

## REQUEST FOR BOARD ACTION

### HENDERSON COUNTY BOARD OF COMMISSIONERS

**MEETING DATE:** October 15, 2008

**SUBJECT:** Engineer Agreement with McGill & Associates  
FY09 Stormwater Master Plan  
Henderson County Engineering

**ATTACHMENTS:** Yes

1. Proposed Engineer Agreement with McGill & Associates
2. Stormwater Management Update Presentation

#### **SUMMARY OF REQUEST:**

As directed by the Board during the September 17, 2008 Board of Commissioners meeting, Engineering staff has negotiated the attached, proposed Engineer Agreement with McGill & Associates to perform the FY09 Stormwater Master Plan. Also during the September 17<sup>th</sup> Meeting, McGill & Associates was selected as the most qualified firm to perform the Master Plan. In addition to the agreement with McGill & Associates, Lapsley & Associates will be work with them under a sub-agreement to perform portions of this project.

The Master Plan will inventory existing conditions within critical areas within the County, model stormwater, develop and prioritize improvements and develop a proposed Stormwater Ordinance for the Land Development Code. The Stormwater Ordinance will create a delegated Stormwater Program from the State similar to the County's delegate Erosion Control program begun in October 2007. In turn, a County Stormwater Program would not be an additional expense to our community; it would simply move the Stormwater fees from the State to the County. The approved Clean Water Management Trust Fund Mini-Grant and local match will fund this Master Plan. The attached presentation provides further information on Stormwater Management and a County delegated program.

The proposed agreement with McGill & Associates to perform the above scope of services is \$70,000. The scheduled completion of the study is March 2009 which will allow staff to incorporate proposed findings into the FY10 budget process. The funding for the Master Plan is from the approved Clean Water Management Trust Fund grant of \$50,000 and the local match of \$20,000 which is included in the FY09 budget.

**BOARD ACTION REQUESTED:** Authorize the County Engineer to execute the proposed agreement for \$70,000 with McGill & Associates to conduct the FY09 Stormwater Master Plan.

#### **Suggested Motion:**

I move that the Board authorize the County Engineer to execute the proposed agreement for \$70,000 with McGill & Associates to conduct the FY09 Stormwater Master Plan.

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# Project Scope of Services Stormwater Master Plan Henderson County, North Carolina

## I. Project Overview

### *General*

Henderson County has received a Stormwater Mini-Grant from the Clean Water Management Trust Fund to develop a comprehensive stormwater management plan. County officials are anxious to use this opportunity to implement a comprehensive, innovative, and aggressive stormwater program. This Scope of Services pertains to the engineering services associated with the Clean Water Management Trust Grant application.

## II. Stormwater Master Plan Scope of Services

The Henderson County Stormwater Master Plan will:

- Assess current stormwater ordinances regulations and policies.
- Implement the requirements of the NPDES Phase II Permit including NPDES outfall inventory and illicit discharge detection and collection and assessment of existing stormwater infrastructure conditions and capacity for Henderson County facilities.
- Collect and assess existing stormwater infrastructure conditions and capacity for specific problem areas as identified by Henderson County.
- Collect and assess existing stream channel conditions for water quality degradation and capacity for specific problem areas as identified by Henderson County.
- Develop solutions for stormwater quantity issues.
- Develop solutions for stormwater quality issues.
- Create a Capital Improvements Plan (CIP) to manage current and future stormwater needs for Henderson County.

### **Task 1 – Creating a Stormwater Ordinance**

McGill Associates will review existing Henderson County ordinances, regulations, and policies that pertain to stormwater, water quality, land development, sediment and erosion control, and flood protection. McGill Associates will review the State of North Carolina Phase II Stormwater Model Ordinance to determine which sections are applicable to Henderson County.

McGill Associates will review existing stormwater ordinances, regulations, and policies of municipalities similar to Henderson County. McGill Associates will create a matrix



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that will be used to compare the major components of each ordinance, regulation, and policy. Based on the information gathered and referenced in the matrix along with the input from Henderson County staff, McGill Associates will create and recommend a Stormwater Ordinance, including illicit discharge provisions as outlined in the NC Phase II Model Ordinance, which will reflect the stormwater management goals of Henderson County. The development of the Stormwater Ordinance may consolidate existing sediment and erosion control and watershed ordinances. The draft ordinance will be formatted into the Natural Resources section of the Henderson County Land Development Code.

### ***Task 2 – Inventory of Existing Henderson County Facilities Stormwater Infrastructure***

McGill Associates will create an inventory protocol for the critical stormwater infrastructure for specific Henderson County facilities as determined by Henderson County staff. McGill Associates will work cooperatively with Henderson County staff to employ proper inventory and data collection techniques and database development. Due to the size and area of the existing Henderson County stormwater infrastructure, a complete inventory will not be feasible for this project.

The County facilities to be inventoried will include the following:

- Landfill and Animal Shelter Property
- King Street Office Building
- Human Services Building Property
- Courthouse and Detention Center Property
- Historic Courthouse Property
- Garage/ Maintenance Property
- Parks
  - Jackson Park
  - Dana Park
  - East Flat Rock Park
  - Etowah Park
  - Westfelt Park
  - Edneyville Park (existing and under-construction)

Other County facilities may include the following:

- *Chamber of Commerce Building*
- *Spectrum Youth Shelter*
- *Travel and Tourism*
- *Nuckolls Building*
- *EMS Offices*
- *Libraries*
  - *Hendersonville*
  - *Etowah*
  - *Green River*
  - *Edneyville*



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## **NPDES Outfall Inventory**

In consultation with Henderson County, a standard illicit discharge collection protocol for Henderson County facilities will be created; it will be consistent with the NPDES Phase II requirements. NPDES outfall inventory will be conducted according to the following:

- Outfalls will be mapped using North Carolina State Plane grid coordinates and will be described using the attribution specified in the geospatial database created for Henderson County.
- The minimum pipe size for NPDES Outfalls collected that do not show signs of illicit discharge will be 12-inches in diameter.
- There will be no pipe size limitation for identifying potential illicit discharges (dry weather flows, significant discoloration, significant odor, significant temperature impacts, oil, grease, suds etc.).
- Shot placement will be on pipe inverts for NPDES outfalls.

During field data collection, the project team will be attentive to identifying severe illicit discharges. These observations will be immediately relayed to Henderson County for confirmation and any needed reconnaissance.

### ***Task 3 – Inventory of Existing Critical Area Stormwater Infrastructure***

The project team will collaborate with Henderson County to determine the critical stormwater areas and the structures to be inventoried for the stormwater master plan. The Henderson County staff will determine the critical stormwater areas of highest priority. These areas will include:

1. Mill Pond Creek (upstream of South Rugby Road)
2. Upper Mud Creek (from Berea Church Road to Middleton Road)
3. Reedy Patch Creek in Edneyville/Bat Cave (from St. Paul Rd to US 74)
4. All of Gash Creek in Etowah (on 303d list)

The inventory will include locating and attributing storm water conveyance structures such as pipes, culverts, bridges, junction boxes, catch basins, roadside ditches, drainage swales, open channel cross sections, and pipe outfalls. Inventory will be collected on pipes 12-inches in diameter and larger.

To expedite data collection procedures and to minimize the cost of the data collection, all structures will be collected with mapping grade accuracy.

Field stormwater conveyance inventory will be collected for open and closed storm drainage systems.



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### **Open System Inventory Items**

Typical open system items include, but are not limited to:

- Natural channels and swales,
- Engineered channels,
- Bridges,
- Culverts,
- Channel cross sections,
- Wetlands,
- Detention/retention ponds, and
- Stormwater quantity and quality control Best Management Practices (BMPs).

### **Closed System Inventory Items**

Typical closed system items include, but are not limited to:

- Pipes,
- Headwalls,
- Catch basins,
- Junction boxes, and
- Underground storm water control BMPs.

### **Streambank Erosion and Scour**

In addition, field evaluations will note and document specific streambank erosion problems, outlet structure erosion/scour issues, and general channel condition throughout the watersheds being evaluated. Digital photographs will be used wherever necessary to augment documentation information on the drainage system.

### ***Task 4 – Mapping of Stormwater System***

After completing the NPDES outfall inventory and limited stormwater infrastructure inventory, McGill Associates will create a GIS compatible digital map of the structures collected. McGill Associates will present the map to Henderson County for the purpose of utilizing the geo-database for in-house GIS data management system, which can be expanded in the future.

### ***Task 5 – Hydrologic and Hydraulic Modeling***

Capital improvements and policy decisions are made through the collection of stormwater infrastructure inventory and the engineering analysis using quantity-based and quality-based models. Modeling for a Stormwater Master Plan must consider the following components to focus on water quantity and quality:

- A hydrologic model for predicting the runoff characteristics of the designated drainage areas.
- A hydraulic model for simulating the movement of stormwater through the pipes and channels and its flooding effect on properties.
- A hydraulic model for calculating shear stress values, scour velocities, and streambank erosion potential.



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- A water quality model to predict and evaluate pollutant runoff and the ability of BMPs to capture and remove those pollutants.

Modeling results will be used to approximate the existing hydrology and hydraulic conditions within the critical stormwater areas determined in Task 3. This process will allow the county to validate known problems or deficiencies in existing drainage systems and identify the extent of risk these deficiencies present. Modeling also uncovers capacity issues that may be unknown.

Modeling results greatly assist the development of alternatives for remedying inadequacies in the existing drainage system. The development of recommendations will be based on either eliminating flooding or pollutant runoff or minimizing the impact caused by the current conditions.

The models developed will be used to consider current and future conditions. McGill Associates will consider the changing impacts from the 10-year probable build-out conditions in developing possible capital improvements and stormwater management strategies.

McGill Associates will conduct closed system modeling with such models as hydraulic grade line spreadsheets, HydroCAD, Hydraflow, or XP-SWMM. Open channel routing will be computed by using the US Army Corps of Engineers HEC-RAS model.

Where applicable, the modeling for the critical areas will include information that meets the nine (9) elements of Section 319 program requirements to assist in future efforts for stream restoration funding.

### ***Task 6 – Stormwater Related Capital Improvement Plan (CIP)***

The process used for developing CIP solutions and prioritizing them is as follows:

#### **Cross Reference Deficiencies with Problems**

Match identified problem areas (from the modeling in Task 5) with known complaints and areas of public health risk and safety concern, areas that are being threatened, or areas that are in need of protection. These areas will include:

1. Mill Pond Creek (upstream of South Rugby Road)
2. Upper Mud Creek (from Berea Church Road to Middleton Road)
3. Reedy Patch Creek in Edneyville/Bat Cave (from St. Paul Rd to US 74)
4. All of Gash Creek in Etowah (on 303d list)

#### **Consider Solutions that will Foster Water Quality and Water Quantity**

McGill Associates will develop alternatives that have varying levels of protection. These solutions will examine up-grading existing systems, re-designing existing systems, regional detention, structural and non-structural water quantity BMPs, structural and non-structural water quality BMPs, and rights of way. Stream restoration/enhancement/stabilization alternatives may be used to enhance the ability of identified stream sections to properly manage storm flows and provide better biological habitats.



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### **Analysis Process**

An analysis process to support prioritization of preferred improvements will be created. Recommendations and analysis will be based on priorities identified by Henderson County. McGill Associates will work with the county in evaluating different methodologies and will develop an evaluation or decision-making tool that is fair, objective, and defensible for CIP funding. When applicable, some areas of interest for the analysis include, but are not limited to:

- Number and severity of structure/house/business flooding,
- Number and severity of road flooding,
- Age of storm drainage infrastructure,
- Number and severity of water quality impacts,
- Community impacts (for example, building, property, or aesthetic impacts),
- Private property access and impact considerations,
- Cost of existing drainage system rehabilitation,
- Cost of recommended improvements,
- Availability of follow-up funding, and
- Current level of service provided by the existing drainage system and level of service and impacts provided by the recommendations.

### ***Task 7 – Master Plan Document***

McGill Associates will create a master plan document based on a 10-year time line. The development of the Master Plan document will include a summary of the previous tasks described herein, but also the detailing of implementation costs and schedules. Other improvements or recommendations may be non-structural in nature and can be phased accordingly to the Henderson County overall program implementation and ordinance development. Typical improvements that will be considered for implementation include:

- Enlarged culverts and/or pipe systems for improved capacity,
- Flood control structures,
- Structural and non-structural water quality BMPs,
- Improved channels for conveyance,
- Improved channels for water quality improvements, and
- Land use control and/or preservation.



**V. Compensation**

The entire fee for this project shall be a lump sum fee of \$70,000. The breakdown of fee per task is as follows.

<b>Stormwater Master Plan .....</b>	<b>\$70,000</b>
Task 1 – Creating a Stormwater Ordinance.....	\$15,000
Task 2 – Inventory of Existing County Facilities Stormwater Infrastructure.....	\$5,000
Task 3 – Inventory of Existing Critical Area Stormwater Infrastructure .....	\$12,000
Task 4 – Mapping of Stormwater System.....	\$3,000
Task 5 – Hydrologic and Hydraulic Modeling .....	\$17,000
Task 6 – Stormwater Related Capital Improvement Plan (CIP).....	\$10,000
Task 7 – Master Plan Document.....	\$8,000

**VI. Schedule**

The anticipated start of this project is October 15, 2008. Per the requirements of the CWMTF grant this project must be completed by August 21, 2009. The anticipated for this project is as follows.

<b>Henderson County Stormwater Master Plan .....</b>	<b>May 1, 2009</b>
Task 1 – Creating a Stormwater Ordinance.....	10/15/08 – 5/31/09
Task 2 – Inventory of Existing Facilities Infrastructure .....	10/15/08 -11/7/08
Task 3 – Inventory of Critical Area Infrastructure .....	11/10/08 -11/26/08
Task 4 – Mapping of Stormwater System.....	12/5/08
Task 5 – Hydrologic and Hydraulic Modeling .....	12/8/08 – 1/16/09
Task 6 – Stormwater Related Capital Improvement Plan (CIP).....	1/19/09 – 2/13/09
Task 7 – Master Plan Document.....	2/16/09 – 3/13/09

**HENDERSON COUNTY**

**McGILL ASSOCIATES, P.A.**

By: \_\_\_\_\_

By: J.P. Johns

Name: \_\_\_\_\_

J.P. Johns, P.E.

Title: \_\_\_\_\_

Principal

Date: \_\_\_\_\_

September 18, 2008

**PREAUDIT CERTIFICATE**  
This instrument has been preaudited in the manner required by the Local Government Budget & Fiscal Control Act, N.C.G.S. 159-28(a)

James C. McKeel  
Henderson County Finance Director

Scope of Services  
Stormwater Master Plan  
Henderson County  
September 18, 2008



# Stormwater Management (SWM) Update Presentation

Henderson County Engineering



## Stormwater Management (SWM)

### Presentation Overview

- Review Information Presented to Date
- Options for Henderson County
- Clean Water Management Trust Fund
- SWM Program Budget
- Implementation
- Additional Considerations for County SWM

Henderson County Engineering



## **SWM Review**

### **Why do we need to manage stormwater and polluted runoff?**

- Increases Localized Flooding
- #1 Cause of Water Pollution in NC
- Increases Cost for Water Treatment
- Harms Wildlife

from NCDENR's [www.ncstormwater.org](http://www.ncstormwater.org)

Henderson County Engineering



## **SWM Review**

### **NCGA Session Law 2006-246**

On July 1, 2007, the Water Quality Section of NCDENR began managing stormwater in Henderson County.

- Will be managed out of Raleigh
- “Self Imposed Unfunded Mandate”
- Permit Fee is \$505.00

Henderson County Engineering



## **SWM Options for Henderson**

- **“Do Nothing Option”** with NCDENR managing the State SWM Program
- **Develop a Delegated County Program**
  - Similar to Erosion & Sediment Control
  - Partnership with Municipalities
  - Complementary to E&SC

Henderson County Engineering



## **NC Clean Water Management Trust Fund**

- Out of Cycle Grant Awarded to Henderson County for Stormwater Master Plan in June
- Model Stormwater in County
  - Identify Projects to Help Control Existing Flooding Problems (CIP)
  - Develop SWM Ordinance (Delegated Program)
  - Local Grant Match in FY09 Budget

Henderson County Engineering



## SWM Program Budget

- Combine SWM with Erosion Control
- Stormwater Enterprise Fund
  - Revenues from permit fees offset expenses with retained earnings (self supporting)
  - Retained earnings possible to fund Stormwater Capital Improvements to resolve existing flooding problems
- State program is funded by permit fees (fee currently paid to NCDENR)

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## SWM Program Budget, cont.

- Estimated annual revenue
  - From State program, monthly permit rate is approximately 15 permits.
  - Annual permits estimated at 180 permits
  - State permit fee is \$505.00
  - Estimated annual revenue (180 permits x \$505.00)  
= \$90,900.00

Henderson County Engineering



## **SWM Program Budget, cont.**

- Estimated annual expenses added to Erosion Control's current budget
  - One additional staff if municipalities participate (salary & related): \$60,000
  - Other operating expenses: \$5,000
  - Total Operating Expense: \$65,000 with approximately \$25,000 in retained earnings
  - Vehicle & Equipment (start up cost only): \$30,000

Henderson County Engineering



## **Implementation of SWP**

- Fiscal Year 2009
  - Approve Agreement with Engineer
  - Model Stormwater
  - Develop Ordinance
  - Apply to State for Delegated Program
  - Estimate and Budget for Program Cost
- Fiscal Year 2010
  - Begin Program

Henderson County Engineering



## Additional Considerations

- **Not a new regulation / developer expense**, currently a State program / expense
- Develop program to fit specific needs of County (not part of Statewide program)
- Efficient Regulation = Better Regulation for Applicants and Environment
  - One stop for Erosion Control & SWM
  - Quicker response: Local vs. Raleigh
  - Possibility for reduced permit fee
  - Efficiency develops cooperation not confrontation

Engineering and Facility Services



## Stormwater Management

Questions?

Thank you.

Henderson County Engineering

