



Date: August 22, 2017
To: Thomas J. Bonfield – City Manager
Through: W. Bowman Ferguson – Deputy City Manager
From: Marvin G. Williams – Director of Public Works
Subject: Intergovernmental Agreement with the U.S. Geological Survey for Operation and Maintenance of the City of Durham Rainfall and Streamflow Network

Executive Summary

In 2008 the City entered into an intergovernmental agreement with the U.S. Geological Survey to purchase, install, operate and maintain a network of automated devices measuring rainfall and streamflow. These devices are needed to provide information necessary for the City of Durham's (City) annual report to the N.C. Division of Water Resources (DWR) regarding stormwater quality, including the response of local streams to rainfall. These devices are also used to evaluate the potential for flooding within the City. The intergovernmental agreement is negotiated and renewed regularly between the City and the U.S. Geological Survey. The cost to the City for the operation and maintenance of the rainfall and streamflow devices is \$204,000.00 for the period from October 1, 2017 through September 30, 2019. The U.S. Geological Survey is providing \$33,600.00 in matching funds for operation and maintenance.

Recommendation

To authorize the City Manager to execute an intergovernmental agreement with the U.S. Geological Survey for the continued operation and maintenance of the automated rainfall and streamflow monitoring network at an amount not to exceed \$204,000.00 for the period covering October 1, 2017 through September 30, 2019.

Background

The federally issued National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit issued to the City (Permit #NCS000249) requires multiple annual reports that rely on manual and automated monitoring of the stream network.

These include the following:

- NPDES Program annual report,
- Total Maximum Daily Load (TMDL) Response Plan, and
- the Water Quality Monitoring and Assessment Plan.

Additional reports for Falls of the Neuse Reservoir and Jordan Lake require information from the automated rainfall and streamflow monitoring network.

TMDL response plans require descriptions of the measures that the City has implemented and plan to be implemented, and the progress made toward meeting the

TMDL targets. TMDL targets are dependent upon streamflow, which is dependent upon rainfall. TMDL implementation plans are currently required in the Third Fork Creek and Northeast Creek watersheds. The state has identified other City watersheds that need TMDLs, including Ellerbe, Little Lick, and New Hope Creeks. The Water Quality Monitoring and Assessment Program is a requirement of the NPDES permit and includes a more comprehensive evaluation of water quality within the City, including progress toward meeting goals for water quality parameters and aquatic life (i.e., stream insects or benthic macroinvertebrates).

The U.S. Geological Survey conducts water resources monitoring throughout the nation through its Cooperative Water Program. Many municipalities participate in the program in order to monitor streamflow to and from reservoirs, to assess flooding, and to evaluate water quality impacts. The City uses streamflow measurements to estimate pollutant loading, particularly nitrogen and phosphorous, from large city watersheds. The City uses the simultaneous measurement of rainfall and streamflow or stream stage to evaluate potential illicit discharges to streams or to the storm water drainage system. The City also has a flood warning system for the Eno River that utilizes the U.S. Geological Survey stream gauge data.

Per the agreement, the U.S. Geological Survey will maintain a total of seven rainfall and eight stage or streamflow gauges around the city. These are listed below in Table 1.

Table 1. U.S. Geological Survey Automated Monitoring Locations and Types

| Stream | General location | Type of monitoring |
|-------------------|----------------------------|-----------------------------|
| Ellerbe Creek | Club Boulevard | Stage, Streamflow |
| Ellerbe Creek (a) | Glenn Road | Stage, Streamflow |
| Ellerbe Creek | Murray Ave | Rainfall |
| Eno River | Cole Mill Road | Stage, Rainfall |
| Eno River (b) | Roxboro Road | Rainfall |
| Little Lick Creek | Wake Forest Hwy | Stage, Rainfall |
| North Prong | Carpenter Fletcher Road | Stage |
| Sandy Creek | Cornwallis Road | Stage, Streamflow, Rainfall |
| Third Fork Creek | Highway 54 | Stage, Streamflow, Rainfall |
| Third Fork Creek | Martin Luther King Jr Pkwy | Stage, Streamflow, Rainfall |

(a) This agreement allows for stream stage and flow monitoring near Glenn Road to have cost-share funding between the cities of Durham and Raleigh.

(b) Stream stage and flow monitoring near Roxboro Road is performed in cooperation with Triangle Area Water Supply Steering Committee and the U.S. Army Corps of Engineers.

Further, this agreement would allow the cities of Durham and Raleigh to continue cost-share funding of a streamflow gauge in lower Ellerbe Creek near Glenn Road.

This agreement will be in place for two years and it will align with the U.S. Geological Survey's 2018 fiscal year (October 1, 2017 to September 30, 2018) and 2019 fiscal year (October 1, 2018 to September 30, 2019).

Stream stage and flow information is available to any interested party and can be accessed on the internet at the U.S. Geological Survey web site under Durham County: http://waterdata.usgs.gov/nc/nwis/current/?type=flow&group_key=county_cd.

Rainfall information is available on the internet at the following web address: http://waterdata.usgs.gov/nc/nwis/current/?type=precip&group_key=county_cd.

Issues/Analysis

Long-term operation of the precipitation and streamflow network will ensure that permitting, water quality, flood forecasting, and urban stream restoration needs can be served. Long-term measurements are needed to evaluate how streams respond to intense periods of rainfall, including delivery of pollutants, stream bank collapse, and flooding potential.

Alternatives

The alternative is to deny authorization to negotiate and execute intergovernmental agreements for continued operation and maintenance of the network. Capital funds spent to purchase and install equipment would be unrecoverable. The ability to complete the annual NPDES report to the state would be compromised, as would the annual reports regarding status and progress towards meeting the Falls of the Neuse Reservoir and Jordan Lakes rules. The ability to evaluate flood warning would be limited to weather forecasts and visual observations. City assets and infrastructure would remain at greater risk.

Financial Impact

The operation and maintenance costs for the 24-month period (October 1, 2017 through September 30, 2019) of \$204,000.00 will be paid from the Public Works Operating Budget from the following accounts in the City fiscal years below:

| FISCAL YEAR | ACCOUNT | AMOUNT |
|--------------|-----------------|----------------------------|
| 2018 | 5500L041-728600 | \$70,275.00 |
| 2019 | 5500L041-728600 | \$106,150.00 |
| 2020 | 5500L041-728600 | \$27,575.00 |
| TOTAL | | <u>\$204,000.00</u> |

The U.S. Geological Survey is providing \$33,600.00 in matching funds for operation and maintenance costs in the City fiscal years below:

| FISCAL YEAR | AMOUNT |
|--------------|---------------------------|
| 2018 | \$12,600.00 |
| 2019 | \$16,800.00 |
| 2020 | \$4,200.00 |
| TOTAL | <u>\$33,600.00</u> |

Equal Business Opportunity Summary

The Equal Business Opportunity Summary section is not applicable for this item.

Attachments

U.S. Geological Survey Cover Letter

Price Quote Table from U.S. Geological Survey

U.S. Geological Survey and City of Durham Joint Funding Agreement