

**Section 319(h) FY07 Grant
Project Description**

1. **Project Title:** Storm Drain Filter System Evaluation in the Potato Creek Basin Utilizing Readily Available Media

2. **Lead Organization:**

City of Griffin Public Works and Utilities Department
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3. **Project Background:**

Several stream segments within the City Limits of Griffin, Georgia are on the Georgia Environmental Protection Division's 305(b) and 303(d) April 2004 list. Potato Creek, located in the Flint River Basin, is one of these streams. Potato Creek is listed for Biota and is only partially supporting its designated use, indicating a need for water quality improvement.

The City of Griffin (City) has been a leader in stormwater Best Management Practices (BMP) and has had great success with its testing and evaluations. BMP testing has ranged from verification of test plans with the National Science Foundation (NSF) on proprietary BMPs to determining pollutant removal efficiencies of regional detention (North Griffin Regional Detention Pond) and inline urban detention ponds (Oakview Detention/Water Quality Pond). Data has been collected over the last seven years on the abovementioned BMPs. Data collected from previous BMP evaluations will be studied as part of this Grant to determine the cost effectiveness and practicality for municipalities to use them.

The City has several practices in place to ensure long-term success in minimizing potential future impacts to hydrological functions. The City operates a Stormwater Utility, which funds capital improvements and the day-to-day operation of the City's stormwater system. The City also has several ordinances in place including, a Soil Erosion and Sediment Control ordinance, an Illicit Discharge and Connection ordinance, a Provisions For Flood Hazard Reduction ordinance, and a proposed Landscaping ordinance. The City is implementing another 319(h) grant project that is evaluating the effectiveness of soil filtration and bio-degradation of nonpoint source pollutants present in stormwater runoff. Additionally, the City is implementing a National Pollution Discharge and Elimination System (NPDES) permit for municipal separate storm sewer systems (MS4s). The permit is scheduled for update at the end of 2007.

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4. Objectives:

The objective of this project is to evaluate the effectiveness of the modified version of the Delaware Sand Filter to address non-point source pollutants present in stormwater runoff using various media readily available in the State of Georgia. The City has been an active participant in evaluating various BMPs to improve the water quality and biologic diversity of streams and rivers in Georgia.

The City will evaluate these modified Delaware Sand Filter systems for use in retrofit situation in urbanized areas by installing a portion of the filters using its own personnel and resources and installing the remaining systems by a contractor selected through competitive bid. This study will be conducted in a select area in the Potato Creek watershed. The City will use the collected data to conduct a cost benefit analysis of the modified Delaware Sand Filters.

5. Specific Project Activities:

The City of Griffin will first design a modified Delaware Sand Filter for retrofitting existing structures, which will then be installed. The City will evaluate several different types of media. One filter will contain a readily available media used in the erosion control industry to evaluate pollutant removal in a filter apparatus and a duplicate with the same media. Three filters will contain sand aggregates of varying particle size and a set of duplicate filters will contain the same media. One filter will serve as a control. Media will be changed every 3 to 6 months to help determine the maintenance and efficiency of the filters. A total of eight BMPs with different types of media and the ninth will serve as a control as shown in Table 1 below.

Table 1- Delaware Sand Filter Media Chart

| Apparatus | Media | Maintenance Schedule |
|------------------|------------------------------------|-----------------------------|
| 1 | None (Control) | N/A |
| 2 | Aggregate 1 | As needed |
| 3 | Aggregate 1 | 3-6 Months |
| 4 | Aggregate 2 | As needed |
| 5 | Aggregate 2 | 3-6 Months |
| 6 | Aggregate 3 | As needed |
| 7 | Aggregate 3 | 3-6 Months |
| 8 | Erosion and Sediment Control Media | As needed |
| 9 | Erosion and Sediment Control Media | 3-6 Months |

After the filters are designed and installed the City will begin to sample on a quarterly basis. The samples will be collected using automated samplers installed in each BMP. The samples from each sampling event will be placed in the appropriate containers, tested for insuit measurements, and then delivered to a lab for analytical testing. The City will collect samples for 4 years for a total of 16 sampling events for each filter.

The City will publish its findings of the project results on its website and plans to help educate municipalities on the effectiveness of the various BMPs.

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6. Roles and Responsibilities of Participating Organizations:

The City will be responsible for administering and managing this project, use its own personnel to install six of the modified Delaware Sand Filters, and will maintain all nine devices. Through a competitive bid process, the selected company will install the three remaining filters. The City has Paragon Consulting Group, Inc. (PCG) on retainer to (1) collect background data, design each system, and formulate construction specifications for the competitive bid package (2) provide construction management services during the construction process; (3) coordinate sampling after the filters are in place; and (4) write the semi-annual reports and closeout report for the City’s review and submittal to GAEPD.

The McIntosh Trail Regional Development Center and Spalding County will assist with the sampling and distribution of educational material.

| Organization | Responsibilities |
|--|--|
| The City of Griffin | The City as grantee will administer and manage the project and ensure that the project objectives are met and the proposed work is successfully carried out. |
| Paragon Consulting Group, Inc. | Provide for the City of Griffin collection of background data, design and construction specifications, construction management services, coordinate sampling, write the semiannual reports and closeout report |
| McIntosh Trail Regional Development Center | The McIntosh Trail RDC will be included in several sampling events and will post several flyers about proprietary BMPs and the project. |
| Spalding County | Spalding County will be included in several sampling events and will post several flyers about proprietary BMPs and the project. |

7. Specific Outputs:

The specific outputs of the proposed project will include the following:

- Implementation of the eight BMPs and one control device.
 - A Public Information and Education Program for nonpoint source pollution and stormwater management.
 - Post the findings of this study on the City’s website to educate the general public as well as other municipalities on the effectiveness of the technology.
- **Best Management Practices:**
 - a. **Description:** The City will design, construct and install nine chamber filter inlets. The first chamber for all the inlets will be used for sedimentation collection and the second chamber will contain different mediums including but not limited to, no medium (control group), sands of different porosity, and filter fabrics. The design will consist more or less of a modified Delaware Sand Filter. All BMPs installed will be maintained at least 5-10 years.

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- b. Installation:** The City will install eight filters and one control in an urbanized area of the Potato Creek Basin.
- c. Load Reductions:** The City will monitor the effectiveness of the BMPs through stormwater sampling. Using the Delaware Sand Filter as a benchmark, the City will provide a comparison of the efficiency of the Modified Delaware Sand Filter. Load reductions will be estimated for sediment, nitrogen and phosphorus and will be provided to GAEPD as appropriate. Current documentation of removal efficiency of the Delaware Sand Filter is presented below.

| Pollutant | Percent Removal |
|---|-----------------|
| Biochemical Oxygen Demand (BOD)* | 70% |
| Chemical Oxygen Demand | N/A |
| Conductivity | N/A |
| Copper | N/A |
| Dissolved Oxygen | N/A |
| Fecal Coliform* | 76% |
| Iron (Fe)* | 45% |
| Lead (Pb)* | 45% |
| Nitrate as Nitrogen (NO ₃ -N)* | 0% |
| Nitrate-Nitrite | N/A |
| Nitrite Nitrogen | N/A |
| pH | N/A |
| Total Dissolved Solids | N/A |
| Total Kjeldahl Nitrogen(TKN)* | 46% |
| Total Nitrogen (TN)* | 21% |
| Total Organic Carbon (TOC)* | 48% |
| Total Phosphorus (TP)* | 33% |
| Total Suspended Solids (TSS)* | 70% |
| Turbidity | N/A |
| Zinc (Zn)* | 45% |

*Source: Galli 1990
N/A – Not Available

- d. Wetlands:** N/A
- e. Streambank Stabilization:** N/A
- **Water Quality Monitoring:**
A detailed Quality Assurance Program Plan will be submitted as required by the 319(h) Grant Program for water quality monitoring.

a. Monitoring Program Elements:

- Biological
- Chemical/Physical
- Habitat
- Sediment

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b. Monitoring Design:

- Paired Watersheds:
- Upstream - Downstream:
- Single Downstream:
- Other:

• **Products:**

- Semi-Annual Water Quality Monitoring Reports.
- Quantifiable field performance data, including cost data, hydraulic performance, water quality data and load reductions.
- Cost Benefit Analysis to evaluate the findings of modified stormwater sand filter systems as compared to the previously evaluated proprietary BMPs and the water quality/stormwater detention ponds constructed with assistance of 319(h) funding.
- Water quality data will be compared to the Atlanta Regional Commission's (ARC) water quality database (i.e. Water Quality Index). This data will be analyzed and compiled semi-annually as well as on a cumulative basis.

• **Semi-Annual Reports:**

The City will submit semi-annual progress reports to the GAEPD for inclusion in the USEPA Grants Reporting Tracking System by February 28th and August 31st of each year.

• **Final Close-Out Report:**

Upon completion of the proposed project, The City will prepare and submit two (2) hard copies and one (1) electronic copy of the Final Project Close-Out Report to the GAEPD for review and approval and submittal to the USEPA.

8. Measures of Success:

The City will consider this a successful project if the proposed BMPs meet or exceed the predicted removal efficiencies of the individual components. Furthermore, the City is confident that the BMP performance data compiled from this project will be utilized by designers and municipalities as future water quality regulations become more stringent with regard to control of non-point source pollution.

The City believes that the data gathered will be used by all members of the development community from regulators seeking to meet NPDES or TMDL pollutant restrictions to developers looking for BMPs having minimal design impacts on their sites. These data will be distributed to regulators and developers through informational flyers and the internet at www.griffinstorm.com

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9. Milestones:

| MILESTONE | STARTING DATES | COMPLETION DATES |
|---|----------------|------------------|
| Execute contract with the Georgia Environmental Protection Division. | 08/07 | 08/07 |
| Submit monitoring plan with QAPP procedures to the GAEPD and the USEPA for review and approval. | 09/07 | 10/07 |
| Purchase Stormwater Monitoring and Sampling Upgrade Equipment. | 09/07 | 10/07 |
| Select Location for BMP installations. | 09/07 | 10/07 |
| Survey & Design BMPs | 10/07 | 01/08 |
| Begin Background Sampling. | 10/07 | 01/08 |
| Advertise Bid for installation of Stormwater BMPs. | 12/07 | 01/08 |
| Execute Contractor contract for configuration of Stormwater BMPs. | 01/08 | 01/08 |
| Install Stormwater BMPs, Monitoring and Sampling Equipment | 02/08 | 03/08 |
| Submit semi-annual report for GRTS update (each Feb. and Aug.) | 01/08 | 01/11 |
| Initiate Water Quality Monitoring Program | 04/08 | 05/11 |
| Submit Performance Data to the General Public via Web Page | 04/08 | 07/12 |
| Submit final project close-out report to the GAEPD and the USEPA for approval | 05/12 | 06/12 |

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12. Impaired Waters

a) Section 303(d) and Section 305(b) lists of waters: List all water bodies in the project area listed on the State's 303(d) and 305(b) lists.

| Waterbody (Miles/Acreage) | Location (County) | Criterion Violated | Has a TMDL been developed for this segment? | Is the project implementing actions | |
|------------------------------|--|-----------------------|--|--|---|
| | | | | To address the criterion violated? | To alleviate the criterion violated (i.e. delist or restore)? |
| Potato Creek (11 miles) | Headwaters to U.S. Hwy. 333 (Spalding/Lamar Counties) | Bio (sediment) | Yes | Yes | No |
| | | | | | |

b) Other Known Impairments (only if applicable):
N/A

13. Planning Activities:

a) Total Maximum Daily Load Implementation Plans:

Is the project proposal developing a new or revising an existing TMDL Implementation Plan?
Yes ___ No X

Is the project proposal implementing a TMDL Implementation Plan?
Yes ___ No X

b) Watershed Management Plans:

Is the project proposal developing a new or revising an existing Watershed Management Plan?
Yes ___ No X

Is the project proposal implementing a Watershed Management Plan?
Yes ___ No X

14. Major Nonpoint Source Pollution Categories and Subcategories:

1. Urban Runoff
 - Residential
 - Commercial
2. Transportation

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15. Nonpoint Source Pollution Activities:

1. BMP / Corrective Action Activities / Demonstration
 - BMP Design / Implementation
 - BMP Performance / Assessment
2. Education / Information Activities
 - Statewide Education / Information Programs
3. Technical Assistance to State Government
 - Technology Transfer to State Government
4. Water Quality Assessment / Monitoring Activities
 - Water Quality Trend Assessment Activities

16. Best Management Practices to be Implemented:

0903 – Urban Catch Basin – Sand.

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17. Project Budget:

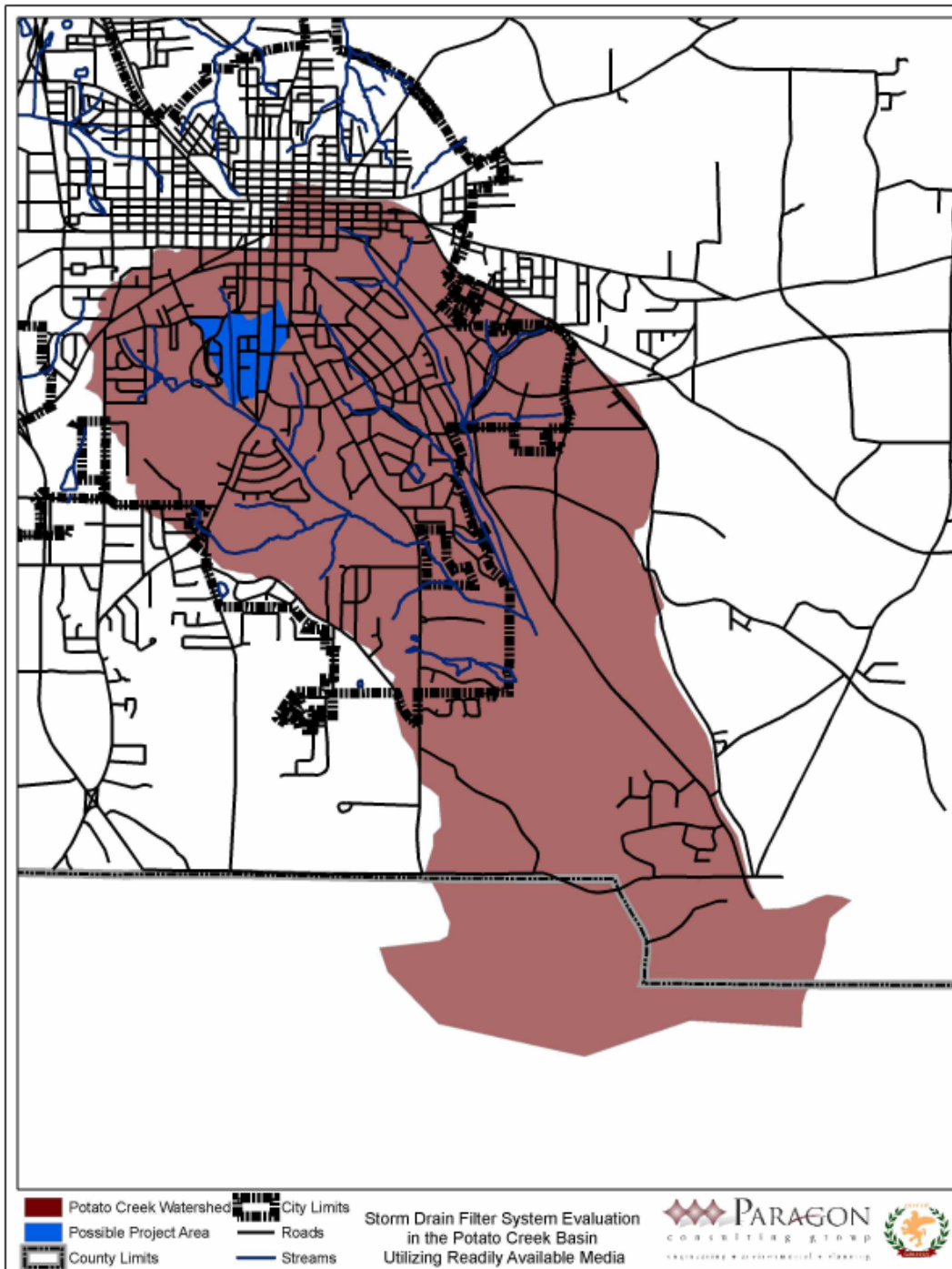
| Item | Object Class Category | 319(h) Grant Funds (60% Maximum) | Non Federal Matching Funds (40% Minimum) | Total |
|------|--|---|--|---|
| A | | | | |
| B | | | | |
| C | Travel: | | | |
| D | Equipment: New Samplers - 13 Samplers and Operating Software (\$6,933.07 per sampler) ¹ - Three yr Maintenance Agreement (\$700 per sampler) - Replacement Tubing Installation Tools Multi-Meter [2] | 54,000 16,380 302 454 4,860 | 36,000 10,920 202 302 3,240 | 90,000 27,300 504 756 8,100 |
| E | Supplies: - Materials for City to install 6 BMPs - Maintenance for all BMPs | 19,200 31,200 | 12,800 20,800 | 32,000 52,000 |
| F | Contractual: - Bid from Contractor to Install BMPs Paragon Consulting Group - Survey - Drainage Analysis, system design, construction specifications - QA/QC - Construction Management for BMP Installation -Install ISCO samplers in each filter -Semi-Annual Sampling Events (4/yr for 4 yrs = 16 samples) - City of Griffin Water Resource Data Base updates -Project Management Analytical Service, Inc. (Lab Testing) -Quarterly Sampling Events (\$850 per BMP) {1} - Deliveries to ASI | 24,000 3,750 15,300 1,920 12,000 5,760 14,820 3,120 14,640 37,500 750 | 16,000 2,500 10,200 1,280 8,000 3,840 9,880 2,080 9,760 25,000 500 | 40,000 6,250 25,500 3,200 20,000 9,600 24,700 5,200 24,400 62,500 1,250 |
| G | Construction ² | N/A | N/A | N/A |
| H | Other: | N/A | N/A | N/A |
| I | Total Direct Charges: (Sum of A-H) | 259,956 | 173,304 | 433,260 |
| J | Indirect Charges: Indirect Charge Rate (By % of categories A, C, E) | N/A | N/A | N/A |
| K | Total: (Sum of I and J) | 259,956 | 173,304 | 433,260 |

¹For details on these expenditures see Appendix A

² This object class category does not apply to Section 319(h) Grants

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18. Project Location Map



APPENDIX A