility fully operational at all times. To provide this operational level, the owner must establish and sustain a maintenance and inspection plan.

### **SECTION 3.1 MAINTENANCE AND INSPECTION PLAN GUIDELINES**

Applicants who receive credits as outlined in this document must keep the stormwater BMPs properly maintained. Inspection and maintenance agreements are required in most cases where the owner requesting a stormwater utility service charge credit.

All maintenance and inspections plans shall contain, without limitation, the following provisions:

- A description of the property on which the stormwater management facility is located and all easements required to access the facility,
- Size and configuration of the facility, and
- Identification of who will have the maintenance responsibility and a schedule of operations.

In order for stormwater retention and detention facilities to operate as they were intended, maintenance must be routinely performed. Improperly maintained stormwater retention and detention facilities do not reduce stormwater impacts effectively. The following items are the basic minimum maintenance requirements for all stormwater facilities:

- Sediment shall be removed when 20% of the storage volume is filled,
- No woody vegetation shall be allowed to grow on the embankment without special design provisions,
- Other vegetation shall be cut when it exceeds 18 inches in height unless part of managed landscaping,
- Debris shall be removed from blocking inlet and outlet structures and from areas of potential clogging. This is especially important after major storms. Extended detention control devices should be checked often for debris accumulation and/or clogging,
- The control structures shall be kept structurally sound, free from sediment, and functioning as designed, and
- No standing water is allowed within detention basins.

More specific maintenance information pertaining to retention/detention facilities is provided in the following sections.

### **SECTION 3.2 ACCESS FOR MAINTENANCE**

Access for inspections, maintenance personnel, and equipment must be provided to all areas of a retention/detention facility that require observation or maintenance. The location and configuration of easements must be established during the construction of the facility, and maintained on a regular basis. The areas requiring access include the embankment, emergency spillway, side slopes, inlets, sediment forebays, riser structures, best management practices (BMP) devices, and pond outlets. In order to provide access for heavy equipment, a suitable width roadway within an appropriate cleared access easement must be provided to the facility as necessary for the purpose of widening, deepening, protecting, relocating, or otherwise improving such facility. A typical roadway would consist of 6-inches of compacted sub-grade (95% Maximum Theoretical Density) and 6-inches of graded aggregate base. On large facilities, additional easement to both upstream and downstream areas should be provided for maintenance access and additional improvements such as all-weather roads, access restrictions, and vandalism deterrents should be considered.

### **SECTION 3.3 SEDIMENT ACCUMULATION AND REMOVAL**

Sediment accumulation resulting from normal operation must be recognized. Accommodations should be made for the removal and disposal of sediments. Disposal should be provided either onsite in reserved areas, used as fill or topsoil supplement, or removed from site. For larger facilities, access must be provided for equipment to dredge and remove accumulated sediment because offsite disposal will likely be necessary.

### **SECTION 3.4 OPERATIONAL AND MAINTENANCE COSTS**

Maintenance needs of retention/detention facilities are somewhat site specific and the costs of conducting needed maintenance will vary accordingly. However, it is possible to determine cost estimates using some general facility maintenance parameters. The operation and maintenance of a facility will usually involve routine and non-routine maintenance procedures. Routine maintenance procedures will include inspections, debris and litter control, mechanical components maintenance, vegetation management, and other routine tasks as determined for the specific facility. Non-routine costs are those associated with removing accumulated sediments from the facility and long term structural repairs. Non-routine maintenance costs will vary greatly depending upon the size and depth of the facility, the volume of sediment trapped in the facility, the accessibility of the facility, and whether onsite disposal of dredged sediment is possible.

The average annual operation and maintenance costs of an extended detention dry pond are estimated at 3% to 5% of the capital cost of the facility. The average annual operation and maintenance costs of a wet pond are estimated at 3% of capital costs. Probable costs for a wet pond less than 100,000 cubic feet is 5% of capital costs, while the probable cost of a wet pond greater than 1,000,000 cubic feet is 1% of capital cost. Initial capital costs will vary considerably depending on the type and size of the facility.

### **SECTION 3.5 INSPECTONS**

Scheduled, periodic inspections should provide the foundation for a comprehensive maintenance program. Detailed inspections, occurring at least annually, should be conducted by a registered engineer or landscape architect to ensure that the facility is operating as designed and to provide a chance to schedule any maintenance which the facility may require. The American Public Works Association recommends that the following items be checked, as minimum inspection requirements:

- Dam settling, woody growth, and signs of piping,
- Signs of seepage on the downstream face of the embankment,
- Condition of grass cover on the embankment, pond floor, and perimeter,
- Rip rap displacement or failure,
- Principal and emergency spillway meet design plans for operation,
- Outlet controls, debris racks, and mechanical and electrical equipment,
- Outlet channel conditions,
- Safety features of the BMP facility, and
- Access for maintenance equipment.

If possible, inspections should be made during periods of wet weather to ensure that the facility is maintaining desirable retention times. An inspection checklist is contained in Appendix C. In addition to regularly scheduled inspections, the opportunity should be taken to note deficiencies during any visits by maintenance personnel. After major storm events the facility should be checked for clogging of the outlet structure.

### **SECTION 3.6 VEGETATIVE COVER**

If allowed to become established, small trees and brush with woody root systems can grow to cause de-stabilization and seepage in pond embankments which may result in the structural failure of the facility. For this reason, the dam embankment, side-slopes, and emergency spillway of a facility should be kept free of woody growth and undesirable vegetation. This will require periodic mowing and a policy of not allowing plantings on these facilities. The frequency of mowing may need to be greater if the facility is located in an area of high visibility. However, if possible, the facility should be managed as an upland meadow with grass no shorter than 6-8 inches. Keeping grass much shorter than this can cause areas of the turf to die off or require a much higher level of maintenance.

Gradual slopes are necessary for establishing vegetation cover and for ease of mowing. Guidelines recommend a maximum of 3H:1V slopes of areas to be maintained by mowing. The pool and bank slopes should be shallow enough to allow for dredging and mowing equipment and the pond bottom should have sufficient slope (maximum 2%) to avoid areas of ponded water.

Erosion and bare areas noted during site visits should be backfilled with topsoil, compacted, and re-seeded. These problems, if taken care of promptly, can help to avoid more costly repairs made necessary by continued erosion of unstabilized soils.

No trees, brush, or other woody vegetation should be allowed to grow within 10 feet of the embankment or side slopes. Any old growth, and its root system, should be completely removed. The excavation should then be filled, compacted, re-seeded, and protected until properly vegetated. Any seedlings or planting should be removed at the earliest opportunity and the disturbed areas properly stabilized.

### ***SECTION 3.7 SHORELINES***

To minimize the maintenance of the area surrounding the shoreline of the facility, the slopes should be relatively flat and bank stabilization materials such as rip-rap and vegetative growth cover should be incorporated into the design. As a minimum requirement, areas of the shoreline which are adjacent to the embankment of those areas that are most subject to wind erosion must be properly stabilized. The layer of stones should be 12 inches thick and placed on a 10 inch bed of gravel and should extend 3 feet below the normal pool elevation. It may also be necessary to add a slight berm on the upstream face of the dam to support the rip-rap and prevent it from slipping.

### ***SECTION 3.8 STRUCTURAL REPAIRS***

The inlet, outlet, and riser structures of the facility should preferably be constructed of precast or reinforced concrete because of its greatly extended service life. The use of quality materials with a long service life should be used.

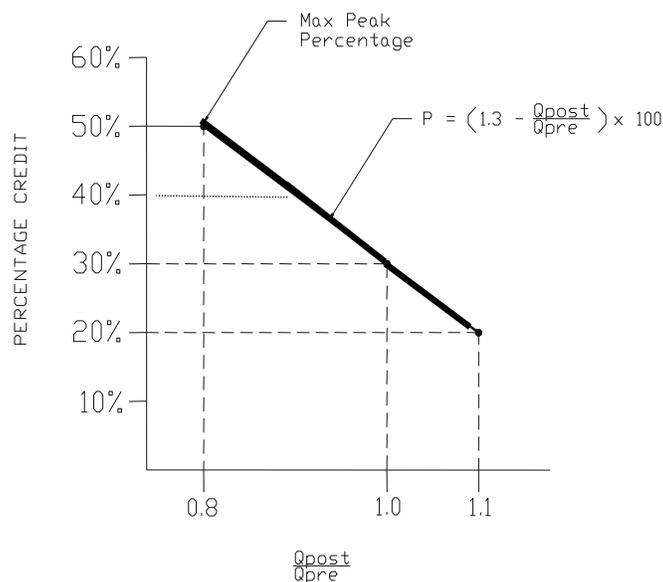
## SECTION 4.0 CREDIT CALCULATIONS FOR ENGINEERED PONDS

Appendix D contains the Credit Calculation Form which is to be completed and certified by a professional engineer (PE) registered and licensed by the State of Georgia.

### SECTION 4.1 CREDIT CALCULATIONS

- A 20% credit is available to owners that can demonstrate that the peak stormwater discharge rate for the 50-year storm from their stormwater retention/detention facility on a post-developed site ( $Q_{post}$ ) is no more than 10% greater than the peak stormwater discharge rate before development ( $Q_{pre}$ );
- A 30% credit is available to owners that can demonstrate that the peak stormwater discharge rate for the 50-year storm from their stormwater retention/detention facility on a post-developed site ( $Q_{post}$ ) is equal to the peak stormwater discharge rate for the 50-year storm before development ( $Q_{pre}$ );
- A maximum of 50% credit is available to owners that can demonstrate that the peak stormwater discharge rate for the 50-year storm from their stormwater retention/detention facility on a post-developed site ( $Q_{post}$ ) is 20% less than the peak stormwater discharge rate for the 50-year storm before development ( $Q_{pre}$ ).

There is a straight line interpolation between the three conditions. The targeted peak discharge rate must be achieved to receive the credit. The figure below illustrates the outlined crediting program for engineered and subdivision ponds:



Based on the figure, a percentage credit value can be calculated from the following equation:

$$P = ( 1.3 - (Q_{\text{post}} / Q_{\text{pre}})) * 100$$

- **P** percent reduction in stormwater service fee applied to the property,
- **Q<sub>pre</sub>** is the pre-development peak discharge rate for a 50-year storm using either the Rational Method or the SCS Method, and
- **Q<sub>post</sub>** is the post-development peak discharge rate determined by calculating the routed peak discharge rate exiting the retention/detention facility for a 50-year storm.

The Rational Method may be used for detention/retention basins draining five (5) acres or less. If the Rational Method is used, the pre-development C factor will be 0.30. Then the peak is calculated as:

$$Q_{\text{pre}} = C I_{50\text{yr}} A$$

- **C** is the Runoff Coefficient,
- **I** is the 50-year rainfall intensity (in/hr) for the calculated time-of-concentration, and
- **A** is the drainage area in acres.

SCS standard unit hydrograph methodology can be used for all calculations when determining the pre- and post-development peak flows, but must be used when the drainage area is greater than five (5) acres. The design storm must be for the 50-year event and at least 24-hours in duration and a curve number of 70 shall be used for the pre-developed condition.

**The same method must be used for both pre- and post-development flow calculations.**

#### **SECTION 4.2 CALCULATED CREDIT EXAMPLE**

The example site is a 10 acre site. The site originally consisted of woods and meadows with a  $t_c=10$  min ( $t_c$  is the computed time of concentration for the site). The pre-developed peak discharge (**Q<sub>pre</sub>**) was calculated using the SCS Type II 24 hour storm. Using a 70 curve number and the computed  $t_c=10$  min, the **Q<sub>pre</sub>** is 36 cfs.

A commercial shopping center is built on site and 85% of the site is developed (impervious surface). A large detention facility is constructed to handle the total stormwater runoff from the facility. Level pool routing was conducted using HEC-1 and the SCS Type II 24 hr design storm to determine the post-developed peak discharge (**Q<sub>post</sub>**). From level pool routing, **Q<sub>post</sub>** is 33.0 cfs for the 50-year storm.

The calculated stormwater utility service charge credit is then calculated by:

$$P = (1.3 - (33.0/36.0)) * 100$$

$$P = 38\%$$