Beaverdam Creek Watershed

Management Plan

July 2016

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I. Introduction

The purpose of developing the Beaverdam Creek Watershed Management Plan is to provide a tool that demonstrates a holistic approach to water quality management by actively engaging stakeholders within the watershed in the selection of management strategies that will be implemented to solve the problems.

This document is not regulatory. Its preparation process engages stakeholders to recognize issues and provide feedback on how to deal with them, as well as to develop momentum and contribute to the restoration effort. The Watershed Partnership (WP) identified the following goal of this plan's implementation:

GOAL: Improve the Beaverdam Creek watershed's water quality to meet state standards.

After sampling events in 1999, the Georgia Environmental Protection Division (GA EPD) listed four stream segments in the Beaverdam Creek watershed on the Georgia 303(d) list of impaired water bodies and in 2002 developed Total Maximum Daily Load (TMDL) Implementation Plans addressing fecal coliform[1] for two stream segments of Richland Creek in the Beaverdam Creek watershed in Greene County: Richland Creek from I-20 to Little Creek and Richland Creek upstream of Greensboro to I-20. In 2003, GA EPD developed a TMDL Implementation Plan, also addressing fecal coliform, for two additional stream segments in the same Beaverdam Creek watershed: Beaverdam Creek from Oliver Creek to Lake Oconee and Town Creek from SR 15 to Richland Creek. The TMDL Evaluation establishes the allowable pollutant loadings or other quantifiable parameters for a water body based on the relationship between pollutant sources and instream water quality conditions. Water quality standards for fecal coliform and sediment limit the amount of pollution allowed to load into a river or stream. If a stream does not meet water quality standards, a TMDL is established for that pollutant. Implementation tools, such as watershed-based plans, are then developed as guides to reduce the pollutants loading into the stream from various (point and nonpoint) sources and restore the water body so that it meets water quality standards.

The TMDL Evaluations identified a four-mile segment of both Town and Beaverdam creeks as well as a twelve-mile segment of Richland Creek as not supporting its designated use of fishing. See Appendix 1, Map 1. In order to meet state water quality standards, the following load reductions are required:

- Beaverdam Creek – 75 percent
- Town Creek – 60 percent
- Richland Creek (Greensboro to I-20) - 94 percent
- Richland Creek (I-20 to Little Creek) - 20 percent

In 2003, a Revised TMDL Implementation Plan for Town Creek and Beaverdam Creek was developed. The revised implementation plan attributes non-point source (NPS) loads to cattle with direct access to streams, high impact areas with runoff directly connected to streams, leaking or damaged sewer lines (in Greensboro), urban runoff, storm sewers, illicit discharges, and leaking or failed septic tanks.

Analysis of the Town and Beaverdam creeks revised implementation plan identified the following steps for load reduction:

- continued implementation of proposed ordinance adoptions and revisions;
- detailed targeted sampling to localize the source of pollutants;
- implementation of urban and agricultural BMPs specific to identified sources;
- educational outreach regarding agricultural BMPs and septic tank maintenance; and,
- evaluation of the effectiveness of plan implementation utilizing the BASINS model.

The TMDL Implementation Plan for Richland Creek, 2001, attributes non point source loads to malfunctioning septic tanks, illicit direct discharge of residential or commercial wastewater into tributary streams, animal waste from livestock, pets, and wildlife, and storm water runoff.

[1] Georgia Department of Natural Resources, TMDL Implementation Plan for Richland Creek, March 26, 2001.

Georgia Department of Natural Resources, Revised TMDL Implementation Plan for Town Creek and Beaverdam Creek, April 2003.

Analysis of the Richland Creek implementation plan identified the following steps for load reduction:

- Formation of a watershed team representing Greene County, Greensboro, public works, NRCS, Cooperative Extension, Greene County Health Department, and Greene County Environmental Codes Enforcement to work on fecal coliform reduction;
- Formation of a stakeholder's group to identify issues of concern, offer input to and feedback on plans, participate in outreach education, and recruit support from the community;
- Educational outreach on sources of urban and agricultural fecal coliform contamination and minimizing the impact of fecal coliform bacteria on stormwater;
- Compiling additional data to support plan development;
- Water quality monitoring to identify potential fecal coliform sources to target for abatement;
- Ranking potential sources of contamination;
- Evaluation of need for and feasibility of adopting a septic tank inspection ordinance; and,
- Funding for urban and agricultural BMP practices.

Based on a review of existing TMDL Evaluations and TMDL Implementation Plans, the WP defined the following objectives that could lead to successful goal attainment of this Plan.

OBJECTIVES:

- Establish Watershed Partnership as long-term committee charged with working with responsible agencies and public to implement Watershed Management Plan.
- Long-term monitoring to provide current data to support decision-making.
- Identification of potential contaminant sources.
- Implementation of management practices to reduce E.coli contamination from identified sources.
- Manage growth so that it does not negatively effect overall water quality or improvements made through implementation of this watershed management plan.
- Promotion of public awareness, understanding, and stewardship through public education and training opportunities for the general population and government agencies.

As the Watershed Management Plan was developed, specific actions were identified and designed to meet the specific objectives thus insuring that the proposed actions could objectively achieve the goals of the Beaverdam Creek Watershed Management Plan.

III. Formation of Watershed Partnership

This Plan's development relied upon the participation of a Watershed Partnership (WP) which represented the Beaverdam Creek watershed and consisted of property owners, staff from Greensboro and Greene County, and regional, state, and federal agencies that would assist with plan implementation. Meetings were held with the WP on the following dates to engage the public in the process of designing an implementation plan: October 6, 2015, November 10, 2015, February 9 ,2016, and May 10, 2016. Meetings focused on gathering input concerning potential problems and solutions, developing priorities, evaluating what BMPs might be met with the best public reception, and obtaining insight on the watershed management plan. Finally, approval was sought for the document to serve as the plan on which implementation efforts will follow to restore and maintain the watershed. See Appendix II for list of WP members.

Based on the TMDL Evaluations, TMDL Implementation Plans, current water quality monitoring, visual survey, land use, tax assessor data, and WP input, the potential causes of water quality impairment were determined as follows:

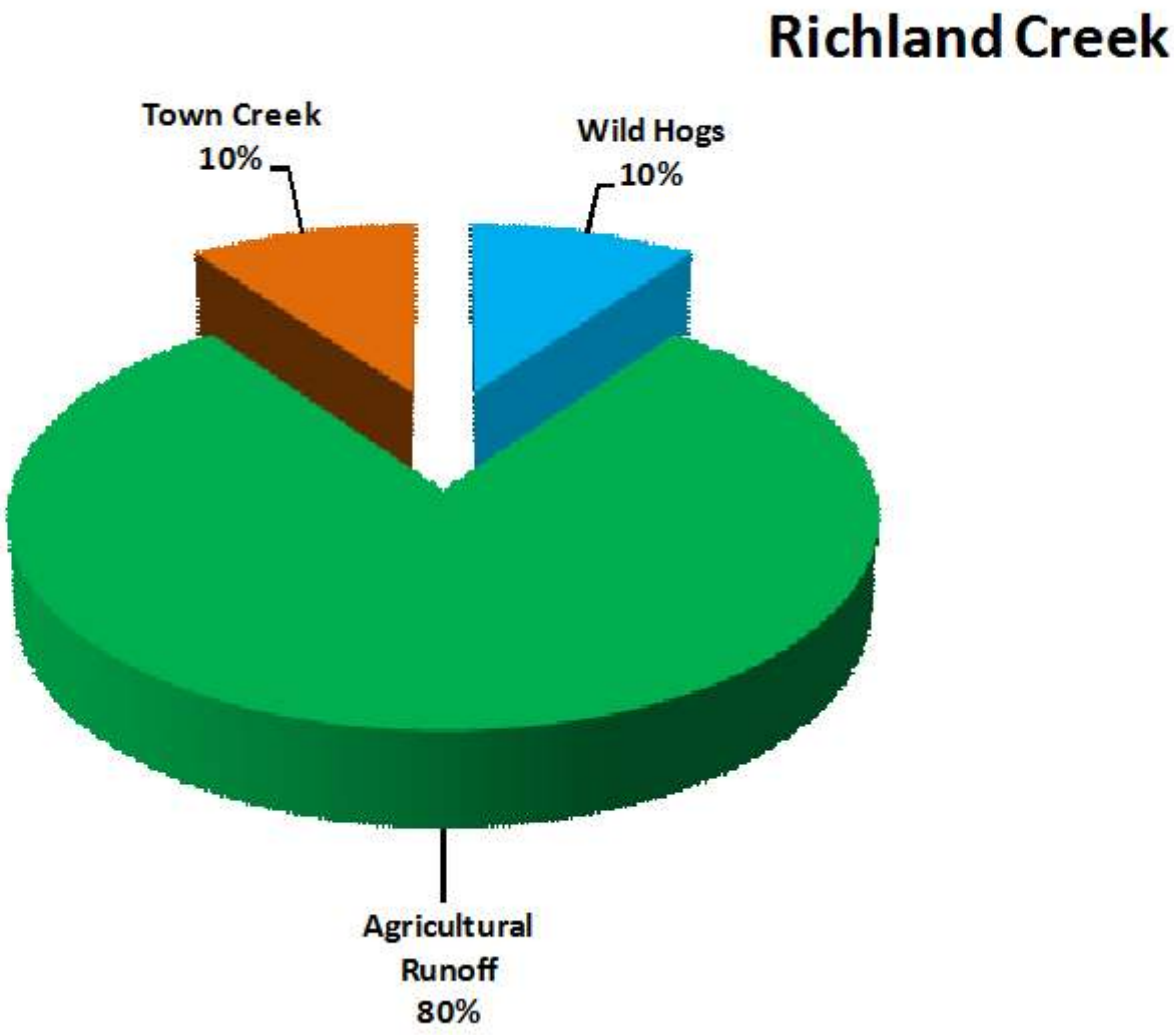
Table 1: Beaverdam Creek Watershed Potential Sources of Contamination

Identified Impairment	Potential Source/Cause
Fecal Coliform	Agricultural practices
	Leaking septic systems
	Leaking sewerage lines (Greensboro)
	Urban runoff from impervious surfaces
	Runoff from commercial practices
	Wild Hogs
	Runoff from EPD-permitted operations
	Natural sources

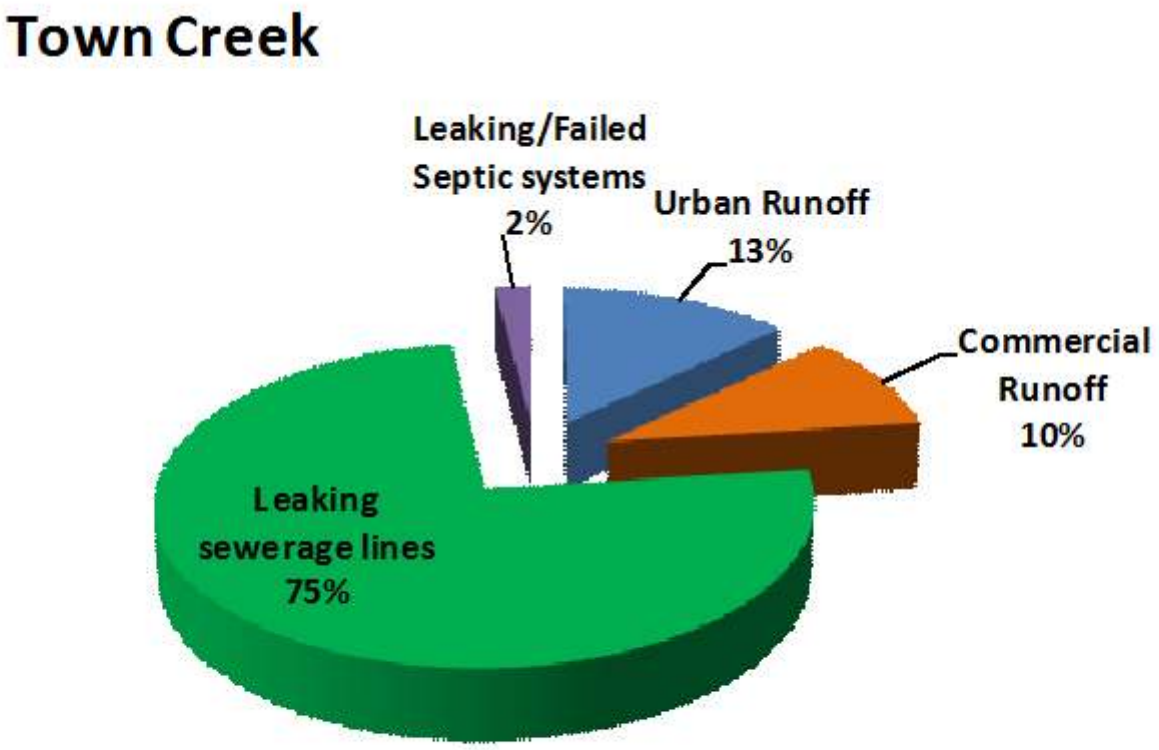
Percentage of Possible Pollution Source/Cause

After reviewing the pre-BMP 2015/16 water quality monitoring data, land use, and input from WP members, the following stream segments were identified as the most critical areas of concern for impacting water quality in the Beaverdam Creek watershed:

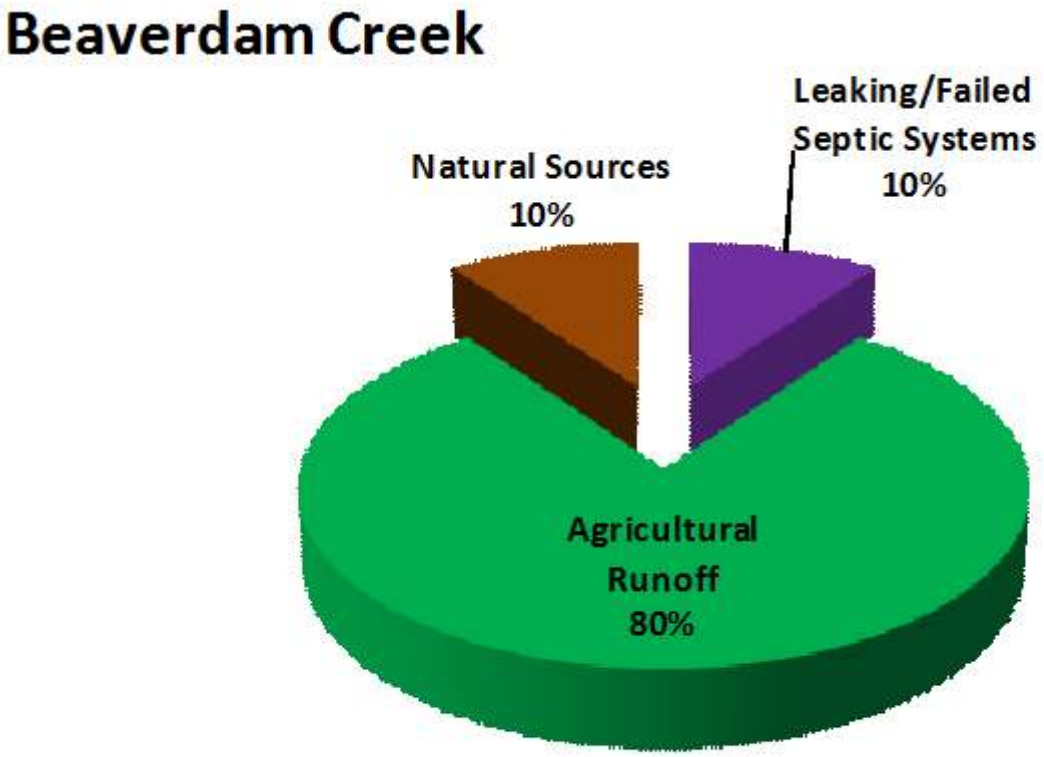
- Richland Creek segment between its confluence with Town Creek and intersection with Highway 44.
  - Area of moderate concern.
  - Possible, though limited, contamination from Town Creek.
  - Agricultural runoff.
  - Wild hog population upstream of Richland Creek at Highway 44 monitoring site.



! Town Creek upstream of Martin Luther King Jr. Dr.
  " Area of high concern
  " Urban runoff from impervious surfaces though, without specific testing at storm water outfalls, it is difficult to gage the true impact of the runoff on water quality.
  " Leaking or failed septic tanks.
  " Leaking sewerage lines (primary suspected source of contamination).
  " Runoff from commercial operations (Plant Nursery and Quail Plantation in northern portion of watershed).



! Beaverdam Creek
  " Area of moderate concern above Ga Hwy 15; area of low concern below Ga Hwy 15.
  " Agricultural runoff.
  " Leaking or failed septic tanks.
  " Natural sources.



Through implementation of urban and agricultural BMPs, the short-term goal is to improve water quality in each impaired stream a minimum of 20 percent resulting in an anticipated adjustment in the TMDL Implementation Plan required load reductions as follows:

o Beaverdam Creek - reduce from 75% to 60%
o Town Creek - reduce from 60% to 48%
o Richland Creek (upstream of Greensboro to I-20) - reduce from 20% to 16%
o Richland Creek (I-20 to Little Creek) - reduce from 94% to 75%.

Long-term, the goal is for each impaired stream segment to meet state water quality standards.

V. Assessment and Characterization of Current Conditions

The Beaverdam Creek watershed contains 77,849.07acres of agricultural and forested land primarily in Greene County and residential, commercial, and industrial lands in and adjacent to the City of Greensboro and Lake Oconee.

The Beaverdam Creek watershed is comprised of four major streams, Richland Creek, Town Creek, Beaverdam Creek and Stewart's Creek, each fed by numerous first- and second-order tributaries.

Richland Creek's headwaters begin north-west of Union Point. From there, it meanders west- southwest through extensive forest and agricultural land in unincorporated Greene County, through northwest Greensboro, then continues south where it is joined by Town Creek and continues to the Lake Oconee embayment south of SR 44.

Town Creek's headwaters are on an agricultural parcel in the vicinity of Interstate 20 and Liberty Church Road. The creek flows west-southwest through agricultural and forest lands in Greene County and then flows through commercial land in south-western Greensboro before it joins Richland Creek as it flows under Interstate 20.

Beaverdam Creek begins southwest of Union Point and flows southwest through agricultural and forest lands in Greene County and continues to the Lake Oconee embayment northeast of Walker's Church Road.

There are several significant wetland areas in the watershed, including adjacent to Bowden Creek, Beaverdam Creek between Highway 15 and Veazey Road, and adjacent to Lake Oconee.

Within the Beaverdam Creek watershed are four impaired stream segments:

- Beaverdam Creek,
- Town Creek,
- Richland Creek (Greensboro to I-20), and
- Richland Creek (I-20 to Little Creek).

The segments are identified in Georgia's 305(b)/303(d) list as not supporting their designated use of fishing due to non-point source fecal coliform contamination. The designation of these segments as "not supporting" due to fecal coliform contamination are based on sampling data from 2004 by Georgia Department of Natural Resources, Environmental Protection Division's (GA EPD) at the following sampling stations:

- Beaverdam Creek at County Road 66
- Town Creek at Highway 44
- Richland Creek at Georgia Highway 15
- Richland Creek at Interstate 20

Physical and Natural Features

Hydrology

The Beaverdam Creek watershed is comprised of five, HUC-12 watersheds, numbers 030701011101, 030701011102, 030701011103, 030701011104, and 030701011105, 48.99 miles of major streams, 218.76 miles of minor streams, and 3,888.30 acres of lakes. Small ponds are scatted throughout the watershed.

Stream Buffers

To help protect water quality, the state mandates wooded stream buffers of at least 25' on each side of the stream bank. Based on a review of 2015 aerial photographs, wooded buffers (see Appendix 1, Map 2) are adequate throughout much of the watershed, along the main channel as well as its tributaries with the exception of the following:

- Penfield Road at Richland Creek (monitoring site 7). There is reduced or no vegetative buffer adjacent to the stream and bank erosion is evident. Likely prior stream access by livestock, upstream and downstream, from both sides of stream. However, as of January, 2016, the fence on the property northeast of the stream crossing has been removed likely indicating that livestock will no longer be kept on the property. Additionally, no livestock have been observed on the property to the southeast of the stream crossing.

  Fencing crosses Richland Creek on the west side of Penfield Road. Livestock on property in the northwest quadrant of the stream crossing have access to the stream.

Richland Creek, upstream, at Penfield Road, aerial photograph, 2015.

Soils

All of the Beaverdam Creek watershed is contained within the Southern Piedmont Major Land Resource Area (MLRA). Dominant soils of the Southern Piedmont have mostly clayey subsoils and kaolinitic mineralogy. Well-drained very gently sloping to strongly sloping Appling, Cecil, Davidson, Hiwassee, Madison, Pacolet, and Wedowee series are found on uplands. Ashlar, Gwinnett, Louisburg, Madison, Pacolet, Wedowee, and Wilkes series are located on the steeper slopes.

In some localities, these soils contain coarse fragments. Cartecay, Chewacla, Congaree, Toccoa and Wehadkee series are in alluvial flood plains. Erosion control is important when cultivating these soils.

Soils of the Piedmont are acidic and low in nitrogen and phosphorus. In many cases, much of the original topsoil has been eroded leaving the clayey subsoil exposed. The less steep slopes and areas where the topsoil has not been completely eroded are adapted to corn, cotton, soybean, and grain sorghum production. Although row crops are productive in this region, the area is better adapted to pasture production.

More than 42 percent of the soils in the Beaverdam Creek watershed are Cecil, Lloyd, and Hard Labor-Appling series soils.[2] The Cecil and Lloyd series are well-drained and have moderate permeability. The Hard Labor-Appling service is moderately well drained. All three series soils are found on very gentle to gentle slopes and are suited to farming and responds well to good management practices.

The following table depicts the Beaverdam Creek watershed generalized soils and provides a general description of the soil associations found in the watershed. See Appendix 1, Map 3.

Table 2: Beaverdam Creek Soils

Soil Series	Characteristic	Acres	Percent
Altavista	Moderately well-drained	102.66	0.14
Cataula	Moderately well-drained	19.06	0.03
Cataula–Cecil	Moderately well-drained	1948.38	5.22
Cecil	Well-drained	21397.01	28.30
Cecil-Cataula	Well–drained to moderately well-drained	1038.80	1.37
Chewacla	Somewhat poorly drained	5150.39	6.81
Chewacla and Congaree	Somewhat poorly drained	714.43	0.95
Hard Labor-Appling	Moderately well-drained	8663.06	11.46
Hard Labor-Cecil	Moderately well-drained	602.88	0.80
Helena	Moderately well-drained	3405.35	4.50
Lloyd	Well-drained	10783.70	14.26
Mecklenburg-Crawfordville	Well-drained to somewhat poorly drained	3902.82	5.16
Mecklenburg-Prosperity-Helena	Well-drained to moderately well-drained	812.00	1.07
Mecklenburg-Sedgefield	Well–drained to somewhat poorly drained	663.47	0.88

[2] USDA Soil Conservation Service and Forest Service, Web Soil Survey, Greene County, GA.

Mecklenburg-Wynott	Well–drained	212.42	0.28
Pacolet	Well-drained	6702.46	8.87
Pacolet-Cataula	Well–drained	1604.73	2.12
Pits, quarries	NA	53.25	0.07
Prosperity-Helena-Bush River	Moderately well-drained	204.13	0.27
Rock outcrop	NA	5.43	0.01
Sedgefield-Crawfordville	Somewhat poorly drained	961.63	1.27
Water	NA	4067.81	5.38
Wehadkee	Poorly drained	348.90	0.46
Wickham	Well–drained	232.56	0.31

Source: - Geospatial Data Gateway. Originator: U.S. Department of Agriculture, Natural Resources Conservation Service, 2015; Soil Survey of Greene County, USDA NRCS; 2013.

LAS/NPDES Permits

According to GA EPD, there are no active NPDES permits in the watershed. However, there are several LAS permits.

- City of Greesnboro, Water Pollution Control Plant.
- Piedmont Water Company[3]
  Piedmont Water Company owns and operates two facilities which are each advanced wastewater treatment reuse facilities permitted by GA EPD.
  - Carey Station Water Reuse Facility (WRF), Permit GAJ030883. The facility is located at 4610 Carey Station Road, Greeneboro, GA in Greene County.
  - Oconee Crossing Water Reuse Facility (WRF), Permit GAJ030683. The facility is located at 165 McGillivray Lane, Eatonton, GA in Putnam County.

  The Carey Station facility's treatment train consist of screening, vertical loop aeration reactors, clarifiers, filtration, U.V. disinfection and aerobic sludge digestion. The Oconee Crossing facility's treatment train consists of screening, Orbal aeration basins, clarifiers, filtration, U.V. disinfection, and aerobic sludge digestion. Both facilities are permitted for 0.5 MGD.

  Typical operations consist of removing liquid sludge from the facilities' digesters into a 3,000 gallon tanker truck and transporting and land applying the sludge at Copeland Farms located at 3701 Lake Oconee Parkway, Greensboro, GA. The approved land application site consist of approximately 154 acres of farmland divided into four separate fields. Biosolids are applied as an agricultural resource at or below agronomic rates for the liquid biosolids generated at both facilities. The biosolids are applied to the hay and pasture land for total or partial replacement of commercial nitrogen and phosphorus.

[3] Piedmont Water Company, Carey Station WRF (GAJ03–0883) and Oconee Crossing WRF (GAJ03–0632) Land Application of Sewage Sludge, Sludge Management Plan, Program Overview, 2009.

The actual amount of biosolids applied is dependent upon the nutrient requirement of the specific crop being grown and the nutrient content of the biosolids. Biosolid application is prohibited within 100 feet of perennial streams and other surface water except intermittent stream. For intermittent streams and drainage ditches, the minimum distance to the application area is 25 feet.

Both the biosolids and application sites soils are sampled at specific intervals to assure the beneficial utilization of the material for agricultural production and to confirm that the application program is not creating any environmental hazard.

A copy of the Sludge Management Plan is found in Appendix II.

According to the 2015 Annual Report submitted to GA EPD for the two permits, application rates from each WRF were as follows:

Table 3: Sludge Management Plan Application Rates, 2015

Carey Station				Oconee Crossing			
Date	Volume (gallons)	Field	Weather Conditions	Date	Volume (gallons)	Field	Weather Conditions
01.21.15	3000	1	clear	01.22.15	21000	1	clear am overcast pm
03.17.15	3000	2	clear	03.18.15	18000	2	clear
04.08.15	3000	2	clear	09.16.15	18000	3	partly cloudy
04.09.15	3000	2	clear	09.17.15	21000	3	clear
04.24.15	3000	2	clear	12.07.15	15000	2	clear
05.05.15	3000	2	clear				
05.07.15	3000	1	clear				
05.08.15	3000	1	clear				
05.11.15	3000	1	clear				
05.13.15	10500	1	overcast				
09.22.15	3000	3	rain				
09.23.15	18000	3	overcast				
09.24.15	27000	3	cloudy/rain				
12.01.15	27000	2	cloudy				
12.04.15	6000	2	clear				
12.09.15	15000	2	clear				

Climate

The Beaverdam Creek watershed is characterized by mild winters and hot summers. Average annual precipitation is 47.11 inches per year with 53 percent of precipitation occurring from April through October. Precipitation occurs chiefly as rainfall, and to a lesser extent, as snowfall.[4]

The warmest month of the year is July with an average maximum temperature of 91.60 degrees Fahrenheit, while the coldest month of the year is January with an average minimum temperature of 32.00 degrees Fahrenheit.[5]

Habitat

This watershed's ecosystem provides habitat for diverse species of aquatic and terrestrial wildlife including white-tailed deer, opossum, raccoon, a variety of songbirds, fox, horned owl, timber rattlesnake, turtle, frog, salamanders, and a variety of fish.

Groundwater Recharge Areas

The Georgia Department of Natural Resources mapped areas of high, average (or medium), and low susceptibility of groundwater to pollution in Georgia. This map is commonly known as Hydrologic Atlas 20 or the Groundwater Pollution Susceptibility Map of Georgia. The Beaverdam Creek watershed is located in a "low" groundwater pollution susceptibility area. However, within a pollution susceptibility area are significant groundwater recharge areas. These areas are mapped on the Hydrologic Atlas 18 or the Groundwater Recharge Area Map of Georgia.

The significant groundwater recharge areas are subject to pollution from spills, discharges, leaks, impoundments, applications of chemicals, injections and other human activities in the watershed. Once in the aquifer, pollutants can spread uncontrollably to other parts of the aquifer thereby decreasing or endangering water quality for an entire region. Once polluted, it is almost impossible for a groundwater source to be cleaned up.

A majority of structures in the watershed receive drinking water from the City of Greensboro or the Piedmont Water System. Structures outside these service areas receive drinking water from wells.

Only portions of two groundwater recharge areas are located in the Beaverdam Creek watershed; however, no recharge area intersects any impaired segment. See Appendix 1, Map 4.

Wetlands

Small, fragmented wetlands are found throughout the watershed. See Appendix 1, Map 5.

Topography

Elevations in the watershed are gently sloping and range from 400 feet to 787 feet.

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[4] Greene County Soil Survey, USDA NRCS.

[5] http://www.idcide.com/weather/ga/greensboro.htm

Land Cover, Land Use, and Demographics

Land Cover

Table 4: Beaverdam Creek Watershed Land Cover

Land Cover Classification	Acres
Open Water	4,227.70
Low Intensity Residential	4,863.11
High Intensity Residential	932.92
Commercial/Ind/Trans	211.05
Barren Rock/Sand/Clay	1,750.93
Deciduous Forest	17,649.08
Evergreen Forest	23,747.85
Mixed Forest	2,793.76
Shrublands	324.25
Grasslands/herbaceous	7,685.86
Pasture/hay	9,441.48
Row crops	197.00
Wetlands	1,793.73
TOTAL	75,620.71

Source: Georgia Land Cover Dataset, 2011

Land Use

Approximately 78% of the watershed contains agricultural/forestry land use.

Commercial land use occupies 1.95 percent of the watershed and is located primarily in Greensboro and in the Lake Oconee area. Residential land occupies 13.86 % of the watershed and is primarily located on small lots in Greensboro and the Lake Oconee area. Larger lots are scatted throughout the remaining watershed on lands transitioning from agricultural lands. Industrial land use comprises 0.46% of the watershed and is located almost entirely within Greensboro. See Appendix 1, Map 6.

Table 5: Beaverdam Creek Watershed Land Use

Existing Land Use (2009)	Acres	% of Watershed	Future Land Use (2024)	Acres	% of Watershed
Agriculture	22676.82	31.57	Agriculture/Forestry (Rural)	37490.72	54.88
Commercial	1403.65	1.95	Commercial	743.16	1.03
Forestry	33647.52	46.85	Institutional	416.15	0.58
Industrial	332.47	0.46	Industrial	1270.13	1.77
Parks/Rec/Conservation	1343.19	1.87	Lakeside Residential	961.27	1.34
Public/Institutional	452.87	0.63	Major Employment Centers	1196.61	1.67
Residential	9957.21	13.86	Mixed Use Community Center	481.73	0.67
Trans/Comm/Utilities	13.13	2.62	Neighborhood Commercial	144.25	0.20
Undeveloped	2242.33	0.17	Parks, Recreation, Conservation	1820.40	2.53
			Residential Growth Area	16842.65	23.45
			Rural Residential	6221.28	8.66
			Trans/Comm/Utilities	2230.81	3.11
TOTAL	71819.07	100.00	TOTAL	71,819.07	100.00

Source: Joint Comprehensive Plan for Greene County, Greensboro, Siloam, Union Point, White Plains, and Woodville. 2004-2024.

The Future Land Use Map shows approximately 31 percent growth in residential property in the southern portion of the watershed adjacent to existing Lake Oconee residential areas and continuing north to include the area bounded by Richland Creek to the east, I-20 to the north, and Oconee River to the west. See 7.

Agriculture

Current farming and agricultural land in Greene County consists of cropland, woodland, and pastureland, with the majority of the land in timber and pasture. The average farm size is 224 acres, ranging from small farms of less than 10 acres to larger tracts of 1,000 acres or more. Agricultural land in the watershed covers 9638.48 acres, or 12.75 percent of the watershed. Top crop products are forages, including hay, grass silage,

and green chop. Corn and sorghum are grown for silage and grain. Conservation tillage is used on many row crop acres, reducing stress on cultivated lands. Because the majority of farming operations are livestock related (dairy, poultry, and beef cattle), nutrient management in association with animal waste is a needed conservation practice. Additional conservation measures use a resource systems approach, such as installation of grazing systems and alternative water sources that include stream crossings, watering ramps, wells with pipeline, heavy use protection, and troughs. Implementing heavy use protection improves degraded areas, such as concentrated travel paths and areas around barns, feeders, and hay rings. Streambanks, wetlands, and similar degraded areas may benefit from fencing, streambank stabilization, critical area treatment, and riparian buffer development and management. By establishing access for livestock and treating critical areas, older ponds can be improved in order to meet today's conservation standards.[6]

According to the Revised TMDL Implementation Plans for each of the watershed's impaired streams, agriculture land uses are a potential source of fecal coliform contamination. Beaverdam and Richland Creek below I-20 are most impacted by agricultural and silvicultural land uses.

Wildlife

According to the Georgia Department of Natural Resources, Wildlife Resources Division (GA WRD), the impact of wildlife on fecal coliform contamination varies widely. The animals that spend a large portion of their time in or around aquatic habitats are the most important wildlife sources of fecal coliform. Waterfowl, most notably ducks and geese, are considered to potentially be the greatest contributors of fecal coliform. This is because they are typically found on the water surface, often in large numbers, and deposit their feces directly into the water. Other potentially important animals regularly found around aquatic environments include racoons, beavers, muskrats, and to a lesser extent, river otters, and mink. Population estimates of these animal species in Georgia are not available.

White-tailed deer have a significant presence in the watershed with an estimated 2004 population of 50 deer per square mile. According to GA WRD, fecal coliform bacteria contributions to water bodies from deer are generally considered less significant than that of waterfowl, racoon, and beaver due to a greater portion of their time being spent in terrestrial habitats. This is also true for other terrestrial mammals such as squirrels and rabbits, and terrestrial birds. While feces deposited on the land surface can result in the introduction of fecal coliform to streams during runoff from storm events, in the warm, humid environments typical of the southeast, there may be considerable decomposition of the fecal matter. This may result in a decrease in the associated fecal coliform numbers introduced from to streams during runoff from storm events.

Water and Sewerage System

Water System

Greene County does not provide public water service to residents within the unincorporated areas of the county. Residents rely on private wells or, if residing in the Lake Oconee area, the private water system operated and maintained by Piedmont Water Company.

The City of Greensboro draws its water from Lake Oconee. The city has a total permitted withdrawal of 1.5 million gallons per day (mgd), with a treatment capacity of 1.660 mgd. The city has a total of 1,017

[6]Greene County, Ga Soil Survey, USDA NRCS, 2013.

residential customers with 239 commercial and industrial customers. The city has 1.100 mgd of storage capacity (0.600 mgd elevated and 0.500 mgd ground storage capacity). The average daily demand is 0.700 mgd with a peak demand of 0.900 mgd.

There are a number of private water supply systems constructed within subdivisions near the Lake Oconee area. The majority of private water systems are hydropneumatic in nature and do not provide fire protection. The Reynolds Plantation system is an exception and has two elevated storage tanks (100,000 gallons and the other 600,000 gallons).

Sanitary Sewer System

There is no governmentally-owned public sewerage system serving unincorporated Greene County. Residents rely on individual septic systems or, if residing in the Lake Oconee area, the private sewerage system operated and maintained by Piedmont Water Company.

The City of Greensboro operates a sanitary sewer and disposal system that serves only the population within the city's boundary. See Appendix 1, Map 8.

The City of Greensboro operates a water pollution control plant (WPC) in the southern section of the city at 1900 South Main Street. The plant utilizes an activated sludge system, discharging the treated wastewater into Town Creek, as well as a slow rate land application system. The total permitted capacity of the city's sewerage system is 0.998 mgd with the ability to accommodate a peak demand of 0.305 mgd. The city serves a total of 934 customers (756 residential and 178 commercial/industrial) with an average daily demand of 0.305 mgd and a peak demand of 1.500 mgd.

Periodically, there have been discharges from the WPC into Town Creek as well as overflows from manholes within the city's sewerage system.[7]

Discharges from the WPC
Jan 2014 – 0.283 gal
Nov 2015 – 0.380 gal
Apr 2016 – 0.500 gal

Sewage Spills
Jan 13, 2014, 6th Street, Samples Town Creek for 1 year
2014, Cherry Street, repaired manhole and jetted lines
2014, Greensboro Elementary School, repaired manhole and unstopped line
2014, Greensboro Elementary School, replaced manhole and installed new line
January 8, 2015, 1570 South Main Street, Repaired line and removed blockage
January 9, 2015, 102 Rachel Street, Repaired line and remove blockage.

There are privately owned and operated sewerage treatment facilities serving existing and planned residential and commercial development in the Lake Oconee area. Currently, the existing and planned wastewater treatment plants are designed as tertiary reuse facilities. The effluent is utilized for irrigation on golf courses and other landscapes.

[7]City of Greensboro, May 10, 2016.

Private Septic Systems

County Boards of Health and the Geogia Department of Human Resources regulate the siting and installation of septic systems up to 10,000 gallon tank capacity. Larger systems are permitted by GA EPD. However, property owners are responsible for properly operating and maintaining the septic system to increase life expectancy and prevent failures.

Residential land accounts for almost 14 percent of the watershed. The majority of dwellings are served by the City of Greensboro sanitary sewerage system. There are scatted properties within the city that are served by individual private septic systems. The Greene County Health Department reports that are periodic problems with septic systems but that they are scattered throughout the watershed rather than located in any confined areas.

Impervious Surface

Impervious surface in the watershed was determined through the 2006 National Land Cover Dataset. The data set identified 5,696.19 acres of impervious surface in the watershed. This includes roads, parking lots, and buildings, most of which are located in Greensboro and to a lesser extent, the Lake Oconee residential and commercial areas. See Appendix 1, Map 9.

As more development occurs in the watershed, the amount of impervious surface will increase leading to more urban runoff and potential for water quality contamination.

Flooding

Flooding in Greensboro is primarily associated with Town Creek. Flooding in unincorporated Greene County is adjacent to major streams in undeveloped portions of the county with the exception of the Lake Oconee residential area. See Appendix I, Map 14.

Urban Runoff

Greensboro has an unmapped, separate stormwater system that discharges to Town Creek. Presently, the city does not utilize or mandate through its ordinances any structural management to capture and treat stormwater before it is discharged to surface waters thereby reducing the amount of fecal coliform discharged to the stream.

Streambanks

Streambanks on the impaired streams generally experience substantial erosion and have little to no vegetation. Based on visual observation and input from City staff, there is a greatly increased volume of water in the stream channels during rain events, particularly events exceeding two inches. Town Creek appears to be the most heavily impacted by the heavy rain events as the creek's banks are steep and severely eroded throughout the impaired segment though, Richland and Beaverdam creeks have isolated areas of eroded banks. Below are photos of areas representing the extent of streambank erosion throughout the watershed.

Richland Creek at Penfield Road, upstream.

Richland Creek at Penfield Road, upstream.

Richland Creek at Penfield Road, downstream.

Town Creek at MLK, Jr. Dr., downstream

Silviculture

The majority of soil erosion from forested land occurs during timber harvesting and the period immediately following, and during reforestation. Once the forest is re-established, very little soil erosion occurs. Timber harvesting includes the layout of access roads, log decks, and skid trails, the construction and stabilization of these areas, and the cutting of trees. Compliance with silvicultural best management practices is at or near 100 percent.[8]

Demographics

From 2000 - 2010, Greene County's total population grew by 10%, and by 3.1% from 2010 – 2014. Most of the growth in the unincorporated county took place in the Lake Oconee area. The City of Greensboro's population also grew 6.9% since 2000.

No population data exists solely for the Beaverdam Creek watershed, however, projections indicate that by 2030, Greene County's total population will be 26,134, or a change of 63% from 2010-2030[9]. The City of Greensboro's total population is expected to increase by 3.7% to 3,382.[10]

[8]Results of Georgia's 2013 Silvicultural Best Management Practices Implementation and Compliance Survey, Georgia Forestry Commission, February 24, 2014.

[9]Georgia Population Projections 2030, Georgia Office of Planning and Budget, March 12, 2010.

[10]City of Greensboro Urban Redevelopment Plan, February 21, 2011.

Waterbody and Watershed Conditions

Visual Survey

A visual survey of the Beaverdam Creek watershed was conducted in August and September 2015, and December 2016.

The purpose of a visual survey is to determine if there are observable problems in the stream and to characterize the environment through which the river flows. The visual survey helps pinpoint areas that may be the source of water quality impairments and determine the overall condition of the stream. Results of the visual survey did not indicate any obvious source(s) of water quality impairment.

All impaired streams, and particularly Town Creek, evidence stream bank scouring. Town Creek is a narrow, shallow stream with some cobble and combination sandy/muddy bottom. Sandbars are periodically visible throughout the stream's reach with the largest at its intersection with Georgia Highway 44. Where observed, its channel averages about five feet in width and its banks average between four to six feet in height. High water marks indicate frequent overflow of its banks during rain events as much as 15 horizontal feet. According to City staff, considerable household garbage in addition to vegetative debris, flows down the stream during these high water events. The Town Creek subwatershed has urban residential and commercial uses on its north side and forest and agricultural uses, primarily pasture, on its south side.

Beaverdam Creek begins as a narrow stream, about six feet in width, but more than doubles its width as it flows to Lake Oconee. The stream bottom periodically has rocks/cobble and a combination sandy/muddy bottom. Stream banks, where observed, are very gently sloping and only about two to three feet in height. In the lower part of its subwatershed, there is evidence of bank scouring. Forest and agriculture are the primary land in this subwatershed; however, a large poultry operation is currently under construction directly upstream of monitoring site 1 on Highway 66 (Lesley Mill Road).

Richland Creek begins as a moderately narrow, shallow stream about ten feet in width and increases its width and depth as it flows to Lake Oconee. The stream has few rocks/cobble and its bottom is a sand/mud mixture. In the upper part of its reach, the stream banks are gently sloping and become considerably steeper as it flows to Lake Oconee, reaching a height of about six feet. However, throughout the stream's reach, visual observation indicates that the stream periodically overflows its bank, particularly in its northern reach. Forestry, agriculture, and urban are the primary land uses in the watershed, with urban uses confined to Greensboro.

Water Quality Standards and Data

Fecal coliform

Coliform bacteria are members of the Enterobacteriaceae family. While some coliform bacteria can be naturally found in soil, the type of coliform bacteria that lives in the intestinal tract of warm-blooded animals and originates from animal and human waste is called fecal coliform bacteria. Escherichia coli (*E.coli*) is one subgroup of fecal coliform bacteria and are good indicator organisms of fecal contamination because they are associated with warm-blooded animal wastes, generally live longer than pathogens, are

found in greater numbers, and are less risky to culture in a laboratory than pathogens. However, their presence does not necessarily mean that pathogens are present, but rather indicates a potential risk to human health. The presence of fecal coliform bacteria in aquatic environments indicates that the water has been contaminated with the fecal material of man or other animals.

Fecal coliform bacteria can enter rivers and streams through direct discharge of waste from mammals and birds, from agricultural and storm runoff, and from untreated human sewage. Individual home septic tanks can become overloaded during the rainy season and allow untreated human wastes to flow into drainage ditches and nearby waters. Agricultural practices such as allowing animal wastes to wash into nearby streams during the rainy season, spreading manure and fertilizer on fields during rainy periods, and allowing livestock watering in streams can all contribute fecal coliform contamination.

At the time this occurs, the source water may be contaminated by pathogens or disease producing bacteria or viruses, which can also exist in fecal material. Some waterborne pathogenic diseases include ear infections, dysentery, typhoid fever, viral and bacterial gastroenteritis, and hepatitis A. The presence of fecal coliform tends to affect humans more than it does aquatic creatures, though not exclusively. While these bacteria do not directly cause disease, high quantities of fecal coliform bacteria suggest the presence of disease-causing agents. The presence of fecal contamination is an indicator that a potential health risk exists for individuals exposed to this water. During high rainfall periods, the sewer can become overloaded and overflow, bypassing treatment. As it discharges to a nearby stream or river, untreated sewage enters the river system. Runoff from roads, parking lots, and yards can carry animal wastes to streams through storm sewers.

Unlike the other conventional water quality parameters, fecal coliform bacteria are living organisms. They do not simply mix with the water and float straight downstream. Instead they multiply quickly when conditions are favorable for growth, or die in large numbers when conditions are not. Because bacterial concentrations are dependent on specific conditions for growth, and these conditions change quickly, fecal coliform bacteria counts are not easy to predict. For example, although winter rains may wash more fecal matter from urban areas into a stream, cool water temperatures may cause a major die off. Exposure to sunlight (with its ultraviolet disinfection properties) may have the same effect, even in the warmer water of summertime.

Georgia's water quality standards set a maximum number of colony forming units (cfu) at 200 per 100 milliliters from May through October, or 1000 per 100 milliliters from November through April. Values in excess are in violation of the State bacteria water quality standard. In addition, a single sample in excess of 4000 cfu per 100 milliliters from November through April or a single sample in excess of 400 cfu per 100 milliliters from May through October can also trigger adding a stream segment to the 303(d) listing. Below is the Georgia EPD 2004 monitoring data that initiated the listing of stream segments in the Beaverdam Creek watershed as impaired. Values in red exceed state water quality standard.

Following is the GA EPD monitoring data for the impaired streams for the period 1996-2004.

Table 6: GA EPD Monitoring Data

Beaverdam Creek at County Road 66 near Veazey, GA			Richland Creek at Ga Highway 15 near Greensboro, GA		
Date	Fecal Coliform (counts/100 ml)	Geometric Mean (counts/100 ml)	Date	Fecal Coliform (counts/100 ml)	Geometric Mean (counts/100 ml)
04.13.04	16000		04.13.04	1300	
04.15.04	230		04.15.04	80	
04.27.04	800		04.27.04	800	
04.29.04	130	786.50	04.29.04	130	322
05.04.04	800		05.04.04	230	
05.11.04	500		05.11.04	170	
05.18.04	500		05.18.04	170	
05.25.04	270	482.10	05.25.04	204	204
08.03.04	170		08.03.04	80	
08.10.04	130		08.10.04	20	
08.17.04	170		08.17.04	500	
08.24.04	110.7	110.70	08.25.04	5000	251
11.09.04	500		11.09.04	80	
11.16.04	1300		11.16.04	70	
11.30.04	500		11.30.04	40	
12.04.04	170	484.80	12.07.04	70	63

Richland Creek at Interstate 20 near Greensboro, GA		
Date	Fecal Coliform (counts/100 ml)	Geometric Mean (counts/100 ml)
01.24.96	13000	

Richland Creek at Ga Highway 15 near Greensboro, GA		
Date	Fecal Coliform (counts/100 ml)	Geometric Mean (counts/100 ml)
04.13.04	1300	
04.15.04	80	
04.27.04	800	
04.29.04	130	322
05.04.04	230	
05.11.04	170	
05.18.04	170	
05.25.04	204	204
08.03.04	80	
08.10.04	20	
08.17.04	500	
08.25.04	5000	251
11.09.04	80	
11.16.04	70	
11.30.04	40	
12.07.04	70	63

Town Creek at Ga Highway 44 near Greensboro, GA		
Date	Fecal Coliform (counts/100 ml)	Geometric Mean (counts/100 ml)
01.31.96	2800	
02.21.96	140	
03.20.96	7000	
04.09.96	15000	
05.22.96	700	
06.11.96	1300	
07.1.96	490	
08.13.96	490	
09.10.96	790	
10.30.96	1700	
11.13.96	490	
12.17.96	330	

Town Creek at Ga Highway 44 near Greensboro, GA		
Date	Fecal Coliform (counts/100 ml)	Geometric Mean (counts/100 ml)
01.06.00	2400	
01.20.00	490	
01.26.00	1300	1695
02.03.00	5400	
05.25.00	700	
06.14.00	170	
06.16.00	2200	
06.22.00	3500	978
07.27.00	490	
08.10.00	54000	
08.17.00	330	
08.24.00	2300	2117
11.09.00	50	
11.16.00	70	
11.23.00	790	
12.07.00	9200	399
04.13.04	5000	
04.15.04	300	
04.27.04	230	
04.29.04	170	492
05.04.04	800	
05.11.04	500	
05.18.04	500	
05.25.04	300	495
08.03.04	300	
08.10.04	170	
08.17.04	500	
08.24.04	130	240
11.09.04	500	
11.16.04	2400	
11.30.04	500	
12.07.04	110	507

In order to obtain more current water quality data, pre-BMP monthly stream water quality monitoring for E.coli was conducted by Resource Management Strategies under contract with the Oconee River RC&D Council for the period August 2015 - April 2016. See Appendix 1, Map 10 and Appendix II, Water Quality Data.

E.coli

The current Georgia bacterial standard for fresh water is based on fecal coliform and varies with the designated use of the water. However, based on studies, USEPA concluded that E.coli was the preferred indicator organism for fresh waters. Using an illness rate of 8 illnesses per 1,000 swimmers (the estimated rate associated with the fecal coliform standard of 200 cfu/100 ml), the regression line was used to find the associated concentration. This associated concentration for E. coli was a geometric mean of 126 cfu/100 ml.[11]

USEPA recommendations for E.coli based on primary contact with the water are as follows:

Table7: USEPA Recommendations for E. coli

Illness Rate/1000	Geometric Mean/100mL	Single Sample/100mL
8	126	235
9	206	300
10	206	383
11	263	490
12	336	626
13	429	799
14	548	1021

Georgia Adopt-a-Stream recommends that E.coli counts exceeding 1000 cfu/100 ml warrant special action which includes notifying the appropriate agency (local Health Department, local government, or GA EPD). A “high” bacterial count may be a one-time event or occurrence but, more sampling is encouraged.

Both dry and wet weather sampling was conducted. Dry weather is defined as no more than 1" of rain in the 48 hours preceding sampling. Wet weather is defined as at least 0.2" of rain in the 24 hours preceding sampling. Sampling data is found in Appendix B.

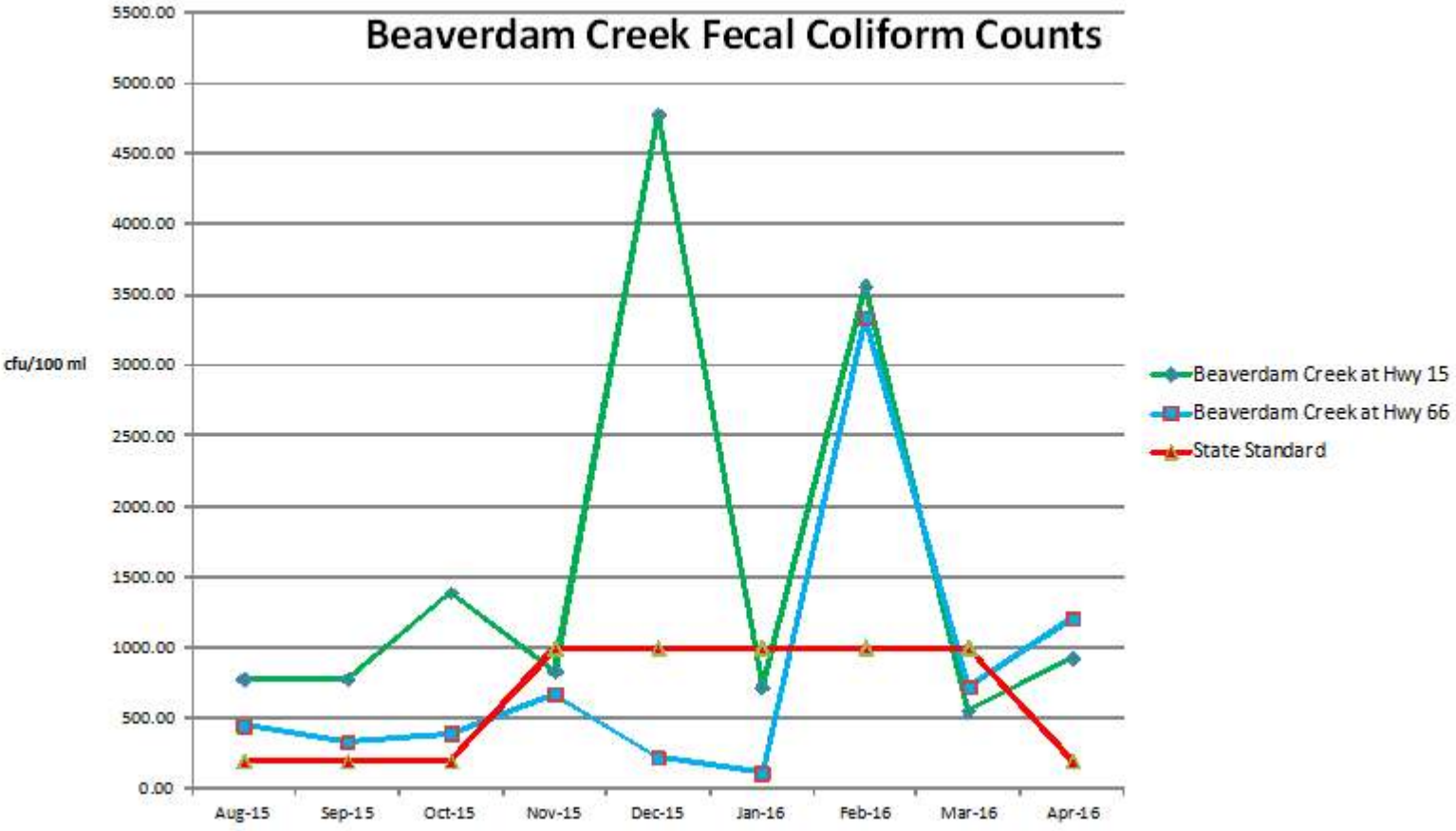
[11] Scientific Basis for Bacterial TMDLs in Georgia, June 2006, pps. 13, 15.

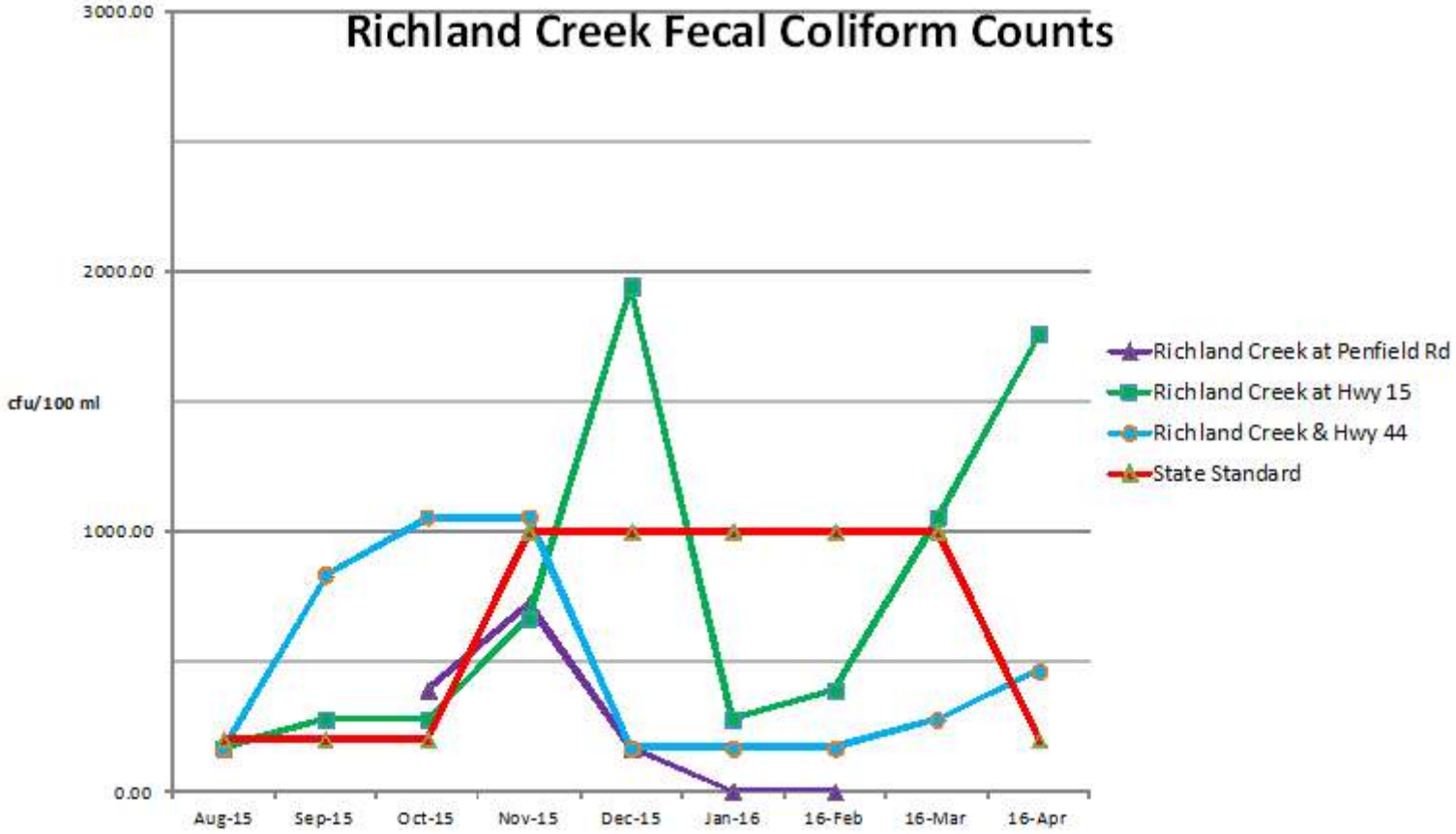
A ranking of monitoring sites based on average E.coli counts is as follows:

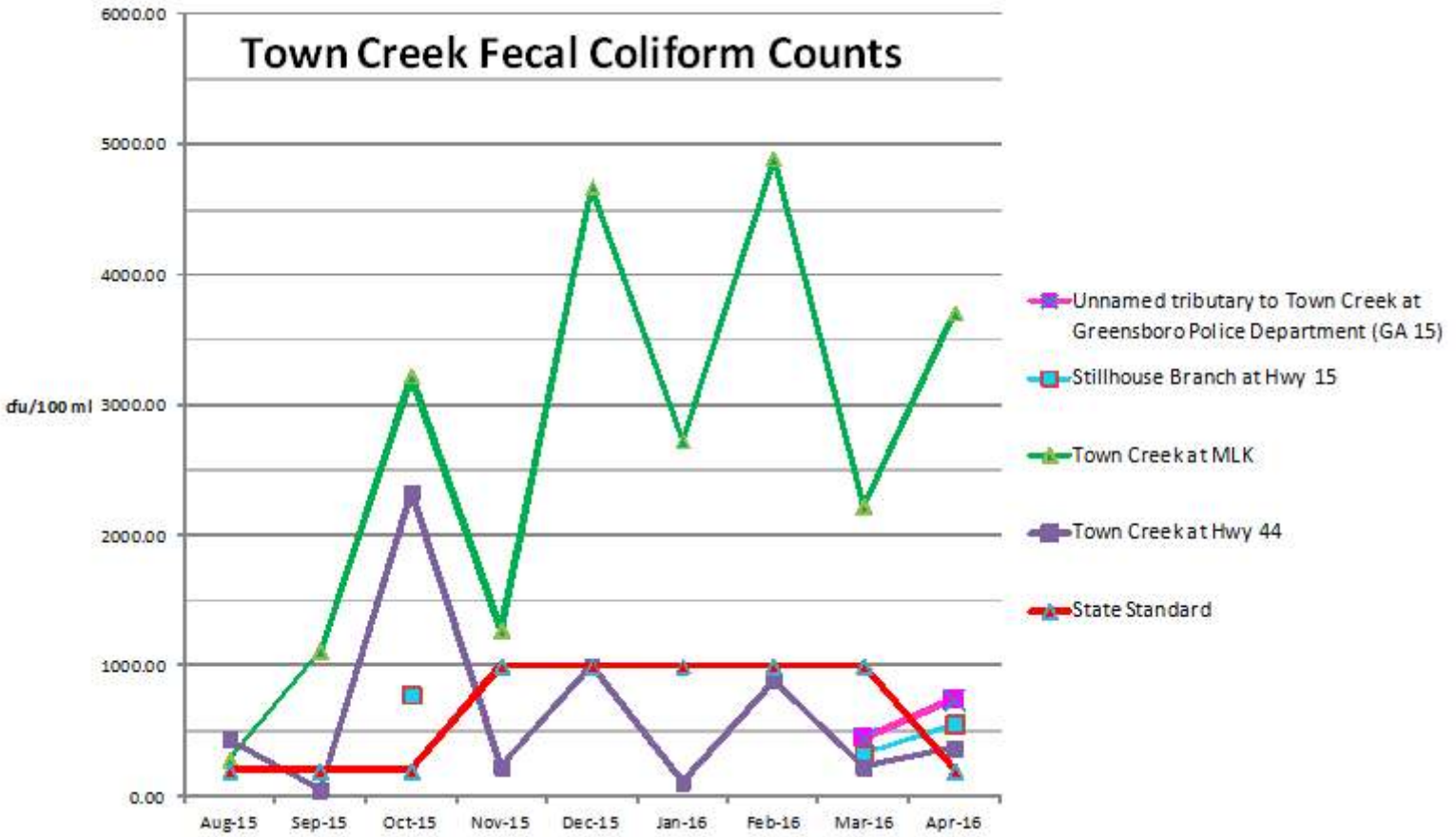
Table 8: Monitoring Site Rank (Aug 2015 – Apr 2016)

Rank	Site	Avg. E.coli cfu/100 ml
1	Town Creek at MLK	1501.08
2	Beaverdam Creek at Ga Hwy 15	935.71
3	Beaverdam Creek at Ga Hwy 66	476.50
4	Town at Ga Hwy 44	407.37
5	Richland Creek @ Ga Hwy 15	367.86
6	Unnamed Tributary to Town Creek at Ga Hwy 15 (Greensboro Police Department)	299.97*
7	Richland Creek at Ga Hwy 44	283.92
8	Stillhouse Branch at Ga Hwy 15	238.87*
9	Richland Creek at Penfield Rd.	153.32*

* fewer monitoring events




Richland Creek Fecal Coliform Counts
3000.00
2000.00
1000.00
0.00
cfu/100 ml
Aug-15
Sep-15
Oct-15
Nov-15
Dec-15
Jan-16
16-Feb
16-Mar
16-Apr
Richland Creek at Penfield Rd
Richland Creek at Hwy 15
Richland Creek & Hwy 44
State Standard


Town Creek Fecal Coliform Counts
6000.00
5000.00
4000.00
3000.00
2000.00
1000.00
0.00
cfu/100 ml
Aug-15
Sep-15
Oct-15
Nov-15
Dec-15
Jan-16
Feb-16
Mar-16
Apr-16
Unnamed tributary to Town Creek at Greensboro Police Department (GA 15)
Stillhouse Branch at Hwy 15
Town Creek at MLK
Town Creek at Hwy 44
State Standard

Sampling events throughout the watershed helped to focus the potential geographic areas of contamination and, in some cases, helped to focus on the potential source(s) of contamination.

- Beaverdam Creek
  - E.coli counts along Beaverdam Creek have been elevated throughout the monitoring period though, with the exception of spikes in December 2015 and February 2016, counts have not been excessively elevated. Both spikes occurred during dry weather sampling events. The cause is unknown. This subwatershed is relatively undeveloped until it reaches Lake Oconee; however, a large poultry operation is under construction just upstream of the monitoring site on Beaverdam Creek at Highway 66 (Lesley Mill Road). There are scatted cattle operations in the subwatershed. Land in this subwatershed are predominately forestry and agriculture with scattered residential on large tracts. The subwatershed is served by individual septic systems until it reaches the Lake Oconee area.
  - Future Development
    - Construction of an extension to Richland Connector, between Walkers Church Road and Veazey Road, is scheduled for completion June 2016. This area is identified on the 2024 Greene County Future Land Use Map as a Residential Growth Area (RGA). RGAs will experience a high volume of transition to residential development. This designation represents areas that are capable of developing in the same character as existing neighborhoods. Higher densities are allowed because of the availability of supportive infrastructure and may be suitable for neighborhood-level commercial activity within the character of the neighborhood. These areas are also designed to accommodate recreation, as well as education, public administration, health care, or other institutional land uses. A large percentage of development within the Residential Growth category consists of master-planned communities and promotes alternative forms of development.
  - Potential contamination sources: Runoff associated with agricultural practices, septic systems, and urban runoff from future development.

- Richland Creek
  - Richland Creek @ Penfield Road – Land use adjacent to this monitoring site and its immediate area is pasture. Only one tract adjacent to, and downstream of the monitoring site, has livestock, a few horses and goats. These animals have access to the stream. The perimeter fencing on the adjacent tract upstream of the monitoring site has been removed. No livestock has been observed during the monitoring period and removal of the fencing indicates that no livestock is anticipated in the immediate future. Residential structures in the area are scattered and served by individual septic systems.

    Due to lack of rain, there was no stream flow during August and September 2015. Monitoring was not possible until October 2015. E. coli counts have consistently been below or near acceptable counts indicating a low likelihood of contamination entering the creek upstream of the monitoring site. Therefore, monitoring at this location was discontinued after February 2016.

    - Future Development
      - The 2024 Greene County Future Land Use map indicates that the area upstream and downstream of the monitoring sate will remain in agriculture. The Greene County Comprehensive Plan defines agriculture as lands retaining their rural character throughout the 2024 planning horizon. Agriculture lands generally lack the infrastructure necessary to accommodate growth. Actual uses may include, but are not limited to, farming, raising of livestock, timber production and harvesting, or any other use compatible with the surrounding environment.

" Richland Creek at Ga Highway 15 – The land use upstream of the minoring site is predominately forest. Four poultry houses are under construction on Georgia Highway 15 just north of this monitoring site. The property is drained by a tributary to Richland Creek downstream of this monitoring site.

E. coli counts have consistently been below or near acceptable counts with the exception of a minor spike in October 2015, a wet weather sampling event, and a major spike in December 2015, a dry weather sampling event. The cause of, in particular the December spike, is unknown. Due to consistently acceptable E.coli counts, there is a low likelihood of contamination entering the creek upstream of the monitoring site.

- Future Development
  # The Future Land Use map indicates that the area upstream of the monitoring site will remain in agriculture, which includes forestry. Between Highway 15 and the Madison Highway the land use will be a mix of agriculture and residential (Greensboro). Below Madison Highway, land will transition to Rural Residential, then to agriculture, and below I-20, to Residential Growth Area.

    The Comprehensive Plan defines Rural Residential as areas suitable for lower density development, typically adjacent to larger population centers. These areas typically do not have direct access to supportive infrastructure and are at densities of more than one dwelling unit per acre. Residential Growth Areas are areas experiencing a high volume of transition to residential development. This designation represents areas that are capable of developing in the same character as existing neighborhoods. Higher densities are allowed because of the availability of supportive infrastructure and may be suitable for neighborhood-level commercial activity developed within the character of the neighborhood. These areas are also designed to accommodate recreation, as well as education, public administration, health care, or other institutional land uses.

" Richland Creek @ Highway 44 – Land use between the Ga Highway 15 monitoring site and I-20 on the north side of Richland Creek is predominantly agricultural land including numerous poultry houses. Land use on the south side of the Richland Creek in this same segment is predominately forest. Below I-20, land use is predominately forest with scattered agricultural property. Town Creek joins Richland Creek just above I-20.

E. coli counts at this site were consistently elevated during September – November 2015 but saw an 80 percent reduction from December 2016 – March 2016. Town Creek may be a source of some of the contamination in Richland Creek, but it does not account for all of the contamination. Other likely sources are agricultural operations, wild hogs reported upstream of the monitoring site, and natural sources. Based on submitted data regarding biosolids application on the Copeland Farm property, it is unlikely that activity on this property impacts water quality standards. Water quality monitoring spikes at Richland Creek at Highway 44 do not correspond with dates of biosolids application.

- Future Development
  # Future Land Use indicates that below I-20 east of the creek will remain agricultural while west of the creek will transition to Residential Growth Areas.

" Town Creek – Town Creek's water quality monitoring has demonstrated that there is significant contamination flowing into the creek above Martin Luther King, Jr. Drive. Initially, there were two

monitoring sites on Town Creek but, in an effort to isolate the geographic area of contamination and the potential contamination source, two additional upstream monitoring sites were added in March 2016.

- Stillhouse Branch at Ga Highway 15 – The is the eastern, uppermost-tributary to Town Creek. Two, large commercial land uses drain to this tributary; Horizon Growers (plant nursery) and Plantation Quail (quail grower and processor). There are five lakes or ponds upstream of this monitoring site that drain directly to Stillhouse Branch. Two ponds are located on the Plantation Quail property, one on Horizon Growers' property, and two on residential/pasture tracts.

  This site has been monitored three times; October 2015, March and April 2016. E. coli counts in October, a wet weather monitoring event, were 777 cfu/100 ml, exceeding the state standard of 200 cfu/100 ml. March and April E. coli counts were under the state standard. Additional monitoring at this site is needed to definitively conclude that there is a low potential for contamination by upstream land uses. However, monitoring to-date indicates that the contamination source is likely downstream of this site and upstream of the MLK Jr., Drive monitoring site.

- Unnamed Tributary to Town Creek at Ga Highway 15 (Greensboro Police Department) - This site was selected because a portion of Greensboro's public sewerage line runs parallel to this tributary. Land use adjacent to this tributary is forested buffers, government uses (fire and police), residential, small-scale commercial, and conservation.

  This site has been monitored twice; March and April 2016. Both monitoring events demonstrated E. coli counts well under the state standard. Additional monitoring at this site is needed to definitively conclude that there is a low potential for contamination by upstream land uses. However, monitoring to-date indicates that the contamination source is likely downstream of this site and upstream of the MLK Jr., Drive monitoring site.

- Town Creek at Martin Luther King Jr. Drive (MLK) – Fecal coliform counts at this site have consistently been greater than the state standard, from as much as 455 percent above the summer standard of 200, to 388 percent above the winter standard of 1000. Counts substantially decrease when measured at the immediate downstream monitoring site at Ga Highway 44. Land use at this monitoring site is agricultural/pasture/forest east of the creek and single-family residential west of the creek. A number of outfalls from Greensboro's stormwater system were observed draining to Town Creek. However, the city's stormwater system has not been mapped so the number of location of outfalls are unknown. Additionally, Greensboro's public sewerage system runs parallel to Town Creek from the upstream monitoring site at the Greensboro Police Department and continues to the MLK monitoring site.
- Town Creek at GA Highway 44 – With the exception of one spike in October 2015, a wet weather monitoring event, counts at this site have been within acceptable limits. Greensboro's WRP is located just upstream of this monitoring site. Land use at this monitoring site is forest south of the creek, and institutional and commercial north of the creek.

Based on observation and input from Greensboro staff, Town Creek frequently overflows its banks during rainfall events exceeding 2 inches. In general, its banks have been scoured from the volume of water it receives and this will continue unless the volume and/or velocity of water entering the stream is reduced.

The Future Land Use indicates that the upper reach of Town Creek will be primarily residential, transitioning to commercial and industrial in the middle reach, to Major Employment Center above its confluence with Richland Creek. A Major Employment Center is comprised of areas providing a compatible mix of higher intensity commercial development (big box type retail outlets), professional offices (office/business parks), or light industrial uses (warehouse/distribution, research/technology). Higher density, multi-family development may be appropriate within this area provided it is part of a planned development to increase the proximity between housing and employment opportunities.

Based on E. coli monitoring data collected from August 2015 - April 2016, Town Creek is the most contaminated of the impaired streams in the watershed, particularly upstream of MLK Jr., Drive. This stream has been designated as a stream of high concern by the WP. Potential contamination sources of Town Creek include public sewerage system leaks and overflows, urban runoff, and commercial operations in the northern portion of the watershed. Anticipated future land use is a concern due to the increased runoff from the concentration of development and the associated impervious surface.

Land Management Ordinances and Activities

Greensboro and Greene County have several land management ordinances that affect development in the Beaverdam Creek watershed, though only a few affect water quality. They are as follows:

Beaverdam Creek Watershed Land Management Ordinances (2016)		
Ordinance	Responsible Entity	Description
Zoning Ordinance	Greensboro	Establishes standards and permissible uses designed to, in part, improve the quality of life through protection of the city's total environment including air and water. Does not address water quality.
Tree Ordinance	Greensboro	Provides for protection and management of existing trees and planting of new trees. Does not address water quality.
Soil Erosion and Sedimentation Control	Greensboro	Establishes minimum requirements effecting land-disturbing activities. Addresses water quality.
Sewer Use and Discharge Ordinance	Greensboro	Requires and regulates use of public sewer system. Requires improved properties within 500 feet of the sewer system to connect to the public system. Addresses water quality.
Wetlands Protection	Greensboro	Requires permitting for wetlands disturbance. Provides for setbacks. Does not address water quality.

Beaverdam Creek Watershed Land Management Ordinances (2016)		
Zoning Ordinance	Greene County	Establishes standards and permissible uses designed to, in part, conserve and protect the natural, economic and scenic resources of Greene County. Does not address water quality.
Soil Erosion and Sedimentation Control	Greene County	Establishes minimum requirements effecting land-disturbing activities. Addresses water quality.
Flood Damage Prevention	Greene County	Establishes minimum standards for new construction in flood hazard areas to reduce damage from flooding. Does not address water quality.
Wetlands Protection	Greene County	Requires permitting for wetlands disturbance. Provides for setbacks. Does not address water quality.

The perceived negative impact on water quality from recent poultry house development in the watershed has been a source of public concern. To address concerns, the Greene County Board of Commissioners amended the county zoning ordinance on April 6, 2016. The amendment includes a provision for Confined Animal Feeding Operations (CAFO) which previously were not specifically regulated. The amendment recognizes the potential negative impact of CAFOs on water quality and community activities and the potential incompatibility with surrounding land uses. CAFOs are restricted to the A1 zoning district, the most intensive agricultural use district, and permitted only as a conditional use. Requirements include a Comprehensive Nutrient (Waste) Management Plan, a 200 foot buffer between perennial streams and the CAFO, and dead animal disposal within 72 hours in a manner that does not affect ground or surface water.

Zoning

Each of the impaired streams forms a sub-watershed within the larger Beaverdam Creek watershed, the subject of this plan. Zoning in each sub-watershed as of February 2016 is as follows:

- Beaverdam Creek sub-watershed
  - Primarily zoned A1 Agricultural District (Intensive Farming) with pockets of A2 Agricultural-Residential, industrial, commercial, and residential. See Appendix 1, Map 11.
- Richland Creek sub-watershed
  - Primarily zoned A1 Agricultural District (Intensive Farming) in the portion of the sub-watershed located in unincorporated Greene County and a variety of residential, commercial, and industrial zoning in the portion of the sub-watershed located Greensboro. See Appendix 1, Map 12.
- Town Creek sub-watershed
  - Primarily zoned A2 Agricultural Residential with pockets of residential and industrial in the portion of the sub-watershed located in unincorporated Greene County and a variety of residential, commercial, and industrial zoning in the portion of the sub-watershed located in Greensboro. See Appendix 1, Map 13.

Primary sources of likely fecal coliform pollution identified by the WP are leaking public sewerage lines/overflows, agricultural runoff and urban runoff. Due to the results of water quality monitoring associated with this plan's development, addressing the potential public sewerage line leaks/overflows is the priority for Town Creek, agricultural runoff is the priority for Richland Creek, and agricultural runoff and development is the priority for Beaverdam Creek.

The suite of potential structural and non-structural management practices identified to control the above-listed pollutant loadings are:

- agricultural best management practices.
- urban best management practices (individual septic system repair/replacement).
- smoke or dye test the sanitary sewerage system and repair and replacement as needed.
- map, repair, replacement and maintenance to the city's storm sewer system with consideration, long-term, of installation of structures that promote on-site stormwater management.
- streambank restoration.
- Implementation of structural management practices to capture and treat stormwater runoff before it is discharged into streams.

The following screening criteria established by the WP should be used to evaluate the suitability of a potential management practice: (Criteria are listed in descending order of importance).

- Critical Area – Will the management measure be implemented effectively within the identified critical areas in the watershed?
- Load Reduction – Will the management measure provide a significant load reduction?
- Ease of Implementation – Will the implementation of the management measure be easy to undertake (potential legal issues, permits, etc.)
- Maintenance – What level of maintenance is required for the measure to function optimally?
- Cost Effectiveness – Is the practice cost-effective when compared to the impact the measure will have on contamination?
- Unintended Impacts/Added benefits – Are the any unintended impacts or added benefits that result from installation of the management measure?
- Social Acceptance - Will the measure have public support?

Recommended Management Practice Effectiveness

Agriculture

The implementation of systems of BMPs reduces nonpoint source pollution. BMPs are defined as structural, vegetative, or managerial conservation practices which reduce or prevent detachment, transport and delivery of nonpoint source pollutants to surface or ground waters. The BMPs result in fewer nutrients and waste being delivered to the water bodies.

The BMPs in a water quality project must be targeted to priority fields within the watershed. Priority fields are cropland, pastureland or hayland that contribute runoff to adjacent hydrologic systems such as lakes,

streams, ditches, wetlands and flood plains. Additional priority areas are feedlots, water storage systems, and waste management systems. Reporting of specific pollutant load reductions will be calculated for all priority fields and areas where new BMPs are installed; however, a general estimated load reduction is provided below to assist with the suitability evaluation of a management practice.

Table 10: Agricultural Best Management Practices to Address Non-Point Source Pollution

Practice Number	Practice Name	Fecal Coliform	Estimated Load Reduction	Cost*
313	Waste Storage Facility	M	96%	medium - high
316	Animal Mortality Facility	M	Products from composting facilities can be incorporated into the soil and improve agronomic conditions and can also be used a part of a nutrient management plan.	moderate – high
317	Composting Facility	M	70-80%	medium - high
329, 345, 346	Conservation Tillage	M	up to 70%	varies by scope of project
330	Contour Farming	M	25-50%	low
332	Contour Buffer Strip	M	20-75%	low
340	Cover Crop		40-60%	low
342	Critical Area Planting	M	75%	high
359	Waste Treatment Lagoon	M	80%	moderate - high
360	Waste Facility Closure	M	reduces likelihood of residual nutrients entering water.	high – depends on scope of project
365	Anerobic Digester - Ambient Temperature	M	90-99%	high. Requires maintenance.
366	Anaerobic Digester - Controlled Temperature	M	90-99%	high. Requires maintenance.
367	Waste Facility Cover	M	protect integrity and capacity of storage facility and reduce overflow.	high
382	Fence	M	50 - 90% in higher order streams, 99% in second order streams	low
390	Riparian Herbaceous Cover	M	50-75%	low - moderate
391	Riparian Forest Buffer	M	50-75%	moderate
393	Filter Strip	M	50-80%	moderate, maintenance required
472	Access Control	M	50 - 90% in higher order streams, 99% in second order streams	low - moderate

Practice Number	Practice Name	Fecal Coliform	Estimated Load Reduction	Cost*
516	Pipeline - Livestock	M	As part of an alternative water supply or a waste management system, pipelines indirectly reduce negative water quality impacts.	moderate
528	Prescribed Grazing		75%	low
578	Stream Crossing	M	Stream crossings reduce animal access, provide stable traffic paths and reduce the amount of nutrients and sediment entering water.	medium - high. Best to redirect around stream.
586	Field Stripcropping	M	75%	low
590	Nutrient Management	M	35% P, 15% N	low - moderate
606	Tree & Shrub Establishment	M	50%	low - moderate
634	Waste Transfer	M	promote nutrient reduction in soil	moderate
635	Vegetated Treatment Area	M	80 - 90% in feedlots	low
642	Water Well	M	No available information	varies by scope of project

Source: Best Management Practices for Georgia Agriculture, Georgia Soil and Water Conservation Comm., Sept 2013

*For additional information on Practice Number costs, see Appendix II, Georgia FY 2016 EQIP Policy.

Sanitary Sewerage System

Greensboro staff indicates a desire to conduct additional monitoring on Town Creek between Ga Hwy 15 and MLK Jr., Drive in an effort to isolate the potential sewerage leak. Additionally, it is recommended that the city conduct smoke or dye testing of the lines. Based on the results of the smoke test, repair and replace the system as needed.

Individual Septic System

Continue coordination between Greene County Code Enforcement and Greene County Health Department to identify and assist users of septic systems with maintenance issues.

Stormwater System

Several initiatives are needed to address stormwater.

- Map the stormwater system.
- Repair and clean catch basins and pipes, as needed.

- Conduct specific water quality monitoring at outfalls to assess the impact of stormwater on Town Creek's water quality.
- Consider changes to city ordinances to require on-site management of runoff based on outfall water quality monitoring data.

The Greene County Comprehensive Plan identified the goal to conserve and protect environmental and natural resources in unincorporated Greene County and Greensboro. To achieve this goal, the following policies were established:

- Protect public water supply.
- Protect river and lake resources.
- Enforce ordinances.
- Balance development with resource protection.

To further that goal, there are a variety of practices a the county and Greensboro can implement to mitigate the impact of stormwater on water quality. These practices would be particularly beneficial in new development identified on the future land use map.

Typical practices include:

- Permeable pavements

  Permeable paving allows rainwater to percolate through the paving and into the ground before it runs off. This approach reduces stormwater runoff volumes and minimizes the pollutants introduced into storm water runoff from impervious surfaces. Permeable paving is appropriate for pedestrian-only areas and for very low-volume, low-speed areas such as overflow parking areas, residential driveways, alleys, and parking stalls. Depending on design, paving material, soil type, and rainfall, permeable paving can infiltrate as much as 70% to 80% of annual rainfall.[12]

Permeable Pavement (sidewalk)

- Rainwater harvesting

  By retaining stormwater runoff for on-site use, harvesting systems reduce the runoff volumes and pollutant loads entering the stormwater collection system, helping to restore pre-development hydrology and mitigate downstream water quality impacts. The impact of rainwater harvesting on pollutant load reduction varies widely.[13]

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[12] Low Impact Development Toolkit, Metropolitan Area Planning Council, http://www.mapc.org/sites/default/files/LID_Fact_Sheet_-_Permeable_Paving.pdf

[13] Rainwater Harvesting - Conservation, Credit, Codes, and Cost Literature Review and Case Studies, U.S. Environmental Protection Agency, Office of Water, Office of Wetlands, Oceans, and Watersheds, January 2013. http://water.epa.gov/polwaste/nps/upload/rainharvesting.pdf

- Rain gardens

A rain garden is a garden which takes advantage of rainfall and stormwater runoff in its design and plant selection. Usually, it is a small garden which is designed to withstand the extremes of moisture and concentrations of nutrients, particularly Nitrogen and Phosphorus, that are found in stormwater runoff. Rain gardens are ideally sited close to the source of the runoff and serve to slow and treat the stormwater as it travels downhill. The stormwater has more time to infiltrate, which contributes to removal of contaminants, and less opportunity to gain momentum and erosive power.

Rain Garden

- Bioswales

Bioswales are landscape elements designed to remove silt and pollution from surface runoff water. They consist of a swaled drainage course with gently sloped sides (less than six percent) and filled with vegetation, compost and/or riprap. The water's flow path, along with the wide and shallow ditch, is designed to maximize the time water spends in the swale, which aids the trapping of pollutants and silt. Bioswales are commonly used around parking lots. Bioswales can reduce pollutant load by up to 94%.[14]

Bioswale

[14] Testing a Bioswale to Treat and Reduce Parking Lot Runoff, Qingfu Xiao, University of California - Davis and E. Greg McPherson, Center for Urban Forest Research, USDA Forest Service, February 24, 2009.
http://www.fs.fed.us/psw/programs/uesd/uep/products/psw_cufr761_P47ReportLRes_AC.pdf

- Urban tree canopy.

  An American Forests study in 2008 measured the stormwater retention capacity of Montgomery, Alabama's urban tree canopy. The study measured the city's tree canopy at 34% and calculated its stormwater retention capacity at 227 million ft^3. [15]

Streambank Restoration

Streambank stabilization measures work either by reducing the force of flowing water, by increasing the resistance of the bank to erosion, or by some combination of both. Generally speaking, there are four approaches to streambank protection:

- the use of vegetation;
- soil bioengineering;
- the use of rock work in conjunction with plants; and
- conventional bank armoring.

Re-vegetation includes seeding and sodding of grasses, seeding in combination with erosion control fabrics, and the planting of woody vegetation (shrubs and trees). Soil bioengineering systems use woody vegetation installed in specific configurations that offer immediate erosion protection, reinforcement of the soils, and in time a woody vegetative surface cover and root network. The use of rock work in conjunction with plants is a technique which combines vegetation with rock work. Over time, the plants grow and the area appears and functions more naturally. Conventional armoring is a fourth technique which includes the use of rock, known as riprap, to protect eroding streambanks.

These relatively low-cost revegetation measures may suffice if the stream is small, the bed is stable, and banks are not seriously eroded; however, a specific evaluation of the appropriate restoration measures needs to be completed for Town Creek, in particular, but also Richland and Beaverdam Creek where bank erosion is present.

[15] Watershed Forestry Research Guide, A Partnership of the Center for Watershed Protection and the US Forest Service. http://www.forestsforwatersheds.org/urban-tree-canopy/

Public support is a key element in the implementation process. Education is extremely important for increasing public awareness of the water quality problems and offering feasible solutions for remediation and prevention of water quality degradation.

Outreach Goals

The overarching goal of the outreach campaign is to engage agricultural producers, residents, and government agencies in reducing fecal coliform non-point source pollution in the watershed. This will be accomplished by developing and promoting initiatives on water quality issues in the watershed, actions that may be taken to improve water quality, and programs available to assist with water quality improvement projects.

Objectives for education include:

- Educating agricultural producers on non-structural and structural agricultural best management practices that could be implemented.
- Increasing watershed residents and government agencies knowledge on the importance of water quality and controlling non-point source pollution in the Beaverdam Creek watershed for the benefit of its creeks and Lake Oconee.

Goal 1: To educate the general public about the watershed plan and its implementation.

- Post permanent signs along major roads notifying travelers that they are entering the Beaverdam Creek watershed.

- Coordinate with the local 4-H, boys and girl scouts, etc. to hold periodic cleanup events to remove smaller debris from watershed streams and particularly Town Creek.

Goal 2: Educate elected officials and government agencies in the watershed about the watershed plan and its implementation.

- Convene a workshop to provide information on the watershed management plan and its implementation.

Goal 3: Educate agricultural producers and users of individual septic systems in the watershed about watershed issues and solutions.

- Provide information on appropriate agricultural best management practices, their cost and effectiveness in reducing water quality impairment, and available funding assistance programs.

- Provide homeowners utilizing individual septic systems information regarding proper care and maintenance of their system.

Instream monitoring is important to gage the recovery of streams after remediation projects are installed, and is also crucial to support partners as they engage in periodic strategic planning of remediation priorities.

Long-term monitoring associated with this watershed management plan will have the following objective:

- To verify long-term, whether water quality meets GA EPD fishing standards for fecal coliform following implementation of the measures outlined in this plan.

The most intractable sources of variation are likely to be changes over time. Since the primary sources of fecal coliform in the watershed are agricultural runoff, the sanitary sewerage system, and urban runoff, the concentration of fecal coliform will vary seasonally and with variations in precipitation. The most important quality assurance measure will be to sample many times throughout a range of hydrologic conditions.

A long-term monitoring plan for *E.coli* should:

- measure the long-term effectiveness of management practices;
- analyze trends; and
- redefine water quality problems, if any.

Monitoring should be accomplished by Adopt-a-Stream certified personnel under a GAEPD–approved QA/QC Monitoring Plan that follows Adopt-A-Stream methodologies, and focuses, at a minimum, on Town Creek at Martin Luther King Jr. Drive, Richland Creek at Highways 15 and 44, and Beaverdam Creek. This will give a broad picture of water quality conditions in the watershed, a rough assessment of potential pollutant sources, and a general assessment of management measure implementation and effectiveness.

Management Strategies

The basic strategy for implementation of this watershed management plan is to create and manage a program that features both structural and non-structural controls within the watershed to address the fecal coliform issues. The goal of this program is to restore the watershed to the extent that the impaired segment as well as all streams in the watershed meet State water quality standards. Measures that will be utilized to accomplish the goals include increasing installation of agricultural BMPs, repair and replacement of the sanitary sewerage system, mapping and repair, if needed, to the stormwater system, restoring stream banks, implementing practices to mitigate the impact of stormwater on water quality, and available educational opportunities to encourage public and governmental participation in the watershed improvement process. The NRCS and GSWCC will assist with technical advisement with respect to agricultural projects. Other stakeholders, the City of Greensboro, Greensboro, and the Watershed Partnership will make key contributions to other facets of the program, in particular education and outreach.

Management Plan

While inclusion of landowners from the entire watershed will be eligible for any cost-share or grant funded projects, Town Creek above Martin Luther King Jr. Dr, and Richland Creek below Ga Highway 15 have been designated as a priority based on water quality monitoring data. Projects in this portion of the watershed are likely to have the greatest impact on fecal coliform load reduction.

Implementation Plan and Interim Milestones

This Watershed Management Plan anticipates an implementation period of 5 -10 years. However, specific projects may be implemented over shorter periods. This section outlines objectives that apply across the entire implementation process and measurable milestones that should reveal significant progress.

Implementation Plan							
Goal: Improve water quality for the impaired stream segment to reduce fecal coliform loading by a minimum of 20% (short-term) and to meet state water quality standards (long-term).							
Task	Responsible Agency	Cost	Fund Source	Evaluation Measure	Milestone		
					Short	Mid	Long
					(< 2 yrs)	(2-5 yrs)	(>5 yrs)
Objective 1: Establish Watershed Partnership.							
Task 1: Establish bylaws and appoint members to ongoing Watershed Partnership. Charge Partnership with responsibility of working with responsible agencies and public to implement Watershed Management Plan.	Greensboro, Greene County, citizens	NA		Establishment of on-going Watershed Partnership.	√		
Objective 2: Establish long-term monitoring program to provide timely data to support decision making.							
Task 1: Update EPD-approved QA/QC Water Quality Monitoring Plan to provide for post-BMP monitoring for fecal coliform or E. coli.	Oconee River RC&D	$200	319(h) grant funds	GA EPD approval of QA/QC Water Quality Monitoring Plan and number and frequency of sites monitored.	√		

Task	Responsible Agency	Cost	Fund Source	Evaluation Measure	Milestone		
					Short	Mid	Long
					(< 2 yrs)	(2-5 yrs)	(>5 yrs)
Task 2: Conduct ongoing short-term, post-BMP monitoring by AAS-qualified personnel under EPD–approved QA/QC Monitoring Plan.	Oconee River RC&D, Greensboro, Watershed Partnership	$750 annually for supplies.	319(h) grant, City of Greensboro (in-kind labor), Watershed Partnership (in-kind labor).	Monthly E.coli water quality data for up to 7 sites upstream and downstream of installed management practices.	√		
Task 3: Continue monthly monitoring on Town Creek upstream of MLK, Jr. Dr. to potentially isolate suspected sewerage system leak.	Greensboro	minimal	City of Greensboro	Identification of portion of sewerage system potentially leaking.	√		
Task 4: Undertake long-term water quality monitoring by AAS-qualified personnel under EPD-approved QA/QC Monitoring Plan.	Greensboro, Greene County, Watershed Partnership	$0 - 750	Greensboro and Greene County for cost of supplies and analysis, volunteer hours through Watershed Partnership.	Monthly E.coli or fecal coliform water quality data for, at a minimum, Town Creek above MLK Jr. Dr, Richland Creek at Ga Hwy 15 and 44, Beaverdam Creek.		√	√
Objective 3: Implement management practices to reduce E.coli contamination from identified sources.							
Task 1: Review NMP or CMP with agricultural producers to insure that they are being appropriately implemented.	NRCS, GSWCC, Ag. Ext., SWCD	0	Part of organization's responsibilities .	Number of plans reviewed.	√		

Task	Responsible Agency	Cost	Fund Source	Evaluation Measure	Milestone		
					Short	Mid	Long
					(< 2 yrs)	(2-5 yrs)	(>5 yrs)
Task 2: Contact agricultural producers for participation in cost-share programs – target producers in subwatersheds upstream of Richland Creek and Ga Highway 44 and Beaverdam Creek.	RC&D Ag Liaison, NRCS, SWCD, GSWCC, UGA Ag Extension,	$7,000	319(h) grant for Ag Liaison, part of other organization's responsibilities.	Number of producers contacted.	√		
Task 3: Install appropriate agricultural BMPs.	NRCS, SWCD, GSWCC, ORRC&D	Varies by BMP.[16].	316(h) grant, NRCS, GSWCC, FSA, landowner cost-share	Number of installed BMPs; estimated fecal coliform pollutant load reduction of a minimum of 20%.	√	√	
Task 4: Conduct periodic smoke or dye testing of Greensboro's Sanitary Sewerage System and repair/replace as necessary.	City of Greensboro	Varies depending on scope of project.	UP EPA Special Appropriations Project, Georgia SRF, USDA Rural Development, CDBG, GEFA loan, Greensboro	Percentage of repairs completed as identified from smoke or dye testing.	√	√	√

[16]See Appendix II, Georgia FY 2016 EQIP Policy.

Task	Responsible Agency	Cost	Fund Source	Evaluation Measure	Milestone		
					Short	Mid	Long
					(< 2 yrs)	(2-5 yrs)	(>5 yrs)
Task 5: Map storm water system.	City of Greensboro	$6,000 - $10,000	GEFA, 319(h) grant, Greensboro	Completed inventory map of storm water system.		√	
Task 6: Develop report of needed repair/replacement to Storm Water System and prioritize repairs.	City of Greensboro	$2,500 – $5,000	GEFA, local	Completed report.		√	
Task 7: Initiate Repairs to Storm Water System.	City of Greensboro	unknown	GEFA loan	Percentage of repairs/replacements completed annually.		√	√
Task 8: Monitor water quality at selected storm water outfalls.	City of Greensboro	varies by number of sites monitored; Staff time $26.44/hr.	In-house	Number of outfalls monitored and number of water quality samples collected annually.		√	√

Task	Responsible Agency	Cost	Fund Source	Evaluation Measure	Milestone		
					Short	Mid	Long
					(< 2 yrs)	(2-5 yrs)	(>5 yrs)
Task 9: Identify on-site storm water management strategies that could be incorporated into local ordinances to improve water quality.	City of Greensboro, Greene County	Unknown. Depends on identified strategies. Staff time $50/hr; Legal Council $175/hr.	In-house for staff and legal counsel.	Appropriate strategies identified that will lead to improvement in water quality.		√	
Task 10: Provide technical assistance with repair, replacement, and maintenance of individual septic systems.	Greene County Health Department	NA	NA	Percentage of repairs or replacements completed based on number of complaints.	√	√	√
Task 11: Identify and implement practices to manage storm water from governmental properties on-site .	City of Greensboro, Greene County	0	NA	Management practices implemented.	√	√	√
Task 12: Identify practices to manage storm water from private property on-site and incorporated into development ordinances.	City of Greensboro, Greene County	0	NA	Management practices incorporated into development ordinance.	√	√	

Task	Responsible Agency	Cost	Fund Source	Evaluation Measure	Milestone		
					Short	Mid	Long
					(< 2 yrs)	(2-5 yrs)	(>5 yrs)
Task 13: Restore degraded stream buffers and stream banks along Town Creek and portions of Richland Creek.	City of Greensboro, Greene County	Varies by scope of project.[17]	local	Restoration of stream buffers and stream banks.	√	√	√
Objective 4: Develop and conduct educational outreach.							
Task 1: Install watershed signage at watershed boundaries on the following roads: Penfield Rd., Ga Hwy 15, US 278, I-20, Ga Hwy 44, and Old Sparta Road.	City of Greensboro, City of Siloam Greene County	$60/sign (Sign produced by Prison Bureau)	local	A minimum of nine signs installed.	√		

[17] While cost for each individual project will vary, a representative cost is provide based on a riparian restoration and streambank stabilization project in Rabun County, GA. Total cost: $28,626. Cost includes use of heavy equipment, professionals, and volunteers.

- Stream bank restoration: 1; approximately 100 feet.
- Stream bank stabilization: 1; approximately 1,320 linear feet
- Riparian area restoration (and non-native vegetation eradication): Approximately 66,000 square feet
- Design & construction by Confluence Engineering
- Per permits issued by the Army Corps of Engineers and the GA EPD's Erosion & Sedimentation Control Unit

Task	Responsible Agency	Cost	Fund Source	Evaluation Measure	Milestone		
					Short	Mid	Long
					(< 2 yrs)	(2-5 yrs)	(>5 yrs)
Task 2: Develop and hold workshop for elected officials and government agencies to inform of content of Beaverdam Creek Watershed Management Plan and its implementation.	City of Greensboro, Greene County, Watershed Partnership	$1,500	US EPA Environmental Education (EE) grant	Number of attendees.	√		
Task 3: Hold annual river cleanup events.	City of Greensboro, Greene County, Watershed Partnership	$250 - 1,000 depending on volume of trash collected.	River's Alive, Ag. Extension, City of Greensboro, Greene County, Georgia Power	Number of participants and amount of trash collected.	√	√	√
Task 4: Convene, at a minimum, bi-annual Adopt-A-Stream water quality monitoring training event.	City of Greensboro, Greene County, Georgia Adopt-a-Stream, Watershed Partnership	0	GA EPD provide training at no cost.	Number of participants and number of certifications.	√	√	√

Indicators to Measure Progress

Targeted water quality monitoring is necessary to measure long-term progress of installed practices. Monitoring must take place under a GA EPD-approved QA/QC Monitoring Plan. Monthly monitoring will occur at Town Creek at MLK Jr. Drive, Richland Creek at Ga Highways 15 and 44, and Beaverdam Creek to provide current data and to evaluate water quality improvements in the Beaverdam Creek watershed.

For more finite objectives, the Evaluation Measure associated with each task in the Implementation Plan will reveal progress that the implementation program is gaining momentum. Referencing these should provide an indication of specific tasks needing more focus. Eligible producer participation rates will be another useful tool in determining the success of grant implementation. Education and outreach participation rates will also be analyzed to help measure progress.

Indicators identified by the WP to measure the status of the watershed management process and educational outreach outlined in this Plan are:

Type of Indicator	Specific Indicator
Environmental	E.coli bacteria - Direct water quality measurement of Beaverdam Creek, Richland Creek, and Town Creek.
Environmental	E. coli bacteria - Direct water quality measurement of storm water outfalls.
Programmatic	Number of urban and agricultural best management practices implemented.
Programmatic	Number of educational initiatives accomplished and number of participants.
Programmatic	Number of river cleanup events.
Social	Participation rate in non-point source education outreach programs.

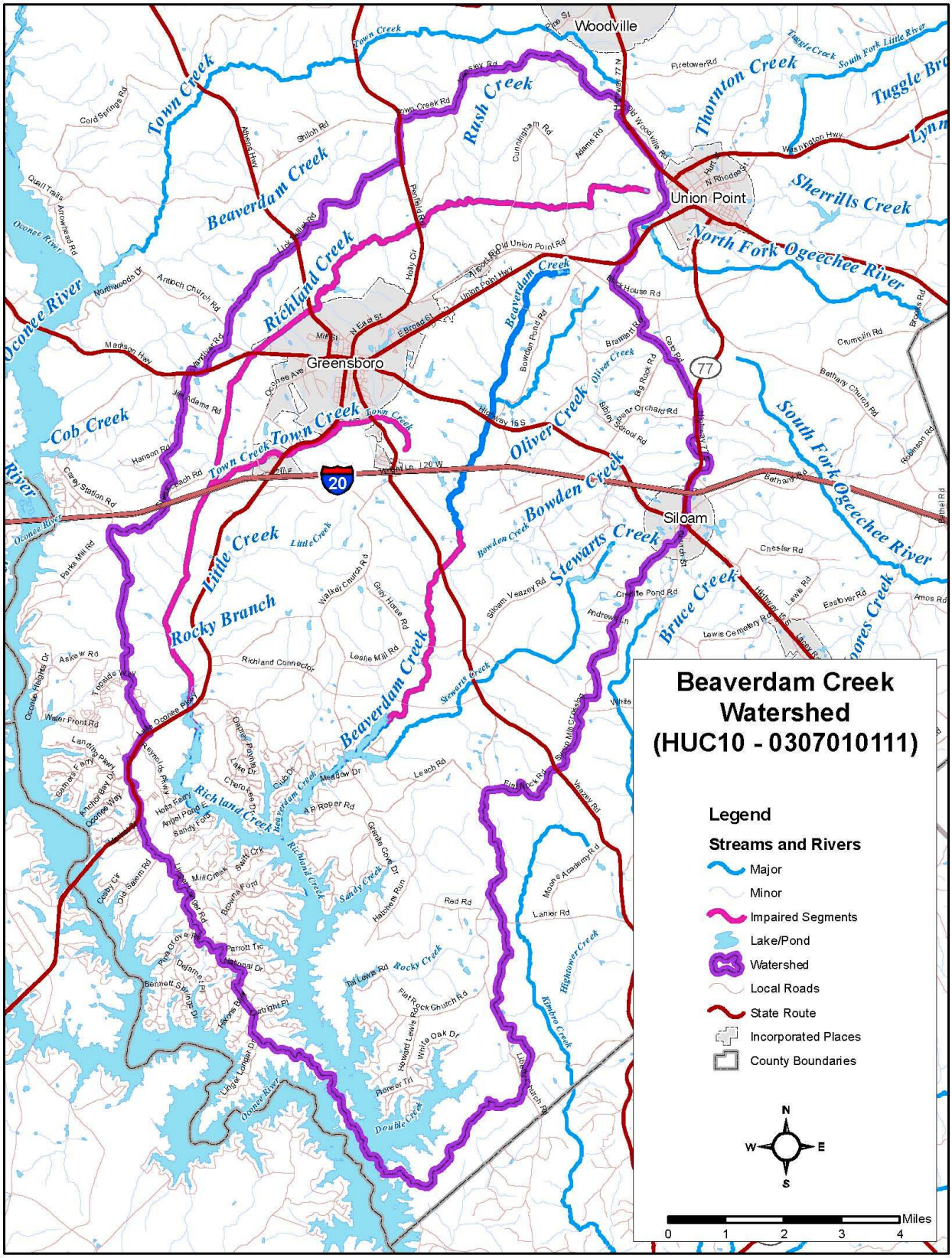
Of greatest importance, is the measure of how the various implementation projects have translated towards accomplishing the goal of attaining State water quality standards. Tracking the watershed management plan and its water quality improvements will best indicate progress toward reducing fecal contamination.

At a minimum of every two years, assessment of the implementation schedule and review of accomplishments are necessary to determine whether task milestones are being met.

Long-term Plan Implementation

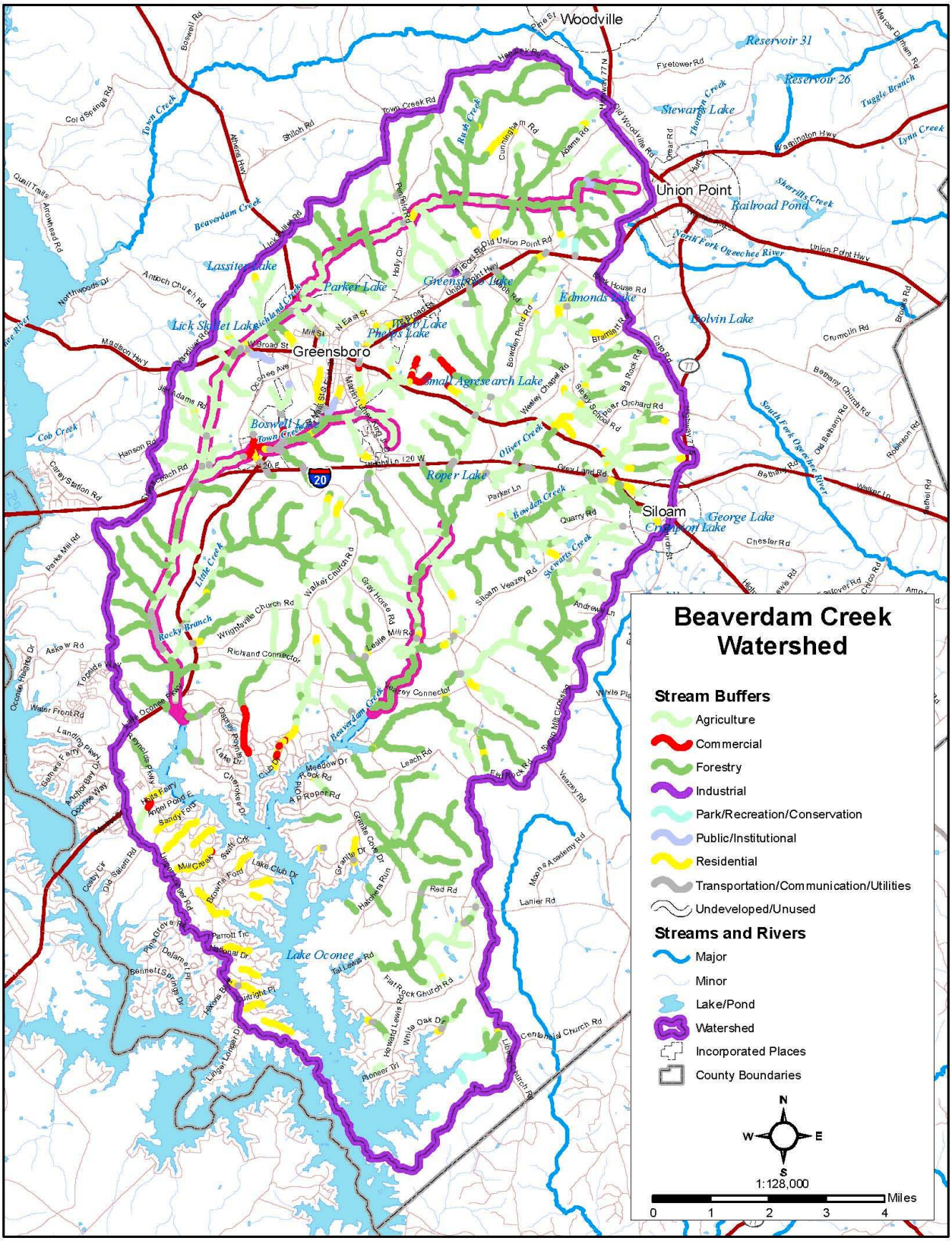
NRCS, GSWCC, UGA Ag. Extension, and SWCD will continue to assist agricultural producers with BMP installation through their respective agency programs. However, funding for other plan implementation activities must be secured through grants, loans, or governmental agencies. Continued plan implementation will be dependent on available funding.

Map 1: Beaverdam Creek Watershed

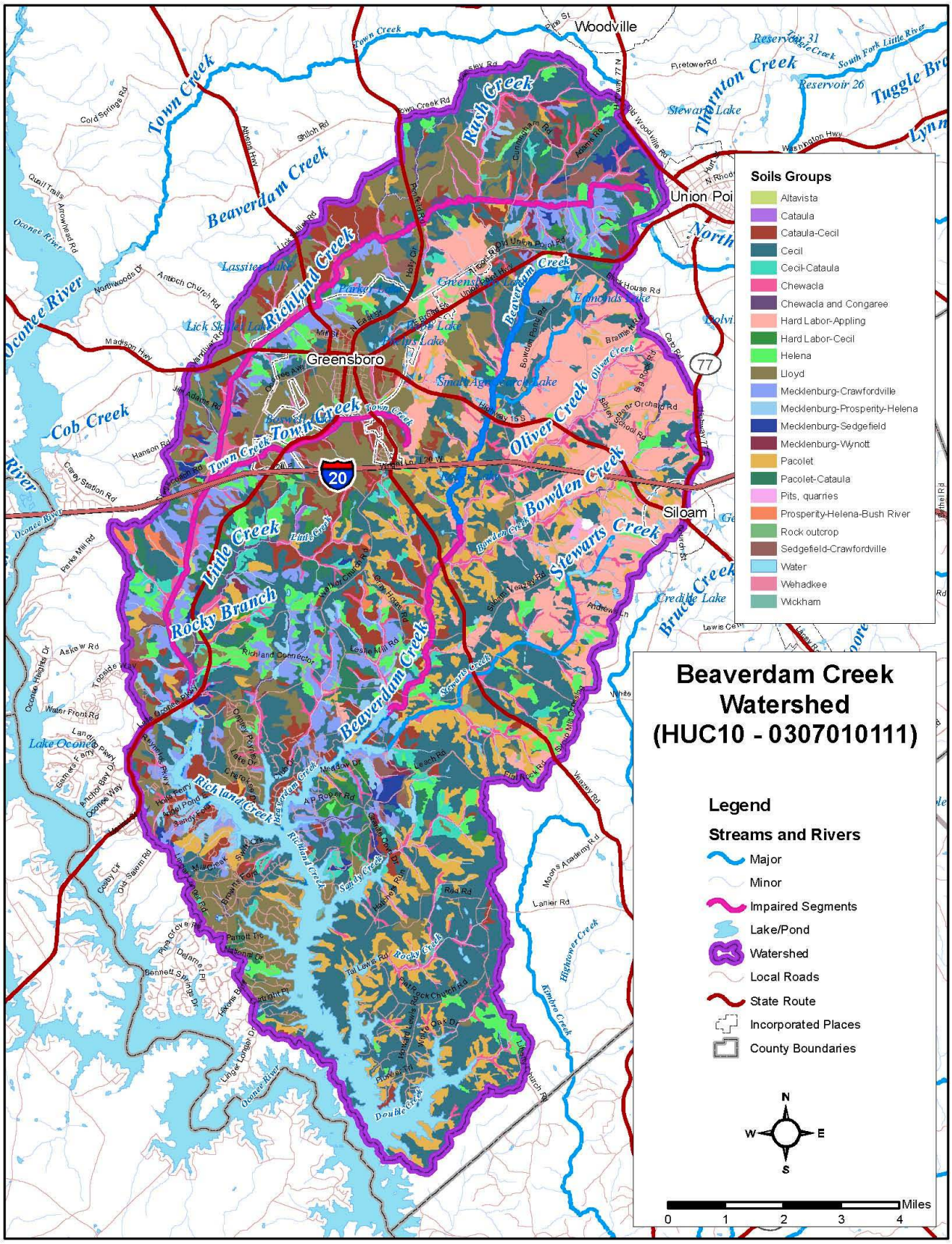


Source: Georgia GIS Data Clearinghouse – Originator, USGS 2000.

Map 2: Stream Buffers

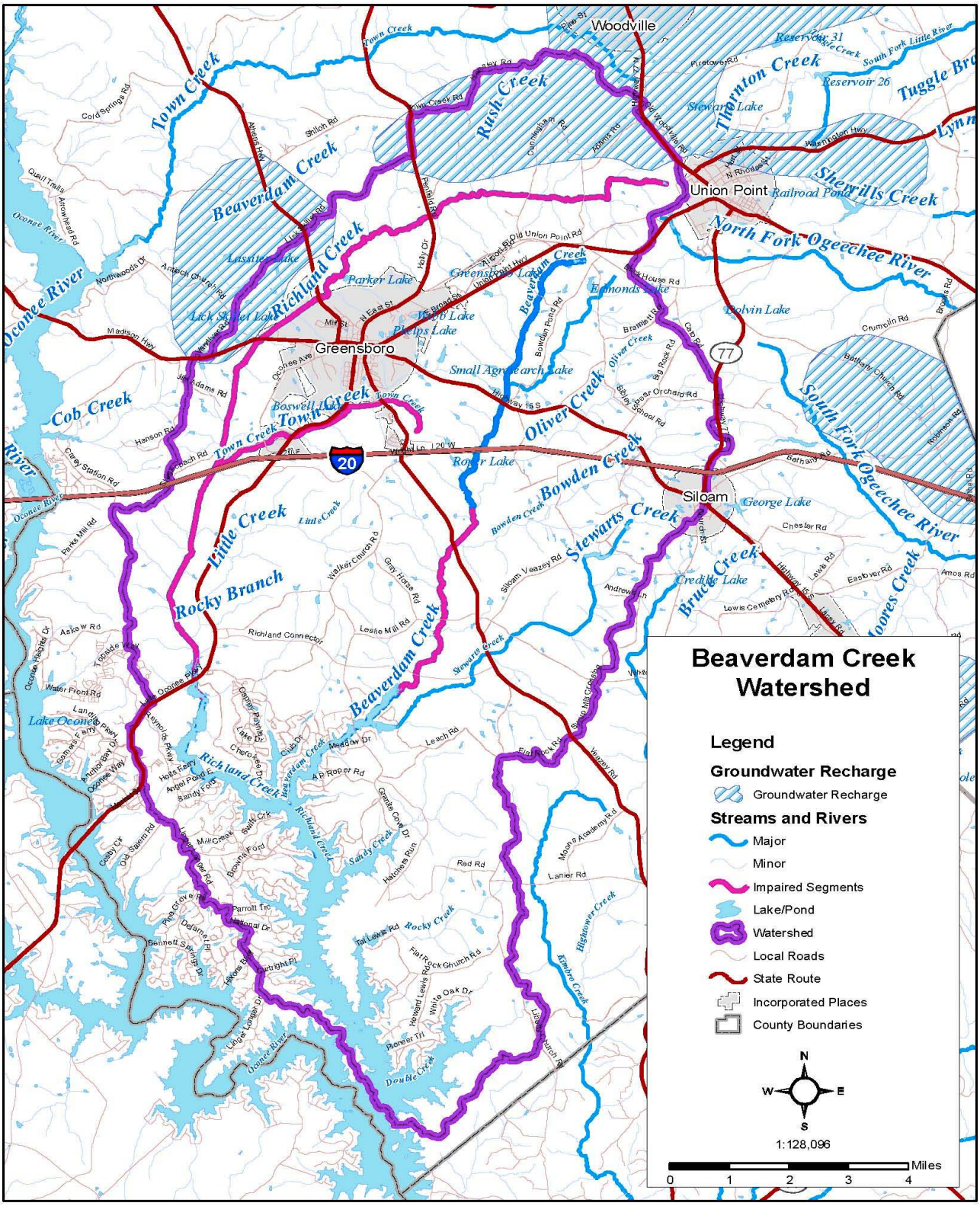


Source: Georgia GIS Data Clearinghouse, Originator, State Based Map of Georgia 2000, updated 2001.



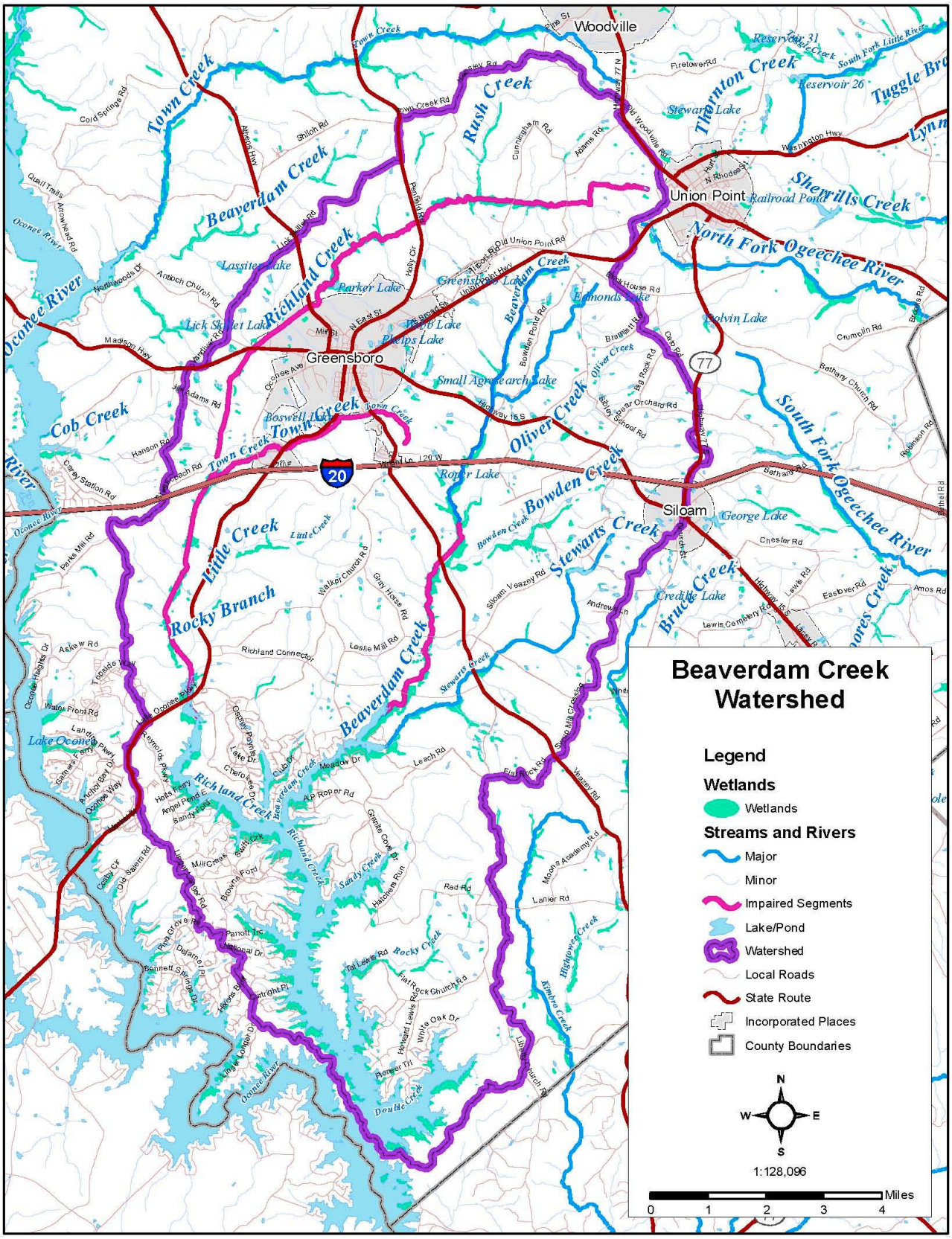
Geospatial Data Gateway, Originator: U.S. Department of Agriculture, Natural Resources Conservation Service, 2013.

Map 3: Soils
Map 4: Groundwater Recharge Area



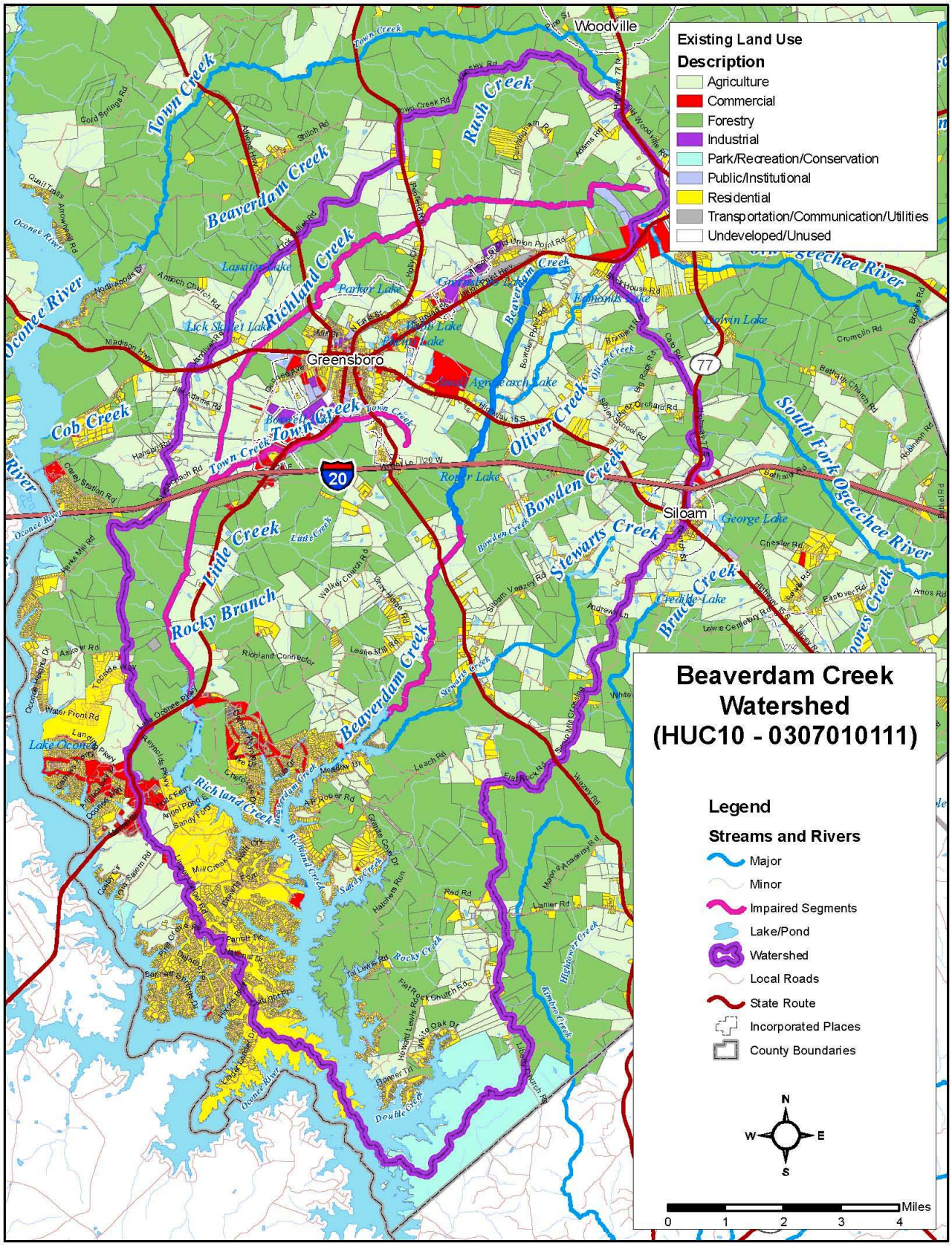
Source: Georgia Hydrologic Atlas Number 20.

Map 5: Wetlands



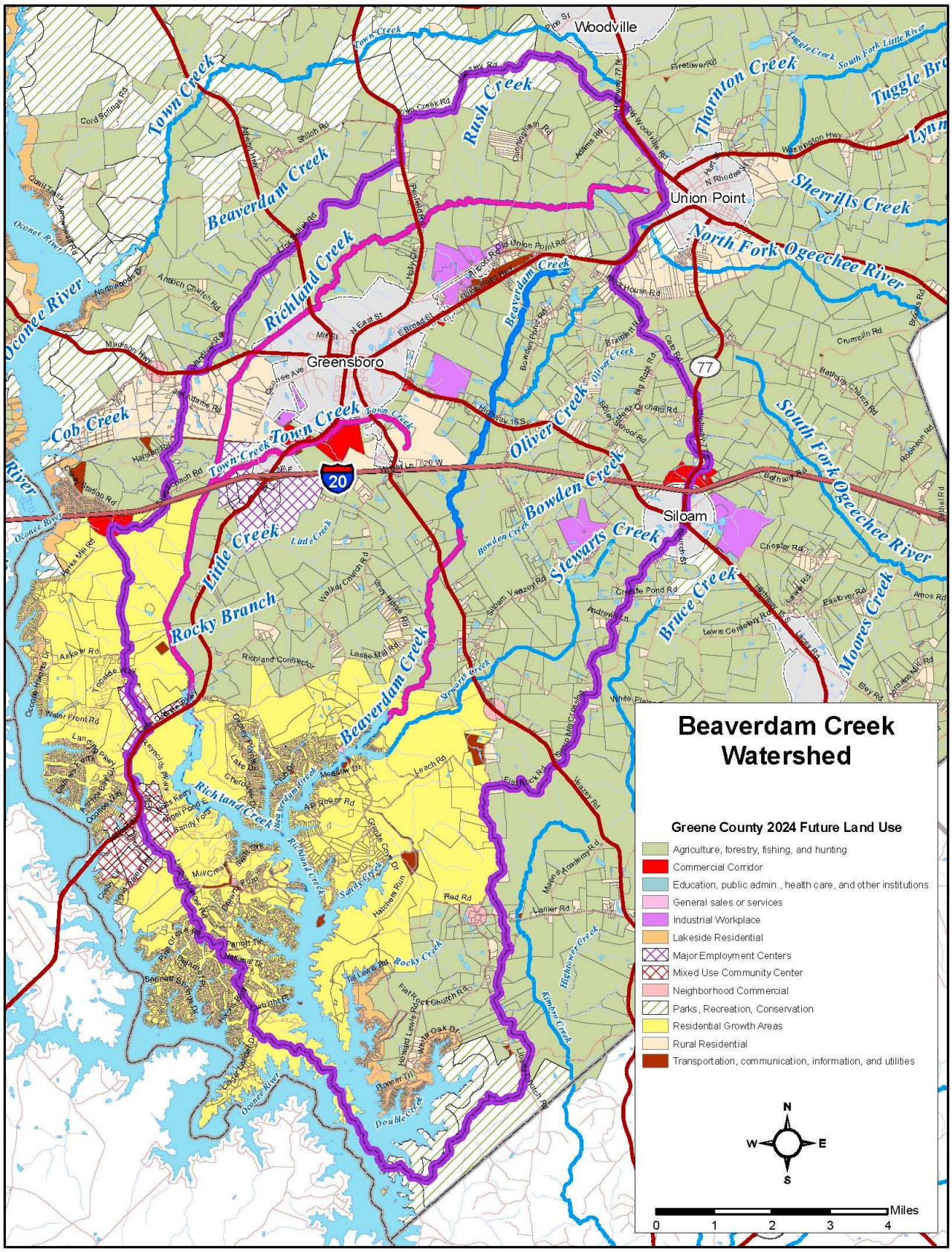
Source: National Wetlands Inventory

Map 6: Existing Land Use



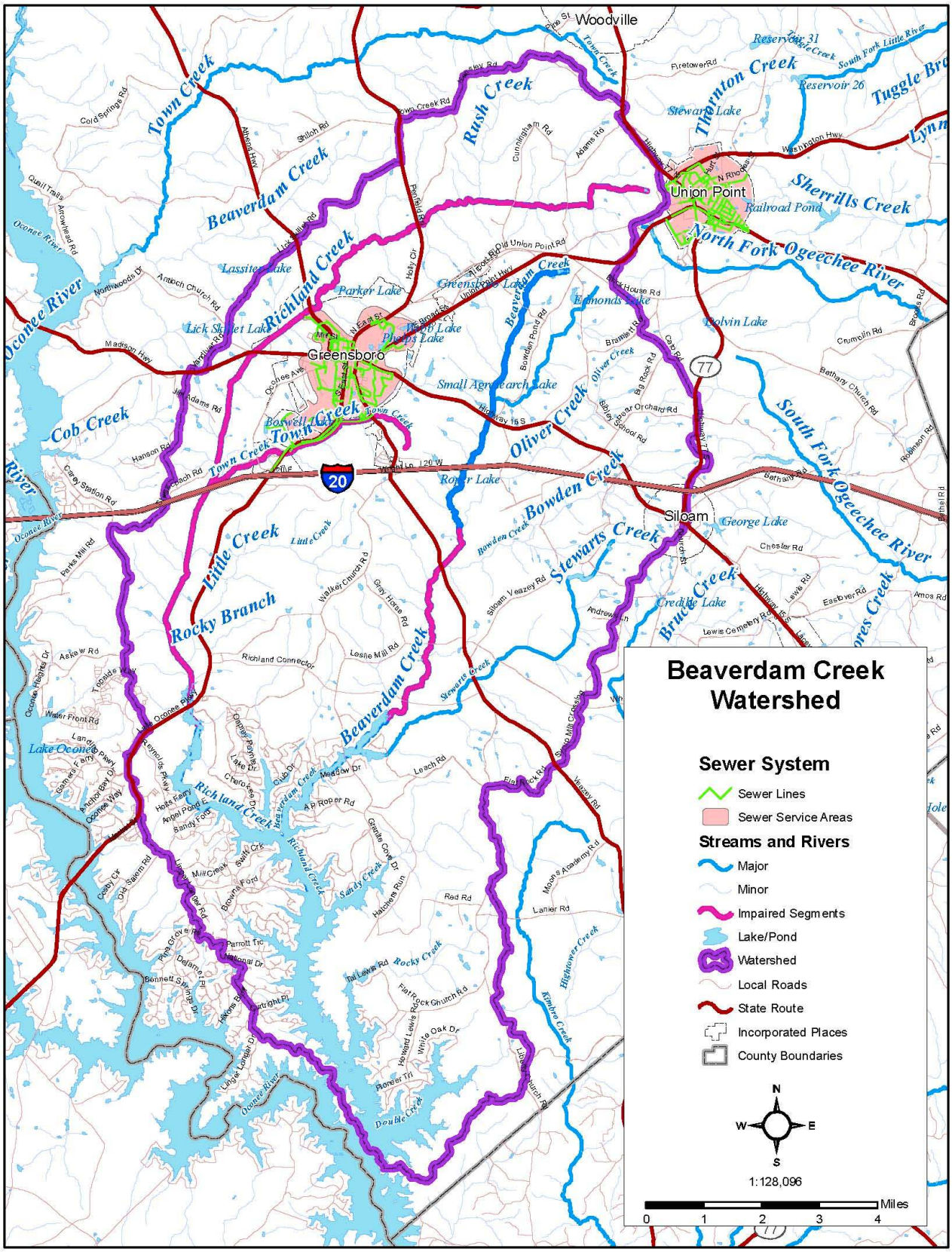
Source: Greene County GIS, 2015.

Map 7: Future Land Use



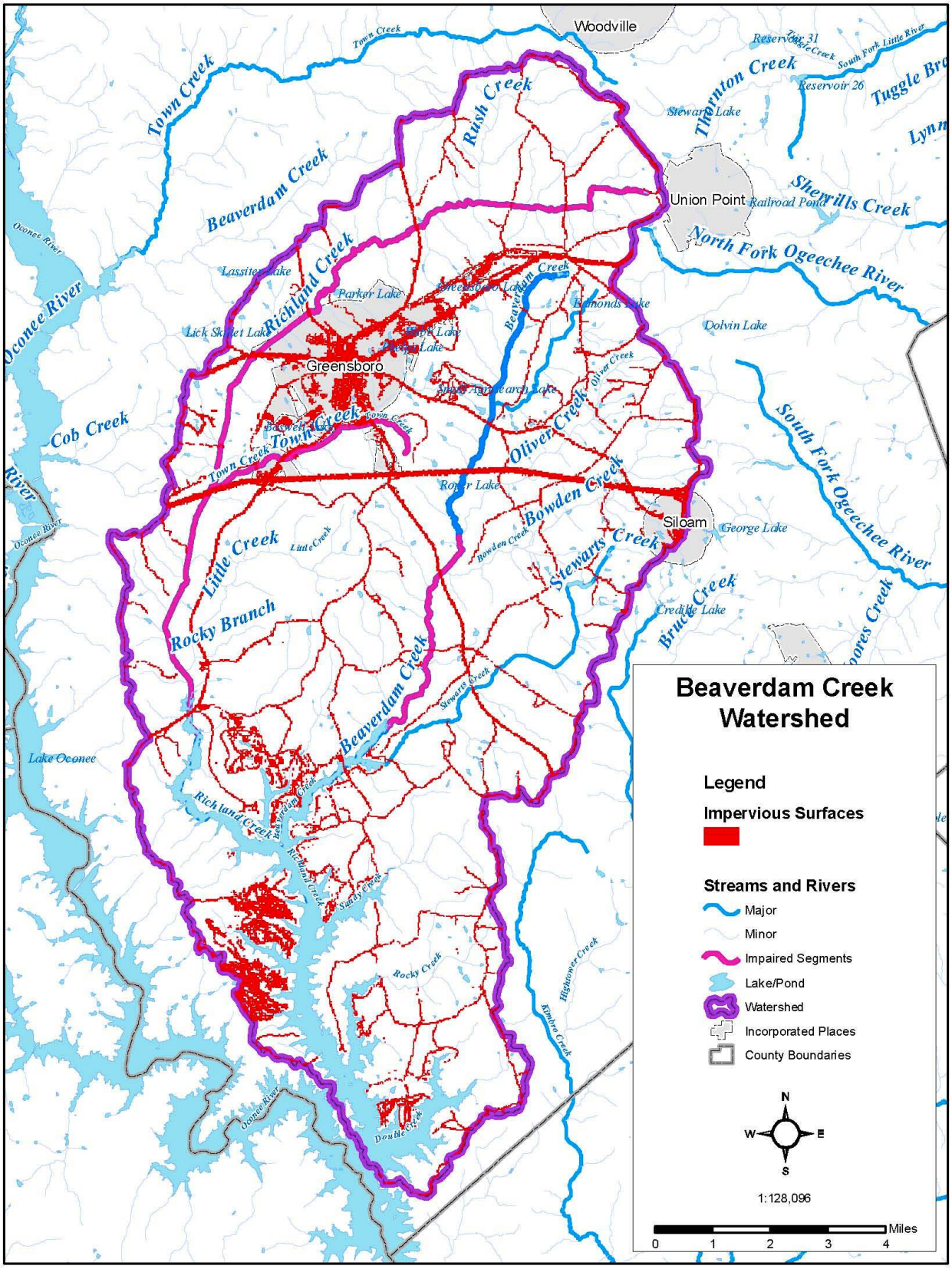
Source: Greene County GIS, 2015

Map 8: Sewerage Service Area



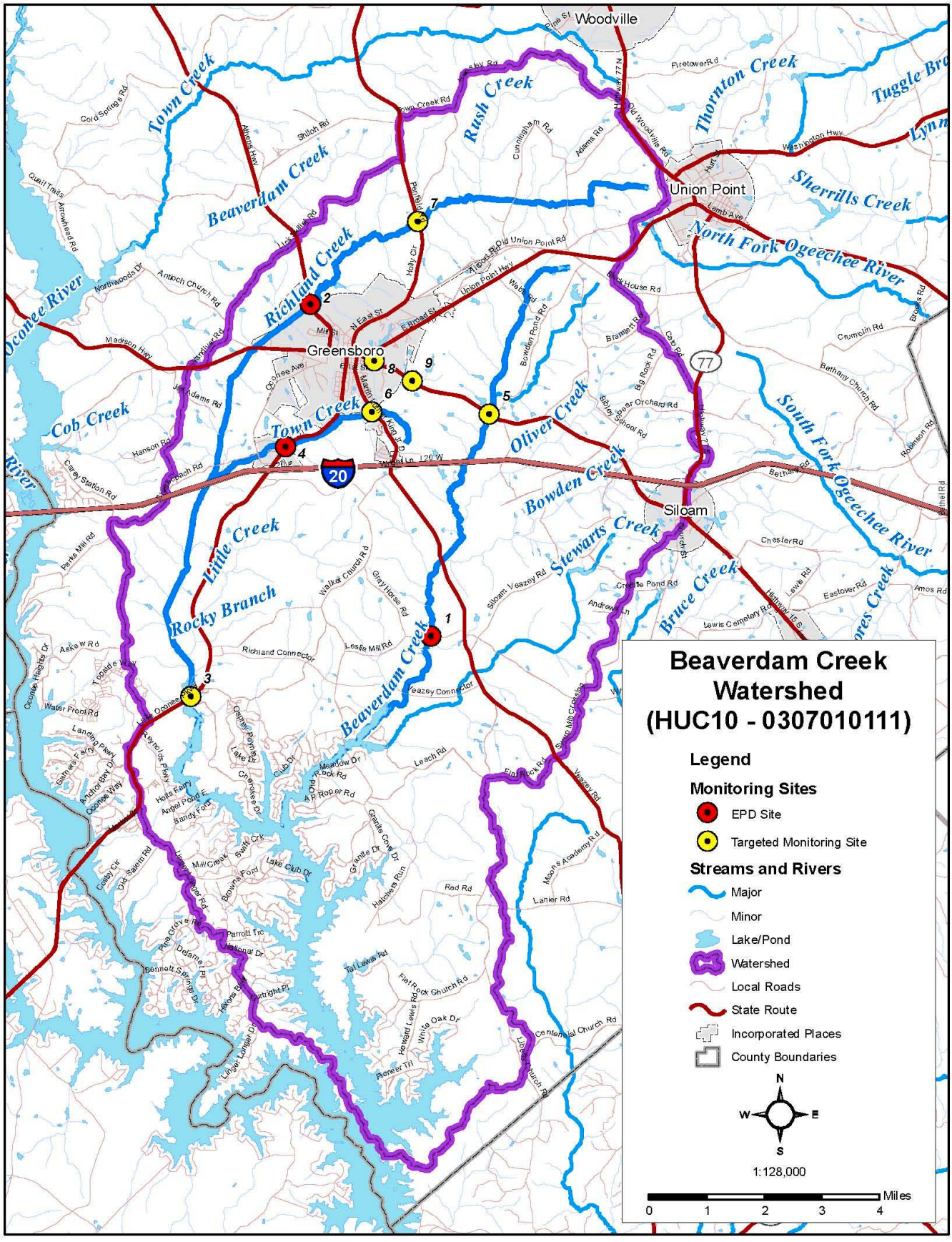
Source: Greene County GIS, 2015

Map 9: Impervious Surface

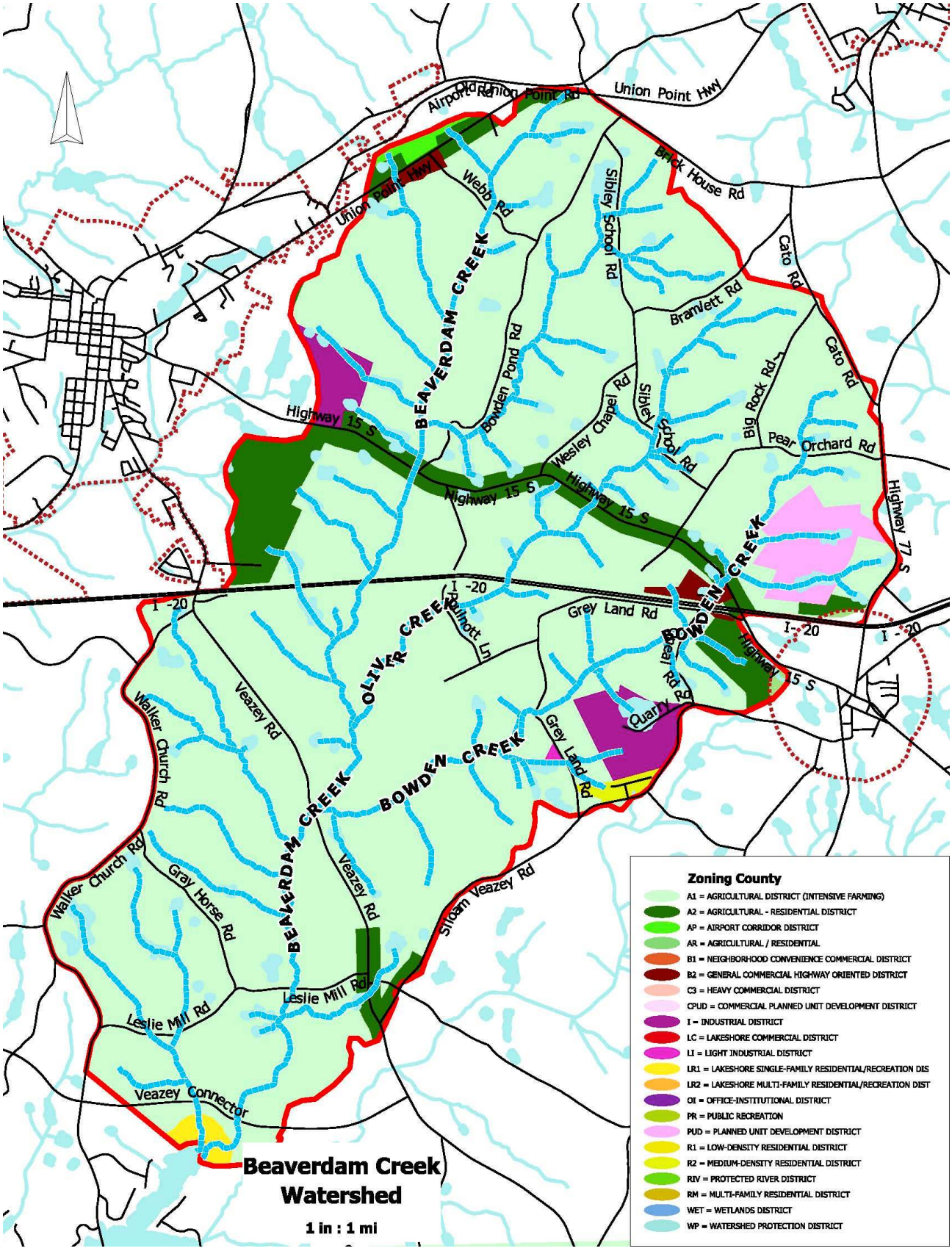


Source: Geospatial Data Gateway, Originator - USDA, NRCS, 2013.

Map 10: Monitoring Sites

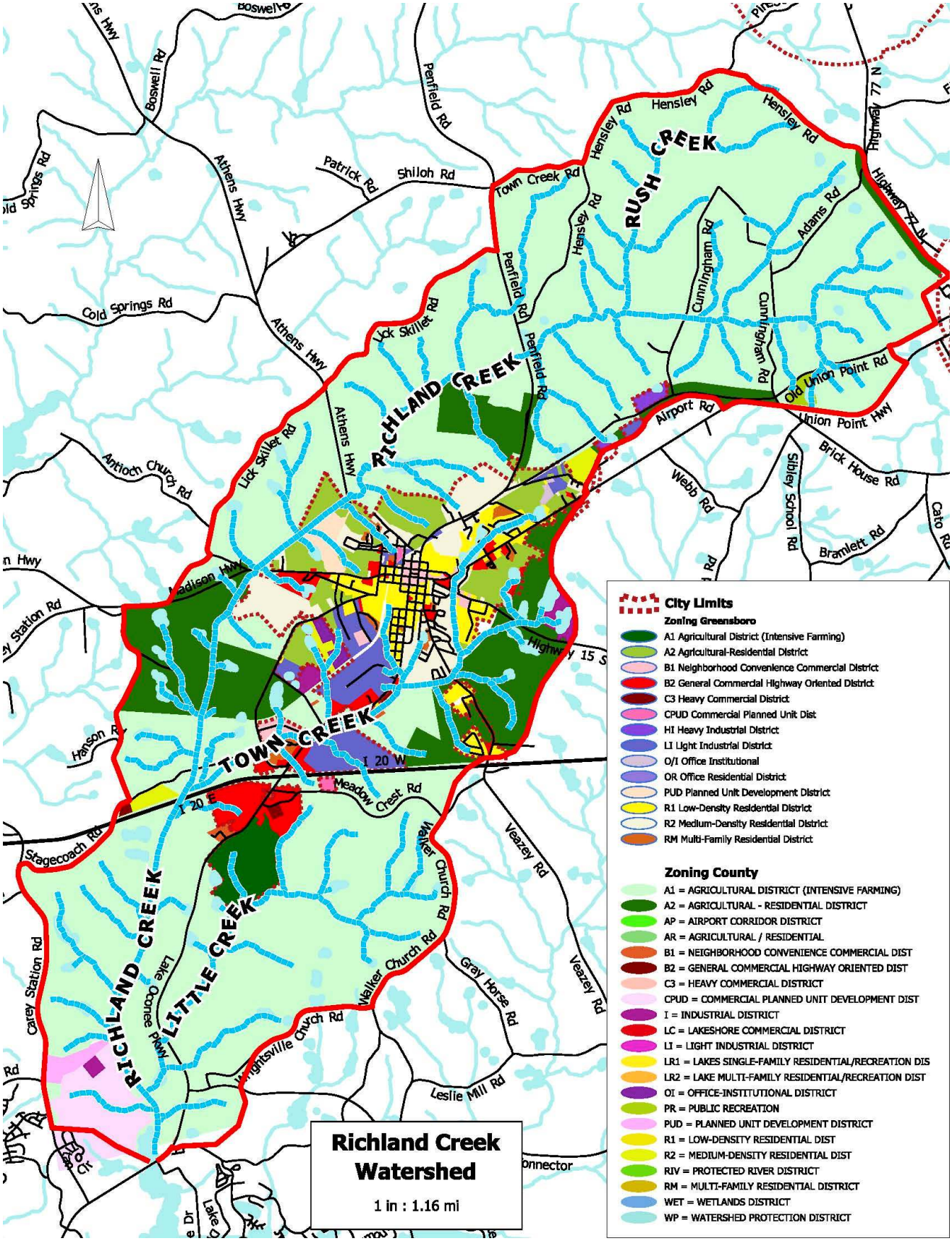


Map 11: Zoning, Beaverdam Creek sub-watershed



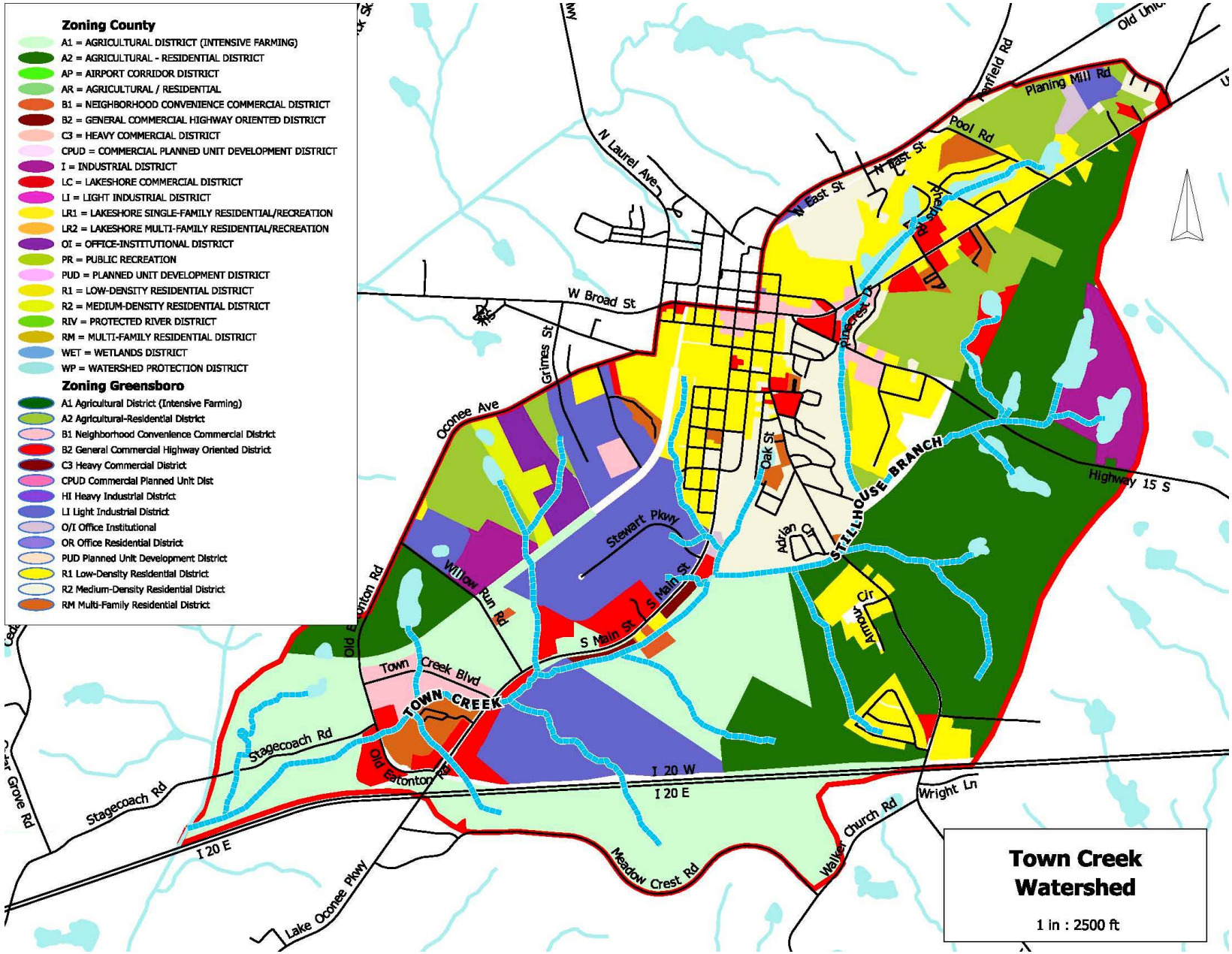
Source: Greene County GIS, 2016.

Map 12: Zoning, Richland Creek sub-watershed



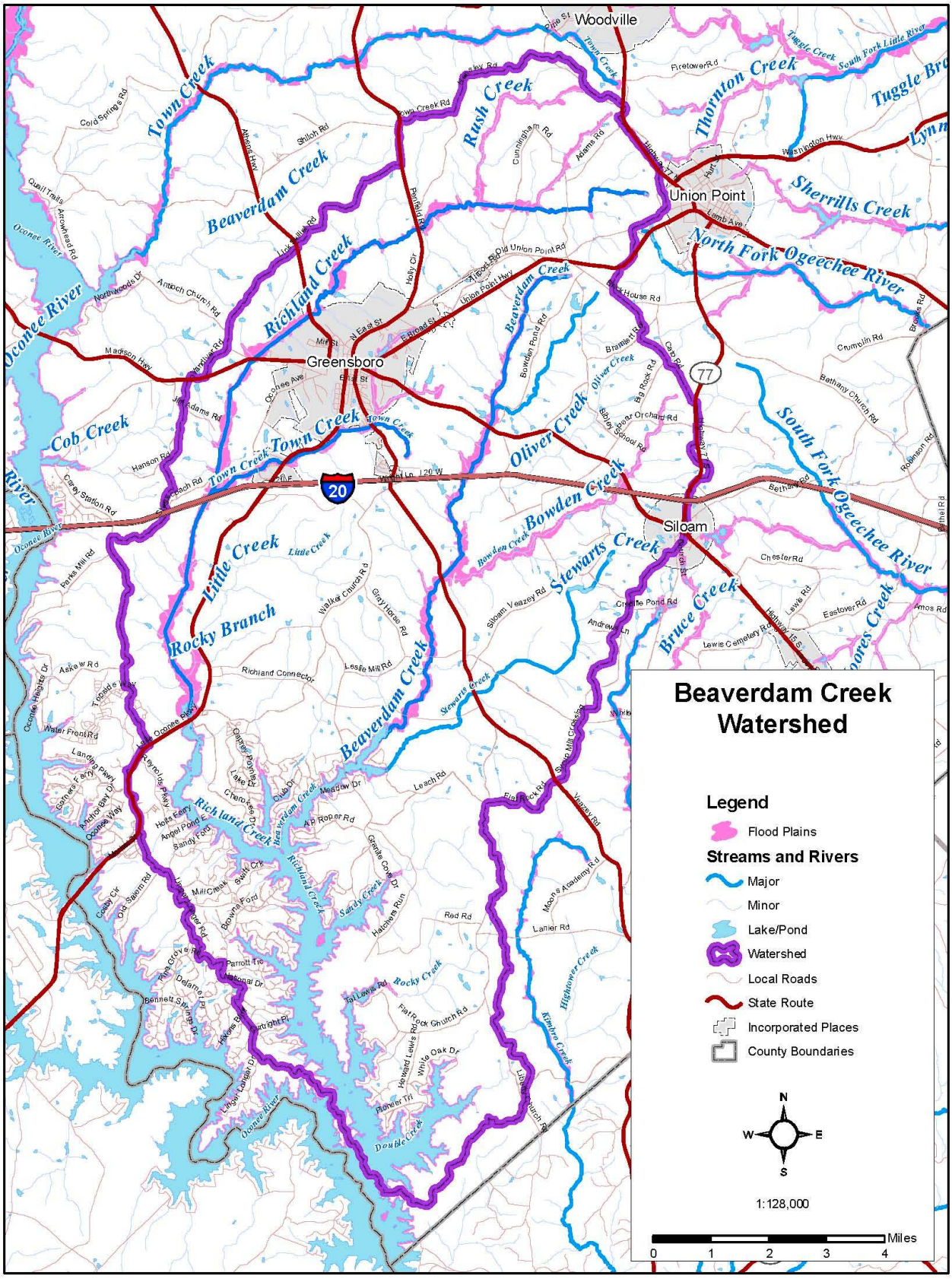
Source: Greene County GIS, 2016.

Map 13: Zoning, Town Creek sub-watershed



Source: Greene County GIS, 2016.

Map 14: Flood Hazard Areas



Source: Geospatial Data Gateway, Originator – Federal Emergency Management Agency, 2008.

Last Name	First Name	Affiliation
Beeler	Craig	Resident & Farmer
Brinkley	Steve	City Greensboro
Bruno	Al	Pristine Pastures
Bruno	Marie	Pristine Pastures
Burke	Brenda	City of Greensboro Public Works
Cash	Robbie	Greene County Building and Zoning
Cathy	Tommy	Piedmont Poultry Producers Association
Collier	BJ	Resident
Crouse	John	Harbor Club
Daniel	David	Greene County Extension Service
Davis	Susan	Georgia Power Company
Deering	Angela	Greene Co. Board of Commissioners
Dennis	Bernice	Resident
Durham	Joe	Forester-Landowner
Dyar	Andy	GA Soil and Water Conservation Commission
Eaddy	Cliff	Natural Resource Conservation Service
Eley	Larry	Piedmont Soil & Water District
Haslbauer	Anna	Lake Oconee Property Owners' Assoc.
Hendricks	Scott	Georgia Power Company
Johnson	Linda	Greene Co. Citizen
Lombard	Byron	Greene County
Nesbit	Joseph	Resident
O'Neal	T.J.	Natural Resource Conservation Service
Pearson	Janet	Lake Oconee Water Watch
Postell	Larry	City of Greensboro
Reed	Les	Save Lake Oconee's Waters
Rhodes	C. L.	City of Siloam
Rhodes	Lee	Greene-Morgan Forest Landowners Assoc.
Schneider	Dick	Greene County Chamber of Commerce
Slaughter	Joe	Georgia Power Company
Smith	Jeffery	Greene County Board of Commissioners
Stephens	David	City of Union Point
Thorn	Alan	Resident
Thorn	Patricia	Resident
Tietjen	William	Lake Oconee Water Watch
Wagner	Warren	GA Power
Ward	Hilliard	City of Greensboro
Webb	Barbara	Resident
Yon	Sylbre	Lake Oconee Water Watch

PIEDMONT WATER COMPANY

CAREY STATION WRF (GAJ03 – 0883)
OCONEE CROSSING WRF (GAJ03 – 0632)

LAND APPLICATION OF SEWAGE SLUDGE

SLUDGE MANAGEMENT PLAN

PROGRAM OVERVIEW

General

Piedmont Water Company (PWC) owns and operates the Carey Station WRF and the Oconee Crossing WRF which are each advanced wastewater treatment reuse facilities permitted with the Georgia Department of Natural Resources Environmental Protection Division. The Carey Station WRF is located at 4610 Carey Station Road, Greensboro, Georgia in Greene County and the Oconee Crossing WRF is located at 165 McGillivray Lane, Eatonton, Georgia in Putnam County.

The Carey Station Facility's treatment train consists of screening, vertical loop aeration reactors, clarifiers, filtration, U.V. Disinfection and aerobic sludge digestion. The Carey Station facility is permitted for 0.5 MGD. The Oconee Crossing Facility's treatment train consists of screening, Orbal aeration basins, clarifiers, filtration, U.V. Disinfection and aerobic sludge digestion. The Oconee Crossing facility is also permitted for 0.5 MGD.

In 2009, PWC contracted with Alliance Environmental Solutions (AES) of Roswell, Georgia to permit and operate an agronomic land application program to beneficially land apply the biosolids generated by the Carey Station and Oconee Crossing WRF facilities. A Sludge Management Plan was submitted and approved by the Georgia EPD in 2009 for land application of each of the WRF's biosolids at Copeland Farms which is located along Lake Oconee Parkway (State Route 44) in Greensboro, Georgia. AES administered the Sludge Management Plan from 2009 until February, 2012 in which time, Piedmont Water Company took over operation of the Plan and now administers the Sludge Management Plan themselves. Piedmont Water Company will continue to administer their Sludge Management Plan in the future.

Typical operations consist of removing liquid sludge from the facility's digesters into a 3000 gallon tanker truck and transporting and land applying the sludge at Copeland Farms. The approved land application site consists of approximately 154 acres of farmland which is divided into four (4) separate fields. Liquid sludge is applied at or below agronomic rates for the liquid biosolids generated at both facilities.

Land Application Management Program

The approved Biosolids Land Application Management Plan for the Oconee Crossing WRF and Carey Station WRF require that the biosolids generated at the facilities be beneficially recycled by land application to the permitted farm site. The biosolids are land applied as an agricultural resource at or below agronomic rates. The biosolids are applied to the hay and pasture land for total or partial replacement of commercial nitrogen (N) and phosphorus (P). The actual amount of biosolids applied is dependent upon the nutrient requirement of the specific crop being grown and the nutrient content of the biosolids.

Biosolids application scheduling is dependent upon biosolids production and the crop management plan. Hay production fields are applied in split applications as are normally done when commercial fertilizers are applied. These applications will occur prior to grass growth in the spring, after each cutting in the growing season or; whenever most appropriate. Application fields will receive biosolids in an agronomic manner and in accordance with the conditions of the letter of authorization and permit issued by the Georgia Environmental Protection Division. Nitrogen loading rates will be the limiting nutrient determining the agronomic application rates. An acceptable pH will be maintained in the soil, biosolids and lime mixture equal to or greater than 6.5 on all application sites with mineral soils.

Prior to an application event, an application rate is determined based on a current biosolids nutrient analysis. A nutrient analysis is obtained by collecting representative biosolids samples from the material to be land applied, compositing the samples and submitting the composite sample to a lab familiar with biosolids analysis. The composite sample is analyzed for requirements set forth by 40 CFR Part 503. Plant available nitrogen (PAN) is calculated from this biosolids analysis and the application rate is determined if the amount passes the two dry tons per acre threshold per calendar year.

Once the appropriate rate is calculated, the biosolids are removed from the WRF(s) and transported to the permitted application sites in an appropriate leak proof transport vehicle. The transport vehicle will travel major routes to application fields where possible. Upon arrival at the field, the transport vehicle will land apply the biosolids directly from the transport vehicle. During this operation, the biosolids applicator will operate in a manner to obtain an even application consistent with agricultural requirements.

At the start of each work day, the driver shall inspect the fields in use for that day. He will identify the permit required buffer zones for that day and will adhere to these restricted areas at all times. Transport and application equipment will only enter a field when conditions are appropriate for application. Biosolids will only be applied when the field is capable of supporting the equipment. When field conditions are not appropriate for an application, such as during wet periods, the biosolids will remain at the WRF(s) until field conditions are suitable.

Buffer Zones			
Land Application of Sewage Sludge Shall Not Occur within the following buffer zones:			
	Minimum Distance(ft) to Land Application Area		
Adjacent Features	**Surface Application**	**Incorporation**	**Winter**
Occupied Dwellings	300	150	300
Water Supply Wells & Springs	500	250	500
Property Lines	100	50	100
Perennial Streams and Other Surface Waters Except Intermittent Streams	100	35	100
Intermittent Streams/Drainage Ditches	25	25	50
All Improved Roadways	10	5	10
Rock Outcrops and Sinkholes	25	25	25
Agricultural Drainage Ditches w/ Slopes ≤ 2%	10	5	10

Application Rates

The biosolids application rate is based on the plant available nitrogen (PAN) requirement for the crop and the PAN content of the biosolids. The PAN requirement is based on grass and hay crops for Copeland Farms which has a nitrogen requirement of 200 lb N/acre/year and from the by local agricultural extension agents and information provided with each soil test.

The PAN content of the biosolids will be based on the analysis of the material for its total Kjeldahl nitrogen (TKN), ammonium-nitrogen (NH_4-N), nitrate/nitrite ($N0_3$-N), nitrite-nitrogen (NO_2-N) content and the mineralization rate of the organic nitrogen into inorganic nitrogen. Most of the nitrogen in the biosolids is in organic form. As the biosolids are incorporated into the soil, the soil microorganisms utilize the biosolids as an energy and nutrient source. In the process, a portion of the organic nitrogen is mineralized or biologically converted into inorganic nitrogen.

Various environmental factors such as temperature, moisture and carbon to nitrogen ratio affect the mineralization rate. Typical mineralization rates range from 10 to 40 percent. A mineralization rate of 30 percent is used for both the Carey Station WRF and the Oconee Crossing since all biosolids are aerobically digested.

The calculated PAN application rate varies according to the method of application. When biosolids are surface applied, as with this application, a large portion of the NH_3 gas is volatized and is lost as a nutrient for crop uptake. As a result, the actual PAN content of the biosolids is less when the biosolids are surface applied as compared to when they are injected into the soil. To reflect the lower PAN content for surface applied biosolids due to

volatilization of NH_3 gas, the calculation used to determine he PAN for surface applied biosolids verses injected biosolids reduces the NH4-N content of the material by 50 percent.

Biosolids Characteristics

The specific nutrient and metals content of the biosolids to be land applied are presented in the enclosed sludge analysis for each facility. The biosolids characteristics for both facilities are typical of other similar aerobically digested municipal biosolids.

Biosolids and Soil Monitoring Plan

Both the biosolids and application sites soils will be sampled at specific intervals to assure the beneficial utilization of the material for agricultural production and to confirm that the application program is not creating any environmental hazard.

Biosolids Monitoring:

Based on the annual volume of the biosolids generated and the monitoring frequency requirements for pollutants, pathogen densities, and vector attraction for Class B biosolids as promulgated by the 40 CFR 503 regulations; biosolids are monitored at both WRF's once per year based on volume. Annual biosolids analysis is conducted by a qualified laboratory familiar with biosolids analysis. The biosolids analysis will be conducted in conjunction of the requirements stated in 40 CFR 503.

Soil Monitoring:

Initial soil sample were taken and analyzed for all fields that were permitted and included with the initial permit application. Each soil sample collected and analyzed consisted of a composite of multiple individual samples taken from the upper 8-inches of a specifically designated field.

Additional soil sampling consists of composite sampling and analysis on an annual basis on each field where an application event has been conducted during the calendar year. Soil samples are analyzed for routine soil fertility and lime requirements. Soil samples are taken in the end of the year to reflect the full year of land application events.

Record Keeping and Reporting Plan

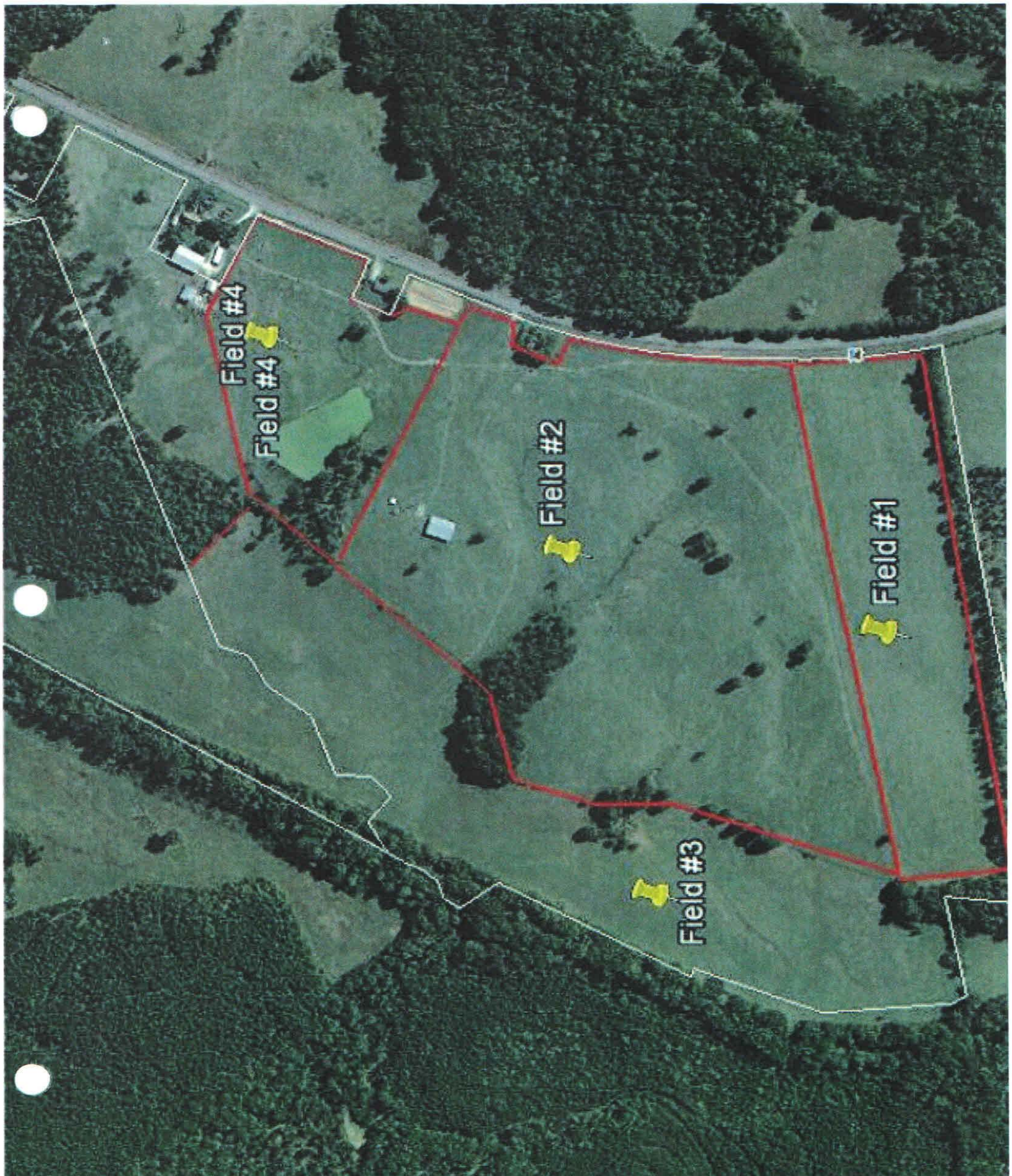
As required by the Sludge Management Plan, all appropriate records pertinet to the successful management of the land application program will be maintained for the benefit of Georgia EPD, USEPA, and the landowner. Each year an annual summary of the activities of the program are prepared and submitted to the appropriate agencies and participants. The annual summary includes at the minimum:

1. Identification of the source of the biosolids.
2. Date of biosolids application
3. Location of biosolids application (field number/date/time)
4. Method of application

5. Weather conditions at time of application.
6. Soil condition
7. Type of crops or crops to be grown
8. Volume of biosolids applied in wet/dry tons per acre
9. Pollutant loading rates for all fields.
10. Soil fertility and pH analysis for each field applied that year.
11. Annual analysis of biosolids from each facility.

Spill Control Plan

1. Halt source of spill.
2. Contain spill.
3. Clean-up. Approved method by EPD/DNR/EPA.
4. Final Clean up.
5. Notification to EPD/DNR, local fire company (if applicable)
6. Contact land owner if affected.
7. Management of clean-up operations and steps for further avoidance of spill.
8. Reporting in writing to all agencies and parties involved.



Field #4
Field #4
Field #2
Field #1
Field #3

Georgia FY 2016 EQIP Policy

This Policy is based on the Final Rule (IFR) for EQIP, published 12/12/14 in Vol. 79 No. 239 of the Federal Register, 7 CFR Part 1466.

Planned conservation practices must be maintained for the lifespan of the practice, as indicated on the NRCS-CPA-1155 or -1156. **All practices must also meet the minimum criteria in the Conservation Practice Standard (see the Georgia eFOTG)** and the criteria listed below. Extents above the minimum necessary to meet practice criteria are not eligible for payment. Note: Payment for some practices is only authorized when used in conjunction with another practice, as detailed in the Conservation Plan of Operation (CPO), with or without payment. The applicant is responsible for the installation, use, and maintenance of all components required in the conservation management system.

Management Practices - Management practice payments are only available on acres where the practice option has not been previously applied &/or utilized, and where there will be a higher level of management required for the requested practice option. Management payments are not authorized if the conservation practice option has previously been implemented on the acres in the application, with or without financial assistance. A management practice payment is only authorized once per acre within the length of the contract period for that conservation practice. Some management practices, where noted in the practice footnotes, are limited to no more than three separate management practices combined per acre.

Structural Practices - Structural practices include conservation practices that are either structural or vegetative, and have a multi-year lifespan. Structural practices involve the establishment, construction, or installation of site-specific measures. Payments are established as a one-time payment. The landowner must be a signatory to a contract which has EQIP funds used for any structural practice. Extents above the minimum necessary to meet practice criteria are not eligible for EQIP payment. Note: Payment for some practices is only authorized when used in conjunction with another practice, as detailed in the Conservation Plan of Operation (CPO), with or without payment.

Conservation Activity Plans (CAP) - Conservation Activity Plans are conservation plans developed for producers to assist in identifying conservation practices needed to address a specific natural resource need. CAPs are completed by NRCS certified Technical Service Providers (TSP). The list of NRCS certified TSPs is available on the NRCS TSP webpage: *www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/technical/tsp*

Cropland specific notes
Grazing land specific notes
Forest land specific notes
Wildlife specific notes

Practice Code	Conservation Practice	Payment Unit	Payment Rate	Maximum Amount	HU Payment Rate	HU Maximum Amount	Lifespan
472	**Access Control**						
	Bat Cave Exclusion	SqFt	$10.87		$13.04		10 Years
Applicable to Wildlife Landuse Only. Only allowed on caves actively utilized as bat hibernacula that are in need of access control. **Must receive prior approval from the NRCS State Biologist** to implement this practice. Must be planned as a supporting practice in conjunction with 643 Restoration and Management of Rare and Declining Habitats.							
309	**Agrichemical Handling Facility**						
	Open building, locked chemical storage room, concrete slab floor 1/	SqFt	$13.14		$15.77		
	Enclosed building, locked chemical storage room, concrete slab floor 2/	SqFt	$20.76		$24.92		15 Years
1/ Includes following components of an open, post frame agrichemical handling facility: wash down station, locked chemical storage area, curbed reinforced concrete pad with collection sump area, and roof structure. Planner may add the following (if needed): critical area planting, mulch, HUA for entrance pads, and roof runoff. **Building must be designed and installation certified by registered Georgia PE or Area Engineer.**							
2/ Includes following components of an enclosed, roofed agrichemical handling facility: wash down station, locked chemical storage area, curbed reinforced concrete pad with collection sump area, a flexible membrane beneath concrete pad, and roof structure. Planner may add the following (if needed): critical area planting, mulch, HUA for entrance pads, and roof runoff. **Building must be designed and installation certified by registered Georgia PE or Area Engineer.**							
316	**Animal Mortality Facility**						
	Static pile, Wood Bin(s) 1/	SqFt	$6.78		$8.13		
	Composting - Small Animals 2/	LB/Day	$13.74		$16.49		
	Composting - Large Animals 3/	LB/Day	$73.44		$88.13		15 Years
If applicant has a functioning composter, incinerator, or rotary drum at the farm, they are eligible for a new composter, incinerator, or rotary drum only if the capacity of the existing animal mortality facility is not sufficient to handle the volume of mortality at the farm (for example: size of operation has increased since existing animal mortality facility was purchased or constructed). **Nutrient Management Plan required for this practice.**							
1/ Composters for animal mortality must use this scenario. Cost covers concrete floor , wooden walls, and any required excavation. Must add roofs and covers, concrete HUA access							
2/ Rotary drums and incinerators - Poultry. Rotary cost include rotary drum, concrete pad and concrete entrance pad. Minimum width of the pad under the composter is 10 feet, and minimum length of pad will be the length of the machine plus 4 feet on each end. Incinerator must be a Type IV. Use the calculated total pounds/day from the Cost Estimator under the "Rotary Drum & Incinerators" tab. The value for pounds/day for this item is highlighted in yellow.							
3/ Rotary drums and incinerators - Swine. See note 2.							
396	**Aquatic Organism Passage**						
	Concrete Dam Removal	CuYd	$105.76		$126.91		
	Earthen Dam Removal	CuYd	$45.76		$54.91		
	Blockage Removal	CuYd	$73.72		$88.46		
	Nature-Like Fishway	Acre	$72,442.44		$86,930.93		
	CMP Culvert	Each	$21,367.64		$25,641.17		
	Bottomless Culvert	Each	$30,871.35		$37,045.62		
	Concrete Box Culvert	Each	$37,595.60		$45,114.72		
	Concrete Ladder	Ft	$9,416.18		$11,299.42		
	Low Water Crossing	CuYd	$469.89		$563.87		5 Year
Applicable to Wildlife Landuse Only. This practice shall only be used in instances where rare and declining aquatic species passage has been identified as a resource concern (does not include low water crossing). Must receive prior approval from the State Biologist and/or engineer to schedule these scenarios.							
Landowner must secure required CWA and other necessary permits							

Practice Code	Conservation Practice	Payment Unit	Payment Rate	Maximum Amount	HU Payment Rate	HU Maximum Amount	Lifespan
314	**Brush Management**						
	Mechanical, Hand tools	Acre	$37.27		$44.73		
	Mechanical Bush Hog 3/	Acre	$28.12		$33.75		
	Mechanical Roller Chopper 4/	Acre	$42.17		$50.60		
	Mechanical & Chemical, Small Shrubs, Medium Infestation 2/	Acre	$107.08		$128.49		
	Chemical Hand 5/	Acre	$72.58		$87.10		
	Chemical - Ground Applied 1/	Acre	$41.31		$49.57		
	Chemical, Aerial Applied 6/	Acre	$57.08		$68.50		10 Years
Applicable to Wildlife Landuse Only. Method selected must have the least negative effect on desirable native vegetation							
1/ Brush management on grazed forest, or pasture thru the use of broadcast application of material using chemical(s) to reduce or remove undesirable deciduous species (brush) in uplands and other areas not in or directly adjacent to streams, ponds, or wetlands.							
2/ Removal of small woody vegetation infestations by the use of mechanical cutter, chopper or other light equipment followed by an application of low cost chemicals in low volume							
3/ Removal of brush by the use of mechanical cutter.							
4/ The removal of brush by the use of chopper.							
5/ **Applicable to Wildlife Landuse Only**. Use of mechanical hand treatments for sensitive habitats that could be damaged by broadcast applications or large machinery.							
6/ To be used where ground applied herbicide application is not feasible or cost effective.							
672	**Building Envelope Improvement**						
	Building Envelope - Attic Insulation 1/	SqFt	$0.48	$ 20,000.00	$0.57	$ 20,000.00	
	Building Envelope - Wall Insulation 2/	SqFt	$1.66	$ 20,000.00	$1.99	$ 20,000.00	
	Building Envelope - Sealant 3/	Ft	$1.01	$ 10,000.00	$1.21	$ 10,000.00	
	Building Envelope - Greenhouse Screens 4/	SqFt	$1.49	$ 10,000.00	$1.79	$ 10,000.00	
	Greenhouse - Insulate Unglazed Walls 5/	SqFt	$0.23	$ 10,000.00	$0.27	$ 10,000.00	
	Tunnel Doors 6/	SqFt	$8.57	$ 30,000.00	$10.29	$ 30,000.00	10 Year
Practice must be a recommended practice in a Type 2 energy audit meeting the requirements of ANSI/ASABE S 612, Completing An On Farm Energy Audit. The energy audit must have been completed within the last 4 years. **Applicant must have certified audit completed before contract ranking to be eligible. Area Engineer will review all Farm Energy Improvement applications. Designs will be completed by third parties (Registered PE,etc) or Area Engineer**. The licensed installer will provide certification that the work was completed in accordance with local codes. Landowner will provide material specifications which are used for these practices in order to certify that the material requirements in the energy audit are achieved and self-certification that these measures were installed in the correct quantities. Energy Savings for each practice must be included in the energy audit and these energy savings must be entered into protracts during ranking.							
1/ Based upon a minimum R-7 insulation in addition to existing attic/ceiling; **All materials other than blown fiberglass insulation must be approved by Area Engineer.**							
2/ Payment based on square foot of wall insulated. Typically only a portion of the wall height is insulated (4 to 6'). The portion of the wall where exhaust fans are located is not insulated. Only approved method of insulation is metal exterior, 3.5" fiberglass batts (R-11), vapor barrier, & interior plywood or OSB sheathing.							
3/ Payment for linear foot of gap sealed by professional contractor							
4/ Mechanical screens for greenhouse to control heat loss and gain.							
5/ Cellouse or bubble insulation for roof or walls							
6/ Based upon square foot of tunnel opening.							
372	**Combustion System Improvement**						
	Electric Motor/Centrifugal Pump in-lieu of IC Engine, < 100 hp 1/	Each	$7,704.21		$9,245.06		
	Electric Motor in-lieu of IC Engine, less than 100 hp 2/	Each	$5,207.14		$6,248.57		
	Electric Motor in-lieu of IC Engine, greater than or equal to 100 hp 3/	HP	$68.04		$81.64		10 Years
Documentation requirements include; picture of the pumping unit being replaced that shows the pump model and capacity; total Dynamic Head calculations used by the dealer to determine the required size of the new pump and/or motor; picture of the new pumping unit showing model, serial number and capacity; new pump must be installed on concrete pad. **Must be submitted by Certified Irrigation Designer (CID), Georgia PE, or Area Engineer**. Documentation that engine has been replaced and evidence (i.e. picture) that an older engine was destroyed or salvaged. Payment will be made for the motor size required by the design or to next largest commercially available pump (ie 48 hp would be a 50 hp motor).							
1/ Surface water							
2/ Well							
3/ Well or Surface water							
317	**Composting Facility**						
	Concrete floor, outer wood wall no bins	SqFt	$5.33		$6.39		
	Composter, whole concrete floor, wood or concrete bins	SqFt	$5.85		$7.02		
	Composter, whole concrete floor, no bins, organic	SqFt	$3.75		$4.50		15 Years
Only for non animal mortality composting (manure, ag by products). Use 316 scenario for dead animal composting. Add roof (if needed), critical area planting, mulch and HUA for entrance pad. Pay based on square foot of concrete pad post to post area.							

Practice Code	Conservation Practice	Payment Unit	Payment Rate	Maximum Amount	HU Payment Rate	HU Maximum Amount	Lifespan
327	**Conservation Cover**						
	Native Grass 2/	Acre	$185.28		$222.34		
	Native Grass - Local seed source	Acre	$93.48		$112.18		
	Pollinator Habitat 3/	Acre	$381.22		$457.47		
	Legume 1/	Acre	$170.78		$204.93		
	Special Restoration/Pollinator Habitat	Acre	$954.54		$1,145.44		
	Monarch Habitat/Milkweed	Acre	$1,716.57		$2,059.89		3 Years
1/ Orchard and groves needing permanent protective cover in the alleyway. Limited to 1 year.							
2/ This practice applies to land retiring from agricultural production and on other lands needing permanent protective cover. See Forage & Biomass Planting (512) native warm season grass option, if the purpose is to reduce erosion and sedimentation. See Native grasses for Wildlife Habitat if the objective is wildlife. The document is filed alphabetically in eFOTG. Limited to 1 year.							
3/ Permanent vegetation, including mix of native grasses, legume, forbs, established on any land needing permanent vegetative cover that provides habitat for pollinators. See Job sheet specification on planting mix. Limited to 1 year.							
Applicable to Wildlife Landuse Only. Only native plantings allowed as a supporting practice to Restoration and Management of Rare or Declining Habitats (643), Stream Habitat Improvement (395), Upland Wildlife Habitat Management (645), Wetland Creation (658), Wetland Restoration (657), or Wetland Wildlife Habitat.							
328	**Conservation Crop Rotation**						
	Specialty Crops 1/	Acre	$17.44		$20.93		1 Year
Limited to 2 years							
Limited to purposes of reducing a) plant pests or b) reducing erosion and increasing soil health.							
1/ The rotation established adds higher residue crop(s) to the rotation that reduce erosion, improve soil quality, and break pest cycles.							
332	**Contour Buffer Strips**						
	Native	Acre	$254.58		$277.36		
	Introduced	Acre	$227.50		$244.86		
	Organic Seed	Acre	$226.82		$244.06		1 Year
Applicable to Wildlife Landuse Only. Only allowed when the contour buffer strips will be planted to native species within active cropland.							
340	**Cover Crop**						
	Cover Crop-Chemical Kill 1/	Acre	$60.98	$ 24,000.00	$73.18	$ 24,000.00	
	Legume-N Fixation 2/	Acre	$71.40		$85.68		
	Organic Cover Crop 4/	Acre	$75.97	$ 15,000.00	$91.17	$ 15,000.00	
	Organic Legume 5/	Acre	$121.33		$145.59		
	Mix 3/	Acre	$67.18		$80.61		1 Year
Limited to 2 years							
1/ The cover crop should be allowed to generate as much biomass as possible, without delaying planting of the following crop. The cover crop will be terminated using an approved herbicide a minimum of 3 weeks prior to planting the subsequent crop. Limited to $24,000 up to 2 years.							
2/ The cover crop should be allowed to generate as much biomass as possible, without delaying planting of the following crop. The cover crop will be terminated using a mechnical kill method (mowing, rolling, undercutting, etc.), a minimum of 3 weeks prior to planting the subsequent crop.							
3/ The cover crop will consist of 3 to 4 species including cereal grains, legumes, and tillage radishes. Limited to $15,000 up to 2 years.							
4/ The cover crop should be allowed to generate as much biomass as possible, without delaying planting of the following crop. The cover crop will be terminated using a mechnical kill method (mowing, rolling, undercutting, etc.), a minimum of 3 weeks prior to planting the subsequent crop. This scenario REQUIRES use of Certified Organic Seed.							
5/ The cover crop should be allowed to generate as much biomass as possible, without delaying planting of the following crop. The cover crop will be terminated using a mechnical kill method (mowing, rolling, undercutting, etc.), a minimum of 3 weeks prior to planting the subsequent crop. This scenario REQUIRES use of Certified Organic Seed.							
342	**Critical Area Planting**						
	Native seeding - light tillage	Acre	$309.66		$371.59		
	Introduced Grass light tillage	Acre	$364.32		$437.19		
	Grass Hydroseeding 1/	Acre	$2,008.42		$2,410.11		10 Years
1/Establishment of permanent vegetation on a site that is void or nearly void of vegetation due to a natural occurrence or a newly constructed conservation practice. Costs include hydroseeding steep areas, grass seed, companion crop, and fertilizer and lime with application.							
Applicable to Wildlife Landuse Only. Native seeding -light tillage is the only approved payment scenario for the widlife fund pool.							
362	**Diversion**						
	Diversion	Ft	$1.69		$2.02		10 Years
Includes grading and shaping. Need to add critical area planting and mulching (if needed)							
647	**Early Successional Habitat Development/ Management**						
	Mowing 1/ 3/	Acre	$28.06		$33.67		
	Disking 2/ 3/	Acre	$26.88		$32.25		1 Year
1/ Provides early successional habitat by mowing in forested openings where existing vegetation needs to be maintained for early successional habitat. May also need 314 brush management, 666 forest stand improvement, 315 herbaceous weed control, 327 Conservation Cover, or 666 forest stand improvement.							
2/ Provides early successional habitat by disking vegetation and creating bare ground. May also need 314 brush management, 666 forest stand improvement, 315 herbaceous weed control, 327 Conservation Cover, or 666 forest stand improvement.							
3/ Applicable to Wildlife Landuse Only. Allowed when planned as a supporting practice to 643, 644,645,or 666. This practice will not disturb high quality, natural habitat.							

Practice Code	Conservation Practice	Payment Unit	Payment Rate	Maximum Amount	HU Payment Rate	HU Maximum Amount	Lifespan
374	**Farmstead Energy Improvement**						
	Ventilation - HAF 1/	Each	$134.56	$ 10,000.00	$161.48	$ 10,000.00	
	Ventilation - Paddle Stir Fan	Each	$154.20	$ 10,000.00	$185.05	$ 10,000.00	
	Plate Cooler ≤ 499 gal/hr	Each	$4,038.77		$4,846.53		
	Plate Cooler 500 - 749 gal/hr	Each	$4,704.07		$5,644.89		
	Plate Cooler 750 - 999 gal/hr	Each	$5,405.62		$6,486.74		
	Plate Cooler 1,000 - 4,999 gal/hr	Each	$8,936.56		$10,723.88		
	Scroll Compressor	HP	$639.52		$767.42		
	Variable Speed Drive ≤ 50 HP	HP	$271.50		$325.81		
	Variable Speed Drive > 50 HP	HP	$95.38	$ 15,000.00	$114.45	$ 15,000.00	
	Automatic Controller System	Each	$1,078.24	$ 7,500.00	$1,293.89	$ 7,500.00	
	Motor Upgrade ≤ 2 HP	Each	$558.81		$670.57		
	Motor Upgrade > 2 and < 40 HP	Each	$1,031.10		$1,237.32		
	Motor Upgrade 40 and < 100 HP	Each	$4,755.70		$5,706.84		
	Motor Upgrade = or > 100 HP	Each	$6,064.01		$7,276.81		
	Vacuum Pump - Compatible w/Variable Speed	Each	$3,337.51		$4,005.01		
	Heating - Radiant Systems 2/	SqFt	$0.45	$ 30,000.00	$0.54	$ 30,000.00	
	Heating (Building) 3/	kBTU/Hr	$9.23		$11.08		
	Heating - Attic Heat Recovery vents	Each	$113.63	$ 10,000.00	$136.35	$ 10,000.00	
	Compressor Heat Recovery Unit	kBTU/Hr	$2,781.61		$3,337.94		10 Years

Practice must be a recommended practice in a Type 2 energy audit meeting the requirements of ANSI/ASABE S 612, Completing An On Farm Energy Audit. The energy audit must have been completed within the last 4 years. **Applicant must have certified audit completed before contract ranking to be eligible. Area Engineer will review all Farm Energy Improvement applications. Designs will be completed by third parties (Registered PE,etc) or Area Engineer. All electrical practices requiring electrical wiring will be completed by licensed electrician. The licensed installer will provide certification that the work was completed in accordance with local codes**. Landowner will provide material specifications which are used for these practices in order to certify that the material requirements in the energy audit are achieved;and, self-certification that these measures were installed in the correct quantities. Energy Savings for each practice must be included in the energy audit and these energy savings must be entered into protracts during ranking.

1/ Horizontal Circulation Fans

2/ Replacement of pancake heaters or equivalent. Can use radiant tube heaters, radiant brooders heaters (aka round radiant heaters), or quad radiant heaters. Based upon square ft. of house.

3/ Natural gas, propane, or fuel oil unit heater or boiler; typically for swine and greenhouse production.

382	**Fence**						
	Barbed/Smooth Wire	Ft	$1.83		$2.20		
	Woven Wire	Ft	$2.44		$2.93		
	Permanent Electric 1/	Ft	$0.97		$1.16		
	Temporary Electric-Polywire 2/	Ft	$0.63	$ 1,400.00	$0.75	$ 1,400.00	20 Years

1/ One and Two Strand Permanent Electric Cross Fencing is acceptable for control of cattle and horses only.

2/ Temporary Electric-Polywire - For Cross Fencing Only. Intended for higher intensity uses such as strip grazing or frontal grazing of stockpiled forage.

General Manual Subpart I - 515.81 E.(1) Boundary fence (property line fence) or perimeter fence is eligible— On expired or expiring Conservation Reserve Program (CRP) land to establish a grazing operation; however, the practice may not be installed until the CRP contract has expired. On land to protect, restore, develop, or enhance habitat for wildlife or to exclude livestock from an environmentally sensitive area, such as a riparian area or wetland. On land where the fence is an integral part of a conservation management system, such as a planned grazing system that facilitates improved management of grazing land.

Applicable to Wildlife Landuse Only. Allowed when planned as a supporting practice to Prescribed Grazing (528) in conjunction with Forest Stand Improvement (666), Restoration and Management of Rare or Declining Habitats (643), Stream Habitat Improvement (395), Upland Wildlife Habitat Management (645), Wetland Restoration (657), or Wetland Wildlife Habitat Management (644). This practice will not disturb high quality, natural habitat.

386	**Field Border**						
	Native Grass 2/	Acre	$344.19		$380.38		
	Pollinator Habitat 3/	Acre	$374.42		$416.66		
	Introduced Grass 1/	Acre	$231.65		$245.33		10 Years

1/ Practice includes seedbed prep and planting of introduced species. The area of the field border is taken out of production.

2/ Practice includes seedbed prep and planting of native species. The area of the field border is taken out of production.

3/ Practice includes seedbed prep and planting of pollinator friendly herbaceous species. The area of the field border is taken out of production. See pollinator job sheet for specific planting recommendations.

Applicable to Wildlife Landuse Only. Allowed when planted around active cropland and the area is taken out of production . Native species must be utilized . Must request a State Biologist variance to use non-native species if no suitable native species are available.

393	**Filter Strip**						
	Filter Strip, Native species: Forgone Income 3/ 4/	Acre	$288.17		$313.15		
	Filter Strip, Introduced species: Forgone Income 2/	Acre	$235.15		$249.53		
	Filter Strip, Organic Seed, Inc Forgone 1/	Acre	$406.57		$455.24		10 Years

1/ Introduced herbaceous vegetation using Certified Organic seeds. Practice includes seedbed prep and planting. The area of the filter strip is taken out of production.

2/ Introduced herbaceous vegetation - Practice includes seedbed prep and planting. The area of the filter strip is taken out of production.

3/ Native herbaceous vegetation - Practice includes seedbed prep and planting. The area of the filter strip is taken out of production.

Applicable to Wildlife Landuse Only. Only the Filter Strip payment scenaraio approvded for use under the wildlife fund pool. This practice will not disturb high quality, natural habitat.

Practice Code	Conservation Practice	Payment Unit	Payment Rate	Maximum Amount	HU Payment Rate	HU Maximum Amount	Lifespan
394	**Firebreak**						
	Constructed - Dozer 1/	Ft	$0.23		$0.28		
	Constructed - Light Equipment 2/	Ft	$0.09		$0.10		5 Years
Install firebreak as per required burn plan and according to the GFC GA Best Management Practices for Forestry Manual.							
1/ track mounted equipment							
2/ rubber tired equipment							
512	**Forage and Biomass Planting**						
	Seedbed Prep. Seed & Seeding-Native Per. Warm Season Grass 5/	Acre	$351.26		$421.51		
	Seedbed Prep. Seed & Seeding-Intro. Perennial Grasses. 4/	Acre	$245.80		$294.96		
	Seedbed Prep. Seed & Seeding-Intro. Perennial Grasses Organic 3/	Acre	$266.95		$320.34		
	Grass Establishment-Sprigging 1/	Acre	$287.54		$345.04		
	Overseeding Legumes 2/	Acre	$207.51		$249.01		
	Overseeding Legumes - Organic	Acre	$199.82		$239.78		
	Remediation - Seed & Seeding-Introduced Perennial Grasses.	Acre	$93.86		$112.63		5 Years
1/ Sprigging new grasses with sprigging application. This scenario assumes fertilizer, sprigs, equipment and labor for seed bed prep, tillage, sprigging ,and spreading.							
2/Overseeding legumes in an existing pasture. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, seed, equipment and labor for no-till seeding and amendment spreading.							
3/ Establish adapted introduced perennial grasses using organic approved seed. Used for either conventional or no-till seeding. This practice is for organic production. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading.							
4/ Establish adapted introduced grasses. Used for either conventional or no-till seedings. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading.							
5/ Establish adapted perennial native warm season grasses. Used for either conventional or no-till seeding of perennial native warm season grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding, and spreading.							
666	**Forest Stand Improvement**						
	Pre-commercial Thinning - Hand tools 1/	Acre	$90.23		$108.28		
	Creating Patch Clearcuts 3/	Acre	$145.03		$174.03		
	Thinning for Wildlife and Forest Health at 60BA 2/ 3/	Acre	$22.12		$26.54		
	Thinning for Wildlife and Forest Health at 50BA 2/ 3/	Acre	$29.18		$35.02		
	Thinning for Wildlife and Forest Health at 80BA 2/ 3/	Acre	$14.52		$17.42		
	Pre-Commercial thinning-mechanical 1/	Acre	$45.46		$54.56		
	Thinning for Wildlife Health at 70 BA 3/	Acre	$18.88		$22.65		10 Years
1/ Adjusting the stocking of a young, non-merchantable stand of trees. The operation is supervised by a registered forester. Mechancial equipment can be utilized to treat pre-commercial forest stand.							
2/ Used to open the canopy of a stand to improve the wildlife habitat and tree health.							
3/ **Applicable to Wildlife Landuse Only**. This practice scenario is approved for use under the Wildlife fund pool. This practice will be implemented according to habitat needs identified by the GA Habitat Suitability Index model and comparisons with site appropriate Ecological Site Descriptions or other suitable reference conditions.Allowed as a supporting practice to Restoration and Management of Rare or Declining Habitats (643), Stream Habitat Improvement (395), Upland Wildlife Habitat Management (645), Wetland Restoration (657), or Wetland Wildlife Habitat Management (644).							
655	**Forest Trails and Landings**						
	Water Bars	Each	$90.55		$108.66		5 Years
Reference Practice 560 Access Road for design criteria. See 655 Jobsheet for specification.							
410	**Grade Stabilization Structure**						
	Check Dams 1/	Ton	$42.07		$50.49		
	Embankment, Pipe <12" 2/	CuYd	$4.26		$5.11		
	Embankment, Pipe >=12" & < 36" 2/	CuYd	$4.56		$5.47		
	Weir Drop Structures 3/	SqFt	$63.70		$76.44		
	Rock Drop Structures 3/	SqFt	$49.43		$59.32		15 Years
	Embankment, Pipe >= 36" 2/	CuYd	$7.87		$9.44		
1/ Excavation and riprap, does not include vegetation. Must add critical area planting and mulch.							
2/ Payment per cubic yard of embankment fill which includes fill and pipe system. Must add critical area planting and mulch.							
3/ Payment is based on weir length in feet times drop in "feet". The drop (feet) is defined as the structure inlet crest elevation minus the control outlet elevation.							
Applicable to Wildlife Landuse Only. Allowed when the planned purpose is wildlife habitat management or natural stream restoration in conjunction with Timber Stand Improvement (666), Restoration and Management of Rare or Declining Habitats (643), Stream Habitat Improvement (395), Upland Wildlife Habitat Management (645), Wetland Restoration (657), or Wetland Wildlife Habitat Management (644). This practice will not disturb high quality, natural habitat.							
412	**Grassed Waterway**						
	Base Waterway	Acre	$1,148.12		$1,377.74		10 Years
Grading Only. Must add critical area planting and mulch.							

Practice Code	Conservation Practice	Payment Unit	Payment Rate	Maximum Amount	HU Payment Rate	HU Maximum Amount	Lifespan
561	**Heavy Use Area Protection**						
	Concrete with sand or gravel foundation 1/	Sq Ft	$3.15		$3.78		
	Steel Reinforced Concrete with sand or gravel foundation 2/	Sq Ft	$5.74		$6.88		
	Rock/Gravel on Geotextile 3/	Sq Ft	$1.13		$1.36		
	Low Velocity 4/	Sq Ft	$2.23		$2.67		
	High Velocity 5/	Sq Ft	$4.33		$5.19		10 Years
1/ 4" thick fiber reinforced concrete pad							
2/ 6" steel reinforced concrete slab (Includes grading/shaping up to 6" deep over the entire slab); Watering Ramps only.							
3/ Includes 6" GAB, Geotextile, Grading and Shaping.							
4/ Using Surge stone for Watering Ramps.							
5/ Using Rip Rap in Watering Ramps.							
Applicable to Wildlife Landuse Only. Can be scheduled as a supporting practice in conjunction with Prescribed Grazing 528 when needed to protect wildlife or natural communities.							
422	**Hedgerow Planting**						
	Pollinator Habitat 1/	Ft	$1.00		$1.20		
	Wildlife Machine Plant 2/	Ft	$0.41		$0.49		15 Years
1/ A stand with a minimum of nine wildflower species and one native warm season grass should be established. This will include at least three flowering species from each of the three bloom periods (spring, summer, and fall). The stand should include a minimum of one legume species and one native bunchgrass for a total of ten or more species (see pollinator establishment jobsheet). Trees should be planted 12 foot apart and shrubs should be planted 6 foot apart following hedgerow jobsheet specifications.							
2/ This scenario is for machine planting of woody species. A minimum of two species of native plants- 2 Trees and/or shrubs are typically plant at eight foot intervals (this will vary with species selection and density goals) and a mix of 2 native grasses.							
Applicable to Wildlife Landuse Only. Native species must be utilized . This practice will not disturb high quality, natural habitat.							
315	**Herbaceous Weed Control**						
	Mechanical 3/	Acre	$32.48		$38.98		
	Chemical, Spot 4/	Acre	$58.86		$70.63		
	Chemical, Ground 1/	Acre	$31.65		$37.97		
	Invasive Chemical and Mechanical 5/	Acre	$460.38		$552.45		
	Chemical-Broad Band 2/	Acre	$27.01		$32.41		
	Mechanical, Hand 4/	Acre	$46.05		$55.26		5 Years
1/ Eradication of vegetation by use of weed treatment using ground equipment to apply chemicals, in order to eliminate noxious weeds, promote forage productivity, and improve ecological condition.							
2/ Eradication of vegetation by use of weed treatment using ground equipment to apply chemicals in a broad strip avoiding the planting row, in order to eliminate noxious weeds, and improve ecological condition. Spray a 4-6 foot wide band across seedlings after the first growing season in the early spring after planting. Forest application only.							
3/ Removal of herbaceous weeds by the use of mower, brush hog, disc or other light equipment in order to reduce fuel loading and improve ecological site condition. Weed has exceeded desired levels based on ecological site potential.							
4/ hand treatment of sensitive habitats that could be damaged by broadcast treatment or heavy machinery use or where treatment areas are small.							
5/ **Applicable to Wildlife Landuse Only**. Only allowed when heavy invasion is present and cannot be adequately treated by less expensive alternatives.							
Applicable to Wildlife Landuse Only. Method selected must have the least negative effect on desirable native vegetation							
430	**Irrigation Pipeline**						
	PVC (Iron Pipe Size)	LB	$1.80		$2.16		20 Years
Must use CPS 449, Irrigation Water Management, in conjunction with this practice. Includes pipe, labor and equipment for placement. Add critical area planting and mulching where needed. Use spreadsheet in section IV of EFOTG to convert length of pipe to pounds							
436	**Irrigation Reservoir**						
	Embankment Dam with On-Site Borrow 1/	CuYd	$3.51	$ 50,000.00	$4.21	$ 50,000.00	
	Embankment Reservoir ≤ 30 Acre-Feet 2/	CuYd	$2.79	$ 50,000.00	$3.35	$ 50,000.00	
	Plastic Tank 3/	Gal	$1.14		$1.37		15 Years
Must use CPS 449, Irrigation Water Management, in conjunction with this practice.							
1/ Earthern embankment built across a natural depression. Cost based upon volume of compacted earth fill. Must add critical area planting and mulch. **NOT FOR GENERAL EQIP, ONLY FOR IRRIGATION PILOT PROGRAM.**							
2/ Excavated reservoir, generally rectangular in shape. Must add critical area planting and mulch. **NOT FOR GENERAL EQIP, ONLY FOR IRRIGATION PILOT PROGRAM.**							
3/ Includes installation and a concrete pad. Pay per gallon of storage in tank. Use standard tank closest in volume to design volume.							
441	**Irrigation System, Micro**						
	Microjet 1/	Acre	$2,077.46	$ 30,000.00	$2,492.96	$ 30,000.00	
	Surface Micro with Screen Filter	Acre	$1,109.00	$ 30,000.00	$1,330.80	$ 30,000.00	
	Surface Micro with Sand Media Filter	Acre	$1,220.36	$ 30,000.00	$1,464.43	$ 30,000.00	
	Microirrigation High Tunnel	SqFt	$0.16	$ 30,000.00	$0.19	$ 30,000.00	
	SDI (Subsurface Drip Irrigation) 2/	Acre	$1,466.91	$ 30,000.00	$1,760.30	$ 30,000.00	15 Years
Water supply and conveyance from source to field is not addressed within this practice. **Irrigation Water Management, CPS 449 must be used in conjunction with these practices (High Tunnel is excluded). Must have a copy of system design completed and certified by a Certified Irrigation Designer (CID), Georgia PE, or Area Engineer. CID designs must be reviewed by NRCS engineers.Certification must be provided that system was installed in accordance with the certified design.** Certification can be provided by the installer, provided the landowner is not the installer, the CID or field office staff. **Irrigation conversion to micro irrigation system. Must be replacing existing non-microirrigation system.** Does not include conveyance pipe from source to field under contract. Includes components for system including filters, control valves, flow meter (if required) and PVC pipe for laterals and sublaterals.							
1/ Orchards/vineyards using above ground emitters or spray jets							
2/ Must have a GPS guidance system or markers placed for annual crops.							

Practice Code	Conservation Practice	Payment Unit	Payment Rate	Maximum Amount	HU Payment Rate	HU Maximum Amount	Lifespan
449	**Irrigation Water Management**						
	Basic IWM 1/	Acre	$10.72		$12.87		
	Intermediate IWM 2/	Acre	$19.48		$23.37		
	Advanced IWM 3/	Acre	$25.32		$30.39		
	Soil Moisture Sensors 4/	Each	$69.34		$83.21		
	Soil Moisture Sensors with Data Recorder 5/	Each	$285.47		$342.56		1 year
1/ Low intensity irrigation water management system. Soil moisture measured by feel or other similar methods. Paper records kept for irrigation applications and rainfall. Producer must provide copy of records to document practice completion; payment after receipt of 1 growing season of data (This practice is for 1-year only).							
2/ Medium intensity irrigation water management system. Soil moisture is determined by soil moisture sensors with manual data download. Records are kept by manual input of data into a computer program. Irrigation amounts determined by flow meters on system. Use in conjunction with Soil Moisture Sensors; payment after receipt of 1 growing season of data (This practice is for 1-year only).							
3/ High intensity irrigation water management system. Soil moisture determined by remote monitor soil moisture sensors. Automated logging of soil moisture data into computer system using telemetry or mobile phone data system. Data is monitored daily and adjustments made accordingly. Use in conjunction with Soil Moisture Sensors with data logger; payment after receipt of 1 growing season of data (This practice is for 1-year only).							
4/ Manually read soil moisture sensors for use in the intermediate IWM scenario. Payment is for each individual sensor; therefore, if customer installs a shallow sensor and a deep sensor, contract would be for 2 sensors.							
5/ Soil Moisture Sensors with automated data logging system for use in the advanced IWM scenario. Use one set per irrigation management unit.							
460	**Land Clearing**						
	Heavy Equipment	Acre	$1,326.52		$1,591.82		10 Years
For use with Irrigation Reservoir only. **NOT FOR GENERAL EQIP, ONLY FOR IRRIGATION PILOT PROGRAM.**							
670	**Lighting System Improvement**						
	Lighting - CFL	Each	$13.56	$ 10,000.00	$16.27	$ 10,000.00	
	Lighting - LED	Each	$17.37	$ 10,000.00	$20.85	$ 10,000.00	
	Lighting - Linear Fluorescent	Each	$255.04	$ 10,000.00	$306.05	$ 10,000.00	
	Lighting - Pulse-Start Metal Halide	Each	$21.23	$ 10,000.00	$25.48	$ 10,000.00	
	Automatic Controller System	Each	$202.34	$ 2,000.00	$242.81	$ 2,000.00	10 year
Practice must be a recommended practice in a Type 2 energy audit meeting the requirements of ANSI/ASABE S 612, Completing An On Farm Energy Audit. The energy audit must have been completed within the last 4 years. **Area Engineer will review all Farm Energy Improvement applications. Applicant must have certified audit completed before contract ranking to be eligible. Area Engineer will review all Farm Energy Improvement applications. Designs will be completed by third parties (Registered PE,etc) or Area Engineer. All electrical practices requiring electrical wiring will be completed by licensed electrician. The licensed installer will provide certification that the work was completed in accordance with local codes.** Landowner will provide material specifications which are used for these practices in order to certify that the material requirements in the energy audit are achieved;and, self-certification that these measures were installed in the correct quantities. Energy Savings for each practice must be included in the energy audit and these energy savings must be entered into protracts during ranking. Lifespan should be considered when selecting item to cost share.							
468	**Lined Waterway or Outlet**						
	Turf Reinforced Matting 1/	SqFt	$0.61		$0.74		
	Rock Lined - 12"or less 2/	SqFt	$2.67		$3.20		15 Years
1/ Payment is for SF of waterway. Includes grading and shaping of waterway and installation of a permanent erosion control mat (TRM). Must add critical area planting.							
2/ Payment is for SF of waterway. Includes grading and shaping of waterway and installation of rock ripap with geotextile beneath it. Must add critical area planting and mulching.							
516	**Livestock Pipeline**						
	PVC (Iron Pipe Size) Linear	Ft	$1.34		$1.60		20 Years
This practice is used only for livestock water supply pipelines. Cost covers pipe materials and installation. Use this cost for any pipe that meets the requirements of CPS 516. Use critical area planting and mulch where needed. Use in conjunction with CPS 614, Watering Facility and CPS 561, Heavy Use Area Protection							
Applicable to Wildlife Landuse Only. Must be planned in conjunction with Prescribed Grazing (528) when planned in conjunction with Timber Stand Improvement (666), Restoration and Management of Rare or Declining Habitats (643), Stream Habitat Improvement (395), Upland Wildlife Habitat Management (645), Wetland Restoration (657), or Wetland Wildlife Habitat Management (644). This practice will not disturb high quality, natural habitat.							
576	**Livestock Shelter Structure**						
	Portable Shade Structure	SqFt	$2.97	$ 2,200.00	$3.57	$ 2,200.00	10 Years
Applicable to Grazing Landuse Only. Grassland Conservationist must be contacted for design requirements. This practice must be used in conjunction with exclusion of animals from sensitive areas, when applicable.							
484	**Mulching**						
	Natural Material - Full Coverage 2/	Acre	$321.51	$ 2,000.00	$385.81	$ 2,000.00	
	Erosion Control Blanket 1/	SqFt	$0.13		$0.16		
	Synthetic Material 3/	Acre	$652.39	$ 2,000.00	$782.87	$ 2,000.00	1 Year
1/ Blanket is typically made of coconut coir, wood fiber, straw and is typically covered on both sides with polypropylene netting. Used to help control erosion and establish vegetative cover.							
2/ Mulch provides full coverage using natural materials and is typically used with critical area planting. Assumes 125 bales/acre (3 bales/1000 sq ft). Payment limit $2,000 per contract.							
3/ Installation of geotextile, biodegradable plastic, polyethylene plastic, or other state approved synthetic mulch to conserve soil moisture, moderate soil temperature, suppress weed growth and provide erosion control. Payment based on actual area covered by mulching material. Payment limit $2,000 per contract.							
Applicable to Wildlife Landuse Only. Allowed when planned in conjunction with Timber Stand Improvement (666), Restoration and Management of Rare or Declining Habitats (643), Stream Habitat Improvement (395), Upland Wildlife Habitat Management (645), Wetland Restoration (657), or Wetland Wildlife Habitat Management (644) to reduce short-term soil erosion concerns.							

Practice Code	Conservation Practice	Payment Unit	Payment Rate	Maximum Amount	HU Payment Rate	HU Maximum Amount	Lifespan
590	**Nutrient Management**						
	Basic NM System 1/	Acre	$5.54		$6.65		
	Basic Organic NM System 3/	Acre	$21.76		$26.11		
	Basic NM system with manure 2/	Acre	$8.82		$10.58		
	Precision NM System 4/	Acre	$19.08		$22.90		1 Year
The planned NM system will meet the current 590 standard. Records demonstrating implementation of the 4 R's of the NM criteria will be required. Must also plant cover crop, CPS 340; Cover crop only applies to crop land, not applicable to hay and pasture land. Use the Georgia Phosphorous Index when the planned rates of phosphorous exceeds UGA recommendations.							
1/ The implementation of a basic nutrient management system where there is no manure application. Implementation will result in the proper rate, source, method of placement, and timing of nutrients. Payment for implementation is to defray the costs of soil testing, analysis, consultant services that provide nutrient recommendations based on LGU recommendations or crop removal rates and an associated nutrient budget, and recordkeeping.							
2/ The implementation of a basic nutrient management system where there is manure or compost application in addition to commercial fertilizer applications. Implementation will result in the proper rate, source, method of placement, and timing of nutrients while minimizing off-site degradation or the excessive built up of N and P. Payment for implementation is to defray the costs of soil testing, manure testing, analysis, proper implementation, consultant services that provide nutrient recommendations based on LGU recommendations or crop removal rates and an associated nutrient budget, and recordkeeping.							
3/ The implementation will result in the proper rate, source, method of placement, and timing of nutrients. Payment for implementation is to defray the costs of soil testing, manure and/or compost analysis, training attendance, consultant services that provide nutrient recommendations. This Scenario is designed to encourage organic producers to effectively utilize organic fertilizers, manure, and/or compost appropriately improving soil quality and minimizing runoff of nutrients from fields to surface waters. The basis for nutrient applications will be recommendations based on soil and manure analyses.							
4/ The implementation of a basic precision nutrient management system on cropland. Payment for implementation is to defray the costs of soil testing, analysis, consultant services that provide nutrient recommendations based on LGU recommendations or crop removal rates and an associated nutrient budget, recordkeeping, and monitoring on a precision level. This scenario goes beyond the basic NM system by using technologies that improve efficiency and effectiveness of nutrient management by utilizing precision techniques and tools. Precision nutrient mgmt techniques ensure that the right rate, proper timing, and proper placement of nutrients minimize non-point source pollution and provide proper amounts of nutrients to the crop where it is needed and not applying where it is not needed.							
521C	**Pond Sealing or Lining - Bentonite Sealant**						
	Bentonite Treatment - Covered	CuYd	$62.16		$74.59		15 Years
Payment for installation of a liner treated with bentonite and a protective compacted fill cover. Payment volume is the sum of the volume of the liner and the volume of the cover. For waste storage ponds and lagoons only.							
521D	**Pond Sealing or Lining - Compacted Clay Treatment**						
	Material Onsite 1/	CuYd	$10.11		$12.14		15 Years
	Material Hauled 2/	CuYd	$16.57		$19.88		
1/ Payment for installation of a compacted clay liner and protective cover using **on site** materials. Volume is sum of liner and cover volumes. For waste storage ponds and lagoons only.							
2/ Payment for installation of a compacted clay liner and protective cover using **imported** materials. Volume is sum of liner and cover volumes. For waste storage ponds and lagoons only.							
521B	**Pond Sealing or Lining - Soil Dispersant**						
	Soil Dispersant - Covered	CuYd	$3.68		$4.42		20 Years
Payment for installation of a liner treated with soil dispersant and a protective compacted fill cover. Payment volume is the sum of the volume of the liner and the volume of the cover. For waste storage ponds and lagoons only.							
338	**Prescribed Burning**						
	Prescribed Burn	Acre	$22.60	$ 3,000.00	$27.12	$ 3,000.00	1 Year
Burn according to designed burn plan and NRCS Prescribed Burning (338) standard and specifications. Site prep burns are included. Constructed firebreak cost is not included in cost of burn.							
Applicable to Wildlife Landuse Only. Allowed when planned in conjunction with Timber Stand Improvement (666), Restoration and Management of Rare or Declining Habitats (643), Stream Habitat Improvement (395), Upland Wildlife Habitat Management (645), Wetland Restoration (657), or Wetland Wildlife Habitat Management (644) and in a manner that burns will be conducted within the natural variability of the ecological system being restored/managed. Where necessary, plan in conjunction with Firebreak (394). Burn according to designed burn plan and NRCS Prescribed Burning (338) standard and specifications and according to the GFC GA Best Management Practices for Forestry Manual. Site prep burns are included.							
528	**Prescribed Grazing**						
	Standard 2/	Acre	$11.78		$14.13		
	Intensive 1/	Acre	$25.33		$30.40		1 Year
Payment will be made for the pump size required by the design for the pump rounded to next largest commercially available pump (ie 1.67 hp would be a 2.0 hp pump). In the case of well pumps the size for payment will be determined by the watering facility design spreadsheet. If the applicant wishes to use a larger pump than the design requires, the additional cost will be the applicant's responsibiity. **Grazing Management Plan required with this practice.**							
1/ Design and implementation of a grazing system using a 4 day or less rotational cycle. Monitoring and record keeping required (ex: photo points, pre and post grazing heights, and once annual Pasture Condition Scoring) .							
2/ Design and implementation of a grazing system using a 5 to 10 day rotation. Monitoring & record keeping required (ex: photo points, pre and post grazing heights, and once annual Pasture Condition Scoring).							
Applicable to Wildlife Landuse Only. Allowed when planned for habitat restoration or management purposes in conjunction with Timber Stand Improvement (666), Restoration and Management of Rare or Declining Habitats (643), Stream Habitat Improvement (395), Upland Wildlife Habitat Management (645), Wetland Restoration (657), or Wetland Wildlife Habitat Management (644).							

Practice Code	Conservation Practice	Payment Unit	Payment Rate	Maximum Amount	HU Payment Rate	HU Maximum Amount	Lifespan
533	**Pumping Plant**						
	Electric-Powered Pump ≤ 5 Hp 1/	BHP	$664.00		$796.81		
	Electric-Powered Pump ≤ 5 HP with Pressure Tank 2/	BHP	$1,410.12		$1,692.14		
	Electric-Powered Pump >5 HP<=30 hp 3/	BHP	$402.30		$482.76		
	Electric-Powered Pump <30 hp <=75 4/	BHP	$281.03		$337.23		
	Electric-Powered Pump >75 5/	BHP	$158.65		$190.38		
	Variable Frequency Drive 6/	BHP	$174.95		$209.94		
	Internal Combustion-Powered Pump ≤ 50HP 7/	BHP	$534.39		$641.27		
	Internal Combustion-Powered Pump > 50 to 70 HP 7/	BHP	$400.33		$480.40		
	Internal Combustion-Powered Pump > 70 HP 7/	BHP	$309.51		$371.41		
	Photovoltaic-Powered Pump 8/	BHP	$6,976.87		$8,372.24		15 Years
Payment will be made for the pump size required by the design for the pump rounded to next largest commercially available pump (ie 1.67 hp would be a 2.0 hp pump). In the case of well pumps the size for payment will be determined by the watering facility design spreadsheet. If the applicant wishes to use a larger pump than the design requires, the additional cost will be the applicant's responsibiity.							
1/ Pump for livestock water, waste transfer or irrigation.							
2/ Pump in well for livestock water or irrigation with pressure tank added.							
3/ Pump for livestock water, waste transfer or irrigation. Centrifugal Pump.							
4/ Pump for waste transfer or irrigation. Centrifugal Pump.							
5/ Pump for livestock or irrigation. Centrifugal Pump.							
6/ Cost includes VFD modifications only.							
7/ Irrigation and Ag Waste Transfer; **Use only when not economically feasible to use electric motor/pump combinations.**							
8/ Typical installation of photvoltaic cells to run solar pump (includes pump); **Option only when there is no available power source and not economical to run power to site. Electricity installation cost must exceed $10,000.**							
Applicable to Wildlife Landuse Only. Can be scheduled as a supporting practice in conjunction with Prescribed Grazing 528 when needed to protect wildlife or natural communities.							
329	**Residue & Tillage Mgmt - Notill/Striptill Direct Seed**						
	No-Till/Strip-Till	Acre	$13.42		$16.10		1 Year
Limited to 2 years. Financial Assistance applies to establishing the cash crop, not the cover crop.							
System is applicable in all cropland and land where crops are planted.							
329	**Residue & Tillage Mgmt - Notill/Striptill Direct Seed**						
	Basic	Acre	$21.35		$25.62		1 Year
643	**Restoration and Mgt. of Rare and Declining Habitats**						
	Habitat Monitoring and Mgt, Low Intensity and Complexity	Acre	$2.41		$2.89		
	Rare or Dec. Habitat Monitoring and Mgt, Medium Intensity 2/	Acre	$8.95		$10.74		
	Habitat Monitoring and Mgt, High Intensity and Complexity 2/	Acre	$16.74		$20.09		
	Dev.of Shallow Micro-Topo Features with Normal Farm Equip 1/	Acre	$28.87		$34.64		
	Dev.of Deep Micro-TopoFeatures with Heavy Equipment 1/	Acre	$78.28		$93.94		1 Year
1/ **Applicable to Wildlife Landuse Only.** Restore and manage according to habitat needs identified by the GA Habitat Suitability Index model and comparisons with site appropriate Ecological Site Descriptions or other suitable reference conditions.							
2/ **Applicable to Wildlife Landuse Only.** Requires a monitoring plan, an approved agreement with the monitoring organization, and a signed landowner release agreeing that the data will be publicly available.							
391	**Riparian Forest Buffer**						
	Bare-root, hand planted 1/	Acre	$193.40		$232.08		
	Bare-root, machine planted 2/	Acre	$210.96		$253.15		15 Years
1/ The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of hand planted bare-root hardwood trees. One third of the area will be planted to each woody plant type. Tree spacing will be 12' x 12'.							
2/ The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of machine planted bare-root hardwood trees. One third of the area will be planted to each woody plant type. Tree spacing will be 12' x 12'.							
558	**Roof Runoff Structure**						
	Roof Gutter, Small, 6 inches wide and smaller 1/	LnFt	$4.31		$5.17		
	Concrete Curb 2/	LnFt	$8.02		$9.62		
	Trench Drain 3/	LnFt	$7.61		$9.13		
	Roof Gutter with storage tank 4/	Gal	$1.17		$1.41		15 Years
1/ Price of length of roof gutter.							
2/ Price of length of concrete curb.							
3/Price of length of trench drain.							
4/ Pay per gallon of storage in tank. Use standard tank closest in volume to design volume. Cost includes length of roof gutter.							

Practice Code	Conservation Practice	Payment Unit	Payment Rate	Maximum Amount	HU Payment Rate	HU Maximum Amount	Lifespan
367	**Roofs and Covers**						
	Post Frame Building 1/	SqFt	$6.42		$7.70		
	Steel Frame Building 2/	SqFt	$5.27		$6.32		10 Years
1/ Posts and roof system with concrete footers at support posts. Square footage is measured post to post.							
2/ Posts and roof system with concrete footers at support posts. Steel frame buildings must be designed and installation certified by a registered Georgia PE. Square footage is measured post to post.							
798	**Seasonal High Tunnel System**						
	Seasonal High Tunnel System	SqFt	$3.40	$ 7,000.00	$4.08	$ 7,000.00	4 Years
Costs are based on purchase of manufactured kit and landowner installing the structure. Structure must be installed to manufacturer's specifications. **NOT FOR GENERAL EQIP, ONLY FOR ORGANIC AND HIGH TUNNEL INITIATIVES.**							
381	**Silvopasture**						
	Commercial thinning and establishment of introduced grasses. 1/	Acre	$231.76		$278.11		
	Tree Establishment 2/	Acre	$80.90		$95.80		20 Years
1/ Commercial thinning of an existing stand of trees followed by establishment of introduced grasses. Thinning should be to a basal area of 30 to 50. Cost includes grass establishment. For the Sandhills, Coastal Plain, and Flatwoods Regions Bahiagrass is the recommended forage species. For the Ridge and Valley and Blue Ridge Regions Orchardgrass and/or Tall Fescue are the recommended forage species. Tall Fescue can be used as the chosen forage species throughout the Piedmont, but Bahiagrass is also acceptable in the lower Piedmont.							
2/ The establishment of trees into an existing pasture where adequate native grasses or introduced forage is present. Typical alley arrangement is 40' wide forage alley with tree spacing of 8'x12'.							
574	**Spring Development**						
	Spring Development 1/ 2/	Each	$2,584.66		$3,101.59		20 Years
1/ Includes collection system and spring box. Does not include livestock pipeline from spring box to watering facility.							
2/ **Applicable to Wildlife Landuse Only**. Allowed when planned in conjunction with Restoration and Management of Rare or Declining Habitats (643), Stream Habitat Improvement (395), Wetland Restoration (657), or Wetland Wildlife Habitat Management (644).This practice will not disturb high quality, natural habitat.							
442	**Sprinkler System**						
	Center Pivot System 1/	Ft	$56.80		$68.16		
	Solid Set System 2/	Acre	$3,611.96	$ 25,000.00	$4,334.35	$ 25,000.00	
	Traveling Gun System 3/	Each	$34,762.34		$41,714.81		
	Retrofit of Existing Sprinkler System 4/	Ft	$10.66		$12.79		
	VRI_System_Renovation 5/	Ft	$16.46		$19.75		15 Years
Water supply and conveyance from source to field is not addressed within this practice. **Ag Wastewater Notes**: For Ag Wastewater the least cost system (center pivot, solid set system, or traveling gun system) will be selected based on acres figured in the Cost Estimator "Ag Waste Calculator" tab. Actual wastewater and soil samples are required to calculate acreage needed to apply yearly wastewater prior to irrigation design or payment. Example, if acreage needed to apply yearly wastewater is 9.6 acres or less then a solid set system would be the least cost system for the practice instead of a hose reel. The producer can install a hose reel but payment will be based on the solid set system. **Ag Wastewater applications will require a NMP**. **Freshwater Notes**: **Irrigation Water Management, CPS 449 must be used in conjunction with these practices.** If a working center pivot system is determined to be past its usable life and landowner is willing to install a new center pivot system, the calculated amount necessary to retrofit the old center pivot system will be provided to the landowner to offset the cost of the new center pivot system. In addition, the old center pivot system being replaced will be destroyed. Conversion from a traveler system to a pivot will be acceptable; cost-share rate will be based on the cost of retrofitting the size pivot necessary for servicing the involved field. **Must have a copy of system design completed and certified by a Certified Irrigation Designer(CID), Georgia PE, or Area Engineer**. **CID designs must be reviewed by NRCS engineers (does not include retrofits). Certification must be provided that system was installed in accordance with the certified design.** Certification can be provided by the installer (provided the landowner is not the installer), the CID or field office staff.							
1/ For Ag Wastewater Only. Use for wastewater application. Waste water application acres based on Cost Estimator "Ag Waste Calculator" tab for nitrogen.							
2/ Includes all components of solid set system and installation costs. Use for wastewater application. Waste water application acres based on Cost Estimator "Ag Waste Calculator" tab for nitrogen. Use for freshwater for historically underserved clients.							
3/ For Ag Wastewater Only. Use for wastewater application. Waste water application acres based on Cost Estimator "Ag Waste Calculator" tab for nitrogen.							
4/ Payment rate covers all materials and labor for completing the retrofit in accordance with the system design . Pressure regulators are required at each sprinkler. Drop nozzles can be either wobblers, orbitors or rotator sprinklers.							
5/ Renovation of a previously retrofitted irrigation system with proper modular components and pressure regulating devices, along with all other needed components. VRI system requirements must be shown at signup.							
570	**Stormwater Runoff Control**						
	Combination, Most common Best Management Practices	Acre	$527.47		$632.96		20 Years
For use with Irrigation Reservoir only. **NOT FOR GENERAL EQIP, ONLY FOR IRRIGATION PILOT PROGRAM.**							

Practice Code	Conservation Practice	Payment Unit	Payment Rate	Maximum Amount	HU Payment Rate	HU Maximum Amount	Lifespan
578	**Stream Crossing**						
	Rock armored low water crossing 1/	SqFt	$4.16		$4.99		
	Concrete low water crossing	SqFt	$5.63		$6.75		
	Culvert installation 2/	LnFt	$2.52		$3.03		
	Low water crossing using prefabricated products 3/	SqFt	$5.08		$6.10		10 Years
Must add critical area planting and mulch. May be used in WRP/ACEP-WRE and livestock systems (livestock must be fenced out of creeks). If needed in a forestry system, contact State Forester and State Engineer							
1/ Includes stream crossing with any rock surface (GAB, surge stone, riprap). Price inlcudes all surfacing materials, geotextile and installation.							
2/ Paid by inches of culvert diameter multiplied by culvert length. Must add HUA; Pipe must be designed to accommodate fish passage.							
3/ Geocell filled with gravel, articulated concrete, pavers, or concrete block.							
Applicable to Wildlife Landuse Only. Allowed when planned for a wildlife habitat purpose and as a supporting practice to Forest Stand Improvement (666), Restoration and Management of Rare or Declining Habitats (643), Stream Habitat Improvement (395), Upland Wildlife Habitat Management (645), Wetland Restoration (657), or Wetland Wildlife Habitat Management (644) ONLY IF a stream crossing is required to carry out wildlife management activities. Use of this practice must be justified in the conservation plan. Plan in conjunction with Aquatic Organism Passage. This practice will not disturb high quality, natural habitat. Landowner must secure required permits. **Must receive prior approval from the State Biologist and/or engineer to schedule these scenarios for wildlife land use.**							
395	**Stream Habitat Improvement and Management**						
	Riparian Zone Improvement-Forested	Acre	$6,518.66		$7,822.39		
	Instream wood placement	Acre	$10,951.75		$13,142.10		
	Instream rock placement	Acre	$9,685.06		$11,622.07		
	Rock and wood structures	Acre	$20,379.22		$24,455.07		
	Fish Barrier	CuYd	$4,364.96		$5,237.95		5 Years
Applicable to Wildlife Landuse Only. Must receive prior approval from the State Biologist and/or engineer to schedule these scenarios. Manage according to habitat needs identified by the Stream Visual Assessment Protocol 2 and comparisons with site appropriate Ecological Site Descriptions or other suitable reference conditions.							
Applicable to Wildlife Landuse Only. Landowner must secure required CWA and other necessary permits							
580	**Streambank and Shoreline Protection**						
	Shaping 1/	LnFt	$14.34		$17.21		
	Bioengineered 2/	LnFt	$49.23		$59.08		
	Structural 3/	LnFt	$120.96		$145.15		
	Toe Protection 4/	LnFt	$74.82		$89.79		20 Years
A preconstruction notification (PCN) must be filed with the Corp of Engineers prior to the construction of streambank stablization projects if the following criteria are met: The Savannah District of the Corp of Engineers has put a regional restriction on Nationwide Permit 13. If you are stabilizing a streambank on a perennial stream and it is 100 feet or greater, the landowner must submit a PCN.							
1/ Includes shaping bank and erosion control fabric. Add critical area planting and mulch as needed.							
2/ Includes shaping bank, livestake, rootwads and revetments. Add critical area planting and mulch as needed.							
3/ Includes shaping bank and installing riprap. Add critical area planting and mulch as needed.							
4/ Type I or III rock rip rap used in conjunction with shaping or bioengineered streambank stabilization.							
Applicable to Wildlife Landuse Only. Allowed when planned in for a wildlife habitat purpose in conjunction with Timber Stand Improvement (666), Restoration and Management of Rare or Declining Habitats (643), Stream Habitat Improvement (395), Upland Wildlife Habitat Management (645), Wetland Restoration (657), or Wetland Wildlife Habitat Management (644).							
570	**Stormwater Runoff Control**						
	Combination, Most common Best Management Practices	Acre	$527.47		$632.96		20 Years
For use with Irrigation Reservoir only. **NOT FOR GENERAL EQIP, ONLY FOR IRRIGATION PILOT PROGRAM.**							
649	**Structures for Wildlife**						
	Nesting Box, Small no pole	Each	$30.59		$36.71		
	Nesting Box, Small, with wood pole	Number	$45.67		$54.81		
	Nesting Box, Large	Each	$61.67		$74.01		
	Nesting Box or Rapture Perch, Large, with Pole	Each	$175.66		$210.79		
	Escape Ramp	Each	$26.03		$31.24		
	Fence Markers, Vinyl Undersill	Ft	$0.11		$0.13		
	Brush Pile - Small	Each	$23.76		$28.51		
	Brush Pile - Large	Each	$95.68		$114.82		5 Years
Applicable to Wildlife Landuse Only. Plan according to the 649 Structures for Wildlife Job Sheet							
600	**Terrace**						
	Broadbased	Ft	$1.60		$1.92		
	Narrow Base, less than 8% slope	Ft	$1.14		$1.37		10 Years
Add critical area planting and mulching as needed							

Practice Code	Conservation Practice	Payment Unit	Payment Rate	Maximum Amount	HU Payment Rate	HU Maximum Amount	Lifespan
612	**Tree/Shrub Establishment**						
	Medium Density-hand plant Conifer B.R. 9/ 12/	Acre	$95.03	$ 20,000.00	$114.04	$ 20,000.00	
	Medium Density-Mech Plant Conifer 10/ 13/	Acre	$96.12	$ 20,000.00	$115.34	$ 20,000.00	
	Medium Density-hand plant Conifer 8/	Acre	$156.27	$ 20,000.00	$187.53	$ 20,000.00	
	Low Density-hand plant Containerized 7/	Acre	$133.20	$ 20,000.00	$159.84	$ 20,000.00	
	High Density mech conifer planting 3/	Acre	$146.70	$ 20,000.00	$176.04	$ 20,000.00	
	High Density-hand plant Conifer 4/	Acre	$204.16	$ 20,000.00	$245.00	$ 20,000.00	
	Hardwood Hand Planting-bare 1/	Acre	$158.12	$ 20,000.00	$189.75	$ 20,000.00	
	Hardwood Hand Planting-bare root-protected 2/	Acre	$257.01	$ 20,000.00	$308.41	$ 20,000.00	
	Shrub Planting 6/	Acre	$107.20	$ 20,000.00	$128.64	$ 20,000.00	
	Hardwoods Tree Planting and Shrubs Hand Planting 2-3 gallon plants--protected 11/	Acre	$456.86	$ 20,000.00	$548.23	$ 20,000.00	15 Years
1/ Hardwood seedlings will be planted at minimum of 12X12 spacing at 300 trees per acre. ALL forestry acres are eligible for payment. Sites will be hand planted. A Forest management plan is required prior to payment.							
2/ Hardwood seedlings will be planted at minimum of 12X12 spacing by hand method at 300 trees per acre with protected tree tubes. ALL forestry acres are eligible for payment. Sites will be hand planted. A Forest management plan is required prior to payment.							
3/ Longleaf pines will be planted by mechancial method. ALL forestry acres are eligible for planting. A Forest Management plan is required prior to payment. A minimum of 605 trees per acre at a 6X12 spacing.							
4/ Longleaf Pines will be planted at 6X12 spacing at 605 trees per acre. ALL forestry acres are eligible for planting. A Forest Management plan is required prior to payment.Sites will be hand planted. Plant containerized longleaf pines seedling only.							
6/ **Applicable to Forestry Landuse Only**. Shrubs will be planted on a 20 X 30 spacing of 1-3 gallon shrubs plants for wildlife in forest openings. Each shrub plant will be protected with tree shelter or tree tube. A Forest Management plan is required prior to payment.							
7/ **Applicable to Wildlife Landuse Only**. 396 containerized trees per acre hand planted							
8/ **Applicable to Wildlife Landuse Only.** 454 containerized trees per acre hand planted							
9/ **Applicable to Wildlife Landuse Only**. 454 bareroot trees per acre hand planted							
10/ **Applicable to Wildlife Landuse Only.** 454 bareroot trees per acre mechanically planted							
11/ **Applicable to Wildlife Landuse Only.** In one acre openings, hand plant 20 trees (hardwood, seedling or transplant, potted or B&B 2-3gal.) per acre and 20 shrubs (seedling or transplant, potted or B&B 2-3 gal.) per acre							
12 /Conifers (loblolly or slash) will be planted by hand method. ALL forestry acres are eligible for planting. A Forest Management plan is required prior to payment. A minimum of 545 trees per acre at a 8X10 spacing.							
13 /Conifers (loblolly or slash containerized) will be planted by machine method. ALL forestry acres are eligible for planting. A Forest Management plan is required prior to payment. A minimum of 545 trees per acre at a 8X10 spacing.							
660	**Tree/Shrub Pruning**						
	Pruning-Low Height 1/ 2/	Acre	$100.52		$120.62		1 Year
Applicable to Wildlife Landuse Only. 1/ Allowed when planned for a wildlife habitat purpose in conjunction with Timber Stand Improvement (666), Restoration and Management of Rare or Declining Habitats (643), Stream Habitat Improvement (395), Upland Wildlife Habitat Management (645), Wetland Restoration (657), or Wetland Wildlife Habitat Management (644) to restore a site-suited native plant community according to a Ecological Site Description or other appropriate reference condition.							
2/ On Grazing and Forest Land, for maintenance of established silvopasture sites only. First lift should be done when trees reach 15-20 feet in height. Prune up to 9 feet (Do not remove>50% of canopy) Second lift should be done when trees reach 30-40 feet in height. Prune to 18 feet. (Maintain a live crown of no less than 40%)							
490	**Tree/Shrub Site Preparation**						
	Mechanical - Medium 2/	Acre	$178.54	$ 17,000.00	$214.25	$ 17,000.00	
	Chemical - Ground Application 1/	Acre	$53.62	$ 17,000.00	$64.35	$ 17,000.00	
	Chemical - Aerial Application 3/ 4/	Acre	$73.21	$ 17,000.00	$87.86	$ 17,000.00	1 Year
1/ The use of various herbicides applied in order to remove undesirable vegetation and improve site conditions for establishing trees and/or shrubs. Typical sites include abandoned fields, pastures, rangelands, agricultural fields or forestland that was recently harvested.							
2/ The use of machinery to treat an area in order to improve site conditions for establishing trees and/or shrubs.							
Applicable to Wildlife Landuse Only . Allowed when planned in conjunction with Timber Stand Improvement (666), Restoration and Management of Rare or Declining Habitats (643), Stream Habitat Improvement (395), Upland Wildlife Habitat Management (645), Wetland Restoration (657), or Wetland Wildlife Habitat Management (644) to restore a site-suited native plant community according to a Ecological Site Description or other appropriate reference condition.							
3/ **Applicable to Wildlife Landuse Only.** This method will be used in instances where there are site accessibility concerns or the cost effectiveness of ground application is unreasonable							
4/ **Applicable to Forestry Landuse Only.** Apply herbicides to a forest cut over site by using aerial methods.							
620	**Underground Outlet**						
	Less than or equal to 6in 1/	Ft	$4.55		$5.46		
	Greater than 6in to 12in 2/	Ft	$9.35		$11.22		
	Greater than 12in to 18 in 2/	Ft	$12.45		$14.94		
	Greater than 18in to 30in 2/	Ft	$18.96		$22.76		20 Years
1/ 6" single wall plastic barrel and 8" riser. Includes pipe, earthwork, and riprap outlet basin. Must add critical area planting and mulch.							
2/ Single Wall Includes pipe, earthwork, and riprap outlet basin. Must add critical area planting and mulch.							

Practice Code	Conservation Practice	Payment Unit	Payment Rate	Maximum Amount	HU Payment Rate	HU Maximum Amount	Lifespan
645	**Upland Wildlife Habitat Management**						
	Habitat Monitoring and Mgt, Very-Low Intensity and Complexity	Acre	$0.71		$0.86		
	Habitat Monitoring and Mgt, Low Intensity and Complexity	Acre	$2.41		$2.89		
	Habitat Monitoring and Mgt, Medium Intensity and Complexity 2/	Acre	$8.95		$10.74		
	Habitat Monitoring and Mgt, High Intensity and Complexity 2/	Acre	$21.75		$26.09		
	Development of Shallow Micro-Topographic Features with Normal Farming Equipment. 1/	Acre	$28.87		$34.64		
	Development of Deep Micro-Topographic Features with Heavy Equipment. 1/	Acre	$78.28		$93.94		
	Establishment of seasonal forage or cover for wildlife on non-cropland.	Acre	$123.41		$148.09		1 Year
1/ **Applicable to Wildlife Landuse Only.** Manage according to habitat needs identified by the GA Habitat Suitability Index model and comparisons with site appropriate Ecological Site Descriptions or other suitable reference conditions.							
2/ **Applicable to Wildlife Landuse Only**. Requires a monitoring plan, an approved agreement with the monitoring organization, and a signed landowner release agreeing that the data will be publicly available.							
360	**Waste Facility Closure**						
	Liquid Waste Impoundment Closure with fill 1/	CuFt	$0.30		$0.36		
	Liquid Waste Impoundment Closure with no liquid/slurry 2/	CuYd	$2.96		$3.55		20 Years
Contract for one item only, not both. **Producer must provide Notice of Termination to State Agency for state permitted sites along with certification that the closure was completed to NRCS Stds. Not for freshwater conversion.**							
1/ Covers the cost of pumping or hauling sludge and disposing of the wastes in accordance with a nutritent management plan and backfilling the holding pond with compacted earth fill. Need to add critical area planting and mulch (if needed).							
2/ Covers the cost of backfilling holding pond with compacted earth fill. Need to add critical area planting and mulch (if needed).							
632	**Waste Separation Facility**						
	Mechanical Separation Facility 1/	Each	$25,839.98		$31,007.97		
	Concrete Seperator 2/	CuFt	$4.05		$4.86		
	Concrete Sand Settling Lane 3/	SqFt	$4.82		$5.78		15 Years
1/ Includes equipment and concrete support pad.							
2/ Based on designed storage and includes grading and concrete placement. Must add critical area planting and mulch as needed.							
3/ Includes grading and concrete placement. Must add critical area planting and mulch as needed.							
313	**Waste Storage Facility**						
	Earthen Storage Facility 1/	CuFt	$0.23		$0.27		
	Dry Stack, concrete floor, wood wall 2/	SqFt	$4.47		$5.37		
	Conc Tank, Buried 3/	CuFt	$1.72		$2.06		
	Dry Stack, concrete floor, concrete wall 4/	SqFt	$5.59		$6.70		15 Years
Nutrient Management Plan required with this practice.							
1/ Payment based on designed storage volume to include manure, wastewater and rainfall on contributing areas and pond surface. Pay volume does not inlclude freeboard or sludge accumulation volume.							
2/ Must add critical area planting, mulch, roof and HUA for entrance pad. Size based on concrete pad area from post to post.							
3/ Must add critical area planting and mulch.							
4/ Must add critical area planting, mulch, roof and HUA for entrance pad. Size based on concrete pad area from post to post. Concrete walls are to be used for high moisture manures like dairy manure, layer litter, etc.							
634	**Waste Transfer**						
	Concrete Channel 1/	SqFt	$8.79		$10.54		
	Manure Flush System of transfer through a collection basin 2/	Gal	$1.89		$2.27		
	Waste Transfer Pipeline 3/	LB	$2.43		$2.91		15 Years
1/ Cost of concrete channel paid by sf of channel bottom.							
2/ Flush Tanks; Includes cost of concrete pad for flush tank							
3/ For waste transfer from a production area to a storage or treatment facility.							
359	**Waste Treatment Lagoon**						
	Waste Treatment Lagoon	CuFt	$0.16		$0.19		15 Years
Nutrient Management Plan required with this practice. Payment based on designed storage including manure, wastewater, minimum treatment volume, and rainfall on contributing drainage areas and pond surface. Pay volume does not include freeboard .							
638	**Water and Sediment Control Basin**						
	WASCOB base	CuYd	$2.12		$2.55		10 Years
Add critical area planting and mulch if needed. Use in conjunction with underground outlets as needed.							

Practice Code	Conservation Practice	Payment Unit	Payment Rate	Maximum Amount	HU Payment Rate	HU Maximum Amount	Lifespan
642	**Water Well**						
	Typical Well 1/	Each	$4,464.96		$5,357.96		
	Deep Well 2/	Each	$6,686.42		$8,023.70		20 Years
If existing well/water source is adequate for livestock water need, a new well is not justified. Not to be used for providing water to confined feeding operations or in buildings. **Must be part of a prescribed grazing system or where livestock exclusion has removed a water supply. Wells may be used for irrigation only for historically underserved applicants but only when existing well/water source is inadequate to supply irrigation water needs. Does not include the cost of the pump so include CPS 533, Pumping Plant, as a companion practice.**							
1/ Water surface 100 to 600 feet below ground surface. Complete well installation (casing, screen, seal, filter pack, concrete pad at well head).							
2/ Water surface > 600 ft. below ground surface. Complete well installation (casing, screen, seal, filter pack, concrete pad at well head).							
614	**Watering Facility**						
	Less than 100 gal 1/	Each	$74.73		$89.67		
	100-200 gal 2/	Each	$196.35		$235.63		
	201-400 gal 3/	Each	$234.54		$281.45		
	401-600 gal 4/	Each	$377.35		$452.82		
	Greater Than 600 gal 5/	Each	$527.56		$633.07		
	2 Ball Freeze proof 6/	Each	$791.23		$949.48		
	4 Ball Freeze proof 6/	Each	$958.11		$1,149.74		
	Storage Tank for Solar Systems 7/	Gal	$0.79		$0.95		10 Years
For livestock grazing systems. Not to be used in confined feeding operations or in buildings. Must use Heavy Use Area Protection, CPS 561, around watering facility. **Use of used materials is not allowed.**							
1/ Very small trough for small animals; includes installation.							
2/ Small size trough; includes installation							
3/ Medium trough; includes installation.							
4/ Large trough; includes installation.							
5/ Extra-Large trough; includes installation.							
6/ Includes trough and installation.							
7/ Includes tank, concrete pad, and installation.							
657	**Wetland Restoration**						
	Riverine Levee Removal and Floodplain Features	Acre	$244.35		$293.22		
	Ditch Plug	CuYd	$10.40		$12.48		
	Estuarine Fringe Levee Removal	Acre	$12.04		$14.45		
	Riverine Channel and Floodplain Restoration	Acre	$331.91		$398.29		15 Years
Applicable to Wildlife Landuse Only. Restoration will occur according to habitat needs identified by the GA Habitat Suitability Index model and comparisons with site appropriate Ecological Site Descriptions or other suitable reference conditions. Must receive State Office biologist approval prior to scheduling this practice.							
644	**Wetland Wildlife Management**						
	Habitat Monitoring and Management, Very-Low Intensity and Complexity	Acre	$0.71		$0.86		
	Wetland Widlife Habitat Mongtand Mgt, Low Intensity and Complexity	Acre	$2.41		$2.89		
	Habitat Monitoring and Management, Medium Intensity and Complexity 2/	Acre	$8.95		$10.74		
	Habitat Monitoring and Management, High Intensity and Complexity 2/	Acre	$21.75		$26.09		
	Dev of Shallow Micro-Topoc Features with Normal Equipment. 1/	Acre	$28.87		$34.64		
	Development of Deep Micro-Topo Features with Heavy Equipment. 1/	Acre	$78.28		$93.94		1 Year
1/ **Applicable to Wildlife Landuse Only**. Manage according to habitat needs identified by the GA Habitat Suitability Index model and comparisons with site appropriate Ecological Site Descriptions or other suitable reference conditions.							
2/ **Applicable to Wildlife Landuse Only.** Requires a monitoring plan, an approved agreement with the monitoring organization, and a signed landowner release agreeing that the data will be publicly available.							

Practice Code	Conservation Practice	Payment Unit	Payment Rate	Maximum Amount	HU Payment Rate	HU Maximum Amount	Lifespan

FOOTNOTES

Maximum Amounts for the life of the contract are established on certain conservation practices or options, as noted in this Policy. EQIP funds provide financial assistance to eligible farmers and ranchers to help these producers enhance agricultural and forested lands in a cost-effective and environmentally beneficial manner. Establishing Maximum Amounts for the contract allows Georgia NRCS to make EQIP funding assistance available to a larger number of eligible farmers, ranchers and forest producers here in Georgia, and also as a method to make funding available to eligible producers regardless of size of operation (i.e., by not obligating large amounts of funds on operations with more acres, Georgia EQIP funds will be available to a larger number of separate operations). The specified "Maximum Amounts" for identified practices within this policy does not allow applicants to exceed the maximums through multiple offers/contracts on different acres when those acres are controlled by the same applicant(s), where 'control' means possession of the land by ownership, written lease, or other legal agreement (as generally indicated on FSA's EZ156 &/or Producer Farm Data Report forms). Historically Underserved Maximum Amounts refers to the maximum contract payment for Historically Underserved Farmers (Limited Resource Farmers, Beginning Farmers, and Socially Disadvantaged Farmers as defined in the 2014 EQIP Final Rule). NOTE: While there is no restriction on the number of applications (or contracts, if funded) that may be submitted by an applicant for EQIP, all FY16 EQIP applications (and contracted amounts) will count towards the Maximum Amount as listed in FY16 EQIP Policy for any and all FY16 EQIP applications (and FY16 EQIP contracts, if funded) where acres are controlled by the same applicant(s).

FMP = Forest Management Plan. Approved FMP's are:
(a) Forest Management Plan 106 Plan developed by a TSP OR
(b) Forest Stewardship Plan (FSP) prepared by GFC OR
(c) GFC Resource Management Plan OR
(d) Conservation Plan on Forest Land OR
(e) a site-specific plan prepared by a professional forester if this site-specific plan has been approved by either an NRCS forester or the Georgia State Forester at the time the EQIP applicant signs the CPA1200.

Conservation practices that are either structural or vegetative, and have a multi-year lifespan. Structural practices involve the establishment, construction, or installation of site-specific measures. Vegetative practices involve the establishment or planting of site-specific vegetative measures. Payments are established as a one-time only payment, not multi-year payments. Georgia policy requires the owner be a signatory to a contract which has EQIP funds used for any structural or vegetative practice, in accordance with CPM515.71(B)(2)(ii).

Technical Service Provider *(http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/technical/tsp)*

Georgia State Conservationist

1/5/2016
Date

Water Quality Data

Site No.	Status	Monitoring Site Description	Aug-15		Sep-15		Oct-15		Nov-15	
			E.coli cfu/100 ml	Fecal Coliform cfu/100 ml	E.coli cfu/100 ml	Fecal Coliform cfu/100 ml	E.coli cfu/100 ml	Fecal Coliform cfu/100 ml	E.coli cfu/100 ml	Fecal Coliform cfu/100 ml
1	Pre BMP	Beaverdam Creek at Hwy 66	266.64	444.40	199.98	333.30	233.31	388.85	399.96	666.60
2	Pre BMP	Richland Creek at Hwy 15	99.99	166.65	166.65	277.75	166.65	277.75	399.96	666.60
3	Pre BMP	Richland Creek & Hwy 44	99.99	166.65	499.95	833.25	633.27	1055.45	633.27	1055.45
4	Pre BMP	Town Creek at Hwy 44	266.64	444.40	33.33	55.55	1399.86	2333.10	133.32	222.20
5	Pre BMP	Beaverdam Creek at Hwy 15	466.62	777.70	466.62	777.70	833.25	1388.75	499.95	833.25
6	Pre BMP	Town Creek @ MLK	166.65	277.75	666.60	1111.00	1933.14	3221.90	766.59	1277.65
7	Pre BMP	Richland Creek at Penfield Rd	NA	NA	NA	NA	233.31	388.85	433.29	722.15
9	Pre-BMP	Stillhouse Branch at Hwy 15	NA	NA	NA	NA	466.62	777.70	NA	NA
		Rainfall - previous 48 hours (inches)	0		0		0.03*		1.38**	
		Rainfall - previous 24 hours (inches)	0		0		0		0	

Site No.	Status	Monitoring Site Description	Dec-15		Jan-16		Feb-16		Mar-16	
			E.coli cfu/100 ml	Fecal Coliform cfu/100 ml	E.coli cfu/100 ml	Fecal Coliform cfu/100 ml	E.coli cfu/100 ml	Fecal Coliform cfu/100 ml	E.coli cfu/100 ml	Fecal Coliform cfu/100 ml
1	Pre BMP	Beaverdam Creek at Hwy 66	133.32	222.20	66.66	111.10	1999.8	3333.00	433.29	722.15
2	Pre BMP	Richland Creek at Hwy 15	1166.55	1944.25	166.65	277.75	233.31	388.85	633.27	1055.45
3	Pre BMP	Richland Creek & Hwy 44	99.99	166.65	99.99	166.65	99.99	166.65	166.65	277.75
4	Pre BMP	Town Creek at Hwy 44	599.94	999.90	66.66	111.10	533.28	888.80	133.32	222.20
5	Pre BMP	Beaverdam Creek at Hwy 15	2866.38	4777.30	433.29	722.15	2133.12	3555.20	333.3	555.50
6	Pre BMP	Town Creek @ MLK	2799.72	4666.20	1633.17	2721.95	2933.04	4888.40	1333.2	2222.00
7	Pre BMP	Richland Creek at Penfield Rd	99.99	166.65	0.00	0.00	0.00	0.00	NA	NA
8	Pre-BMP	unnamed tributary to Town Creek @ Greensboro Police Department (GA 15)	NA			NA	NA	NA	266.64	444.40
9	Pre-BMP	Stillhouse Branch at Hwy 15	0***		0.00		NA	NA	199.98	333.30
		Rainfall - previous 48 hours (inches)	0		0.00		0.00		0.00	
		Rainfall - previous 24 hours (inches)					0.00		0.00	

Site No.	Status	Monitoring Site Description	Apr-16				
			E.coli cfu/100 ml	Fecal Coliform cfu/100 ml			exceeds seasonal fecal coliform standard (200 May - Oct))
1	Pre BMP	Beaverdam Creek at Hwy 66	333.30	555.50			exceeds seasonal fecal coliform standard (1000 Nov
2	Pre BMP	Richland Creek at Hwy 15	166.65	277.75			wet weather sampling event
3	Pre BMP	Richland Creek & Hwy 44	133.32	222.20			
4	Pre BMP	Town Creek at Hwy 44	299.97	499.95		*	Rainfall amounts as follows: 10/3 - 0.66"; 10/4 - 0,48" 10/5 - 0.03"; 10/6 - 0". This sampling event is considered a wet weather sampling event per Ga EPD.
5	Pre BMP	Beaverdam Creek at Hwy 15	233.31	388.85			
6	Pre BMP	Town Creek @ MLK	766.59	1277.65		**	Rainfall amounts as follows: 11/1 - 1.02"; 11/2 - 1.38" 11/4 - 0.00". This sampling event is considered a wet weather sampling event per Ga EPD.
7	Pre BMP	Richland Creek at Penfield Rd	NA	NA			
8	Pre-BMP	unnamed tributary to Town Creek @ Greensboro Police Department (GA 15)	99.99	166.65		***	12/4 there was 0.14" rainfall. Monitoring partners reported very heavy rainfall from ~7 am.
9	Pre-BMP	Stillhouse Branch at Hwy 15	166.65	277.75			
		Rainfall - previous 48 hours (inches)	0.00				
		Rainfall - previous 24 hours (inches)	0.00				