

REPORT ON THE EXTENSION  
OF THE  
GUINEA MILL WATERSHED IMPROVEMENT  
SERVICE DISTRICT

April 1, 2019

In accordance with Chapter 153A, Article 16 of the North Carolina General Statutes, the Guinea Mill Watershed Improvement Service District was formed on February 21, 2000 in order to finance, provide and maintain for the district water management and watershed improvements.

Pursuant to North Carolina General Statute 153A-303(a) the board of commissioners may annex territory into the service district upon finding that:

- (1) The area to be annexed is contiguous to the district, with at least one eighth of the area's aggregate external boundary coincident with the existing boundary of the district; and
- (2) That the area to be annexed requires the services of the district.

In order to provide additional drainage and watershed improvements to areas outside the current district, it is proposed to annex additional areas into the district as shown on the enclosed map.

### **Identified Need for Service District**

The Guinea Mill Run Canal has been in existence for approximately 100 years. It was initially dug to provide drainage for timbering of the Great Dismal Swamp. Over the years, major land use has changed from forestland to cropland and now is changing to residential, making adequate drainage far more important than before. Subdivisions being developed when the current service district was formed included: Ranchland, Eagle Creek, Wildwood Acres, Dove Roost, Duck Ridge, Quail Point, Crown Point and Orchard Park. The remaining 2,000 acres of cropland within the current service district also has a potential for becoming residential properties, making Guinea Mill Run Canal an important utility with a need for yearly maintenance. Traditionally, the farmers had been maintaining most drainage systems including Guinea Mill Run Canal. With the land use changing to residential, the current service district provides a mechanism for the landowners that drain into Guinea Mill Run Canal to share in the future maintenance cost. Thus, the current Guinea Mill Service District for Watershed Improvements was formed in the year 2000 to provide for the consistent and cohesive management of water, flood control, and protection to the integrity and quality of Tulls Creek and Currituck Sound.

In 2000, the Guinea Mill Service District for Watershed Improvements received a grant from the Clean Water Management Trust Fund for ditch widening, instream wetlands and water control structures on Guinea Mill Run Canal from South Mills Road to NC Highway 168. This project was completed in 2003. The projected life was 15 years before additional maintenance was expected.

Subdivisions continue to be developed adjacent to the current district including Cahoon Farms, Summit Farms, Backwoods Reserve, Saddlebrook and Backwoods Estates. Major storms in the past have created flooding issues in the old as well as the new subdivisions. This flooding not only occurs along Guinea Mill Run Canal, but also within its drainage basin to the south which includes Laterals A, B, and C, and Hayward Ditch. In response to a need to protect the

growth areas and farms from flooding issues, it is proposed that the current service district be expanded. The area to be annexed includes the southern part of the Guinea Mill Run Canal drainage basin including Laterals A, B and C and Hayward Ditch.

### **Resident Population and Population Density**

The resident population of the proposed service district area according to the 2010 United States Census is approximately 3,240 persons and contains 10,374 acres.

### **Appraisal Value of Property Subject to Taxation in the Proposed Service District**

The assessed valuation of property subject to taxation in the current service district is approximately \$183,422,732. The existing tax rate for the service district is \$0.015 per \$100 valuation.

The assessed valuation of the property subject to taxation in the area to be annexed is approximately \$217,500,000. Therefore, the total assessed valuation would be \$400,922,732. The current county wide tax rate, which includes the proposed service district area, is 48 cents per \$100 valuation.

The service district tax with the new annexed area will be initially set at \$0.015 per \$100 valuation. As an example, this equates to \$22.50 per year for a \$150,000 property or \$37.50 per year for a \$250,000 property. For a farm with a value of deferred value of \$1000 per acre, the tax would equate to \$0.15 per acre per year.

### **Plan for Providing Services within the Proposed Service District**

A study was needed to determine the flooding issues of the areas along the current service district which primarily consists of Guinea Mill Run. The study would identify the drainage basin or the area that flows into Guinea Mill Run. Once this was determined, it was proposed that this drainage basin area be annexed into the current service district. This would provide the mechanism to allow the service district to provide additional ditch improvements and help alleviate flooding in the current district and the surrounding area.

On July 21, 2017, Currituck County received a Planning Assistance to States grant from the Department of the Army. The purpose of the grant was to fund a Hydrology and Hydraulics Study for the Guinea Mill Run drainage basin to be prepared by the US Army Corps of Engineers. The following is the recommendation from the study.

The Guinea Mill Run watershed is located approximately 2.5 miles south of the Moyock Community. The communities that live in the nearby floodplain have historically struggled with flood problems following local rainfall as well as from more significant tropical storm events.

The underlying flood problem in the Guinea Mill Run watershed is typical of that generally found in coastal regions where the streams have extensive swamp areas at their headwaters. What makes the Guinea Mill Run watershed unique is the presence of a complex network of man-made canals, laterals, and intercepting ditches. Due to its complex nature, understanding how flooding interacts with natural and man-made drainage paths required a technical approach.

The study served to assess and address the existing flood problems within the watershed by proposing drainage improvements that could be implemented. Improvements to drainage relied heavily on the efficiency of the canal network. A hydrologic model was developed to simulate the transformation of rainfall to runoff over a range of storm events. A hydraulic model was then developed to simulate how the runoff flowed through the canals, natural flow paths, and over the floodplain. A physical survey was conducted in the initial stages of the study to be incorporated into these technical models.

Improvements that were analyzed included (1) removal of vegetation and debris within existing primary drainage canals, (2) modification to existing culvert structures to increase their hydraulic capacity, and (3) modification to canal dimensions, side slopes, channel bottom width, and grade, so there is consistency throughout their entire length as well as serve to increase their hydraulic efficiency.

Improvements had to meet several criteria that include (1) provide a flood stage reduction when compared to existing conditions, (2) prevent backwater effects at culvert structures, (3) reduce flood durations, and (4) ensure flooding is not made worse downstream.

An incremental approach was taken to construct and present improvements. This approach helped to identify the most beneficial improvements that should be prioritized as well as determine when benefits start to diminish. A final recommendation consisted of (1) clearing and snagging of all primary drainage canals – Guinea Mill Run Canal, Lateral A, Lateral B, Lateral C, and Haywood Ditch, (2) replacement of 1 culvert structure in Guinea Mill Run Canal, 2 culvert structures in Lateral A, and 1 culvert structure in Lateral B and (3) channel modification of Guinea Mill Run Canal – widening to a 45-foot channel bottom width in the lower portion of the canal for a distance of approximately 0.75 miles, transitioning to a 15 foot channel bottom width upstream for a distance of approximately 6 miles, and improving the entire canal grade to an approximate bed slope of 0.03%.

The recommended plan provided a 0.5-foot to 1.8-foot flood stage reduction over the range of design storm events to a number of residential communities adjacent to the primary canals. It also reduced significant backwater effect at culvert structures within the primary canals. Finally, the plan reduced the duration of flooding and allowed for flood stages to return to pre-storm conditions more efficiently.

### **Map of the Proposed Service District**

A map of the existing service district and the area to be annexed is attached to this report.