Revised TMDL Implementation Plan
Little River Watershed
HUC 030701011401
ELEMENT 21 – FY11 Section 319(h) Grant

U.S. Environmental Protection Agency
Region 4
Atlanta, Georgia

Georgia Department of Natural Resources
Environmental Protection Division
Atlanta, Georgia

Newton County
Water and Sewerage Authority
Newton County, Georgia
2012 - 2014

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The preparation of this report was financed in part through a grant from the U.S. Environmental Protection Agency under the Provisions of Section 319(h) of the Federal Water Pollution Control Act, as amended.

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Organization

This revised TMDL Implementation Plan was developed in response to federal and state requirements to improve the water quality in the 303(d) of the Little River that is "not supporting" its designated use of “fishing”. Under federal and state mandates, a TMDL Implementation Plan is developed or revised once every five years for streams not meeting their designated use.

This document was funded by the U.S. Environmental Protection Agency and Newton County Water and Sewerage Authority and prepared under an agreement dated February 2, 2012 between the Georgia Environmental Protection Division and the Newton County Water and Sewerage Authority. Under this agreement and under the scope of services are descriptions of 15 tasks. Task 8 includes the delivery of this revised TMDL Implementation Plan. A second document was prepared in conjunction with this Plan and includes the other 14 tasks that support the findings included herein. This revised TMDL Implementation Plan may be used as a stand-alone document.

Introduction

The Federal Clean Water Act of 1972 mandated that all lakes, rivers, and streams of the United States meet certain water quality standards. This mandate required states to conduct monitoring that would identify polluted waters that do not meet water quality standards. Those not meeting the standards were placed on the state’s Section 303(d) list as required by the U.S. Environmental Protection Agency.

Through consistent stream testing and monitoring, a three-mile section of the Little River was identified as a stream that was “not supporting” its designated beneficial use of “fishing”. For streams that are not supporting their designated beneficial use, the state requires the development of a TMDL Implementation Plan and periodic revisions until water quality standards are achieved.

This project and the preparation of this Revised TMDL Implementation Plan is funded by a 60% grant from U.S. Environmental Protection Agency and a 40% share from the Newton County Water and Sewerage Authority. The Georgia Environmental Protection Division is responsible for administering the U.S. EPA grant and providing regulatory guidance on this project.

Background

This project consists of planning, educating, monitoring and implementing activities whose ultimate purpose is to significantly reduce fecal coliform in the 303(d) section of Little River. Both fecal coliform and sediment have impaired the section of the Little River that extends from Social Circle to Nelson Creek. The section is part of the HUC 030701011401 basin.

The project focuses on fecal coliform because the TMDL Implementation Plan of August 2003 states that over time the 303(d) section of the Little River will purge itself of sediment. The report states that "Based on the current estimated annual loading for the listed segments (Little River) . . . . no reduction in sediment loading is needed . . . . to meet the applicable water quality target."

The development of TMDLs in the TMDL Loads for Fecal Coliform in the Oconee River Basin dated February 2002 represents an initial step in the long-term process of reducing fecal coliform loading. According to the report, this 3-mile 303(d) section of Little River is classified as "Fishing" and has a drainage area of 27 square miles. In preparing this report, Little River was sampled and modeled for fecal coliform. As a result, this section was included in the 303(d) list of streams in the Oconee River basin. A 59 percent reduction requirement for fecal coliform is noted in the summary table of that report.

The TMDL Implementation Plan dated August 2003 succeeded the initial TMDL report as a part of a subsequent step in the remediation of area streams. The 2003 TMDL Implementation Plan confirms the "not supporting" status of Little River from Social Circle to Nelson Creek and the need for a 59 percent reduction in fecal coliform. Since the reporting of TMDL loadings in February 2002, this plan provides an update of fecal reduction activities conducted in Newton, Walton, Putnam, Jasper and Morgan Counties. For Newton and Walton Counties in which the 303(d) section of Little River is located, the following observations were recorded:

- Poultry farmers, in general, use stack houses, accept advice on land application rates for chicken manure, and comply with setbacks and buffers on streams. Approximately 80 percent of farms comply with suggested BMP's.
- Waste Management Plans were required for confined animal feeding operations and new rules were promulgated for lagoons treating animal waste.
- At the time the plan was completed, neither Newton nor Walton County had ordinances controlling illicit discharges or storm water ordinances. Neither county had regulations governing septic tank inspections or maintenance.

The plan reported progress with some aspects of fecal reduction in streams. Newton County had adopted a land development ordinance requiring 100-foot setbacks on all streams and 150-foot setbacks for impervious surfaces and septic tank drain fields. When the plan was published, Walton County had set up a Clean and Beautiful office for the purpose of educating public schools, civic groups, and the general public on water-quality related issues. The program sponsors an Adopt-a-Stream program.

The TMDL Implementation Plan recognized the need to identify specific sources of fecal coliform before taking action. To locate a source, the types of sources were considered as a starting point for subsequent investigation. Those listed include failed septic tanks, leaking sewer lines, animal waste, agricultural runoff and kennels. Stakeholders involved in the planning process stated that the significance of each source's impact on the stream must to be considered.

The TMDL Implementation Plan concluded with a recommendation of steps to take toward fecal coliform reduction. These steps for fecal reduction are summarized as follows.

- Continue implementation of recent and proposed ordinance adoptions and revisions
- Pinpoint pollutant sources through systematic sampling for fecal coliform
- Implement BMP's suited to reduce fecal pollution at specific locations
- Develop a stormwater utility to fund BMP's
- Continue educational efforts
- Re-evaluate the effectiveness of the plan after 5 years

The action plan for the TMDL Implementation Plan was presented in tabular format. This table identified the impaired section of the 303(d) stream, sited the regulatory standards and indicated the required pollutant reduction. Little River from Social Circle to Nelson Creek was identified and the standards to meet are winter limits of 1000 counts per 100 ml and summer limits of 200 counts per 100 ml fecal coliform. The required reduction is 59 percent in loading. Subsequent tables listed management measures that have been or will be implemented to achieve water quality standards and the load reductions established in the TMDL Implementation Plan. The information for Little River is presented below.

The TMDL Implementation Plan included a set of criteria to determine the progress made towards reducing pollutants in the 303(d) stream section. The criteria are listed in bulleted format.

- By 2008, fecal coliform TMDL in the Little River should be reduced by 50%
- By 2008, Little River should be classified at least as "partially supporting" its designated use
- All new ordinances and BMP programs should be enacted or in progress by 2008
- Existing BMPs, plus additional BMPs, in combination with replacement of agricultural with residential and commercial land use is expected to result in 80% of active agriculture enterprises using recommended BMPs by 2008

The TMDL Implementation Plan calls for the completion of activities that leads to the reduction of fecal coliform in the 303(d) section of Little River. The essence of these activities is to educate the public, pinpoint problem areas through sampling, and implement BMP's.

This 319(h) project revises the current TMDL Implementation Plan, supplements activities where efforts have lagged and extends the program by replacing and/or adding to the numbers of BMPs used to prevent human and animal wastes from entering streams. The essence of this project mirrors the previous project and includes activities to monitor the stream, pinpoint problems, educate the public through workshops, create and enforce

environmental ordinances and livestock management, and install BMPs to protect the Little River.

Objectives

This project revises the 303(d) Little River section of the TMDL Implementation Plan by detailing and implementing activities resulting from comprehensive stream monitoring/analysis, public education and the creation and enforcement of environmental ordinances. This project is a continuum of the TMDL Implementation Plan of August 2003 and will build upon an assortment of historical data, previous studies and stakeholder meetings. This project includes the applicable "nine minimum elements" which were developed in support of a Section 319(h) funded project.

This project focuses on the fecal coliform pollution in the 303(d) section of the Little River located in HUC 030701011401 watershed. More specifically, this project will pinpoint locations that generate fecal pollution, match the proper BMP's with selected source locations and implement a limited number of the more cost-effective activities to reduce fecal coliform. The desired outcome is to develop a plan that will reduce levels of fecal coliform in the 303(d) sections of Little River to below TMDL limits.

To achieve the project objectives of revising portions of the TMDL Implementation Plan of August 2003, a list of proven activities are carried out. EPA published a manual entitled, Handbook for Developing Watershed Plans to Restore and Protect Our Water in March 2008. This manual contains a collection of successful activities that are included in this Revised TMDL Implementation Plan. Specific activities in the handbook that are used on this project are referred to as the "nine minimum element" for revising a TMDL implementation plan. The nine minimum elements are summarized in bulleted format and are addressed in this revised TMDL Implementation Plan.

Nine Minimum Elements:

a. Identify causes of impairment and pollution sources
b. Estimate load reductions expected from management measures
c. Describe non-point source management measures that will achieve load reductions
d. Estimate Technical and financial assistance needed to implement the plan
e. Conduct informational and educational meetings for the public
f. Schedule the implementation of nonpoint source management measures
g. Describe interim measurable milestones to determine if controls are being implemented
h. Establish criteria to determine whether load reductions are being achieved
i. Measure the effectiveness of management measures using criteria in h.

Public Outreach

Public outreach events were organized to engage three types of audiences for three distinct purposes. Group identification names and descriptions are given as follows:

Steering Committee:	Environmental and community experts who advise the Authority and consultant concerning matters of the project.
Workshop:	Presentation on the presence of fecal coliform and how to reduce coliform concentrations through BMPs. Discussions follow.
Public Meeting:	Presentation of water quality and how to reduce coliform concentrations through the implementation of BMP's. Questions and answers follow.

Steering Committee - The Newton County Water and Sewerage Authority chose the members of the steering committee through an evaluation of individual environmental expertise, knowledge of the project surroundings, and influence within the local community. In choosing committee members, the Authority selected those who would give the group a balance of expertise and a broad range of knowledge concerning environmental issues.

The Authority tapped the social and political network within the community to find individuals who have a passion for protecting the environment and a heart-of-concern for the environmental health of the community. A passion and heart for the environment are important criteria and are essential metrics when group participation is needed in a committee setting.

Those chosen as steering committee members are listed below.

Steering Committee Members

1. Kay Lee
   Executive Director
   The Center
   Covington, Georgia

2. Larry McSwain
   Biologist, Retired
   Fisheries and Wildlife Management
   Covington, Georgia

2. Patti Landford
   Wildlife Resources Division
   Social Circle, Georgia

4. Christine McCauley
   Madison Morgan Conservancy

The Steering Committee met on four separate occasions. The percentage of attendance for the four meetings was 75%. The dates and synopsis of the meetings are given as follows:

1. April 4, 2013 – Percent Attendance 100% - The meeting began with individual introductions of committee members, NCWSA staff and consultant for the newly formed steering committee. Introductions were followed by a power point presentation that provided an overview of the regulatory and water quality history of the impaired section of the Little River. At the conclusion of the presentation, discussions began that centered on the question, "What does NCWSA hope to achieve with the Steering Committee?"

2. May 23, 2013 – Percent Attendance 75% - The second committee meeting included a 5-stop tour of problem sites within the impaired Little River basin. These sites were identified as major sources of fecal coliform. Committee members asked questions and commented on each site's potential for polluting.

3. August 21, 2013 – Percent Attendance 75% - The August meeting began with a brief review of previously discussed information and an update on the project's progress. This update was followed by descriptions of two BMP demonstration projects and an explanation of how we intend to reduce fecal coliform in the Little River. The meeting concluded with discussion concerning the forum, topics and format for conducting the upcoming workshops.

4. April 14, 2014 – Percent Attendance 50% - The final meeting began with a note appreciation to those who served on the committee, their active participation and valuable input. The highlight of the meeting was a PowerPoint presentation that provided an overview of activities conducted up to the third committee meeting and an update of work that has been accomplished since the meeting. An introduction of the proposed BMPs for the next project was given and was followed by questions and group discussions.

Workshop - Two workshops were held with one on November 19th and the other on November 21st. One hundred letters were sent to area residents announcing the events. Each was held at The Center, a location in Covington, Georgia that is used for community planning.

One person attended the November 19th meeting and no one, other than Authority staff and the consultant, attended the November 21st meeting. A 25-slide power point presentation was prepared that answered the following six questions.

1. Why review and study the Little River?
2. What is the water quality of the Little River?
3. What is the problem with having fecal coliform in Little River?
4. Where are the major sources of fecal coliform?
5. What can be done to reduce fecal coliform in Little River?
6. What funding is available for reducing fecal coliform in Little River?

Public Meetings – Public Meetings were held on two separate evenings. The purpose of the meetings was to inform the local community about the need for quality water in our streams, the water quality status of the Little River, the importance of good water quality in the Little River and how the level of contaminants in the Little River can be reduced.

A 25-slide PowerPoint presentation was developed to convey the information listed under the purpose. Selected PowerPoint slides that were prepared for the meetings were retained with the support documents.

The two public meetings were held at The Center in Covington, Georgia on March 18th and March 20th at 6:00 pm. Each meeting was advertised in The Covington News for four consecutive Sundays prior to each meeting. A copy of the advertisement is included in the supporting documents.

Ordinances

The more likely sources of fecal coliform are livestock waste and community wastewater because of the prevalence of pastures and an upstream wastewater treatment plant. Specifically, livestock waste in proximity to the Little River, or its tributaries, has a significant impact on the water quality of Little River. An ordinance that eliminates or reduces the contamination by livestock will restrict the disturbance and use of the 100-foot riparian buffer by livestock.

Concerning community wastewater, fecal coliform contaminates Little River by way of sewer collection system defects, sewage overflows, mismanaged sewage discharges and failing septic tanks. An ordinance that eliminates or reduces contamination by community wastewater will control illicit wastewater discharges into Little River.

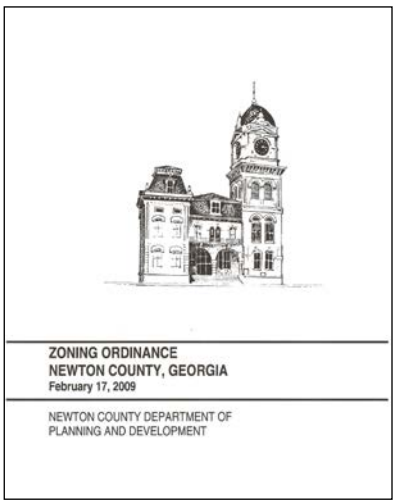
Based on the findings under this project, recommendations for reducing fecal coliform contamination are offered as additions or modifications to the current ordinances of Newton County and Walton County. These recommendations should be reviewed by legal counsel before they are incorporated into a document of ordinances.

Recommendations - The recommendations below offer additions and modifications to reduce present and future fecal coliform pollution with livestock waste as its source. Remedies through ordinances for fecal coliform pollution with community wastewater are covered by federal, state and local laws and ordinances. Strict enforcement of current ordinances is a must for reducing fecal coliform pollution in the Little River.

The Carl Vinson Institute of Government serving under The University of Georgia System provides an excellent document for creating effective riparian buffer ordinances. The document is entitled Protecting Stream and River Corridors and is written by Wender and Fowler.

Newton County

Newton County's document for controlling development is the Zoning Ordinance, Newton County, Georgia dated February 17, 2009. The zoning ordinance was developed through the Newton County Department of Planning and Development. The following narrative is suggested as additions or modifications to the current Zoning Ordinance document. Note that the recommended additions and modifications are presented in *italics*.



Zoning Ordinance

Sec. 420-050 Riparian Buffers
Page 123

A. All development and disturbance of land within this district not located in a designated Development Node shall preserve a natural and undisturbed riparian buffer of 100 feet in width along shorelines of lakes and banks or rivers or perennial streams identified on the US Geological Survey 7.5 min. quadrangle map.

Preserving a natural and undisturbed riparian buffer of 100 feet in width prohibits the clearing of land within the 100-foot riparian buffer for the specific use of grazing, moving, relocating, watering and cooling livestock. No livestock shall be fenced, confined or allowed to defecate or urinate within the 100-foot riparian buffer. Any previously disturbed riparian buffer shall be allowed to recover through the natural vegetative process or approved systematic planting of field borders, filter strips and/or forest buffers.

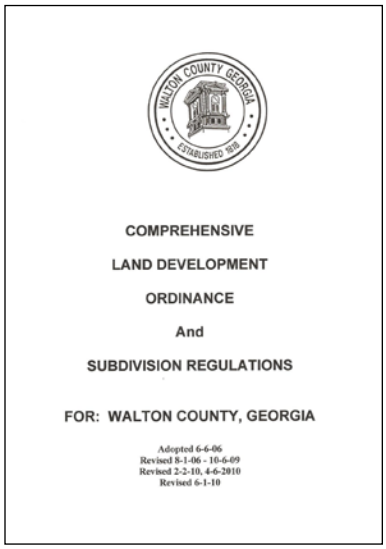
Sec. 420-080 Exemptions
Page 124

D. Stream and agricultural activities that are consistent with Best Management Practices established by the Georgia Forestry Commission for the Georgia Department of Agricultural are permitted, provided such activity shall not impair or degrade the water quality.

The use of livestock within the 100-foot riparian buffer is restricted. Livestock shall not be fenced, confined or allowed to defecate or urinate within the riparian buffer.

Walton County

Walton County's document for controlling development is The Code of Walton County, Georgia dated February 1, 2005. The regulating ordinance is entitled Comprehensive Land Development Ordinance and Subdivision Regulations for Walton County, Georgia, revised June 1, 2010. The regulating ordinance for land development and protection is listed in the code by reference. The following narrative is suggested as additions or modifications to the current Zoning Ordinance document. Note that the recommended additions and modifications that are presented in *italics* should be added to the end of Section 100.



Comprehensive Land Development Ordinance and Subdivision Regulations for Walton County, Georgia

Article 11 Environmental Protection

Part 1 Protected Resources
Section 100 River and Stream Corridor Protection (12-2-08)
Page 350

The Little River

A. The following greenways and setbacks are hereby established along the Little River.

1. Stream Greenway

The area extending a distance of 100 feet from the river shall remain a natural and undisturbed buffer except as otherwise provided in this District.

Stream Setback: No impervious surface shall be constructed within a distance of 150 feet from the river.

Facilities handling hazardous waste within a seven-mile radius of a water supply intake shall perform operations on impermeable surfaces having spill and leak collection systems.

B. Development Regulations

All requirements relating to the development of a site along this corridor shall be those that apply to the underlying Land Development District as required by this Ordinance, except where the provisions of this District differ or are contained elsewhere in this Ordinance or are more restrictive than the development regulations applying to the underlying Land Development District.

1 Septic Tank Construction

Septic tanks and septic tank drain fields are prohibited within the greenway or setback areas of the river.

2. Wildlife and Fisheries

Wildlife and fisheries management activities consistent with the purposes of Section 12-2-8 (as amended) of Article 1, Chapter 2, Title 12 of the Official Code of Georgia Annotated (O.C.G.A.).

3. Public Utilities

Utilities shall be exempt from the above greenway and setback provisions in accordance with the following conditions if the utilities to be located in the greenway or setback areas cannot feasibly be located outside these areas:

(a) The utilities shall be located as far from the river bank as reasonably possible.

(b) The installation and maintenance of the utilities shall protect the integrity of the greenway and setback areas as reasonably as possible using watershed best management practices.

4. Roadways

Roadways, bridges and drainage structures may encroach upon required greenways and setbacks where such structures are necessary to provide access. Such roadways and bridges shall cross-streams perpendicularly where reasonably possible. The number of such stream crossings and associated structures shall be minimized as possible.

5. Recreation

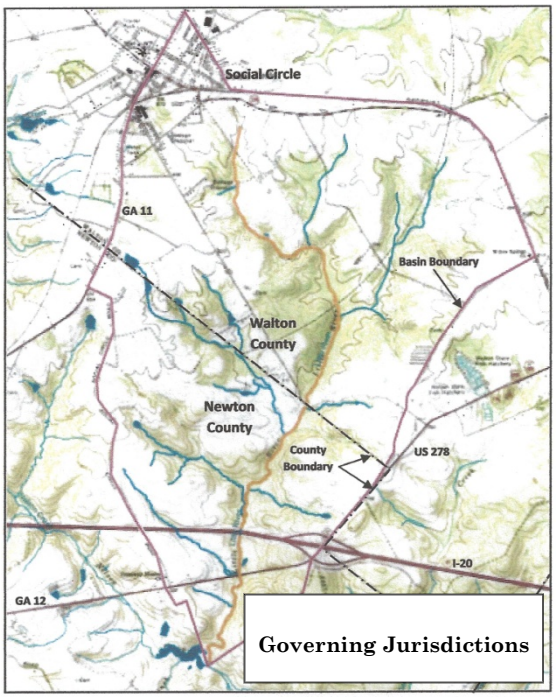
Recreational usage shall be consistent either with the maintenance of a natural vegetative greenway or with river-dependent recreation, such as a boat ramp.

6. Livestock

Preserving a natural and undisturbed riparian buffer of 100 feet in width prohibits the clearing of land within the 100-foot riparian buffer for the specific use of grazing, moving, relocating, watering and cooling livestock. No livestock shall be fenced, confined or allowed to defecate or urinate within the 100-foot riparian buffer. Any previously disturbed riparian buffer shall be allowed to recover through the natural vegetative process or approved systematic planting of field borders, filter strips and/or forest buffers.

The use of livestock within the 100-foot riparian buffer is restricted. Livestock shall not be fenced, confined or allowed to defecate or urinate within the riparian buffer.

Governing Jurisdictions of the Project Area - The impaired portion of Little River lies within the political boundaries of Newton and Walton Counties. The southern half of the project area is governed by an elected Board of Commissioners in Newton County. The Board consists of six members elected from five districts with a chairman elected at-large. Walton County is served by a seven member Board of Commissioners elected from six districts. The Chairman is elected at large.



A portion of the City of Social Circle lies within the project area and is governed by an elected city council. Most residents within the city limits receive sewage collection service from the City. Sewage is treated at the Social Circle WPCP which is regulated by the Georgia Environmental Protection Division.

Legal Jurisdiction and Authority - The state of Georgia legislates governmental responsibilities to local jurisdictions like Newton and Walton Counties. Governmental responsibilities pertinent to this project include the creation of new ordinances and enforcement of current ordinances, regulations, codes and articles relating to zoning, sediment and erosion, stormwater and stream impairment. Each County has a health department that monitors area septic systems and enforces the standards for the installation of new and replacement septic systems.

Newton County Water and Sewerage Authority does not have the authority to enact or enforce local ordinances.

The table on the following page provides a list of contacts for each legal jurisdiction that governs the project area.

Jurisdictional Contacts

Regulating Authority	Public Entity	Contact	Address	Phone
Newton County	Board of Commissioners	Keith Ellis, Chairman	1124 Clark Street Covington, GA 30014	(678) 625-1200
Newton County	Environmental Health	Don Loggins	1113 Usher Street NE Covington, GA 30014	(770) 784-2121
Walton County	Board of Commissioners	Kevin W. Little, Chairman	303 Hammond Drive Monroe, GA 30650	(770) 267-1301
Walton County	Environmental Health	Jon Terry, Manager	126A Court Street Monroe GA, 30655	(770) 267-1430

Current Requirements - State regulations and local codes were researched and evaluated with respect to their use in improving and protecting the water quality of the 303(d) Little River basin. Since a large portion of the watershed is undeveloped, strict enforcement of current and future regulations, codes and ordinances will have an enormous impact on the future water quality of the stream. Ordinances pertinent to improving and protecting water quality are summarized by jurisdiction.

Newton County Ordinances

Newton County adopted the Community Agenda (JJ&G 2007) as part of the Comprehensive Plan for Newton County. The Community Agenda documents the community's vision and implementation of strategies for future development within the County.

The Community Agenda identifies 24 character areas within the County, each intrinsically different and having its own vision for future development. Therefore, each has designated its own set of land-use policies. For example, Stanton Springs is a nearby character area that is set aside as a Multi-County, Mixed-Use Business Park.

Ordinances covering the Little River area are listed in bulleted format.

Zoning:

- Dictates lot sizes and impervious areas based on property usage.
- Restricts activities within 100 and 50-foot riparian buffers, 100-year floodplains, areas with slopes greater than 15%, and areas with soils having severe limitations.
- Establishes and enforces 150-foot setbacks for impervious surfaces, structures, and septic systems.
- Recognizes and enforces an effective Open Space Conservation policy that h limitations on the percent of impervious surfaces for new and redeveloped residential sites.

- Requires Conditional Use Permits for CAFOs, landfills, underground and above ground storage tanks, and wastewater facilities.

Water Resources Management:

- Includes and enforces all applicable codes and regulations for local jurisdictions as annotated in Georgia's Phase II NPDES General Permit.
- Enforces the county's Illicit Discharge Detection and Elimination article through the regulation of non-stormwater discharges within the county. This article serves to improve and protect local water quality through inspection of properties and facilities that are suspect as pollutant sources. As part of an emergency response plan, it also provides for the notification of accidental spills or discharges
- Enforces the Post-Construction Stormwater Management article that establishes a minimum requirement to control adverse effects of increased runoff and pollution due to development
- Maintains a Stormwater Local Design Manual to supplement the Georgia Stormwater Management Manual for the design and permitting of stormwater control structures
- Enforces a Flood Management article that regulates new and replacement sanitary sewer systems to minimize or eliminate floodwater infiltration into sewer systems and the exfiltration of sewage into floodwaters. Requirements include the proper locating of waste disposal systems on properties in order to avoid impairment or contamination of streams during flooding.

Qualified Sewage Disposal:

- Adopts and enforces the requirements of O.C.G.A. 290–5–26 of the Administrative Code of Georgia for on-site sewage waste disposal systems. This code is incorporated into the county's local permitting requirements.

Walton County Ordinances

In 2007, the Northeast Georgia Regional Development Commission prepared the Community Agenda as part of the Comprehensive Plan for Walton County. The Walton County Community Agenda records the community's vision and recommends strategies for future development within the county.

The Walton County Community Agenda identifies six character areas within the county that are used as models for future planning and development in the county. The emphasis of the Community Agenda is business and employment model. This model's character area is intended for large-scale, employment and intensive commercial uses.

Although a major focus in Walton County is commercial use, the community agenda includes provisions for enforcing riparian buffer and tree canopy protection ordinances. The rural/residential character area model recognizes the importance of preserving as much open space as possible by minimizing the land used for new development.

Ordinances covering the Little River area are listed in bulleted format.

Zoning:

- Dictates lot sizes and impervious areas based on property usage.
- Recognizes and enforces an Open Space Conservation policy that has limitations on the percent of impervious surfaces for new and redeveloped residential sites.

Environmental Protection:

- Includes and enforces all applicable codes and regulations for local jurisdictions as annotated in Georgia's Phase II NPDES General Permit.
- Enforces the county's Illicit Discharge Detection and Elimination article through the regulation of non-stormwater discharges within the County. This article serves to improve and protect local water quality through inspection of properties and facilities that are suspect as pollutant sources. As part of an emergency response plan, it also provides for the notification of accidental spills or discharges.
- Enforces Post-Construction Stormwater Management regulations which establish a minimum requirement to control adverse effects of increased runoff and pollution due to development.
- Enforces the requirements set forth in the Georgia Stormwater Management Manual for the design and permitting of stormwater control structures.
- Enforces a Flood Management article that regulates new and replacement sanitary sewer systems to minimize or eliminate floodwater infiltration into sewer systems and the exfiltration of sewage into floodwaters. Requirements include the siting of waste disposal systems in order to avoid impairment or contamination of streams during flooding.
- Restricts activities within 50-foot riparian buffer.
- Establishes and enforces 75-foot setbacks for impervious surfaces, structures, and septic systems.

On-Site Septic Systems:

- Enforces regulations regarding on-site septic system permitting and installation through the Walton County Environmental Health Department.

Regulatory Takings - Understanding regulatory "taking" is important in the preparation, approval and enforcement of ordinances. In preparing and approving ordinances, elected officials may be reluctant to approve an effective ordinance because of political and public repercussions. However, approving a less effective ordinance serves no purpose.

During the 17th and 18th century, British property rights were changing dramatically from a feudal state to private ownership mentality. Our founding fathers were advanced in their thinking regarding property rights, but never viewed the right to ownership as absolute. They stopped short of absolute ownership because they recognized that ownership rested on the mutual obligations of the people.

Our founding fathers understood the concept of common law doctrine of nuisances. This doctrine was common knowledge because it prevented property owners from using their land in a way that unreasonably interferes with the rights of their neighbor. Our founding fathers penned the Bill of Rights in order to provide property ownership protection in three separate areas.

The first protection prevents the federal government from depriving a person of property ownership without due process of law. The first applies to any deprivation of property, not just taking property for public use. The second prevents the government from taking private property for private use and the third requires payment of just compensation when property is taken for public purposes.

The court cases relevant to this project involved regulatory takings related to health and safety. In these cases, the courts recognize that all property in this country is held under the implied obligation that the owner's use of property shall not be injurious to the community. Courts have shown that laws designed to protect water quality are justified in the interest of public health and safety.

In Lucas v. South Carolina Coastal Council (1992), the US Supreme Court ruled that property uses may be denied if the use is a nuisance according to longstanding common law. This case is important because riparian buffers may be protected from takings claims on the grounds that nonpoint source pollution to water may be a public nuisance. In a case like this, loss of some but not all economic value does not support a taking claim.

Georgia courts have also denied taking claims using similar criteria. However, Georgia courts differ and consider government regulations valid unless the plaintiff can prove that 1) the regulation causes "significant detriment" and 2) there is no relationship between the regulation and the public interest. Even with the additional state requirements, Georgia courts have upheld the validity of riparian buffer protection programs. In Threatt v. Fulton County (1996), the Georgia Supreme Court upheld Fulton County's riparian buffer ordinance and cited the Metropolitan River Protection Act in support of the ordinance.

In general Georgia courts favor the prudent use of riparian buffer protection ordinances when public health and safety is considered. Although buffers may reduce the permissible use of portions of property, the private loss of use is small compared to the public benefit received. A riparian buffer protection ordinance has a greater chance of being upheld by Georgia courts when the ordinance includes a clear explanation of the requirements, program flexibility, and a fair consideration for variances.

Stream Monitoring

Background - A review of GA EPD reports, Georgia's 2008 - 303(d) of impaired waters, US EPA Total Maximum Daily Load (TMDL) reports, and available geographic information shows an impaired waterway segment within Newton and Walton Counties. The impaired segment begins at Little River head waters in Social Circle and ends at the confluence of Little River and Nelson Creek. The stream is impaired by fecal coliform and was included on US EPA's 303(d) list when the stream's water quality standard was violated twice in 2004.

This stream segment is designated as "fishing", but received a Category 4a classification. A Category 4a classification means that data indicates that at least one designated use is not being supported, but TMDLs have been completed for the parameter that is causing the stream not to meet its designated use.

The impaired segment is not supporting "fishing" because limits for fecal coliform were exceeded per Chapter 391-3-6-. 03 of the Rules and Regulations for Water Quality Control. According to the rules, from May through October, fecal coliform must not exceed a geometric mean of 200 counts per 100 ml based on at least four samples collected from a sampling site over a 30-day period and at intervals of not less than 24 hours. From November through April, fecal coliform must not exceed a geometric mean of 1000 counts per 100 ml.

Objective - The project objective is to reduce fecal coliform in the 303 (d) segment of the Little River. To meet the overall goal of fecal coliform reduction, monitoring locations must be carefully selected. The analysis of test data will help to isolate and pinpoint pollution sources.

The importance of properly selecting sampling locations is to obtain stream samples that are truly consistent and representative of the stream quality at the designated locations. Consistent and represented to samples will yield data that is necessary in developing meaningful stream and sub basin analysis.

Monitoring Area - The monitoring area includes all of the drainage sub-basins that feed the impaired stream segments of the Little River, located in the upper Oconee River Basin. The impaired stream segment is 3 to 4 miles long and receives surface and groundwater flow from a 27 square mile drainage area. The watershed is located in the jurisdictional boundaries of Newton and Walton counties.

Targeted/BMP Monitoring Strategy - Earlier stream monitoring was conducted once in the year 2000 and on 16 separate occasions throughout 2004. The sampling was taken from Georgia EPD Monitoring Site No. 4 where the Little River flows under Georgia Highway 12 in Newton County.

This sampling location was selected as a primary monitoring point for both first and second series of sampling and was used to build upon Georgia EPD's historical monitoring data base. Additional sampling sites were selected to include three others that are also located on the Little River. The remaining six of the ten sites are located on tributaries to the Little River.

The purpose of setting up sampling sites under the targeted/BMP monitoring strategy was to isolate and pin-point sources of fecal coliform. Site locations were also positioned to simplify the fecal coliform process for determining load reduction and obtain conclusive data on which to implement best management practices. The overall purpose is to bring the Little River back into regulatory compliance for fecal coliform.

The location of each of the 10 monitoring sites was key to honing in on the precise location of fecal coliform sources. As mentioned, four of the monitoring sites are located along the Little River. Each of the monitoring sites is separated by an equal portion of stream flow travel time. By spacing the monitoring sites in this manner, a spike in fecal coliform concentrations between two consecutive monitoring sites can isolate a source to within a few square miles.

The six remaining monitoring sites are located on tributaries and are used to monitor suspected sub-basins of only a few square miles. The isolation of sources, based on the results of the 10 monitoring sites, narrows the search for sources to a few square miles where windshield surveys and a variety of map reviews can focus.

A map of the pre-selected monitoring sites is provided in the figure that follows. GPS coordinates for the monitoring sites are displayed in the table that follows.

Targeted/BMP Monitoring Plan Site Coordinates

Monitoring Site Number	Latitude North Degrees	Longitude West Degrees
1	33.607019	83.709132
2	33.612465	83.708416
3	33.623017	83.701333
4*	33.606700	83.709400
5	33.620450	83.703683
6	33.623037	83.701244
7	33.643800	83.711098
8	33.631733	83.697250
9	33.631500	83.697233
10**	33.643244	83.709349

*Monitoring Site No. 4 was established by GA EPD as a part of a previous stream monitoring project. The current project includes this monitoring site as well and uses the same monitoring site number. The monitoring of this site is a GA EPD requirement for this project.

** Monitoring Site No. 10 replaces Monitoring Site No. 2 that was established under a previous monitoring plan for the Little River basin. Monitoring Site No. 2, whose fecal coliform test results remained under regulatory limits, was located

above the Social Circle WPCP discharge. Monitoring Site No. 10 is located downstream of the Social Circle WPCP discharge.

Sampling Parameters and Schedule - The only parameter scheduled for sampling and testing was fecal coliform. Sampling and testing was conducted in three phases. The first phase was scheduled May 2012 in which a single sample was collected from each of the 10 sites. When the results from testing were obtained, adjustments were made in the location of the 10 sampling sites.

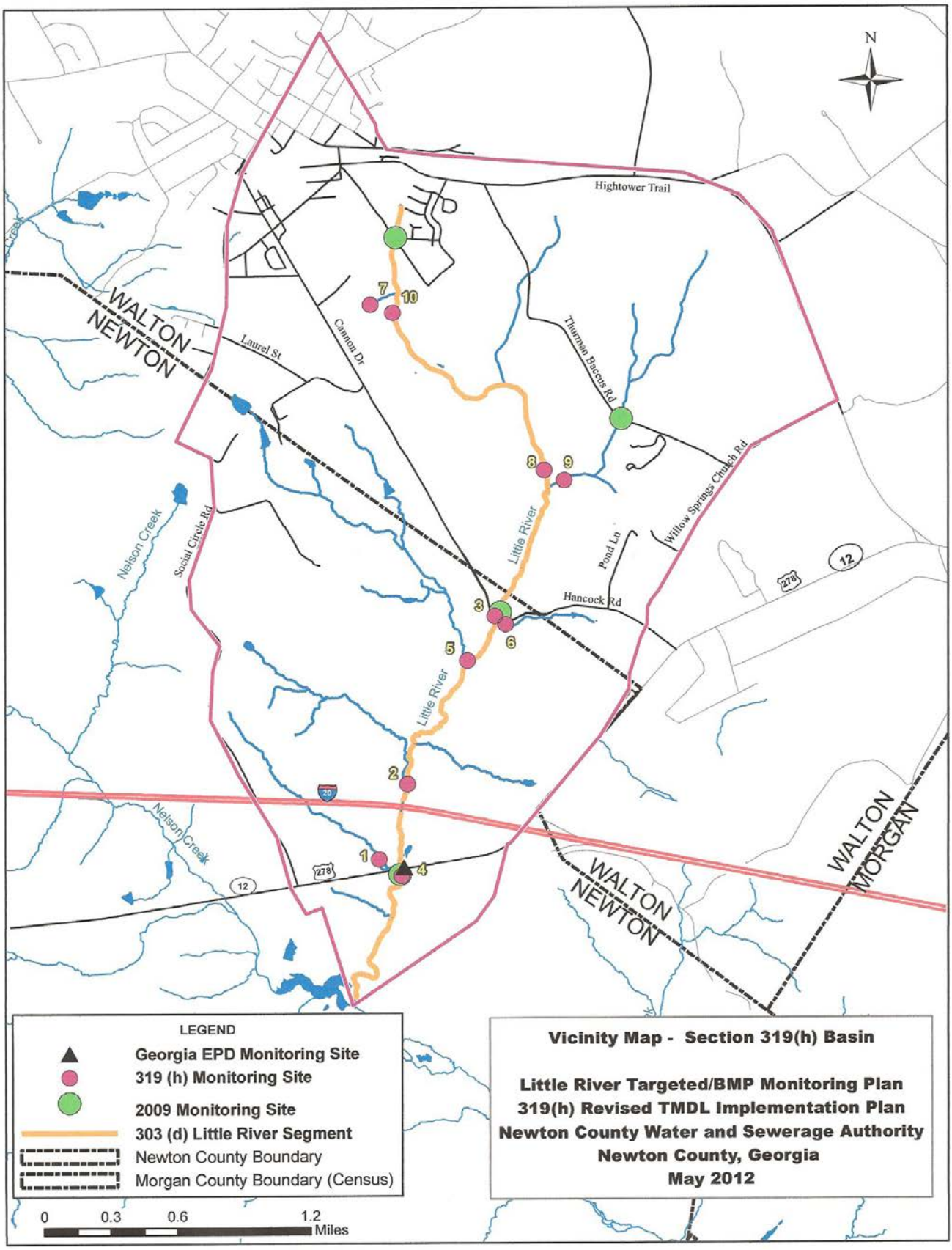
Once adjustments were made, the second phase began with a collection of the first series of stream samples. For the following 12 months, a single sample was collected from each of the 10 sites, once per month. Over a year's time, 120 samples were collected. This first series of sample collection was used to set a baseline for fecal coliform at each of the 10 sites. Samples were also used to pinpoint pollution sources.

During the final phase, adjustments were made at site locations. Some sampling sites were relocated to test the effectiveness of BMPs while others remained to trend data at key locations. Additional samples were collected during the sampling period to gain insight into data patterns.

Each set of 10 monthly samples were collected during the third week of each month. As a matter of protocol, one sample was collected from each monitoring site and one field blank was prepared for each monitoring event.

Personnel and Resources - The Georgia College and State University (GCSU) Department of Biological and Environmental Sciences was responsible for sample collection and testing and provided source tracking services for pinpointing the origins of fecal coliform pollution. The GCSU provided all equipment for the collection and testing of fecal coliform samples.

Quality Assurance - Georgia EPD has developed standard operating procedures establishing uniform methods for the field collection of data, documentation control, quality assurance, laboratory safety, as well as other activities. These guidelines were developed to document, the validity of measurements, analyses and the representativeness of samples collected. This project will comply with the applicable sections of the Georgia EPD's standard operating procedure for Surface Water Sampling (EPD-WPMP-2) as well as the Georgia Adopt-a-stream, Bacterial Monitoring Manual.


N
Hightower Trail
WALTON
NEWTON
Laurel St
Cannon Dr
Thurman Bascus Rd
Willow Springs Church Rd
Pond Ln
Hancock Rd
Social Circle Rd
Nelson Creek
Little River
Little River
Nelson Creek
12
278
20
WALTON
MORGAN
WALTON
NEWTON
1
2
3
4
5
6
7
8
9
10
LEGEND
Georgia EPD Monitoring Site
319 (h) Monitoring Site
2009 Monitoring Site
303 (d) Little River Segment
Newton County Boundary
Morgan County Boundary (Census)
0
0.3
0.6
1.2
Miles
Vicinity Map - Section 319(h) Basin
Little River Targeted/BMP Monitoring Plan
319(h) Revised TMDL Implementation Plan
Newton County Water and Sewerage Authority
Newton County, Georgia
May 2012

Source Investigation

Summary - Finding the top fecal coliform pollutant sources is one of the more important tasks of the revised TMDL Implementation Plan. This Source Investigation section lists the top fecal coliform pollutant sources and prioritizes each source according to its environmental impact on the Little River. The table entitled Top Suspected Fecal Coliform Sites on page 24 lists the top twenty-two fecal coliform pollution sources that contaminate the 303(d) section of the Little River basin.

This section provides visual aids that give perspective to each source and its relation to the others. A map showing the location of top suspected sources is viewed in the figure Top Suspected Fecal Coliform Sites on page 25. A complete list of the 44 sources is provided in the table Evaluated Fecal Coliform Sites, page 32, under the heading of Waste Load Scoring and Prioritization Process. A topographic map, property map, aerial map, photographs and a list of sources for each area is provided at the end of this document under the heading of Source Maps and Photos, page 64.

Of the top ten sites, two are in Newton County and rank first and second among sources. At the time of the investigation, the top-ranked source was a large cattle farm where cattle had easy access to a major tributary of Little River. The second-ranked site is located in Area No. 1 but is associated with the "hobby farm" community in Area No. 4. The farm is not well maintained and as result, little attention is given to the amount of animal waste that runs off into the Little River.

Area No. 4 is in Walton County and includes seven of the top ten sites. These sites rank third through ninth and are located within one-half mile of one another. These properties are over-grazed by horses, donkeys, goats, and emus, and subsequently, have little surface vegetation. Soils on these properties are packed hard by animal hooves, making it easy for stormwater to carry animal waste to the Little River.

The remaining site is ranked tenth and is found in Area No. 2. This site is a cattle farm with a moderate number of cattle that gaze within properly maintained pastures. A wet weather tributary to the Little River originates at this site. Fecal coliform concentrations near the Little River confluence have been between 32 and 137 counts per 100 mL.

Area No. 3 and No. 5 do not include any top ten suspected sources. The two areas contain cattle farms that are well managed and are considered minor contributors to the fecal coliform pollution found in the Little River. The cattle farms, however, were evaluated because of the number of cattle that were found in the areas.

A possible fecal pollutant source that is not among the top ten sources is the Social Circle Water Pollution Control Plant (WPCP). The Social Circle WPCP was suspected as a prime fecal coliform source because fecal coliform is present in the plant's discharge. Additionally, the plant's discharge is closely monitored by Georgia EPD and daily monitoring reports indicate that the plant's limit for fecal coliform was exceeded within the

last ten years. Other noted concerns include the release of untreated sewage from the collection and treatment system.

The more recent daily monitoring reports, however, show that the plant has been within its established limits. Additionally, tests from random samples near the plant's discharge indicate low levels of fecal coliform concentrations.

On April 22, 2013, samples were withdrawn from each of the ten monitoring sites and later tested for Bacteroides dorei. Bacteroides dorei is a human specific bacterium that is used to pin point human fecal coliform sources. Since all ten samples were negative for Bacteroides dorei and since recent fecal concentrations near the plant's discharge were low, this investigation views the Social Circle WPCP as a minor contributor to the fecal coliform problem in the Little River during dry weather.

However, during wet weather seasons and immediately after rainfall events, the Social Circle sewage collection system and treatment plant are subject to overflow and upsets. On April 8, 2014, a routine battery of monitoring site sampling was conducted. The test results showed that Little River had high concentrations of well over 2500 counts per 100 mL. Surprisingly, all sampled tributaries showed concentrations of less than 220 counts per 100 mL.

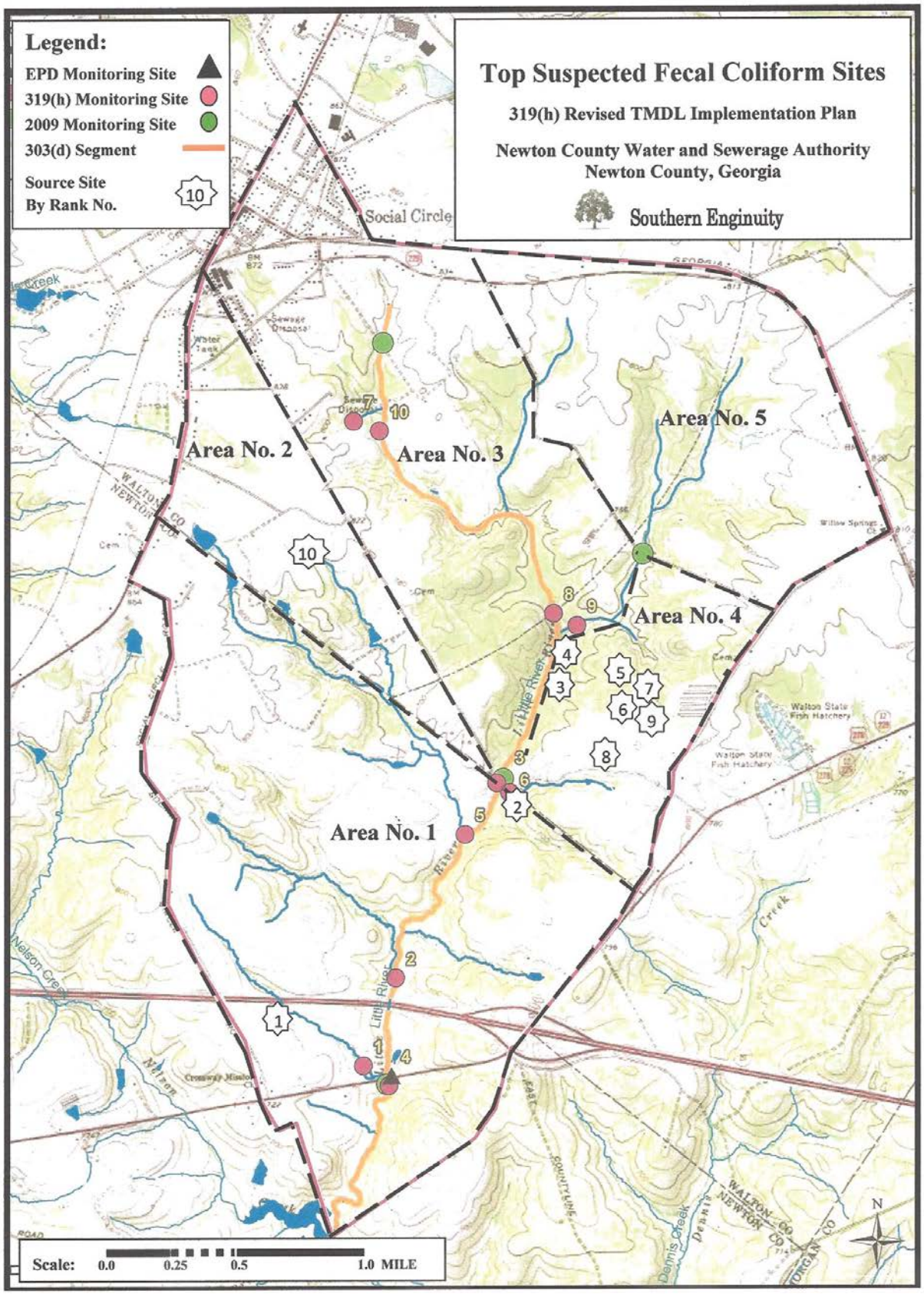
Since Monitoring Site No. 10 is less than one-half mile from the Social Circle WPCP and sewage collection system, the WPCP and collection are highly suspected of contributing to the fecal coliform problem in the Little River during rainfall events. Parenthetically, total rainfall for the preceding day, April 7, 2014 was 2.01 inches as measured at Newton County Water and Sewerage Authority's Yellow River Water Reclamation Facility. Bacteroides dorei bacterium tests were also conducted on the April 8th samples. The test results identified the fecal coliform source as human, adding additional suspicion that Social Circle WPCP and the Social Circle collection system are wet weather polluting sources.

From the negative test results for Bacteroides dorei April 22, 2013, other important conclusions were drawn. Since this bacterium helps to differentiate between sources of human and animal fecal coliform, negative test results are a good indicator that failed septic tanks are not significant contributors to fecal coliform pollution in the Little River. Using the bacterium test results and analyzing health department records, aerial photographs and windshield surveys, this report concludes that the search for fecal coliform sources should focus on animal sources.

Descriptions of the top ten fecal coliform polluting sources are provided under the heading of Pollutant Source Descriptions, page 26.

Top Suspected Fecal Coliform Sites

Rank No.	County	Area	Location	Relative Load	% Removal			Load Score	Direct Stream Access	Parcel	Street	Comments
					On-site	Pond	Overland					
1	Newton	1	8	960	50	10	5	410.4	Yes	124 013	US Hwy 278	Livestock Pond
2	Newton	1	6	150	0	0	0	150.0	Yes	133 2B 133 2C	365 Hancock Road	Poor site for fenced livestock
3	Walton	4	2	100	0	0	0	100.0	Yes	C1560001A00	2415 Pond Lane	Direct Livestock Watering
4	Walton	4	3	100	0	0	0	100.0	Yes	C1560001A00	2415 Pond Lane	Direct Livestock Watering
5	Walton	4	8	194	5	0	55	82.9	-	C1560001B00	2411 Pond Lane	Fenced Goats, Donkeys, Emu's
6	Walton	4	10	100	0	0	20	80.0	-	C1580101000	2429 Pond Lane	Fenced Horses
7	Walton	4	9	100	0	0	20	80.0	-	C1580100000	2409 Pond Lane	Fenced Horses
8	Walton	4	12	250	35	0	55	73.1	-	C1580106000	2467 Hancock Road	Fenced Horses
9	Walton	4	11	100	5	0	25	71.3	-	C1580096000	2438 Pond Lane	Fenced Horses
10	Walton	2	6	1344	85	30	60	58.3	Yes	SC180010000	1000 Laurel Drive	Livestock Pasture and Pond
11	Walton	5	4	573	80	0	50	57.3	-	SC230008000 SC230009000	348 Thurman Baccus Road	Grazing Livestock
12	Walton	4	1	100	20	30	0	56.0	Yes	C1560001B00	2411 Pond Lane	Livestock Pond
13	Walton	3	6	160	65	0	0	56.0	-	SC170077000	187 Vine Circle	Social Circle WPCP
14	Walton	5	3	1600	90	30	50	56.0	-	SC230013000	East Hightower Trail	Grazing Cattle
15	Walton	4	4	50	10	0	5	42.8	-	C1560001000	2419 Pond Lane	Disturbed Riparian Buffer
16	Walton	4	7	20	0	10	10	16.2	-	N158A003000	5442 Willow Wind Court	Fenced Goats
17	Newton	1	2	200	75	30	60	14.0	-	123 19	878 Social Circle Road	Active pasture
18	Walton	2	4	150	50	60	60	12.0	-	SC170005000	668 Laurel Drive	Hobby Farm
19	Walton	2	5	150	50	60	60	12.0	-	SC180001000	704 Laurel Drive	Hobby Farm
20	Newton	1	4	100	80	0	40	12.0	-	132 3	Cannon Drive	Active pasture
21	Walton	2	1	1500	90	90	25	11.3	Yes	SC170004000	714 South Cherokee Road	Livestock Pond
22	Walton	4	6	2	20	30	10	1.0	-	N158A005000	5422 Willow Wind Court	Small Dog Kennel


Legend:
EPD Monitoring Site
319(h) Monitoring Site
2009 Monitoring Site
303(d) Segment
Source Site
By Rank No.
10
Top Suspected Fecal Coliform Sites
319(h) Revised TMDL Implementation Plan
Newton County Water and Sewerage Authority
Newton County, Georgia
Southern Enginuity
Social Circle
Area No. 1
Area No. 2
Area No. 3
Area No. 4
Area No. 5
Little River
Walton State Fish Hatchery
Scale: 0.0 0.25 0.5 1.0 MILE
N

Background - The TMDL's developed in the TMDL Loads for Fecal Coliform in the Oconee River Basin dated February 2002 represent the first phase of a long-term process to reduce fecal coliform loading. According to the report, this 3-mile EPA 303(d) segment of the Little River is classified as "fishing". In preparing the report, the Little River was sampled and modeled for fecal coliform. As a result, this segment is included in the EPA's 303(d) list of streams in the Oconee River basin.

The TMDL Implementation Plan of August 2003 succeeded the initial TMDL report and is a part of the second phase in the remediation of area streams. The TMDL Implementation Plan confirms the "not supporting" status of Little River from the city of Social Circle to Nelson Creek. Since the reporting of TMDL loadings in February 2002, this plan provides an update of fecal reduction activities conducted in Newton, Walton, Putnam, Jasper and Morgan Counties.

The TMDL Implementation Plan of August 2003 recognized the need to identify specific sources of fecal coliform before taking action. To locate a source, the types of sources were considered as a starting point for subsequent investigation. Those listed include failed septic tanks, leaking sewer lines, animal waste and agricultural runoff. Stakeholders agreed that the significance of each source's impact on the stream must be considered.

The TMDL Implementation Plan calls for the completion of activities that leads to the reduction of fecal coliform in EPA's 303(d) reaches of the Little River. The essence of the activities is to educate the public, pin-point the problem sources and implement BMPs.

This section of the revised TMDL Implementation Plan serves to pin-point and prioritize fecal coliform pollutant sources. Subsequent sections address the effective use of BMPs to reduce fecal coliform pollution from these sources.

Pollutant Source Descriptions - One of the more important tasks of the revised TMDL Implementation Plan is finding the source of fecal coliform pollution. Finding these sources requires adherence to guidance documents, a diligent review of local land-use and planning documents, a thorough analysis of stream monitoring and a meticulous reconnaissance of the basin using aerial photographs, topographic maps, and windshield surveys.

The methodology for prioritizing sources requires a keen sense of fecal loading and pollutant reduction by considering the species of animals, on-site containment and natural overland treatment. This section of the revised TMDL Implementation Plan concludes with a prioritized list of the sources identified. The table Top Suspected Fecal Coliform Sites on page 24, lists the larger contributors of fecal coliform pollution to the Little River basin.

The composite of fecal coliform sources can be characterized by their points of origin. The points within the study area include the Social Circle

Water Pollution Control Plant (WPCP) and associated collection system, hobby farms, failing septic tanks, and managed livestock farms. Although the Social Circle WPCP is currently meeting its mandated fecal coliform limits during dry weather, it is none-the-less a contributor of fecal coliform to the Little River.

In order for the Little River to re-gain its "supporting" status for fishing, all contributors to the impairment of the Little River must be considered. Therefore, the treatment plant is compared to other sources in the study basin and is included in the prioritization process for identifying the leading sources.

The city of Social Circle sewage collection system is considered a part of the Social Circle WPCP. Portions of the collection system may be considered as separate pollutant sources if there are frequent sewage spills due to overflows and exfiltration from deteriorated pipes. On occasion, downstream residents have noticed signs posted by the city warning of contaminated water in the Little River. Spills were suspected on April 8, 2014. The location of collection system sources should be conducted through a sewer system evaluation survey.

The method for locating failing septic tanks incorporates maps showing areas of septic tank installations, areas having steep slopes and poor soils and areas with dark soils and thick, green vegetation. Aerial maps were used to aid windshield surveys in locating septic tanks and tile fields for signs of failure. Efforts to locate failing septic tanks are limited because of limited access to private property. No failing septic tanks were found during the investigation and failing septic tanks, and therefore, are not listed as a priority pollutant source.

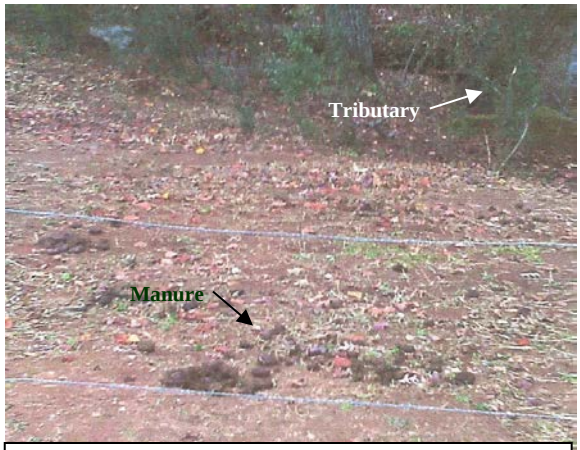
A plethora of analytical tools is available for identifying fecal coliform sources on managed livestock and hobby farms. The more useful tools include land use, topographic and aerial maps, water quality and flow data and windshield surveys. Land use and aerial maps are useful in eliminating large areas from detailed analysis. Water quality and flow data are helpful in narrowing the investigation to areas of only a few acres. Windshield surveys along with the aid of aerial maps help link a pollutant source to a specific parcel and street address.

The prioritization of sources requires knowledge and experience in estimating on-site containment and overland treatment. Well managed, large farming operations may be less likely to pollute than a smaller hobby farm because of effective on-site containment and overland treatment. Many of the well-managed farms retain pollutants while smaller operations have less control over animal wastes.

Two of the top ten polluting source sites lie within Newton County. The top-ranked site

is located on a managed farm with several heads of cattle. A factor responsible for the high-ranking include cattle access to a major tributary of the Little River. A second factor involves a cattle watering pond that allows cattle to defecate in a major tributary and re-suspend solids that eventually migrate to the Little River. Without on-site containment and any means of reducing fecal coliform, much of the pollutants are disbursed to the Little River rather than being retained and treated on-site.

A second location, ranking second, lies at the edge of the Newton County and Walton County line. Neighboring properties to the north, east and west are within Walton County. This property, however, lies within Newton County's jurisdiction. The figure on page 25 is a USGS Quadrangle Map that shows this property and its second place ranking. Although this property shelters two to three horses, the four factors that cause it to rank so high are its proximity to the Little River, its over-grazed pasture, its shortage of on-site containment and its lack of natural treatment. The photo to the right shows an area where over-grazing has increased soil imperviousness and eliminated the vegetative ground cover that retains and reduces fecal coliform. Photos provided at the end of this document for Area No. 1 show where horses feed and congregate near a major tributary. Under these conditions, animal waste is easily carried away to the Little River.



Hancock Road – Manure and Tributary

The remainder of the top ten pollutant sources lies to the north in Walton County. Seven of the ten sites are clustered together in Area No. 4 and are characterized as hobby farms. These sites, which rank third through ninth, are farms with over-grazed pastures and have hard compacted soils with little ground vegetation. Many of the properties are not well maintained and are littered with abandoned vehicles and auto body parts. Considering the mass of vehicles and auto parts on these properties, contaminants found in radiator fluid, transmission fluid and automotive lubricants may be sources of other pollutants found in Little River. These vehicles and auto body parts can also pose a health problem because the vehicles provide a habitat for disease-carrying rodents.

The one site in Newton County ranked second and the seven sites identified in the paragraph above are all in close proximity to one another. These sites are located immediately upstream of Monitoring Site No. 3. The eight sites are the probable cause for the large rise in fecal coliform concentrations at Monitoring Site No. 3. The figure on page 25 shows the location of Monitoring Site No. 3 and the eight sources in and around Area No. 4. All eight sources are suspected of contributing to the fecal coliform pollution in Little River.

The last of the top ten sites is a cattle farm. Pastures used for grazing cattle are open and relatively flat with surfaces covered in short grass. Although this farm is among the top ten pollutant sources, credit is given to the site for its ability to contain animal wastes on-site and reduce the pollutants that are carried by stormwater runoff. The site's distance to the Little River is 1-1/2 miles. One half mile from the site is a pond that captures and settles out many pollutants before they reach the Little River.

Cattle Gazing near Tributary Headwaters

Social Circle Water Pollution Control Plant - A fecal pollutant source that is not among the top ten sources is the Social Circle Water Pollution Control Plant (WPCP). The WPCP, however, is considered a significant wet weather source.

Social Circle WPCP lies in Area No. 3. Area No. 3 is a unique area because it is cordoned by Cannon Drive to the Southwest and Thurman Baccus Road to the Northeast. The system of roads and ridges isolates pollutant sources in this area. According to the current land-use maps and recent windshield surveys, no active pastures are in Area No. 3. Since the Social Circle WPCP appeared to be the only source of fecal coliform pollution in this area, the treatment plant was initially placed among the top ten suspected fecal coliform sites. The suspicion that the Social Circle WPCP was among the top fecal coliform sites led to an investigation of Georgia EPD stream monitoring data and research of WPCP daily monitoring reports. The reports indicate that the plant's limit for fecal coliform was exceeded within the last 10 years. Other noted concerns include the release of untreated sewage from the collection and treatment system.

The more recent daily monitoring reports, however, show that the plant has remained within its established limits. Tests from random dry weather samples near the plant's discharge also indicate low levels of fecal coliform concentrations. However, during the wet weather season and immediately after rainfall events, the Social Circle sewage collection system and treatment plant are subject to overflows and upsets.

On April 8, 2014, a routine battery of monitoring site sampling was conducted. The test results showed that Little River had high concentrations of well over 2500 counts per 100 mL. Surprisingly, all sampled tributaries showed concentrations of less than 220 counts per 100 mL.

Since Monitoring Site No. 10 showed a concentration of greater than 2400 counts per 100mL and since Monitoring Site No. 10 is less than one-half mile from the Social Circle WPCP, the WPCP and collection system are highly suspected of contributing to the fecal coliform problem in the Little River after recent rainfall events.

Parenthetically, total rainfall for the preceding day, April 7, 2014 was 2.01 inches as measured at Newton County Water and Sewerage Authority's Yellow River Water Reclamation Facility. Bacteroides dorei bacterium tests were also conducted on the April 8th samples. The test results identified the fecal coliform source as human, adding additional suspicion that Social Circle WPCP and the Social Circle collection system are wet weather polluting sources.

Waste Load Scoring and Prioritization Process - A waste load scoring and prioritization process was used to identify a group of pollutant sources that may have a significant impact on Little River. This process was used to determine the top ten pollutant sources in the study area.

Developing waste loads requires an estimation of wastes generated by a variety of animal species. Using a scoring system, however, is a matter of assigning relative waste loads per animal for comparison. For instance, according to the USDA Soil Conservation Service Agricultural Waste management Field Handbook, a 1000 pound horse produces 50 pounds of manure each day. Similarly, a 125 pound sheep produces 5 pounds of manure each day. Mathematically, one horse contributes 10 times the polluting potential as one sheep.

A second piece of needed data is a count of animals by species. The recent windshield surveys include animal counts where possible. Animal counts are used in conjunction with individual animal waste load scores to calculate relative waste loads generated at each pollutant source.

The relative waste load score for each pollutant source may be reduced because of the waste load reduction that occurs while waste is transported to the Little River. Three reduction conditions are considered in determining the amount of waste load reduced. These conditions are waste load reductions by on-site containment, settlement in ponds and natural overland flow.

On-site containment may be natural or man-made. Trees and bushes that grow along a fence line are natural barriers that keep waste loads on-site. The feeding of livestock in confined areas is an example of man-made containment. This study uses waste load removal rates of 0% to 95%.

Some ponds lie between pollutant sources and Little River. Many recreational and farm ponds offer treatment like oxidation ponds and primary clarifiers. Facultative ponds can remove as much as 90% of fecal coliform by sedimentation (Design of Municipal Wastewater Treatment Plants, WEF Manual of Practice No. 8, page 836). A waste load reduction rate from 0% to 45% is used considering the effectiveness of under-loaded, well-maintained ponds.

Natural overland treatment is a great means of reducing waste loads. Man-made, land applied treatment systems are good in removing fecal coliform. With proper ground cover, soils and slopes; overland treatment can remove up to 99% of the bacteria (Design of Municipal Wastewater Treatment Plants, WEF Manual of Practice No. 8, page 851). For the purpose of prioritizing pollutant sources, a range of 0 to 60% removal was used.

Once waste load scores for each pollutant source are calculated and waste load reduction rates are applied, pollutant sources are sorted by relative waste load scores. Sorting highlights the sources with the greater potential to pollute the Little River. Forty-four pollutant sources are identified and listed in the table entitled Evaluated Fecal Coliform Sites, page 32.

Twenty-two sources are assigned relative waste load scores. This table ranks each pollutant source by its relative waste load score and sorts the data beginning with the most likely contributor to pollute the Little River.

Evaluated Fecal Coliform Sites

County	Area	Location	Relative Load	% Removal			Load Score	Direct Stream Access	Parcel	Street	Comments
				On-site	Pond	Overland					
Newton	1	1	0	0	0	0	0.0	-		South Cherokee Road	Open yard, inactive pasture
Newton	1	2	200	75	30	60	14.0	-	123 19	878 Social Circle Road	Active pasture
Newton	1	3	0	0	0	0	0.0	-		958 Social Circle Road	Horse trailers but no horses
Newton	1	4	100	80	0	40	12.0	-	132 3	Cannon Drive	Active pasture
Newton	1	5	0	0	0	0	0.0	-		Cannon Drive	Hay production
Newton	1	6	150	0	0	0	150.0	Yes	133 2B 133 2C	365 Hancock Road	Poor site for fenced livestock
Newton	1	7	0	0	0	0	0.0	-		Social Circle Road	Hay production
Newton	1	8	960	50	10	5	410.4	Yes	124 013	US Hwy 278	Livestock Pond
Newton	1	9	0	0	0	0	0.0	-		US Hwy 278	Hay Production
Newton	1	10	0	0	0	0	0.0	-		US Hwy 278	Alternate grazing pasture
Newton	1	11	0	0	0	0	0.0	-		US Hwy 278	Hay production
Walton	2	1	1500	90	90	25	11.3	Yes	SC170004000	714 South Cherokee Road	Livestock Pond
Walton	2	2	0	0	0	0	0.0	-		South Cherokee Road	Row Crops
Walton	2	3	0	0	0	0	0.0	-		South Cherokee Road	Inactive Pasture
Walton	2	4	150	50	60	60	12.0	-	SC170005000	668 Laurel Drive	Hobby Farm
Walton	2	5	150	50	60	60	12.0	-	SC180001000	704 Laurel Drive	Hobby Farm
Walton	2	6	1344	85	30	60	58.3	-	SC180010000	1000 Laurel Drive	Livestock Pond
Walton	2	7	0	0	0	0	0.0	-		Cannon Drive	Inactive Pasture
Walton	3	1	0	0	0	0	0.0	-		Spring Street	Inactive Pasture
Walton	3	2	0	0	0	0	0.0	-		Cannon Drive	Inactive Pasture
Walton	3	3	0	0	0	0	0.0	-		Thurman Baccus Road	Inactive Pasture
Walton	3	4	0	0	0	0	0.0	-		Cannon Drive	Inactive Pasture
Walton	3	5	0	0	0	0	0.0	-		Cannon Drive	Inactive Pasture
Walton	3	6	160	65	0	0	56.0	-	SC170077000	187 Vine Circle	Social Circle WPCP
Walton	3	7	0	0	0	0	0.0	-		Vine Circle	Public Land Hay Production
Walton	3	8	0	0	0	0	0.0	-		Cannon Drive	Inactive Pasture
Walton	3	9	0	0	0	0	0.0	-		Thurman Baccus Road	Row Crops
Walton	3	10	0	0	0	0	0.0	-		Cannon Drive	Dirt Track
Walton	4	1	100	20	30	0	56.0	Yes	C1560001B00	2411 Pond Lane	Livestock Pond
Walton	4	2	100	0	0	0	100.0	Yes	C1560001A00	2415 Pond Lane	Direct Livestock Watering
Walton	4	3	100	0	0	0	100.0	Yes	C1560001A00	2415 Pond Lane	Direct Livestock Watering
Walton	4	4	50	10	0	5	42.8	-	C1560001000	2419 Pond Lane	Disturbed Riparian Buffer
Walton	4	5	0	0	0	0	0.0	-		2161 Willow Springs Church Road	Hobby Farm
Walton	4	6	2	20	30	10	1.0	-	N158A005000	5422 Willow Wind Court	Small Dog Kennel
Walton	4	7	20	0	10	10	16.2	-	N158A003000	5442 Willow Wind Court	Fenced Goats
Walton	4	8	194	5	0	55	82.9	-	C1560001B00	2411 Pond Lane	Fenced Goats, Donkeys, Emu's
Walton	4	9	100	0	0	20	80.0	-	C1580100000	2409 Pond Lane	Fenced Horses
Walton	4	10	100	0	0	20	80.0	-	C1580101000	2429 Pond Lane	Fenced Horses
Walton	4	11	100	5	0	25	71.3	-	C1580096000	2428 Pond Lane	Fenced Horses
Walton	4	12	250	35	0	55	73.1	-	C1580106000	2467 Hancock Road	Fenced Horses
Walton	5	1	0	0	0	0	0.0	-		East Hightower Trail	Fenced Pasture
Walton	5	2	0	0	0	0	0.0	-		East Hightower Trail	Fenced Pasture
Walton	5	3	1600	90	30	50	56.0	-	SC230013000	East Hightower Trail	Grazing Cattle
Walton	5	4	573	80	0	50	57.3	-	SC230008000 SC230009000	348 Thurman Baccus Road	Grazing Livestock

Stream Monitoring - Stream monitoring began with the submittal of the Targeted/BMP Monitoring Plan in May of 2012. Water quality sampling and flow measurement began in late May and continued until the project was completed in April 2014.

Timing for sampling allowed the sampling crew to begin the work with the start of summer stream limits in May. Regulatory summer limits of 200 counts/100mL run a six month gamut from May to October. These are the more critical months for meeting regulatory limits because limits are lower and the potential for fecal coliform pollution are greater.

Five sets of samples at ten locations were tested for fecal coliform during the summer. Data from samples pulled in June were not reported because the bacteria were too numerous to count at all sites.

Four of the ten monitoring sites are located along the Little River. The first tailwater site is Monitoring Site No. 4. This site corresponds with Georgia EPD's Monitoring Site No. 4. Sites located upstream continue with Monitoring Site No. 3 and No. 8 and end with Monitoring Site No. 10. Six other sites monitor tributaries empty into the Little River. Five of these sites are ephemeral and were dry during the summer months. The stream associated with Monitoring Site No. 9, however, is a perennial tributary and continued to flow throughout the summer months.

Fecal coliform concentrations for the months beginning May 2012 and ending October 2012 are provided in the table below.

Fecal Coliform Concentrations

Counts/100mL

Monitoring Site No.	River Mile	May	July	August	September	October
7	4.1	-	-	-	-	-
10	4.0	286.3	195.6	402.8	315.2	488.4
8	2.8	225.4	158.5	497.8	326.2	547.5
9	2.7	32.3	48.7	8.3	19.4	3.1
3	2.12	461.1	166.4	321.4	774.6	185.0
6	2.1	-	-	-	-	-
5	1.9	71.7	93.2	137.8	-	-
2	1.2	-	-	-	-	-
4	0.83	83.6	121.0	266.8	428.6	109.5
1	0.8	-	-	-	-	-

*River miles begin at the confluent of Nelson Creek and Little River

Stream flow was calculated at each of the ten monitoring sites in order to translate concentrations and flows into waste loads. The data needed to calculate flow was recorded when the samples were pulled, thereby, eliminating errors in developing waste loads.

The Department of Ecology of the state of Washington has developed a citizen's guide to understanding and monitoring lakes and streams. This guide lays out the procedure for obtaining stream data and accurately determining flow. The sampling crew followed this procedure.

The procedure uses simple hydraulic measurements and calculations. The procedure requires a technician to choose a stream cross-section that allows measurements and flow calculations to be as accurate as possible. Since flow is determined by multiplying the stream cross-section by stream velocity, a measurement of the area bounded by the water surface and the stream bed is taken to obtain the cross-sectional area.

To determine the stream velocity, a small floating object is used. Once a distance along the stream is established, finding the velocity is a matter of timing the object's travel from the upstream end to the other. When the stream velocity is multiplied by the cross-sectional area, flow is quantified in units of cubic feet per second.

Stream monitoring includes the measurement of flow. With flow measurements, reasonable estimates of fecal coliform loads can be estimated. During routine sampling, a crew member captures stream samples to test for fecal coliform. Other members measure the depth in the stream and stream velocity for calculating flow.

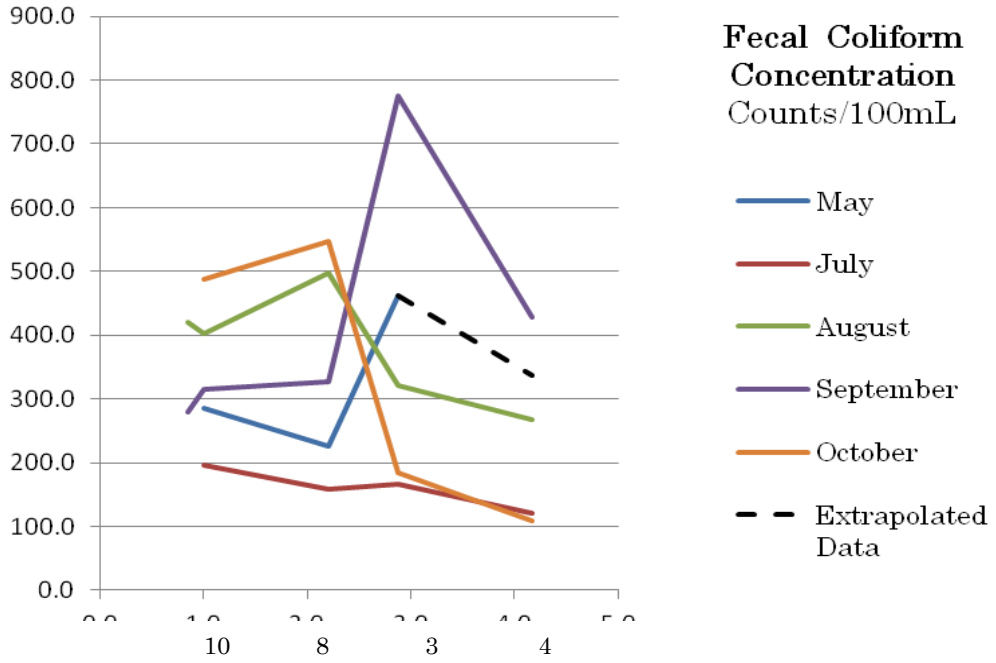
Once fecal coliform concentrations are determined and flows are calculated, fecal coliform waste loads are calculated. From May 2012 to October 2012, samples and measurements were taken every third week of the month. The results of the sampling, measuring and calculating are embodied in the three graphs shown in the figure, Stream Monitoring Graphics, on the next page.

Fecal coliform loads shown in the third graph, page 36 appear to be consistent. Several patterns are observed between Monitoring Site No. 10 and No. 4. The most consistent pattern is the decline in concentrations from Monitoring Site No. 3 to No. 4. The decline in concentrations and fecal coliform loads is an indication that this stream segment is purging itself of pollution.

A second consistent pattern is the rise in flow and fecal coliform loads between Monitoring Sites No. 8 and No. 3. This increase raises the suspicion that the eight pollutant sources identified in and around Area No. 4 are contributing to the high fecal coliform loads in Little River.

The lines from Monitoring Site No. 10 to No. 8 are flat. The lack of change between the two sites is expected because this reach is surrounded by forest and inactive pastures. The only significant contributor to fecal coliform pollution in this area is the Social Circle Water Pollution Control Plant and the city's sewerage collection system.

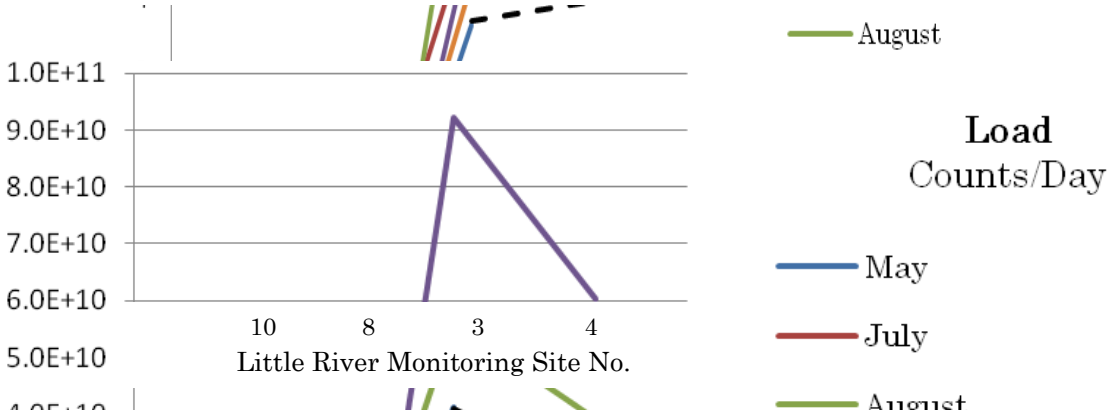
Stream Monitoring Graphics



Little River Monitoring Site No.

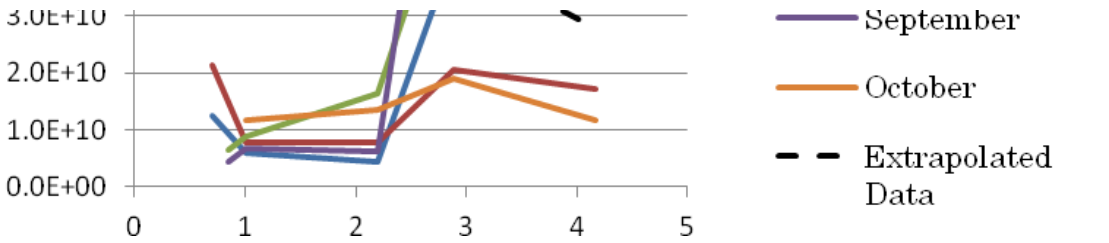
Stream Monitoring Graphics

(Continued)



Little River Monitoring Site No.

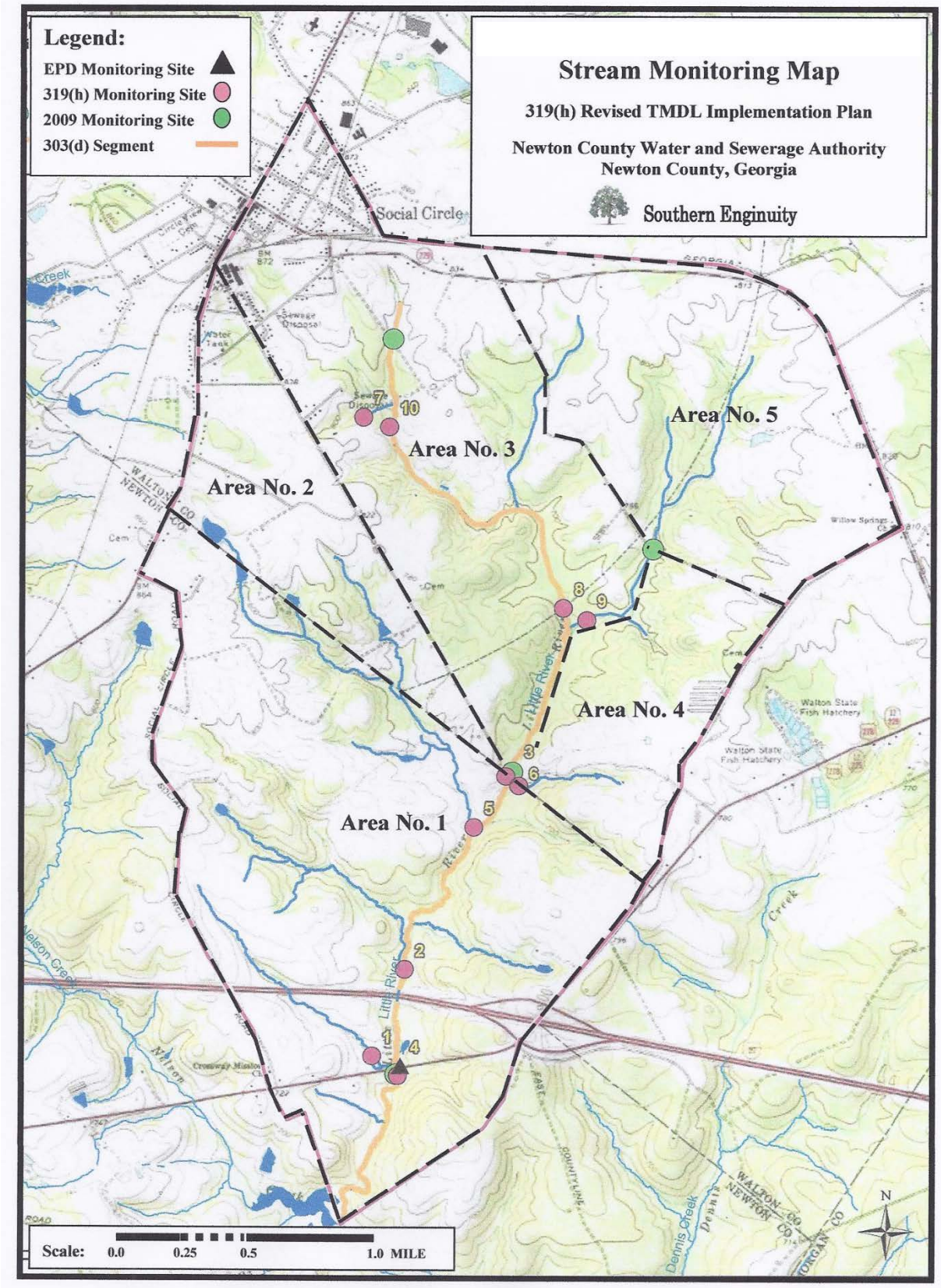
*Each graph begins at the Little River headwaters and proceeds downstream to Monitoring



10 8 3 4

Little River Monitoring Site No.

*Each graph begins at the Little River headwaters and proceeds downstream to Monitoring Site No.4


Legend:
EPD Monitoring Site
319(h) Monitoring Site
2009 Monitoring Site
303(d) Segment
Stream Monitoring Map
319(h) Revised TMDL Implementation Plan
Newton County Water and Sewerage Authority
Newton County, Georgia
Southern Enginuity
Social Circle
Area No. 1
Area No. 2
Area No. 3
Area No. 4
Area No. 5
Little River
Walton State Fish Hatchery
Scale: 0.0 0.25 0.5 1.0 MILE
N

Best Management Practices - BMPs

The source investigation identified 22 sources that are contributing to the fecal coliform impairment of the Little River. Of the 22 sources, the top 10 contributors were identified using a prioritizing methodology. The top two contributors were selected as candidates for two demonstration projects using Best Management Practices (BMPs). As a requirement of this project, BMPs were selected for these two sites for the purpose of reducing fecal coliform in the Little River and determining the effectiveness of the selected BMPs.

The table entitled Top Suspected Fecal Coliform Sites, found on Page 24, lists the 22 priority sites for the 303(d) segment of the Little River. The figure BMP Demonstration Projects on Page 43 shows the geographical location of the top two sites selected for BMP design and installation.

This BMP section includes an overall review of the two sites regarding topography, stormwater hydrology, and physical features. The types of animals on the sites and their daily routines are also considered as a part of developing a solution. When land characteristics and animal routines are evaluated, solutions may include changing the location of feeding and watering, developing on-site containment and the use of enhanced features for treatment.

Background - Conservation practices for protecting surface water quality are provided through the Georgia Soil Conservation Commission in a manual entitled Best Management Practices for Georgia Agriculture. The BMPs offered in this section were obtained from this manual. This manual is also used as a guideline for selecting combinations of BMPs for the most effective means of reducing fecal coliform in the 303(d) segment of the Little River. The Manual for Erosion and Sediment Control in Georgia was also used to supplement selected BMPs found in the Best Management Practices for Georgia Agriculture manual.

The Federal Water Pollution Control Act or Clean Water Act is the impetus for designing and implementing BMPs around the country. BMPs were developed under the Clean Water Act to include measures for reducing the amount of pollutants entering regulated streams and waterways of the United States. A BMP is a concept or structure that is implemented or installed as the most effective and practical means of preventing or reducing pollution generated by non-point sources (NPSs). The goal of BMPs is to reduce pollutants to levels below total maximum daily loads.

BMPs are closely related to those practices associated with NPSs. Agriculture is a significant source of NPS pollution in the Southeast. Much of the difficulty in reducing fecal coliform through the use of BMPs is pin-pointing the source of nonpoint pollution. The source investigation identified the top two suspected sources of fecal coliform pollution in the 303(d) segment of the Little River.

NPS pollution is typically unintentional. Polluting may occur as a slow or sudden release of contaminants that are unobserved. Releases can be accelerated by runoff from fields or changes in an animal's routine of feeding and watering. A build-up of pollutants can occur over time until a storm water event carries the fecal coliform to a major stream or river.

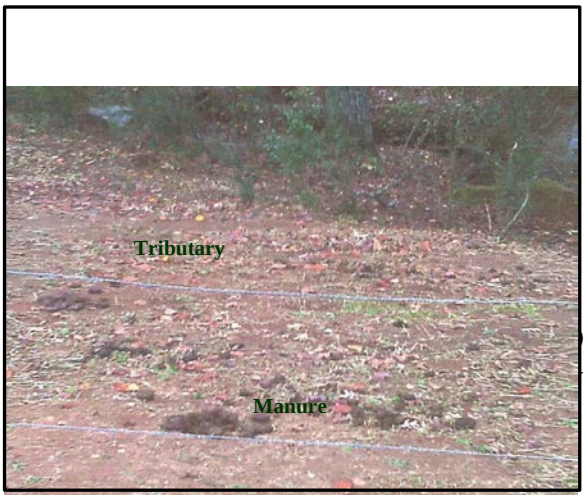
One of the tasks of the revised TMDL Implementation Plan is to raise public awareness for the need to protect our streams from NPS sources. Of greater importance is to raise the concern among agricultural producers of the effect of practices that pollute our streams. Hobby as well as commercial farmers should be encouraged to take advantage of assistance and funding to reduce the environmental impacts caused by the use of their animals.

BMP Demonstration Projects

BMP Demonstration Site No. 1 is a site that includes a pond that was used for watering cattle. In essence, the cattle were defecating in the pond and stirring up settled solids which were contaminating the Little River. In June 2013, the site was assessed and a design was developed to limit the cattle's access to the pond. In July 2013 and after BMPs were designed, Jim and Billie Brewer removed the cattle and sold the property to the Georgia Power Company. As stewards of the environment, the Georgia Power Company surrounded the pond with several effective BMPs that are consistent with Natural Resources Conservation Service standard practices.

Cattle Leaving Pond

A combination of Natural Resource Conservation Service BMPs was installed by the Georgia Power Company. BMPs included planting grass according to NRCS Practice Standard 390; native hardwoods, Stream Management Zone 3, NRCS Practice Standard 391; and fast-growing pines, Stream Management Zone 2, NRCS Practice Standard 391. A layout of the BMPs for Site No. 1 is shown in the figure BMP Demonstration Site No. 1, Page 44.



BMP Demonstration Site No. 2, owned by David and Amenda White, is a site that was

overgrazed by horses. This site did not restrict horses from accessing a nearby tributary which contributed to fecal coliform contamination of the Little River.

An initial design for this site included BMPs consisting of a woven fence to restrict animal access to the tributary. The fence was designed as containment for manure because the woven wire at ground level prevents most of the manure from passing beyond the fence.

Over Grazed, Manure Laden Pasture

At the completion of the first BMP design, the Whites were boarding two to three horses. Shortly after completing the design, the horses and portions of the pasture fence were removed by the owner. With the horses and fence removed, a second design was developed to remove surface manure, install a rock filter dam to slow stormwater flow and plant grass to stabilize the topsoil and provide treatment of upstream contaminants. A revised layout of the recommended BMPs for Site No. 2 is shown in figure BMP Demonstration Site No. 2, page 45.

Cost details for BMP Demonstration Site No.s 1 and 2 are given in the table Best Management Practices – Cost Details on Page 46.

Effectiveness of BMPs

With the installation of BMP Demonstration Project Nos. 1 and 2, testing the effectiveness of the demonstration project BMPs was possible for the months of February, March and April 2014. Comparative testing results derived from upstream and downstream sampling, however, did not provide 100% certainty concerning the effectiveness of the either BMP project.

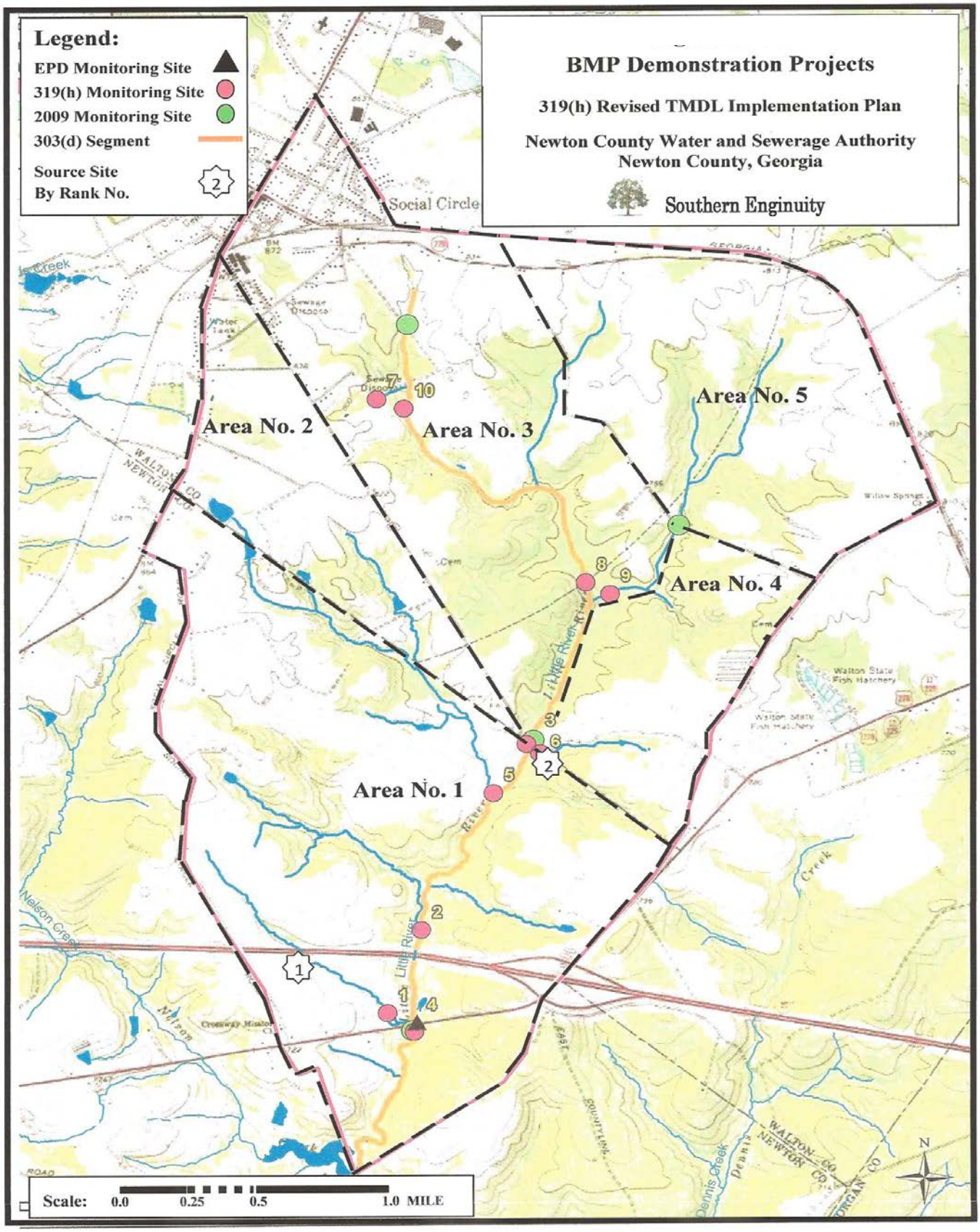
Out of the three sampling events, two of the three events showed a reduction in fecal coliform concentrations for BMP Demonstration Project No. 1. February showed a 78% reduction in fecal coliform while March had a 12% reduction. April, however, showed a 40% increase. Swings in percentages of this magnitude was not expected at this location. More consistent results may be obtained during the summer months when temperatures are warmer and concentrations are higher. With higher concentrations and additional time for the sub-basin to reach a steady state, more consistent and conclusive data are probable.

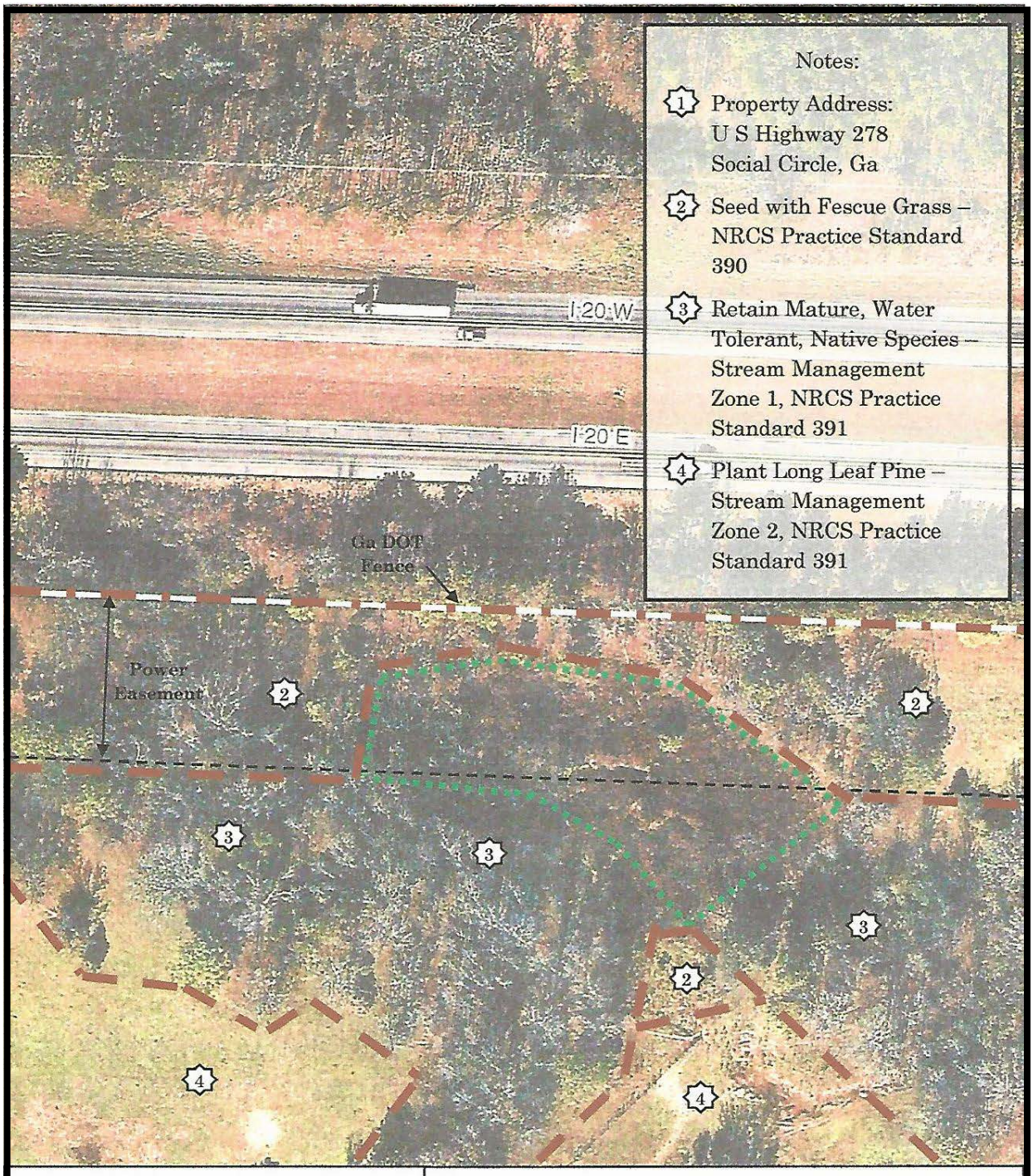
For BMP Demonstration Project No. 2, the data was less consistent than the data for BMP Demonstration Project No. 1. April was the only month that showed a reduction in fecal coliform concentrations. The reduction in fecal coliform was a modest 6%. February and March showed increases of 60% and 40% respectively. Again, more consistent results may be obtained during summer months when temperatures are warmer and concentrations are higher. The sub-basin also needs additional time to purge itself and reach a steady state in order to obtain more consistent results.

Comparative data for BMP Demonstration Project Nos. 1 and 2 are provided in the table Comparative Data for BMP Demonstration Projects on Page 47.

Top Suspected Fecal Coliform Sites

Rank No.	County	Area	Location	Relative Load	% Removal			Load Score	Direct Stream Access	Parcel	Street	Comments
					On-site	Pond	Overland					
1	Newton	1	8	90	50	10	5	38.5	Yes	124 013	US Hwy 278	Livestock Pond
2	Newton	1	6	27	0	0	0	27.0	-	133 2B 133 2C	365 Hancock Road	Poor site for fenced livestock
3	Walton	4	2	18	0	0	0	18.0	Yes	C1560001A00	2415 Pond Lane	Direct Livestock Watering
4	Walton	4	3	18	0	0	0	18.0	Yes	C1560001A00	2415 Pond Lane	Direct Livestock Watering
5	Walton	4	8	40	5	0	55	17.1	-	C1560001B00	2411 Pond Lane	Fenced Goats, Donkeys, Emu's
6	Walton	4	10	18	0	0	10	16.2	-	C1580101000	2429 Pond Lane	Fenced Horses
7	Walton	4	9	18	5	0	20	13.7	-	C1580100000	2409 Pond Lane	Fenced Horses
8	Walton	4	12	45	40	0	50	13.5	-	C1580106000	2467 Hancock Road	Fenced Horses
9	Walton	4	11	18	10	0	20	13.0	-	C1580096000	2438 Pond Lane	Fenced Horses
10	Walton	2	6	126	80	30	30	12.3	Yes	SC180010000	1000 Laurel Drive	Livestock Pasture and Pond
11	Walton	5	4	117	80	0	60	9.4	-	SC230008000 SC230009000	348 Thurman Baccus Road	Grazing Livestock
12	Walton	4	1	9	0	0	0	9.0	Yes	C1560001B00	2411 Pond Lane	Livestock Pond
13	Walton	3	6	160	95	0	0	8.0	-	SC170077000	187 Vine Circle	Social Circle WPCP
14	Walton	5	3	150	85	30	50	7.9	-	SC230013000	East Hightower Trail	Grazing Cattle
15	Walton	4	4	9	10	0	5	7.7	-	C1560001000	2419 Pond Lane	Disturbed Riparian Buffer
16	Walton	4	7	12	5	30	10	7.2	-	N158A003000	5442 Willow Wind Court	Fenced Goats
17	Newton	1	2	36	60	30	30	7.1	-	123 19	878 Social Circle Road	Active pasture
18	Walton	2	4	27	25	60	15	6.9	-	SC170005000	668 Laurel Drive	Hobby Farm
19	Walton	2	5	27	30	60	20	6.0	-	SC180001000	704 Laurel Drive	Hobby Farm
20	Newton	1	4	18	60	0	20	5.8	-	132 3	Cannon Drive	Active pasture
21	Walton	2	1	270	80	90	15	4.6	Yes	SC170004000	714 South Cherokee Road	Livestock Pond
22	Walton	4	6	2	20	30	10	1.0	-	N158A005000	5422 Willow Wind Court	Small Dog Kennel


Legend:
EPD Monitoring Site
319(h) Monitoring Site
2009 Monitoring Site
303(d) Segment
Source Site
By Rank No.
2
BMP Demonstration Projects
319(h) Revised TMDL Implementation Plan
Newton County Water and Sewerage Authority
Newton County, Georgia
Southern Enginuity
Social Circle
Area No. 1
Area No. 2
Area No. 3
Area No. 4
Area No. 5
Little River
Walton State Fish Hatchery
Scale: 0.0 0.25 0.5 1.0 MILE
N



Legend:

Pond Shoreline

Ga DOT Fence

Species Boundary

Scale: 1 inch ~ 120 feet

Southern Enginuity

Figure 12.0.2

BMP Demonstration Site No. 1

319(h) Revised TMDL Implementation Plan

Newton County Water and Sewerage Authority
Newton County, Georgia

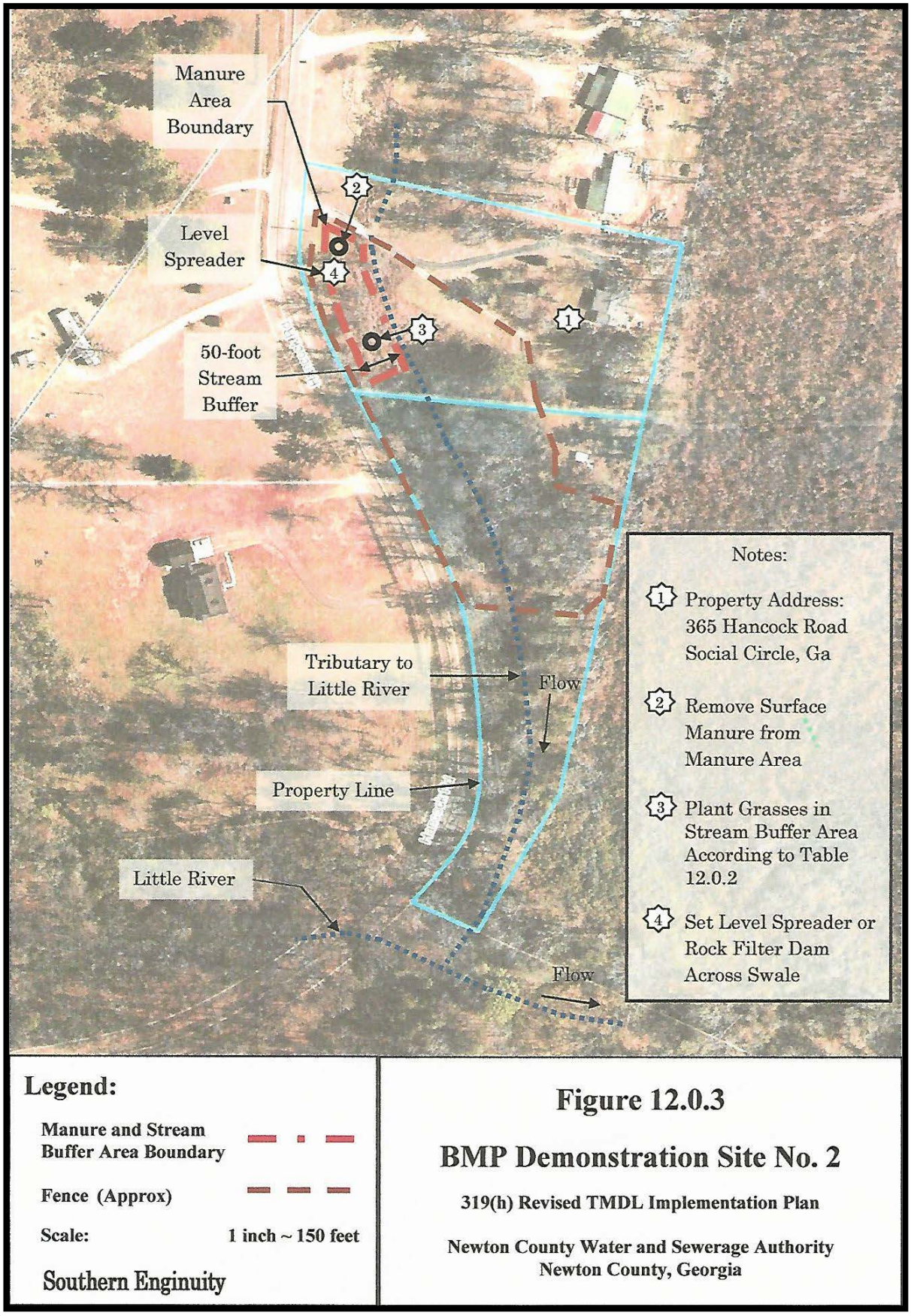


Figure 12.0.3

BMP Demonstration Site No. 2

319(h) Revised TMDL Implementation Plan

Newton County Water and Sewerage Authority
Newton County, Georgia

Best Management Practices - Cost Details

Site Rank No.	NRCS Code	Item Description	Unit	Qty	Unit Cost $	Total Cost $	Comment
1		BMP Demonstration Project No. 1 - Georgia Power Company Property					See Figure 12.0.2
	490	Prepare Easement for Seed Planting - Remove Trees & Shrubs	Acre	2.5	$ 6,000	$ 15,000	Remove trees and shrubs using mechanical site preparation methods prior to seeding with Fescue grass. Use E&SC measures before beginning work.
	390	Seed Easement with Fescue	Acre	2	400	800	Broadcast or hydro-seed area
	490	Prepare Pine Planting Area	Acre	2.5	200	500	Remove shrubs and stumps
	391 612	Plant Long-Leaf Pine in Pine Planting Area	Acre	2	400	800	Use mechancial pine tree planting equipment for installation.
Sub-Total Cost, $						$ 17,100	
2		BMP Demonstration Project No. 2 - David & Amenda White Property					See Figure 12.0.3
	490	Prepare Seed Planting Area	Acre	1.5	$ 400	$ 600	Remove surface manure within manure removal area.
	391	Seed Area with Bermuda or Equal	Acre	1	1,000	1,000	Broadcast or hydro-seed area.
	-	Install Level Spreader	Lump Sum	1	1,250	1,250	Install level spreader or rock filter dam (Rd) according to the Manual for Erosion & Sediment Control in Georgia.
Sub-Total Cost, $						$ 2,850	
Total Cost, $						$ 19,950	

Comparative Data for BMP Demonstration Projects

Month	February	March	April
BMP Demonstration Project No. 1			
Upstream Sample	135.4	217.4	127.4
Downstream Sample	29.5	190.4	214.3
Percent Reduction (+)	+78	+12	-40
BMP Demonstration Project No. 2			
Upstream Sample	61.3	261.3	203.5
Downstream Sample	98.5	365.4	191.8
Percent Reduction (+)	-60	-40	+6

Nutrient Management Plan

The definition of nutrient management is directing or controlling the application rate, the source, the method of application, and timing of plant nutrients and soil amendments. The purpose of developing a nutrient management plan is to identify the proper balance between adding excessive plant nutrients and soil amendments, and not adding enough. When plant nutrients and soil amendments are added to an excess, some forms of nitrogen, phosphorus, and potassium are not assimilated in the soil or plant tissue and are transported from the site by ground or surface water.

When products of plant nutrients and soil amendments reach a perennial stream, substances such as nitrogen can cause health issues and promote excessive vegetative growth of algae and water plants that are a nuisance. Excessive nitrogen, phosphorus and plant growth can lead to eutrophication in major drinking water reservoirs.

From an agricultural perspective, a shortage of plant nutrients and soil amendments can result in marginal crop yields and a reduction or loss in agricultural economic growth. Farmers working with state and federal agencies cooperate in order to apply optimum amounts of plant nutrients and soil amendments without wasting plant nutrients and causing environmental issues downstream.

This project is driven by the need to reduce fecal coliform in the impaired portion of the Little River. The focus, therefore, is not to optimize the growth of ground cover or crops but to develop a nutrient management plan that will allow the optimum goal of fecal coliform reduction to be achieved.

This project includes two BMP Demonstration Projects that were designed to reduce the amount of fecal coliform being transported to the Little River. The optimum goal for each of these is to reduce the amount of fecal coliform being transported to the Little River from the project sites.

The essence of the nutrient management plans for each of these sites is to halt the application of plant nutrients and soil amendments. Achieving this plan for each of the two projects is possible because of events surrounding the two properties during the course of revising the TMDL Implementation plan.

BMP Demonstration Project No. 1 - A description of BMP Demonstration Project No. 1 site and background information is as follows:

Georgia Power Company/Brewer Property

1. This site was owned by Jim and Billie Brewer in 2012 and was used primarily to raise cattle and cut hay. The Brewers pastured at least 15 head of cattle on this land.

2. The Brewers constructed a small pond for cooling and watering their cattle. The unrestricted access of cattle to the pond was a source of fecal coliform pollution.
3. The source investigation identified this site as having the greatest fecal coliform polluting potential to the impaired segment of the Little River.
4. In the spring of 2013, a BMP demonstration project was designed to restrict animal access to the pond by fencing the perimeter of the pond and creating a watering ramp with limited room for cattle watering and no room for loitering.
5. In the early summer of 2014, letters were sent to the Brewers notifying them of Newton County Water and Sewerage Authority's interest in establishing a BMP demonstration project. Letters were sent certified mail, return receipt requested but the Newton County Water and Sewerage Authority did not receive a letter or a phone call from the Brewers.
6. A few months later, the Newton County Water and Sewerage Authority learned that the Georgia Power Company had purchased the property from the Brewers.
7. With the purchase of the property, the Georgia Power Company installed soil erosion measures according to Georgia EPD Soil Erosion and Sediment Control guidelines. A power line was installed through the proposed BMP demonstration projects site.
8. A new set of BMP Demonstration Project No. 1 site plans were prepared to reflect the site improvements.

The benefits of Georgia Power Company purchasing this property include:

1. Elimination of over 15 head of cattle or 960 pounds of manure per day from the impaired segment of the Little River basin.
2. Conversion of a cattle watering, polluting source to a fecal coliform treatment pond.
3. Ability to purge excess loads of manure and possibly plant nutrients (nitrogen and phosphorus) from the site.

Evidence that the property will not revert to raising animals again:

1. Fences in the area that were used to confined cattle have been removed.
2. Trees have been planted in areas where cattle once grazed.
3. The Georgia Power Company's interest in the property is for power distribution and as an investment in trees (biofuels) and industrial/commercial property.

Because of the primary goal to reduce fecal coliform at this site and the desire to keep plant nutrients and soil amendments from leaving the site, the essence of Nutrient Management Plan is to:

1. Prohibit all applications of manure
2. Prohibit all applications of plant nutrients
3. Eliminate nitrogen fixing plants (legumes) from the project sites

In preparing supporting documentation for the nutrient management plan, calculations involving application rates of nutrients from manures, commercial fertilizers and nitrogen fixing plants

will be zero. Factors which are not relevant to this BMP Demonstration Project No. 1, i.e., animal mortality, will be noted as NA or not applicable.

BMP Demonstration Project No. 2 - A description of the BMP Demonstration Project No. 2 site and background information is as follows:

David and Amenda White Property

1. This property has been the residence of Amenda White for forty years. David White, her son, lives with Amenda at 365 Hancock Road. In 2012, David White cared for his daughter's three horses. A small area in the front yard was fenced and the horses were given oats and hay at a feeding station on-site.
2. The horses had direct access to a tributary leading to the Little River. The shoreline of the tributary was littered with piles of manure.
3. The source investigation identified this site as having the second greatest fecal coliform polluting potential to the impaired segment of the Little River.
4. In the spring of 2013, a BMP demonstration project was designed to restrict animal access to the stream by fencing a 50-foot stream buffer adjacent to the tributary. Berms and other features were designed to capture the manure, i.e., feeding station, before manure could be washed away.
5. In the early summer of 2014, letters were sent to the Whites notifying them of Newton County Water and Sewerage Authority's interest in establishing a BMP demonstration project. Letters were sent certified mail, return receipt requested but the Newton County Water and Sewerage Authority did not receive a letter or a phone call from the Whites.
6. A few months later, the Newton County Water and Sewerage Authority was able to speak directly with Amanda White. Newton County Water and Sewage Authority expressed their interest in installing a BMP demonstration project. The Whites approved of the project.
7. BMP Demonstration Project No. 2 site plans were prepared for the installation of proposed site improvements.

The benefits of Amenda and David White agreeing to install the project improvements include:

1. Elimination of 3 horses or 150 pounds of manure per day from the impaired segment of the Little River basin.
2. Conversion of a horse feeding site to a manure retention and treatment site.
3. Ability to purge excess loads of manure and possibly plant nutrients (nitrogen and phosphorus) from the site.

Evidence that the property will not revert to raising animals again:

1. Fences in the area that were used to confined horses have been removed.

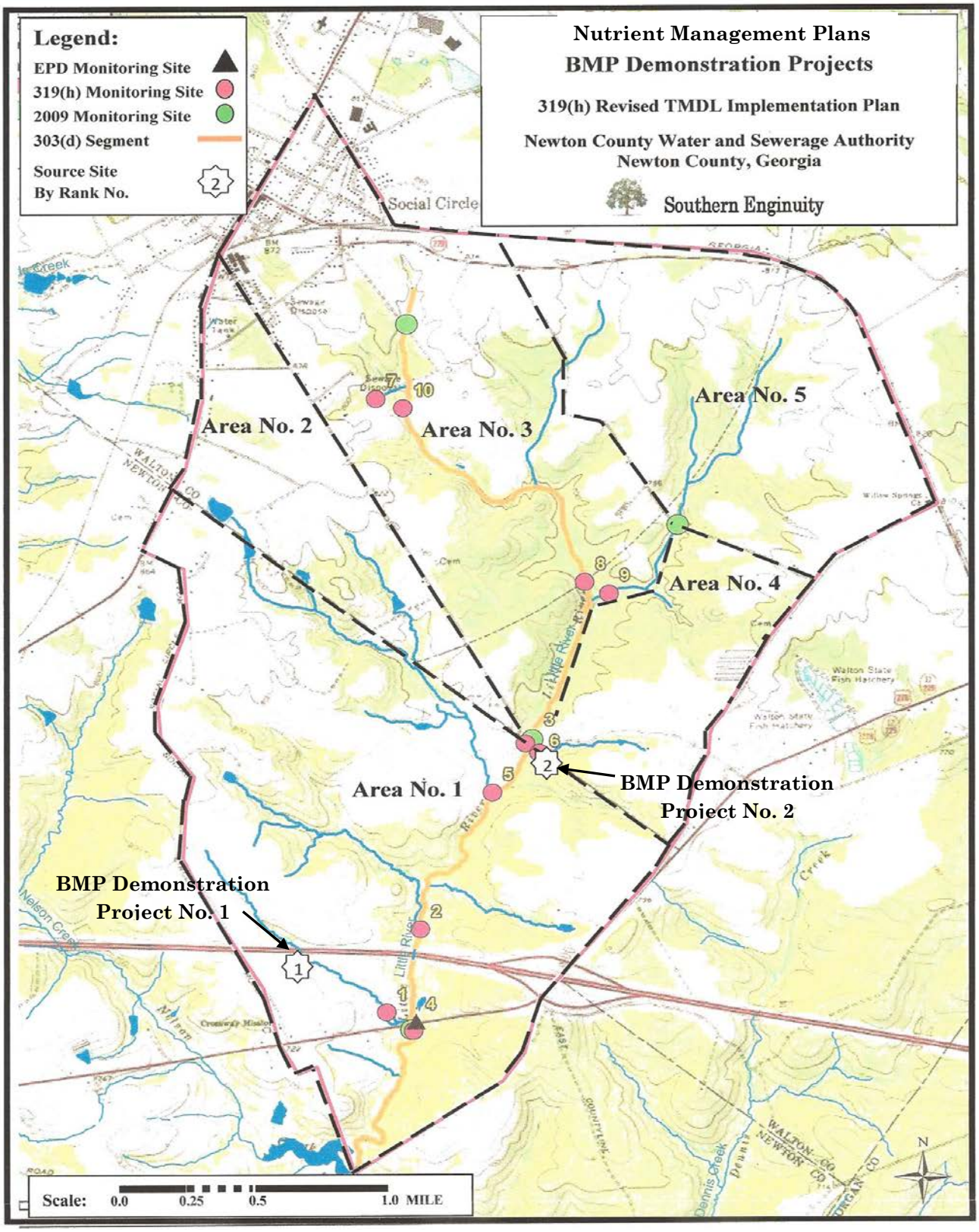
2. Rock filter dams have been stalled where horses once grazed.
3. The Whites have no interests in pasturing horses.

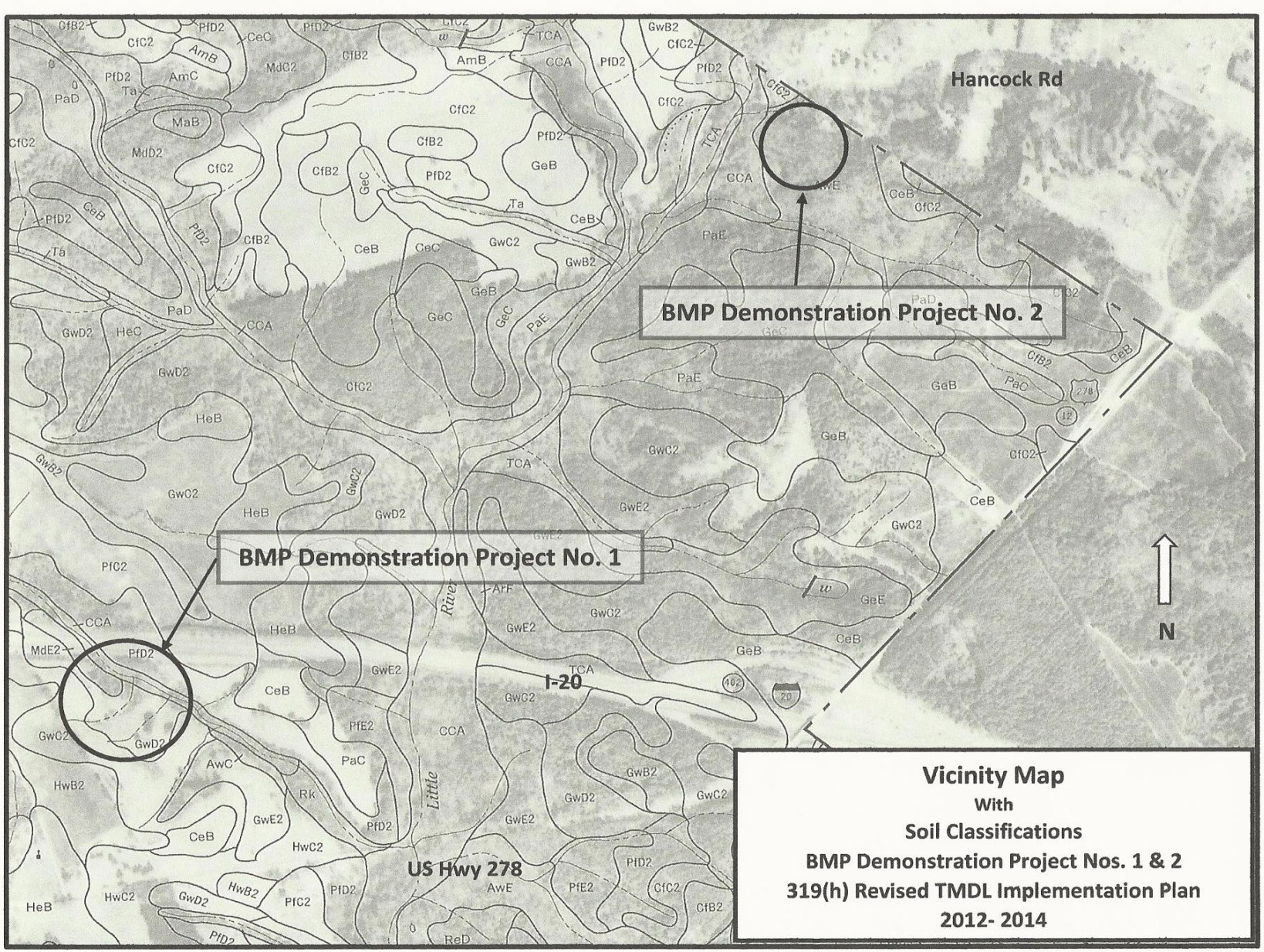
Because of the primary goal to reduce fecal coliform at this site and the desire to keep plant nutrients and soil amendments from leaving the site, the essence of Nutrient Management Plan is to:

1. Prohibit all applications of manure
2. Prohibit all applications of plant nutrients
3. Eliminate nitrogen fixing plants (legumes) from the project site

In preparing supporting documentation for the nutrient management plan, calculations involving application rates of nutrients from manures, commercial fertilizers and nitrogen fixing plants will be zero. Factors which are not relevant to this BMP Demonstration Project No. 2, i.e., animal mortality, will be noted as NA or not applicable.

Maps related to both BMP Demonstration Projects are provided on the following pages.


Legend:
EPD Monitoring Site
319(h) Monitoring Site
2009 Monitoring Site
303(d) Segment
Source Site
By Rank No.
Nutrient Management Plans
BMP Demonstration Projects
319(h) Revised TMDL Implementation Plan
Newton County Water and Sewerage Authority
Newton County, Georgia
Southern Enginuity
Social Circle
Area No. 1
Area No. 2
Area No. 3
Area No. 4
Area No. 5
BMP Demonstration Project No. 1
BMP Demonstration Project No. 2
Little River
Scale: 0.0 0.25 0.5 1.0 MILE
N


Hancock Rd
BMP Demonstration Project No. 2
BMP Demonstration Project No. 1
I-20
US Hwy 278
Little
N
Vicinity Map
With
Soil Classifications
BMP Demonstration Project Nos. 1 & 2
319(h) Revised TMDL Implementation Plan
2012- 2014

Load Reduction

This section presents the standard water quality limits for Little River and the water quality data collected and analyzed from 2012 and 2014. The limits and data are compared to calculate the amount of fecal coliform reduction needed to bring the highest water quality datum of fecal coliform within compliance.

At the conclusion of this section, a plan is presented that proposes BMPs for reducing fecal coliform in the Little River by the calculated amount. The plan includes the street location of proposed BMPs and cost and schedule tables for implementation.

Standard Water Quality Limits - The upper reach of the little River remains on Georgia EPD's 303(d) list and will not be removed until its designation of "not supporting" is upgraded to supporting. The designation change can only be approved by the state after the stream has been re-tested and the results are within TMDL limits.

In order to re-test the stream, a geometric mean must be established for each of four consecutive 30-day testing periods. Within each 30-day testing period, four samples must be taken no less than 24 hours apart. To obtain a geometric mean, the results from the four samples collected are multiplied and their products is taken to the fourth root. The four 30-day geometric means are then compared with the TMDL limits to determine compliance.

TMDL limits for fecal coliform are found in State of Georgia Rules and Regulations for Water Quality Control, Chapter 391-3-6, latest revision. The rules state that during the months of May through October fecal coliform is not to exceed a geometric mean of 200 counts per 100 mL.

Should water quality studies show fecal coliform levels from non-human sources occasionally exceed 200 counts per 100 mL, then the allowable geometric mean fecal coliform should not exceed 300 counts per 100 mL in lakes and reservoirs and 500 counts per 100 mL in streams. For free-flowing fresh streams, fecal coliform is not to exceed a geometric mean of 1000 counts per 100 mL for the months of November through April and 4000 counts per 100 mL for any one sample.

The 200 counts per 100 mL limit is the primary value for the focus of this revised TMDL Implementation Plan. The TMDL summer limit is used because fecal coliform counts are highest and TMDL limits are more stringent in the summer. A check of all winter and summer sampling events for years 2012 to 2014 confirms this assumption.

Criteria and Assumptions - Monitoring Site No. 4 is used as a point for collecting and testing samples. This point is used by Georgia EPD and is also numbered as their Site No. 4.

The focus for load reduction is on non-human sources. Human sources were determined to be not as significant as non-human sources. Human sources would include wastewater treatment plants (WWTPs) and failed septic tanks. In May 2013, a bacteria source tracking process was undertaken. The results showed no sign of human bacteria although fecal coliform concentrations were relatively high.

The city of Social Circle operates a WPCP upstream of Monitoring Site No. 4. According to daily monitoring reports, the plant rarely exceeds its operating limits. Random tests conducted on Little River and near the treatment plant show reasonably low concentrations of fecal coliform. Therefore, the Social Circle WPCP is not considered a significant dry weather contributor to the fecal coliform problem in the Little River. However, the Social Circle WPCP and/or the city of Social Circle sewage collection system was suspected a substantial human fecal coliform release on April 8, 2014.

Failing septic tanks are also considered as insignificant contributors of fecal coliform. In addition to bacteria source tracking, a thorough windshield survey was conducted to see if there were signs of failed septic tanks. Signs might include soft dark spots around houses that resemble the tops of underground tanks and field run pipes. No indication of failed septic tanks were found.

Sampling and testing under this project consists of gathering samples from 10 different sites for each month. Unlike using a geometric mean for comparing data to TMDL limits, this project will use the highest fecal coliform load data recorded in a single month for Monitoring Site No. 4 in which to calculate the needed percent load reduction.

Load Reduction Data - Load reduction data was collected for months beginning May 2012 to April 2014. As mentioned, the highest values with the more stringent limits were recorded from May 2012 to October 2012. Summer and winter loads for 2012 and 2013 are listed in the table that follows.

Monitoring Site No. 4*
Summer Fecal Coliform Loads
Counts/100mL

Data Description	May 2012	June 2012	July 2012	August 2012	September 2012	October 2012
Actual Concentration, Counts per 100mL	83.6	-	121.0	266.8	428.6	109.5
Flow, cfs	-	0.8	5.5	7.1	10.9	7.7
Actual Load, Counts per 30 Days	0	0	4.9 E+11	1.4 E+12	3.4 E+12	6.2 E+11
**Target Concentration, Counts per 30 Days	200	200	200	200	200	200
Target Load, Counts per 30 Days	-	1.2 E+11	8.1 E+11	1.0 E+12	1.6 E+12	1.1 E+12
Target Reduction, %	0	0	0	25	53	0

*Monitoring Site No. 4 is the site that GA EPD monitors.
** Summer limits are 200 Counts/100mL

Winter Fecal Coliform Loads
Counts/100mL

Data Description	November 2012	December 2012	January 2013	February 2013	March 2013	April 2013
Actual Concentration, Counts per 100mL	73.6	128.8	40.2	48.7	23.1	80.1
Flow, cfs	4.7	4.8	9.8	12.5	11.0	12.0
Actual Load, Counts per 30 Days	2.5 E+11	4.5 E+11	2.9 E+11	4.5 E+11	1.9 E+11	7.1 E+11
***Target Concentration, Counts per 100 mL	1000	1000	1000	1000	1000	1000
Target Load, Counts per 30 Days	3.5 E+12	3.5 E+11	7.2 E+12	9.2 E+12	8.1 E+12	8.8 E+12
Target Reduction, %	0	0	0	0	0	0

*** Winter limits are 1000 counts/100mL

The highest positive deviation from the target load was recorded September 2012. Based on collective data from May 2012 to October 2012, close to 75% of the load measured at Monitoring Site No. 4 comes from Area No. 4. See the load reduction map on page 59.

During September 2012, the combined load from upstream Monitoring Sites No. 8 and 9 was 0.2E+12 while Monitoring Site No. 3 was 2.7E+12. The difference in the two is the load coming from Area No. 4 or 2.5E+12 counts per 30 days.

The amount of load that needs to be reduced is the difference between the September Actual Load and Target Load shown in the previous table. This amounts to 1.8E+12 counts per 30 days. Clearly, if the load contribution from Area No. 4 can be reduced by 72%, the load at Monitoring Site No. 4 will be reduced by 53% and the Little River sub-basin will be in compliance.

The installation of two BMP demonstration projects is a step toward load reduction at Monitoring Site No. 4. These projects were recently completed. One project is in Area No. 4 and will make a significant impact on load reduction. A second project was installed in Area No. 1 and will help to further reduce loads below the TMDL limits. Both projects and their contribution to fecal coliform reduction will be factored into the total projected fecal coliform reduction in the Little River.

Load Reduction Plan - The source investigation prioritized a list of 22 polluting sources according to their impact as fecal pollution sources. The list used a scoring approach that considered the number and types of animals for determining the pounds of manure per day produced by each of the 22 sites. A load scoring system was developed that considered load reduction by on-site containment, pond retention and overland treatment. This same prioritization system is used to determine an achievable percent reduction through the installation of effective BMPs.

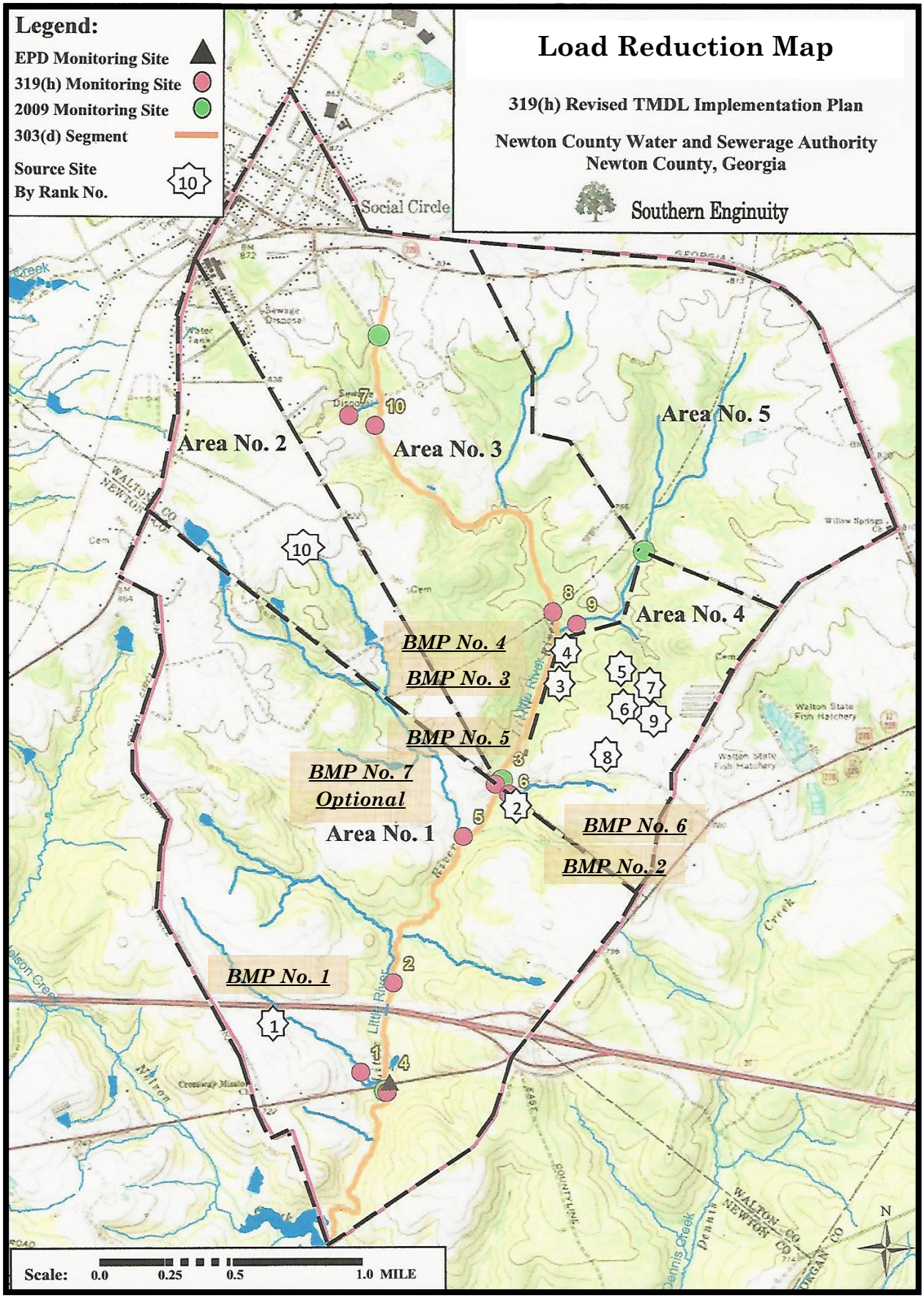
The original scores from the prioritization are retained in the table on page 58. The percent removal or reduction has been altered to reflect the effect of the proposed BMPs. The difference between the original scores and the revised scores determine the percent reduction that is achievable in Area No. 4.

The Load Reduction Table shows a reduction that is better than 72% and also provides an index that includes the source location by area number and location number. Sources may be referenced by their rank number on the map that follows. Parcel and street addresses of properties are also included. Finally, the last column of the table indicates the type of BMP that is proposed.

The top 9 sites that are scheduled for BMPs are listed in the Load Reduction Table. This table is followed by the Load Reduction Map showing the location of the improvements and the Load Reduction Cost Table.

Load Reduction Table

Rank No.	County	Area	Location	Relative Load	% Removal			Original Score	Revised Area No. 1 Load	Area No. 1 Load Reduction	Revised Area No. 4 Load	Area No. 4 Load Reduction	Parcel	Street	BMP No./Improvement
					On-site	Pond	Overland								
1	Newton	1	8	960	90	80	0	410.4	19.2	95%	-	-	124 013	US Hwy 278	1. Remove cattle. Install NRCS buffers with trees and grass.
2	Newton	1 (4)	6	150	95	0	0	150.0	-	-	7.5	95%	133 2B 133 2C	365 Hancock Rd	2. Remove horses. Grass area and install GDOT rock filter dam.
3	Walton	4	2	100	90	0	0	100.0	-	-	10.0	90%	C1560001A00	2415 Pond Lane	3. Install NRCS woven fence across 2 watering ramps.
4	Walton	4	3	100	0	60	0	100.0	-		40.0	60%	C1560001A00	2415 Pond Lane	4. Isolate pond by installing NRCS watering ramp.
5	Walton	4	8	194	5	0	90	82.9	-	-	18.4	78%	C1560001B00	2411 Pond Lane	5. Re-route ditch to drain along foot of hill and not directly to Little River.
6	Walton	4	10	100	0	0	85	80.0	-	-	15.0	81%	C1580101000	2429 Pond Lane	6. Install GDOT rock filter dams across from 365 Hancock Road and upstream from 365 Hancock Road.
7	Walton	4	9	100	0	0	90	80.0	-	-	10.0	88%	C1580100000	2409 Pond Lane	6. Install GDOT rock filter dams across from 365 Hancock Road and upstream from 365 Hancock Road.
8	Walton	4	12	250	35	0	70	73.1	-	-	48.8	33%	C1580106000	2467 Hancock Rd	6. Install GDOT rock filter dams across from 365 Hancock Road and upstream from 365 Hancock Road.
9	Walton	4	11	100	5	0	85	71.3	-	-	14.3	80%	C1580096000	2438 Pond Lane	6. Install GDOT rock filter dams across from 365 Hancock Road and upstream from 365 Hancock Road.
Total								737.3	19.2	95%	163.9	78%			


Legend:
EPD Monitoring Site
319(h) Monitoring Site
2009 Monitoring Site
303(d) Segment
Source Site
By Rank No.
10
Load Reduction Map
319(h) Revised TMDL Implementation Plan
Newton County Water and Sewerage Authority
Newton County, Georgia
Southern Enginuity
Social Circle
Area No. 1
Area No. 2
Area No. 3
Area No. 4
Area No. 5
BMP No. 1
BMP No. 2
BMP No. 3
BMP No. 4
BMP No. 5
BMP No. 6
BMP No. 7
Optional
Little River
Walton State Fish Hatchery
Scale: 0.0 0.25 0.5 1.0 MILE
N

Load Reduction Cost Table

Rank No.	County	Area	Location	Area No. 1 Load Reduction	Area No. 4 Load Reduction	Parcel	Street	BMP No./Improvement	BMP Demonstration Costs	Future BMP Costs
1	Newton	1	8	95%	-	124 013	US Hwy 278	1. Remove cattle. Install NRCS buffers with trees and grass.	$ 17,000	-
2	Newton	1 (4)	6	-	95%	133 2B 133 2C	365 Hancock Rd	2. Remove horses. Grass area and install GDOT rock filter dam.	$ 4,000	-
3	Walton	4	2	-	90%	C1560001A00	2415 Pond Lane	3. Install NRCS woven fence across 2 watering ramps.	-	$ 500
4	Walton	4	3	-	84%	C1560001A00	2415 Pond Lane	4. Isolate pond by installing NRCS watering ramp.	-	$ 5,000
5	Walton	4	8	-	78%	C1560001B00	2411 Pond Lane	5. Re-route ditch to drain along foot of hill and not directly to Little River.	-	$ 7,000
6	Walton	4	10	-	81%	C1580101000	2429 Pond Lane	6. Install GDOT rock filter dams across from 365 Hancock Road and upstream from 365 Hancock Road.	-	$ 15,000
7	Walton	4	9	-	88%	C1580100000	2409 Pond Lane	6. Install GDOT rock filter dams across from 365 Hancock Road and upstream from 365 Hancock Road.	-	-
8	Walton	4	12	-	33%	C1580106000	2467 Hancock Rd	6. Install GDOT rock filter dams across from 365 Hancock Road and upstream from 365 Hancock Road.	-	-
9	Walton	4	11	-	80%	C1580096000	2438 Pond Lane	6. Install GDOT rock filter dams across from 365 Hancock Road and upstream from 365 Hancock Road.	-	-
-	Walton	4	-					7. Install sign prohibting the dumping of animal carcasses along the side of the road.	-	Optional
Total				95%	78%				$ 21,000	$ 27,500

Load Reduction Cost and Schedule - The Load Reduction Cost Table on the previous page provides the cost for installing the proposed BMPs in the Little River sub-basin. To present a comprehensive cost profile, other costs that are needed to fully execute the load reduction plan were collected.

Other costs that are considered and added to the plan include administrative, public outreach, water quality monitoring and BMP design and layout costs. Each of these costs are shown in the table below. No costs were provided for Grant Application preparation, Nutrient Management Plans or De-Listing Process efforts.

The cost for project execution is expected to be $57,000.

Revised TMDL Implementation Plan - Cost Breakdown

Little River Fecal Coliform Load Reduction

Revised TMDL Implementation Plan Activity	319(h) Grant - US EPA 60% Participation	Municipal Sponsor (Applicant) 40% Participation	Total Cost, $
Revised TMDL Implementation Plan			
Submittal	-	-	-
Approval	-	-	-
Municipal Sponsor (Applicant)			
Project Administration	0	4,500	4,500
Project Closeout	0	500	500
Grant Application			
Submittal	-	-	-
Award	-	-	-
Notice to Proceed	-	-	-
Public Outreach			0
Education	1,500	0	1,500
Workshop	1,500	0	1,500
Best Management Practices			
Design and Layout	6,000	4,000	10,000
Installation	16,500	11,000	27,500
Contingency	2,700	1,800	4,500
Construction Administration	1,500	1,000	2,500
Stream Monitoring			
Data Base	2,500	0	2,500
303(d) Delisting	2,000	0	2,000
Delisting Process	-	-	-
Annual Cost, $	34,200	22,800	57,000

The schedule fits the five year cycle that is associated with other revised TMDL Implementation Plans. The succeeding cycle begins with the submission of this revised TMDL Implementation Plan.

The lengthiest activity in the plan is the identification and commitment of a "plan" sponsor. The sponsor will be responsible for executing the plan and securing funds for project execution and BMP installation.

Candidates for sponsors would include Walton County, the city of Social Circle or a storm water utility established by Walton County. After the sponsor is awarded a grant, the majority of work would begin starting January 2017.

Activities that are scheduled after January 2017 include public outreach programs, stream monitoring and the installation of BMPs. See the Schedule of TMDL Implementation Plan Activities on page 63 for details.

Funding Sources

Funding sources are listed as follows:

1. EPA Section 319(h) Grant – Funds BMP Projects that prevent or reduce stream pollution

2. EPA Environmental Education Grant – Supports environmental education projects for public awareness of environmental issues

3. EPA Five Star Restoration Project – Provides technical support to enable community-based restoration projects

4. EPA Targeted Watershed Grant Program – Provides funding for community-driven environmental projects

5. Special Purpose Local Option Sales Tax – Funds environmental projects through local 1 cent sales tax

6. Clean Water State Revolving Fund Program – Provides low interest loans for environmental projects

Schedule of TMDL Implementation Plan Activities

Little River Fecal Coliform Load Reduction

Year	2014				2015				2016				2017				2018				2019				Cost,
Season	W	S	S	F	W	S	S	F	W	S	S	F	W	S	S	F	W	S	S	F	W	S	S	F	$
Revised TMDL Implementation Plan																									
Submittal																									0
Approval																									0
Municipal Sponsor (Applicant)																									
Project Administration																									4,500
Project Closeout																									500
Grant Application																									
Submittal																									0
Award																									0
Notice to Proceed																									0
Public Outreach																									
Education																									1,500
Workshop																									1,500
Best Management Practices																									
Design and Layout																									10,000
Installation																									34,500
Stream Monitoring																									
Data Base																									2,500
303(d) Delisting																									2,000
Delisting Process																									0
Annual Cost, $	0				0				0				44,175				11,425				1,400				57,000

Source Maps and Photos

Area No.s 1 through 5

1. Figure - Topographic Map
2. Table - Area Source Sites
3. Figure - Property Map
4. Figure - Aerial Map
5. Figure - Photographs

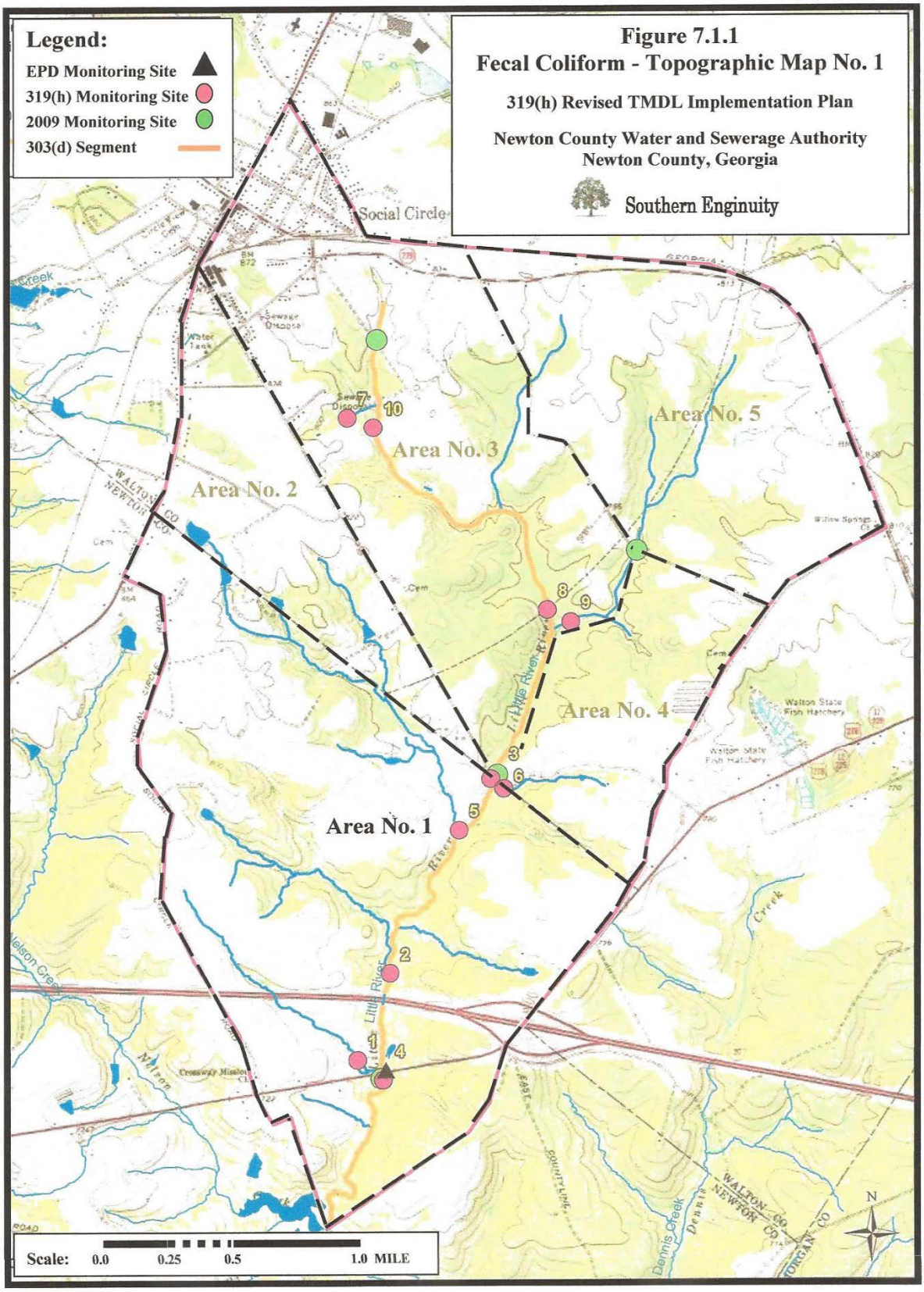
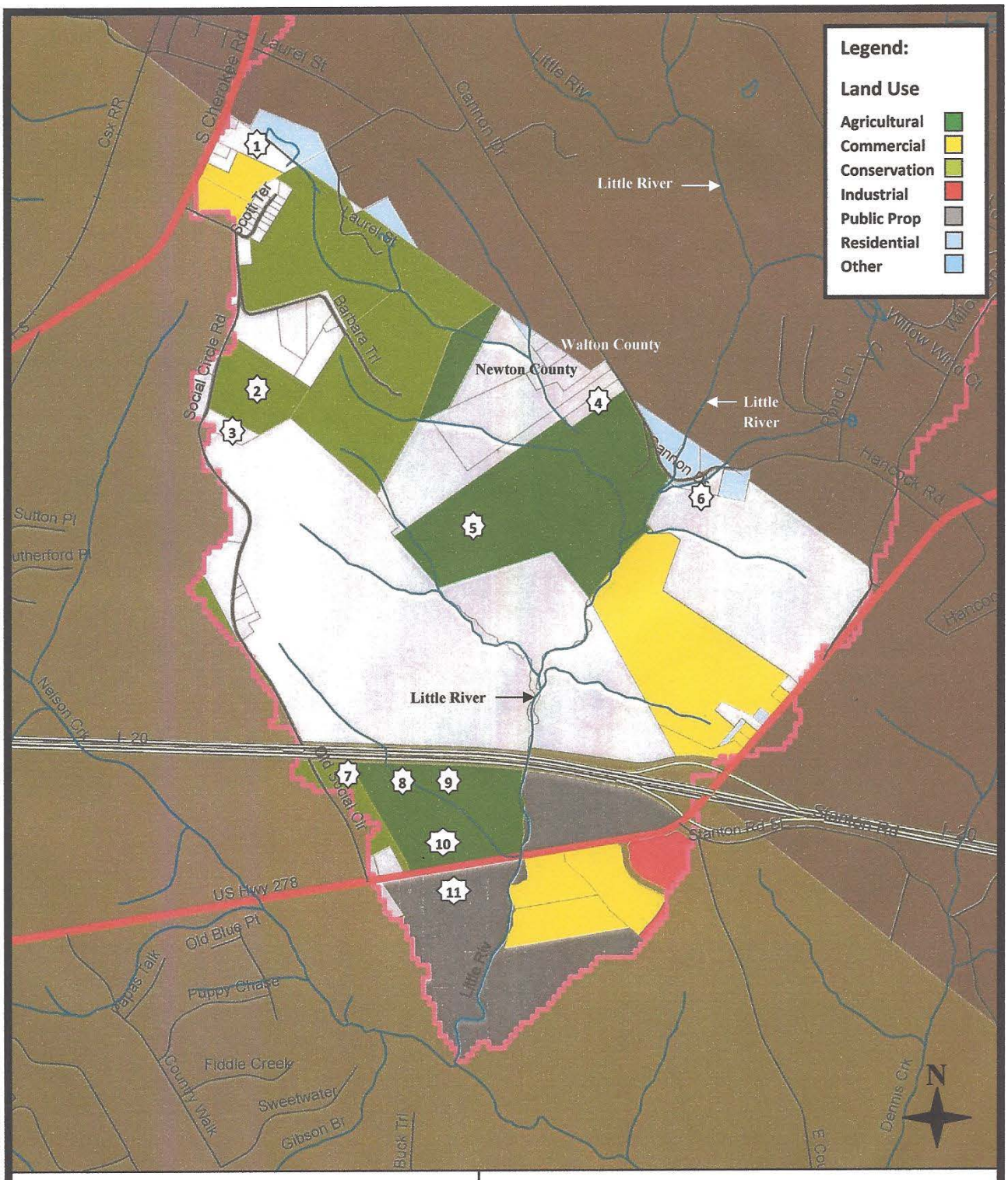

Legend:
EPD Monitoring Site
319(h) Monitoring Site
2009 Monitoring Site
303(d) Segment
Figure 7.1.1
Fecal Coliform - Topographic Map No. 1
319(h) Revised TMDL Implementation Plan
Newton County Water and Sewerage Authority
Newton County, Georgia
Southern Enginuity
Social Circle
Area No. 1
Area No. 2
Area No. 3
Area No. 4
Area No. 5
Little River
Walton State Fish Hatchery
Scale: 0.0 0.25 0.5 1.0 MILE
N

Table 7.1.1

Source Sites - Fecal Coliform - Area No. 1

County	Area	Location	Relative Load	% Removal			Load Score	Direct Stream Access	Parcel	Street	Comments
				On-site	Pond	Overland					
Newton	1	1	0	0	0	0	0.0	-		South Cherokee Road	Open yard, inactive pasture
Newton	1	2	200	75	30	60	14.0	-	123 19	878 Social Circle Road	Active pasture
Newton	1	3	0	0	0	0	0.0	-		958 Social Circle Road	Horse trailers but no horses
Newton	1	4	100	80	0	40	12.0	-	132 3	Cannon Drive	Active pasture
Newton	1	5	0	0	0	0	0.0	-		Cannon Drive	Hay production
Newton	1	6	150	0	0	0	150.0	Yes	133 2B 133 2C	365 Hancock Road	Poor site for fenced livestock
Newton	1	7	0	0	0	0	0.0	-		Social Circle Road	Hay production
Newton	1	8	960	50	10	5	410.4	Yes	124 013	US Hwy 278	Livestock Pond
Newton	1	9	0	0	0	0	0.0	-		US Hwy 278	Hay Production
Newton	1	10	0	0	0	0	0.0	-		US Hwy 278	Alternate grazing pasture
Newton	1	11	0	0	0	0	0.0	-		US Hwy 278	Hay production



Legend:

Site Location/No. 11

Scale: None

Southern Enginuity

Figure 7.1.2
Fecal Coliform – Property Map No. 1

319(h) Revised TMDL Implementation Plan

Newton County Water and Sewerage Authority
Newton County, Georgia

Legend:

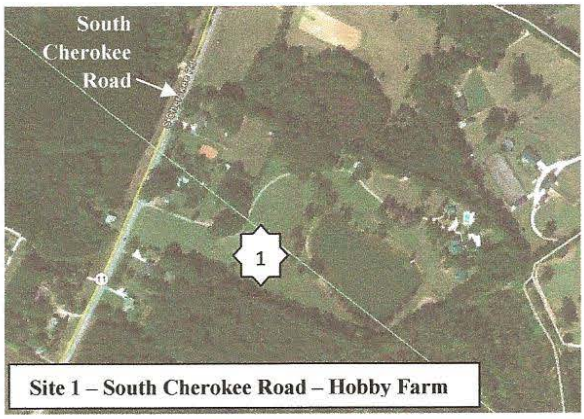
Site Location/No. 011
Area 1 Boundary .....
Scale: None

Southern Enginuity

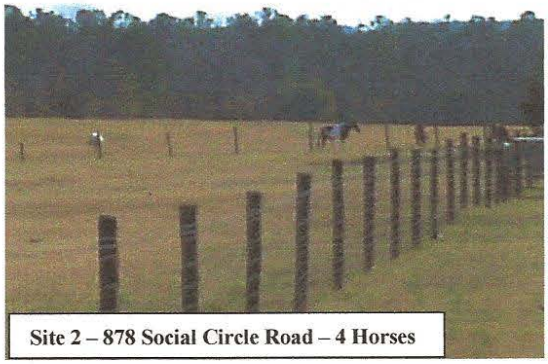
Figure 7.1.3
Fecal Coliform - Aerial Map No. 1

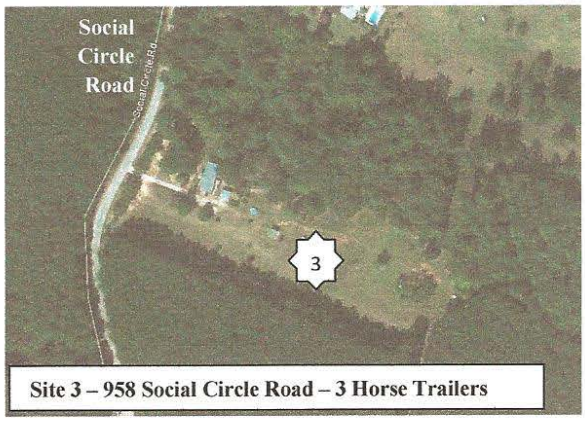
319(h) Revised TMDL Implementation Plan

Newton County Water and Sewerage Authority
Newton County, Georgia

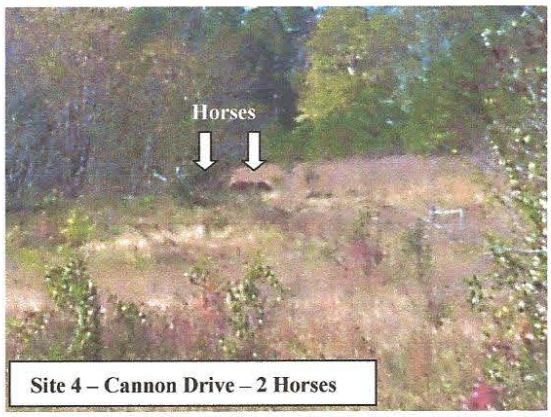


Site 1 – South Cherokee Road – Hobby Farm

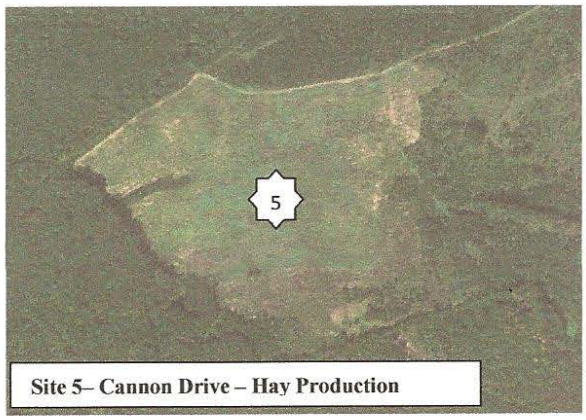

Site 2 – 878 Social Circle Road – 4 Horses



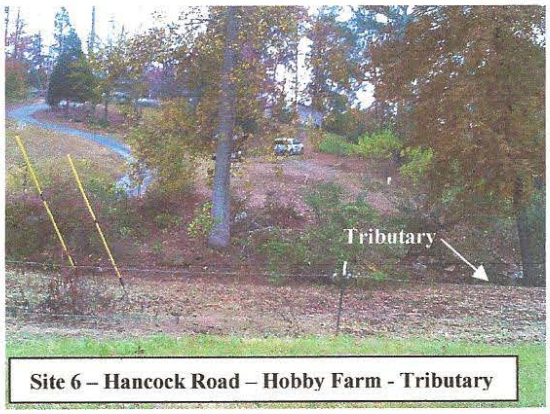
Site 3 – 958 Social Circle Road – 3 Horse Trailers



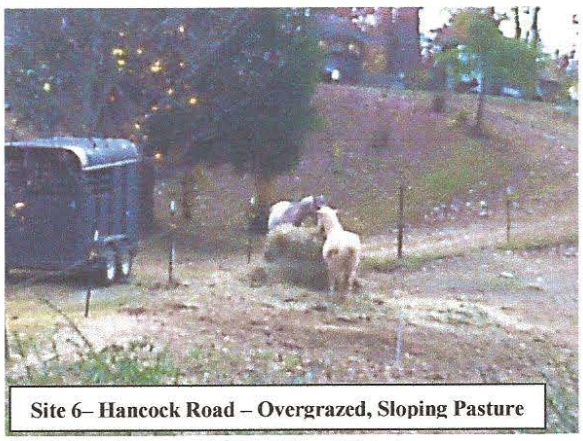
Site 4 – Cannon Drive – 2 Horses

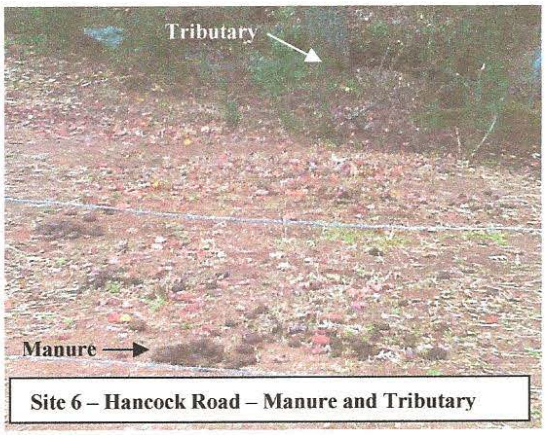


Site 5– Cannon Drive – Hay Production



Site 6 – Hancock Road – Hobby Farm - Tributary

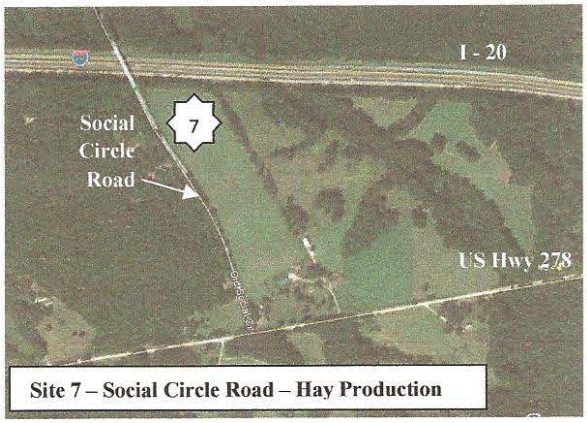

Site 6– Hancock Road – Overgrazed, Sloping Pasture



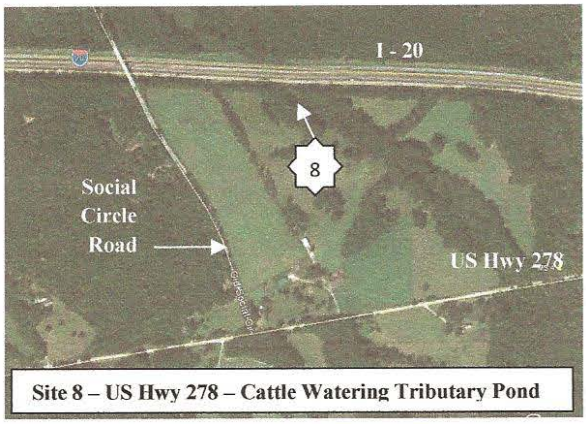
Site 6 – Hancock Road – Manure and Tributary

1. North is toward the top of each aerial photograph.
2. Photographs have no scale.

Southern Enginuity

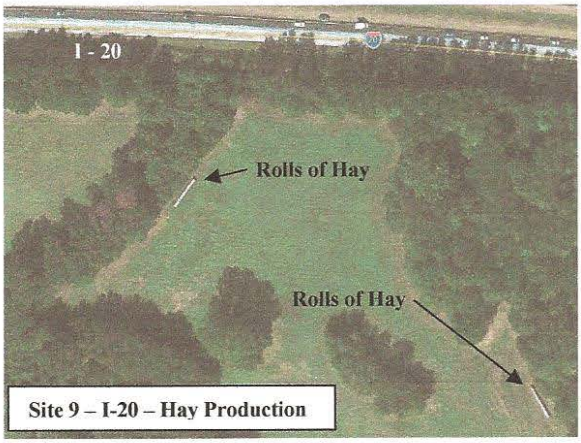


Site 7 – Social Circle Road – Hay Production

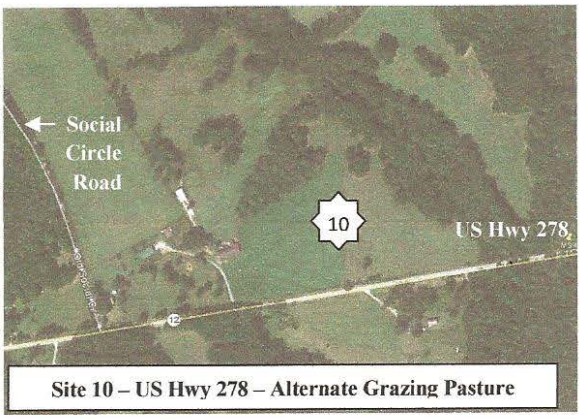


Site 8 – US Hwy 278 – Cattle Watering Tributary Pond

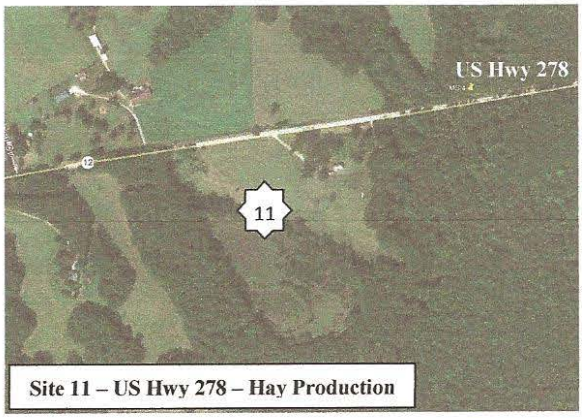

Site 8 – US Hwy 278 – Cattle Watering Tributary Pond



Site 9 – I-20 – Hay Production



Site 10 – US Hwy 278 – Alternate Grazing Pasture



Site 11 – US Hwy 278 – Hay Production

1. North is toward the top of each aerial photograph.
2. Photographs have no scale.

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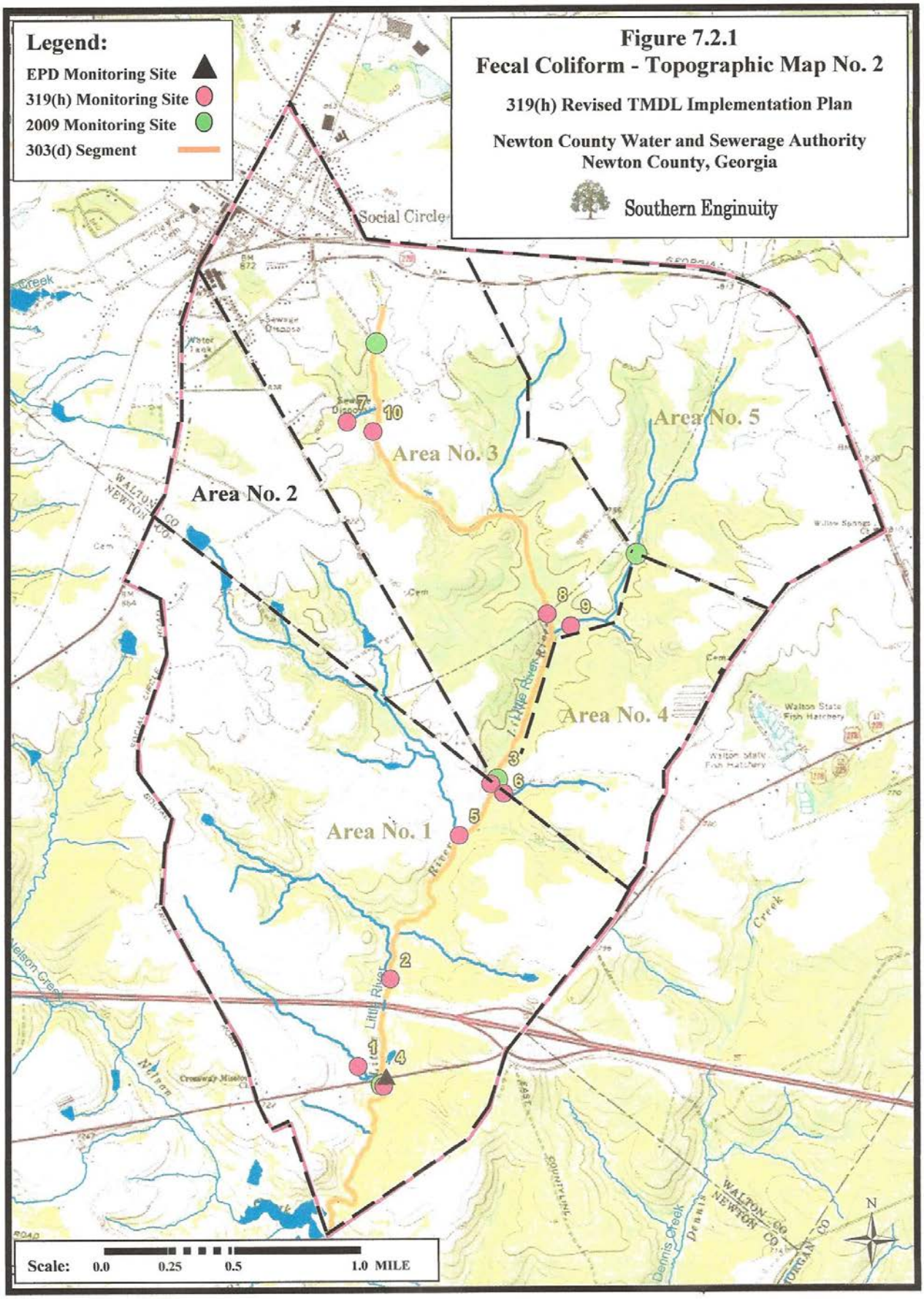

Legend:
EPD Monitoring Site
319(h) Monitoring Site
2009 Monitoring Site
303(d) Segment
Figure 7.2.1
Fecal Coliform - Topographic Map No. 2
319(h) Revised TMDL Implementation Plan
Newton County Water and Sewerage Authority
Newton County, Georgia
Southern Enginuity
Social Circle
Area No. 1
Area No. 2
Area No. 3
Area No. 4
Area No. 5
Little River
Walton State Fish Hatchery
Scale: 0.0 0.25 0.5 1.0 MILE
N

Table 7.2.1

Source Sites - Fecal Coliform - Area No. 2

County	Area	Location	Relative Load	% Removal			Load Score	Direct Stream Access	Parcel	Street	Comments
				On-site	Pond	Overland					
Walton	2	1	1500	90	90	25	11.3	Yes	SC170004000	714 South Cherokee Road	Livestock Pond
Walton	2	2	0	0	0	0	0.0	-		South Cherokee Road	Row Crops
Walton	2	3	0	0	0	0	0.0	-		South Cherokee Road	Inactive Pasture
Walton	2	4	150	50	60	60	12.0	-	SC170005000	668 Laurel Drive	Hobby Farm
Walton	2	5	150	50	60	60	12.0	-	SC180001000	704 Laurel Drive	Hobby Farm
Walton	2	6	1344	80	30	30	131.7	Yes	SC180010000	1000 Laurel Drive	Livestock Pond
Walton	2	7	0	0	0	0	0.0	-		Cannon Drive	Inactive Pasture

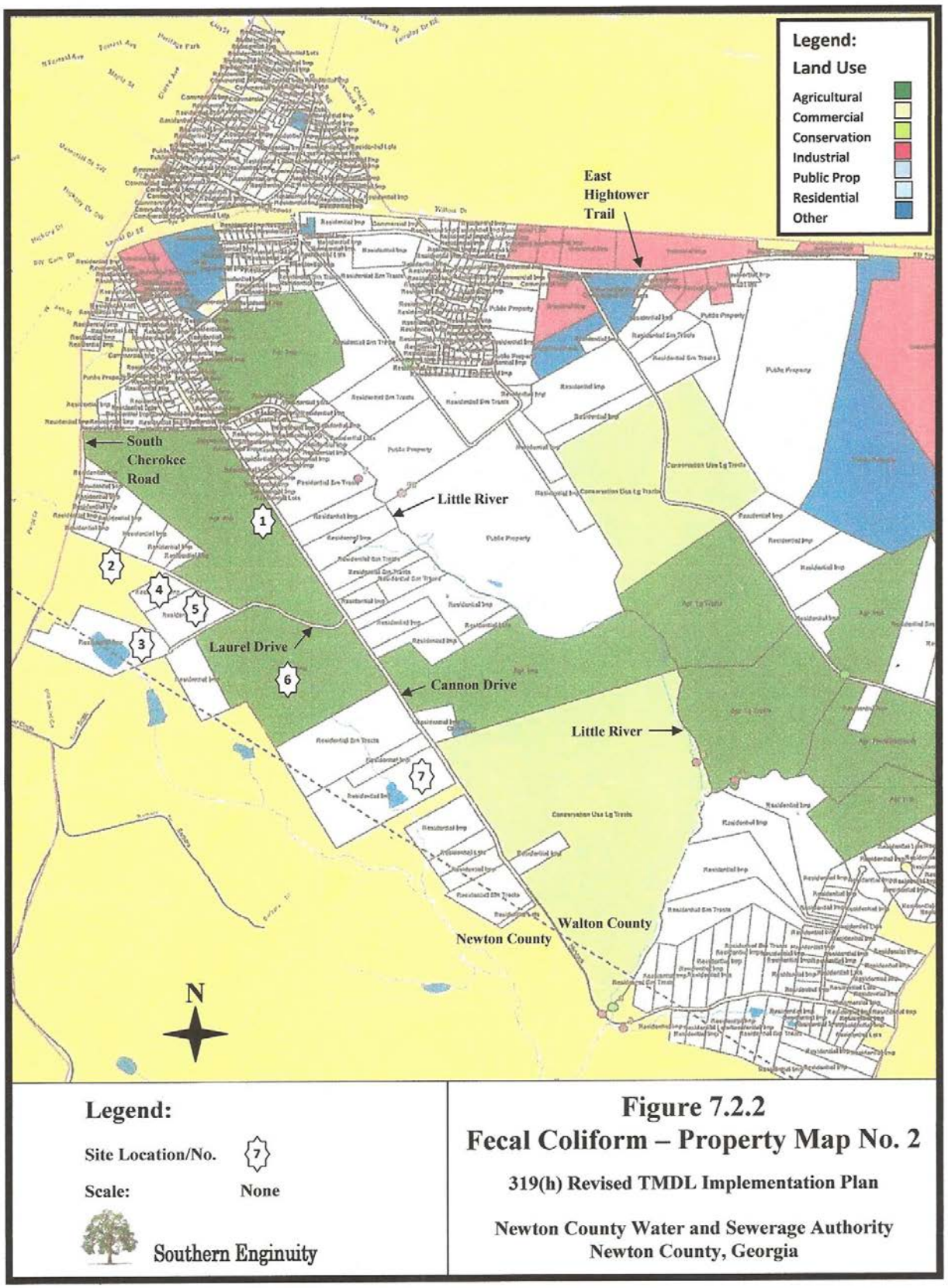


Figure 7.2.2
Fecal Coliform – Property Map No. 2

319(h) Revised TMDL Implementation Plan

Newton County Water and Sewerage Authority
Newton County, Georgia

Legend:

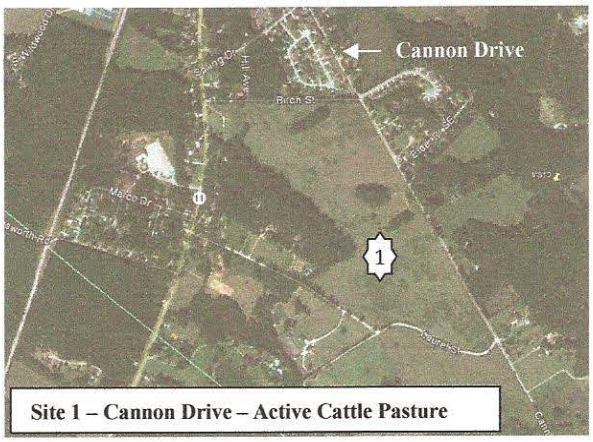
Site Location/No. 7
Area 2 Boundary
Scale: None

Southern Enginuity

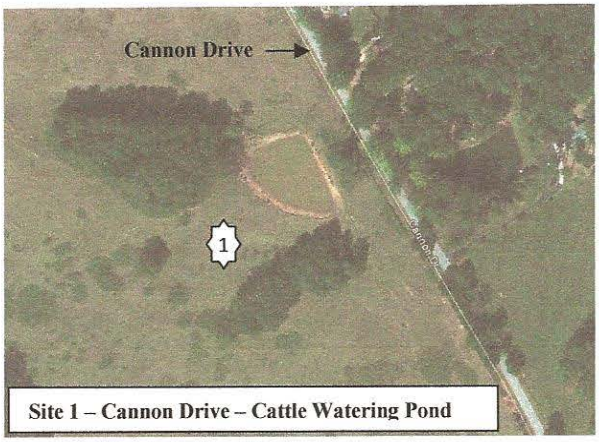
Figure 7.2.3
Fecal Coliform - Aerial Map No. 2

319(h) Revised TMDL Implementation Plan

Newton County Water and Sewerage Authority
Newton County, Georgia

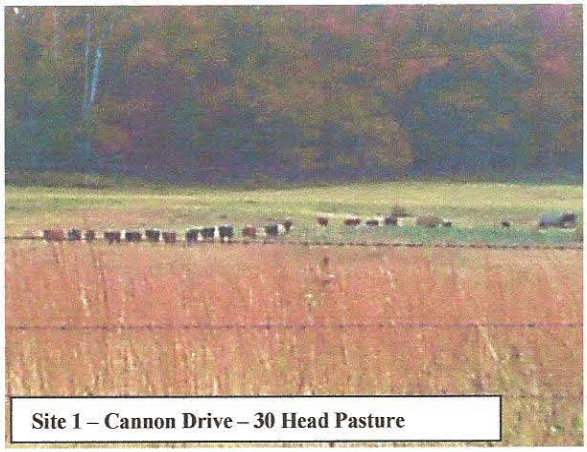


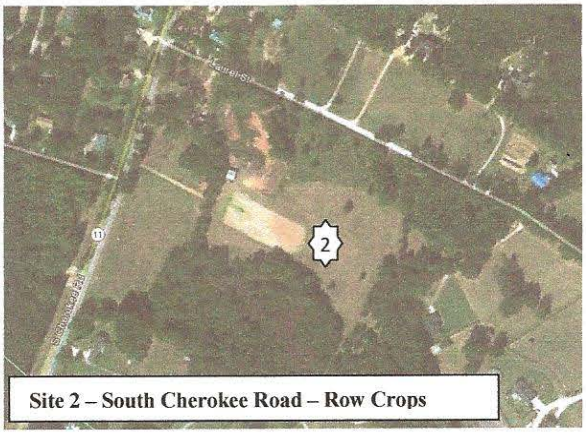
Site 1 – Cannon Drive – Active Cattle Pasture



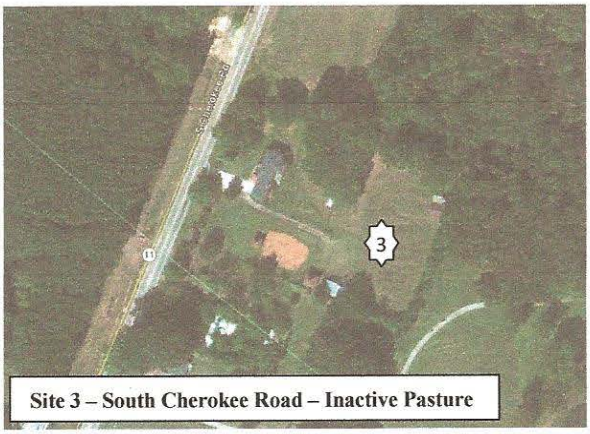
Site 1 – Cannon Drive – Cattle Watering Pond


Site 1 – Cannon Drive – Active Watering Pond


Site 1 – Cannon Drive – 30 Head Pasture

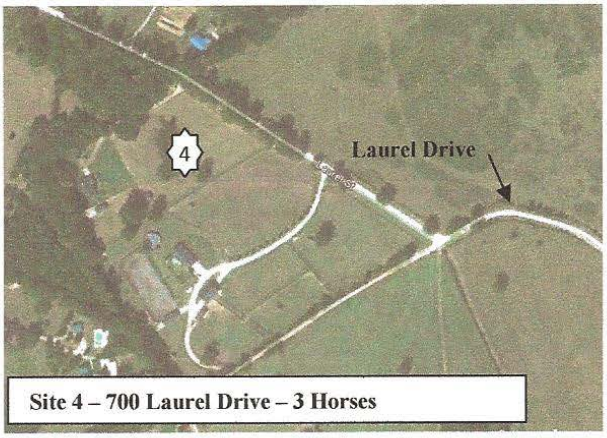


Site 2 – South Cherokee Road – Row Crops

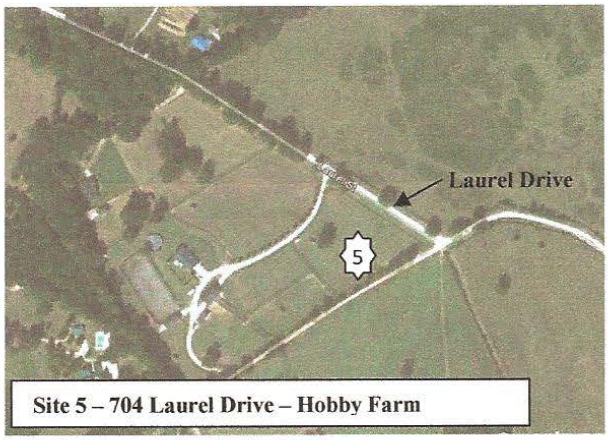


Site 3 – South Cherokee Road – Inactive Pasture

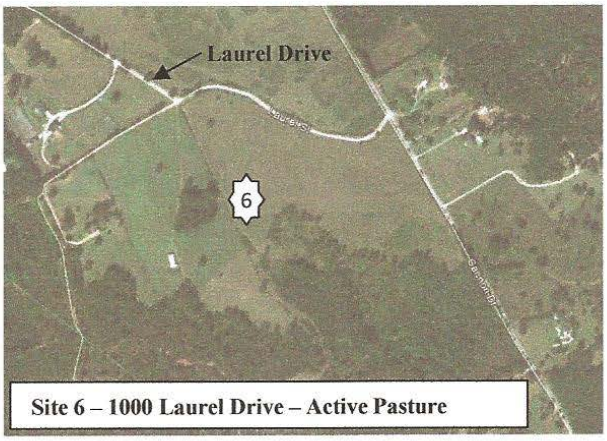
1. North is toward the top of each aerial photograph.
2. Photographs have no scale.



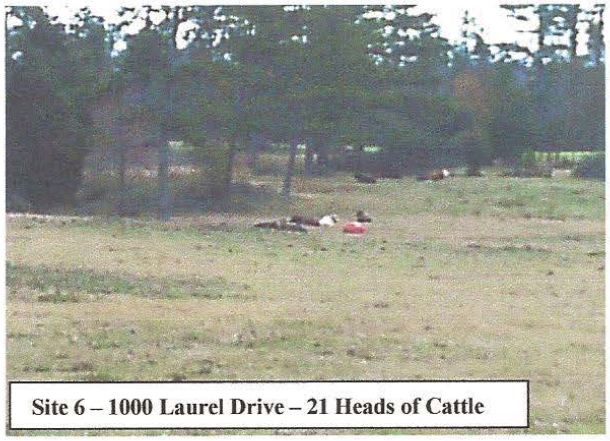
Site 4 – 700 Laurel Drive – 3 Horses

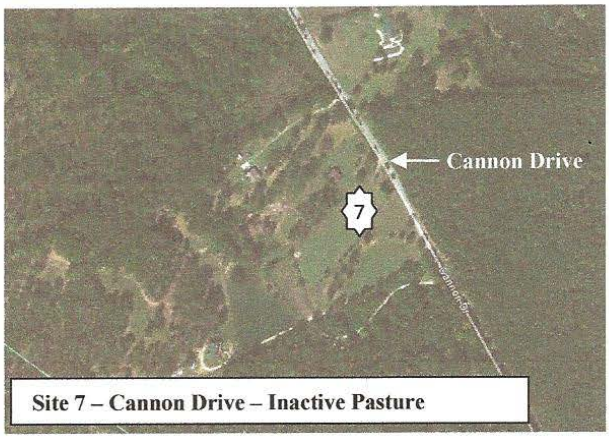


Site 5 – 704 Laurel Drive – Hobby Farm



Site 6 – 1000 Laurel Drive – Active Pasture


Site 6 – 1000 Laurel Drive – 21 Heads of Cattle



Site 7 – Cannon Drive – Inactive Pasture

1. North is toward the top of each aerial photograph.
2. Photographs have no scale.

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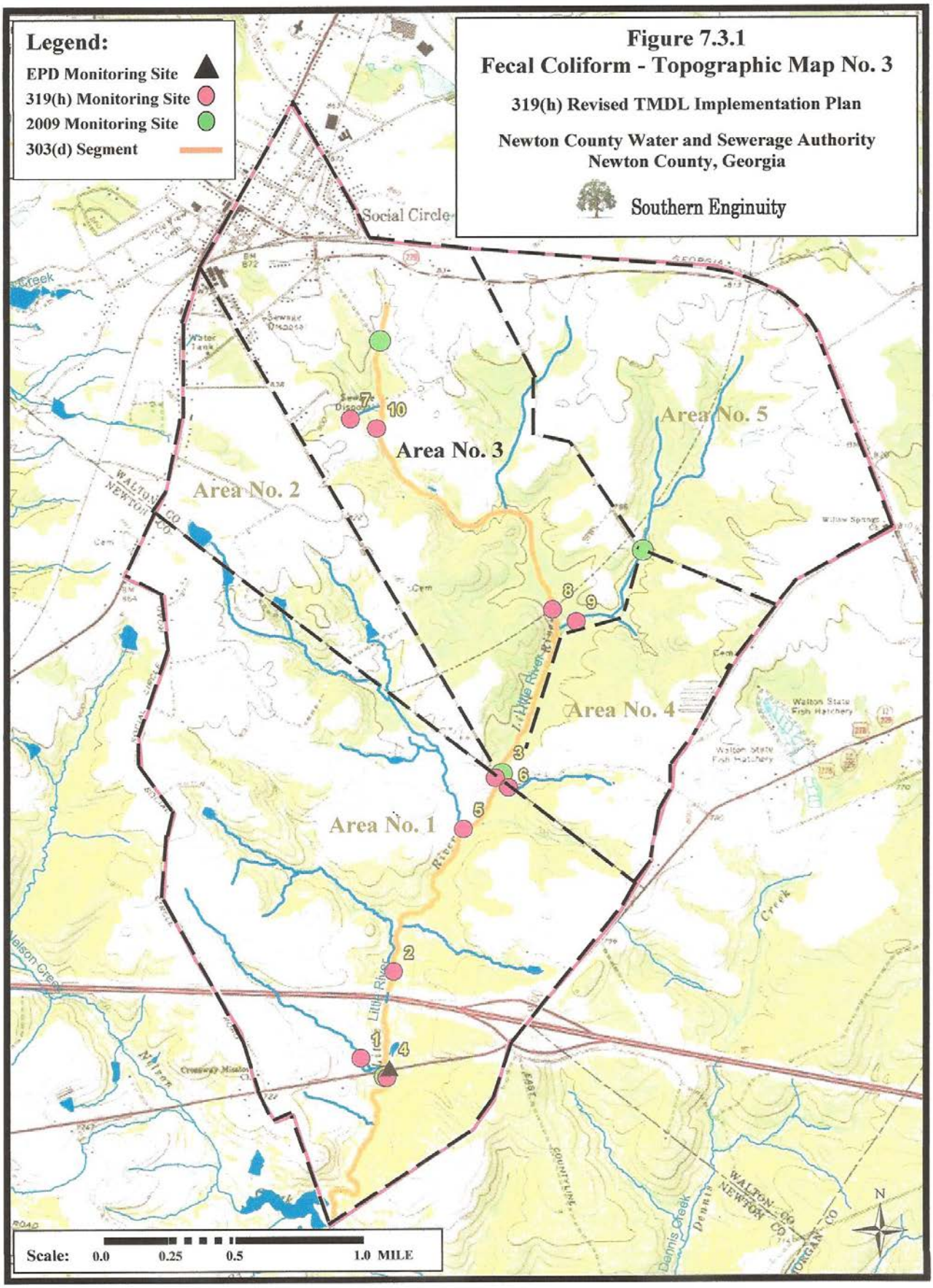
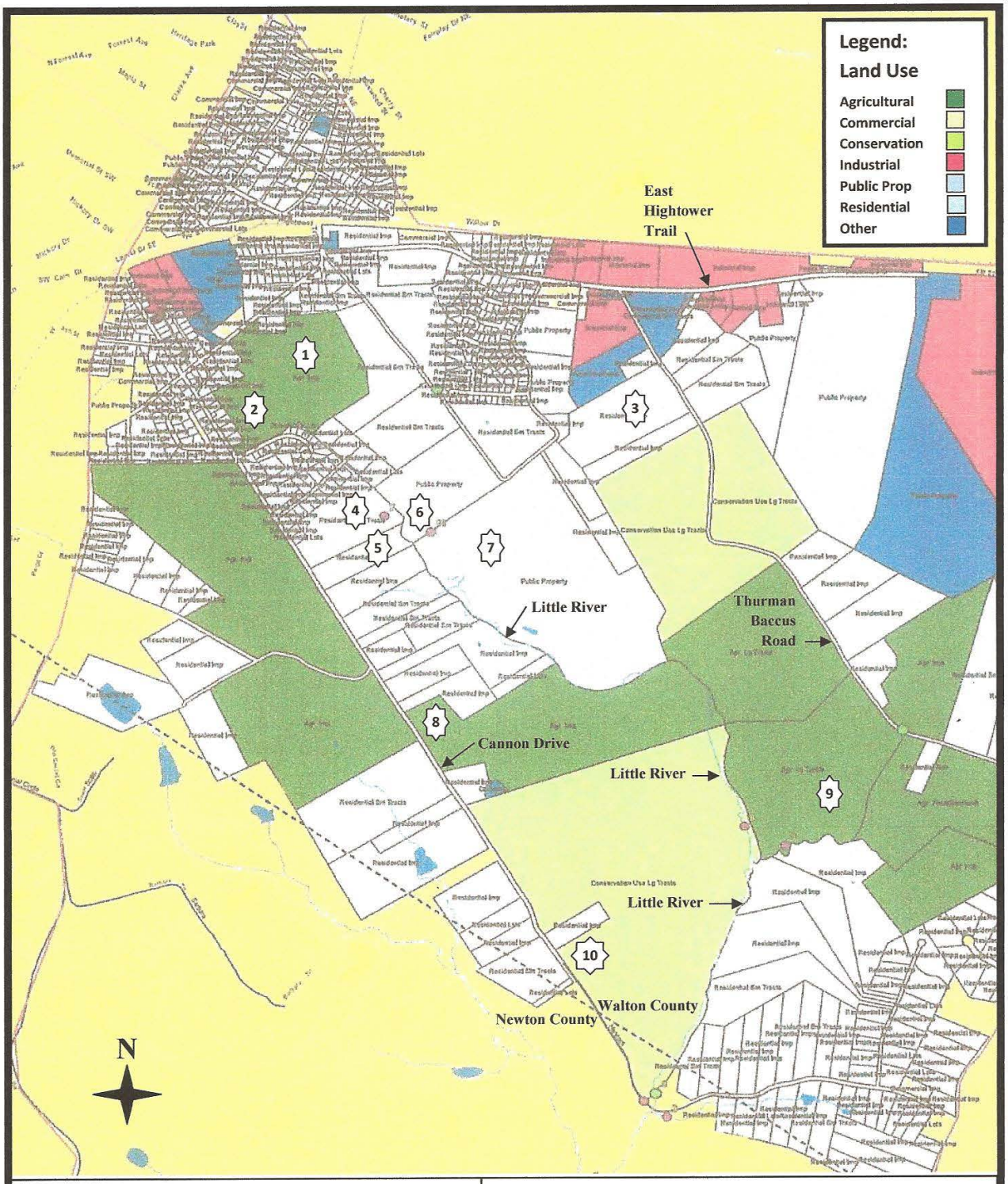

Legend:
EPD Monitoring Site
319(h) Monitoring Site
2009 Monitoring Site
303(d) Segment
Figure 7.3.1
Fecal Coliform - Topographic Map No. 3
319(h) Revised TMDL Implementation Plan
Newton County Water and Sewerage Authority
Newton County, Georgia
Southern Enginuity
Social Circle
Area No. 1
Area No. 2
Area No. 3
Area No. 4
Area No. 5
Little River
Walton State Fish Hatchery
Scale: 0.0 0.25 0.5 1.0 MILE
N

Table 7.3.1

Source Sites - Fecal Coliform - Area No. 3

County	Area	Location	Relative Load	% Removal			Load Score	Direct Stream Access	Parcel	Street	Comments
				On-site	Pond	Overland					
Walton	3	1	0	0	0	0	0.0	-		Spring Street	Inactive Pasture
Walton	3	2	0	0	0	0	0.0	-		Cannon Drive	Inactive Pasture
Walton	3	3	0	0	0	0	0.0	-		Thurman Baccus Road	Inactive Pasture
Walton	3	4	0	0	0	0	0.0	-		Cannon Drive	Inactive Pasture
Walton	3	5	0	0	0	0	0.0	-		Cannon Drive	Inactive Pasture
Walton	3	6	160	65	0	0	56.0	-	SC170077000	187 Vine Circle	Social Circle WPCP
Walton	3	7	0	0	0	0	0.0	-		Vine Circle	Public Land Hay Production
Walton	3	8	0	0	0	0	0.0	-		Cannon Drive	Inactive Pasture
Walton	3	9	0	0	0	0	0.0	-		Thurman Baccus Road	Row Crops
Walton	3	10	0	0	0	0	0.0	-		Cannon Drive	Dirt Track



Legend:

Site Location/No. 10

Scale: None

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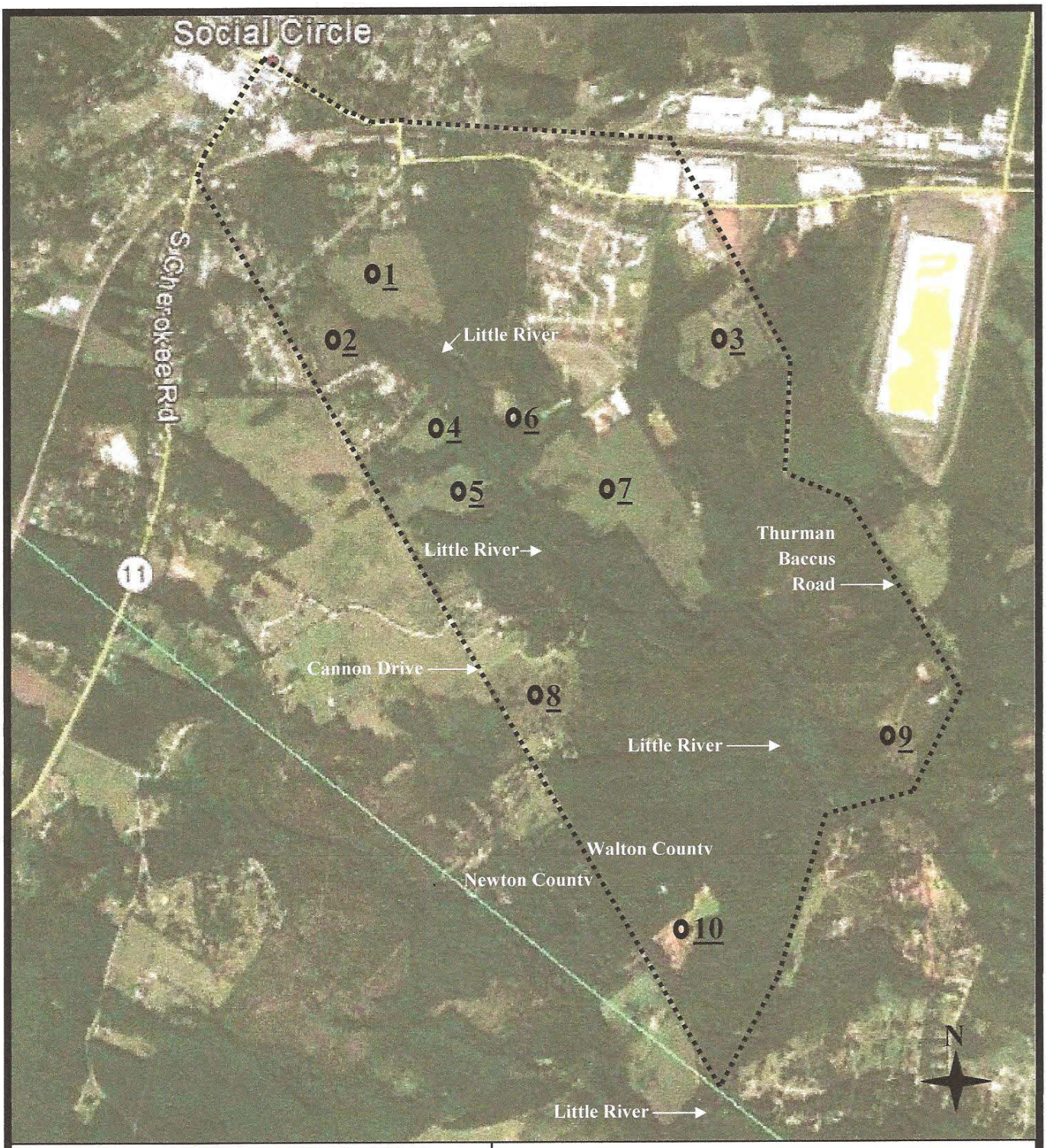
Figure 7.3.2
Fecal Coliform – Property Map No. 3

319(h) Revised TMDL Implementation Plan

Newton County Water and Sewerage Authority
Newton County, Georgia



Legend:

Site Location/No. 010

Area 3 Boundary .....

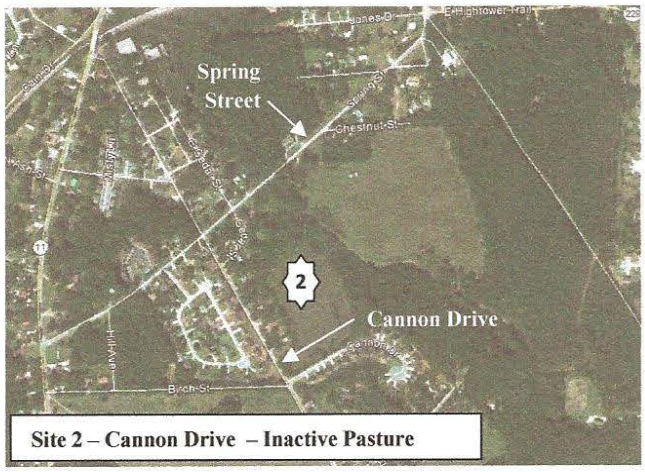
Scale: None

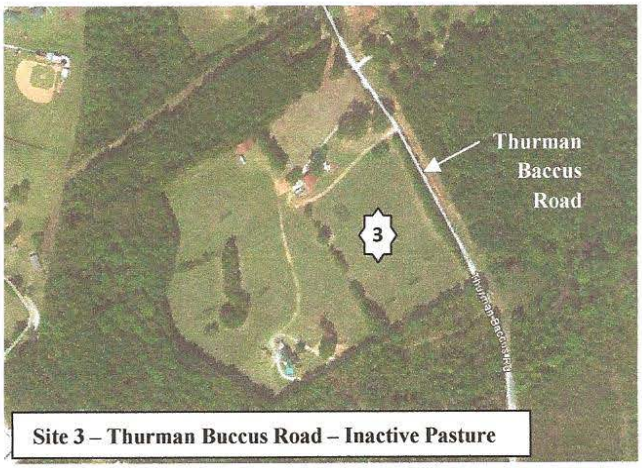
Southern Enginuity

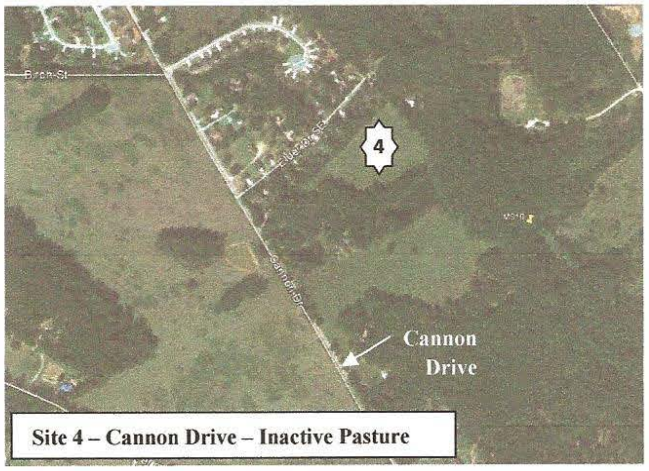
Figure 7.3.3
Fecal Coliform - Aerial Map No. 3

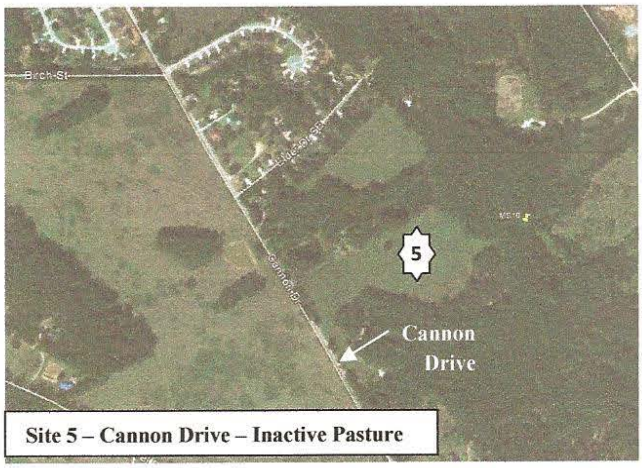
319(h) Revised TMDL Implementation Plan

Newton County Water and Sewerage Authority
Newton County, Georgia









1. North is toward the top of each aerial photograph.
2. Photographs have no scale.

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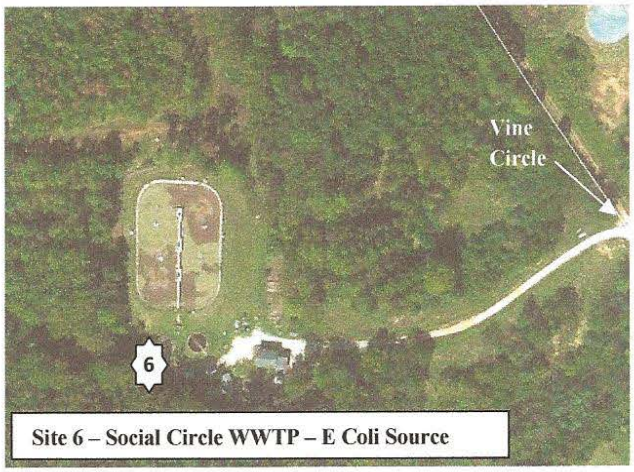
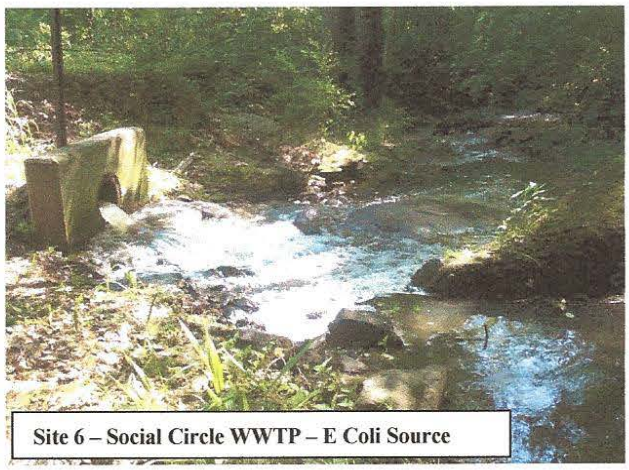
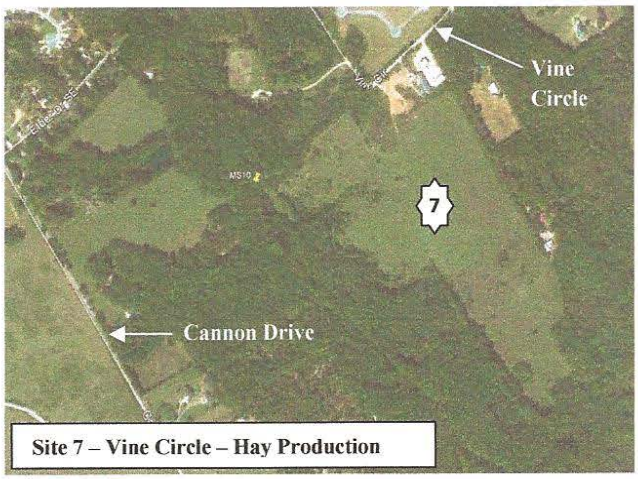
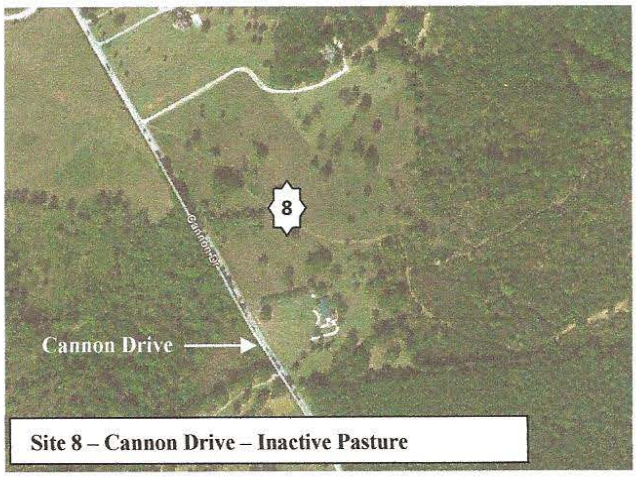


Site 6 – Social Circle WWTP – E Coli Source

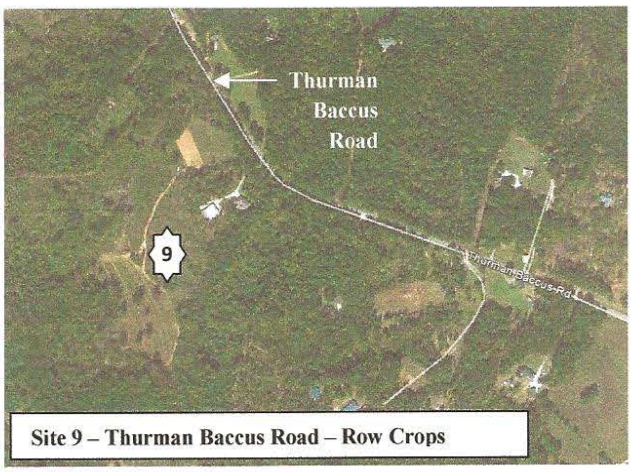

Site 6 – Social Circle WWTP – E Coli Source



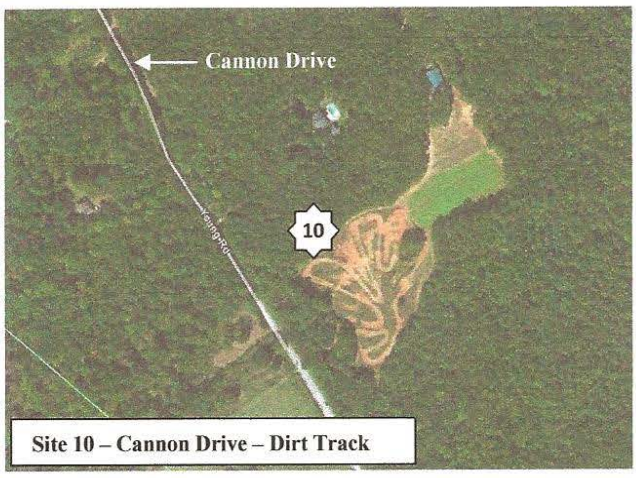
Site 7 – Vine Circle – Hay Production



Site 8 – Cannon Drive – Inactive Pasture



Site 9 – Thurman Baccus Road – Row Crops



Site 10 – Cannon Drive – Dirt Track

1. North is toward the top of each aerial photograph.
2. Photographs have no scale.

Southern Enginuity

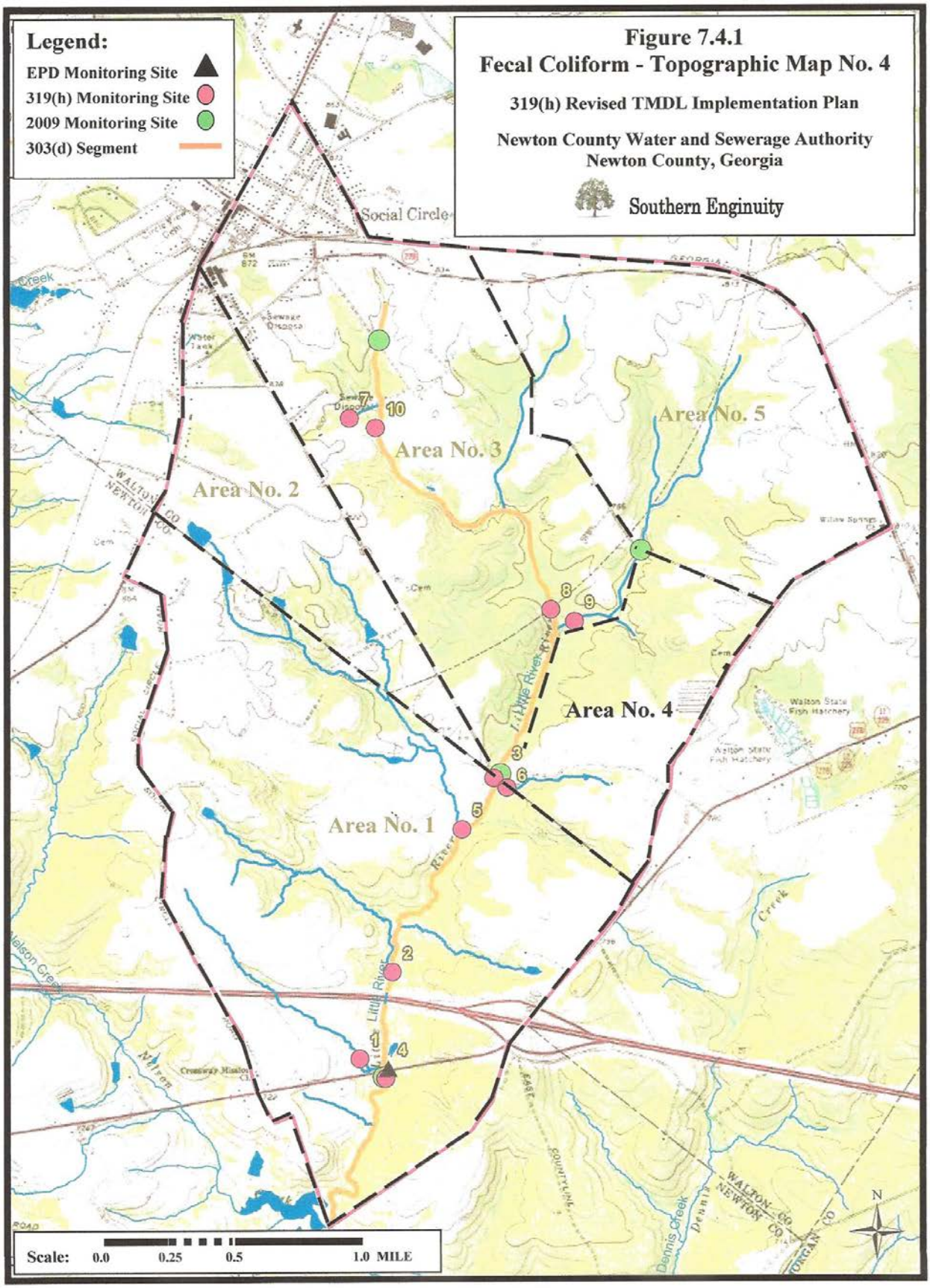
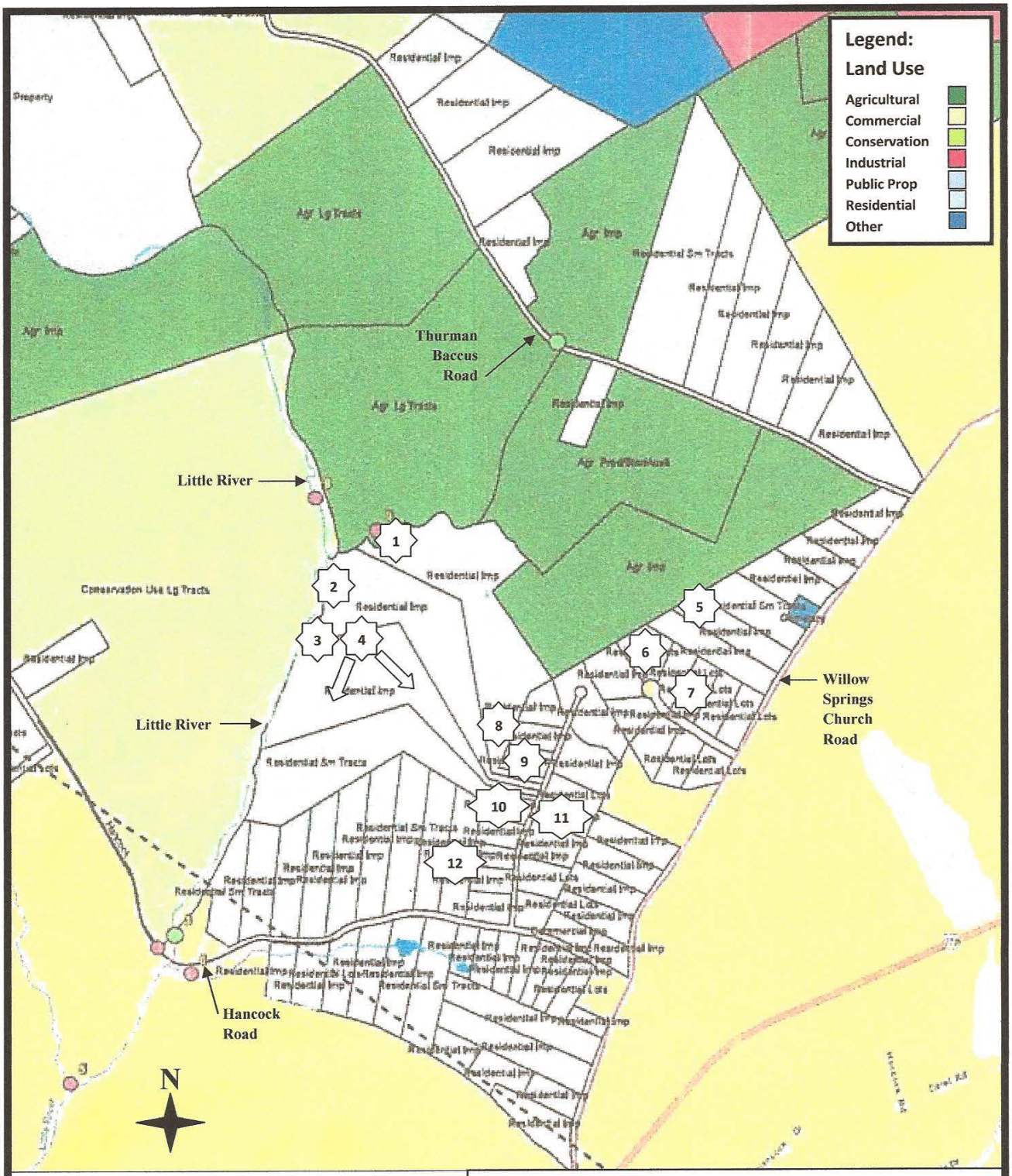

Legend:
EPD Monitoring Site
319(h) Monitoring Site
2009 Monitoring Site
303(d) Segment
Figure 7.4.1
Fecal Coliform - Topographic Map No. 4
319(h) Revised TMDL Implementation Plan
Newton County Water and Sewerage Authority
Newton County, Georgia
Southern Enginuity
Social Circle
Area No. 1
Area No. 2
Area No. 3
Area No. 4
Area No. 5
Little River
Scale: 0.0 0.25 0.5 1.0 MILE
N

Table 7.4.1

Source Sites - Fecal Coliform - Area No. 4

County	Area	Location	Relative Load	% Removal			Load Score	Direct Stream Access	Parcel	Street	Comments
				On-site	Pond	Overland					
Walton	4	1	100	20	30	0	56.0	Yes	C1560001B00	2411 Pond Lane	Livestock Pond
Walton	4	2	100	0	0	0	100.0	Yes	C1560001A00	2415 Pond Lane	Direct Livestock Watering
Walton	4	3	100	0	0	0	100.0	Yes	C1560001A00	2415 Pond Lane	Direct Livestock Watering
Walton	4	4	50	10	0	5	42.8	-	C1560001000	2419 Pond Lane	Disturbed Riparian Buffer
Walton	4	5	0	0	0	0	0.0	-		2161 Willow Springs Church Road	Hobby Farm
Walton	4	6	2	20	30	10	1.0	-	N158A005000	5422 Willow Wind Court	Small Dog Kennel
Walton	4	7	20	0	10	10	16.2	-	N158A003000	5442 Willow Wind Court	Fenced Goats
Walton	4	8	194	5	0	55	82.9	-	C1560001B00	2411 Pond Lane	Fenced Goats, Donkeys, Emu's
Walton	4	9	100	0	0	20	80.0	-	C1580100000	2409 Pond Lane	Fenced Horses
Walton	4	10	100	0	0	10	90.0	-	C1580101000	2429 Pond Lane	Fenced Horses
Walton	4	11	100	5	0	25	71.3	-	C1580096000	2428 Pond Lane	Fenced Horses
Walton	4	12	250	35	0	55	73.1	-	C1580106000	2467 Hancock Road	Fenced Horses



Legend:

Site Location No. 12

Scale: None

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Figure 7.4.2
Fecal Coliform – Property Map No. 4

319(h) Revised TMDL Implementation Plan

Newton County Water and Sewerage Authority
Newton County, Georgia

Legend:

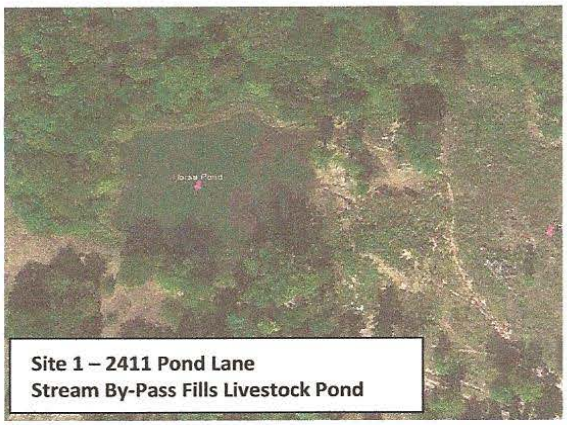
Site Location/No. 012
Area 4 Boundary
Scale: None

Southern Enginuity

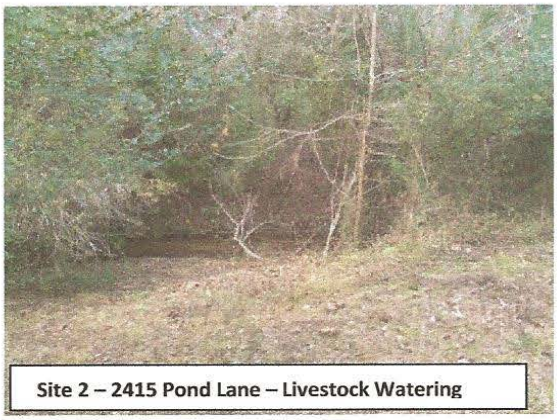
Figure 7.4.3
Fecal Coliform - Aerial Map No. 4

319(h) Revised TMDL Implementation Plan

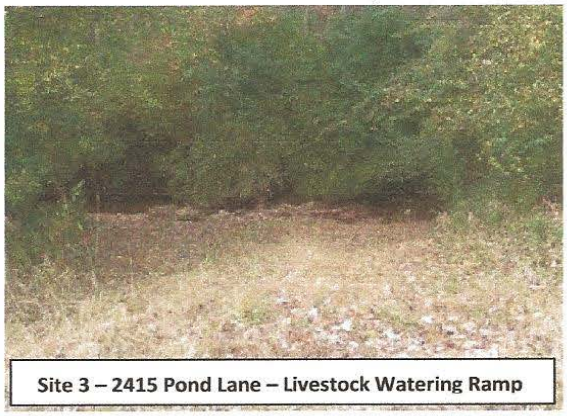
Newton County Water and Sewerage Authority
Newton County, Georgia



Site 1 – 2411 Pond Lane
Stream By-Pass Fills Livestock Pond



Site 2 – 2415 Pond Lane – Livestock Watering



Site 3 – 2415 Pond Lane – Livestock Watering Ramp

Site 4 – 2415 Pond Lane – Small Tributary
Drains Two-Horse Pasture

Site 4 – 2417 Pond Lane – Disturbed Riparian Buffer

Site 4 – 2417 Pond Lane – Disturbed Riparian Buffer

Site 4 – 2417 Pond Lane – Steep Slope Approaching
Disturbed Riparian Buffer

Site 5 – 2161 Willow Springs Church Road - Livestock

1. North is toward the top of each aerial photograph.
2. Photographs have no scale.

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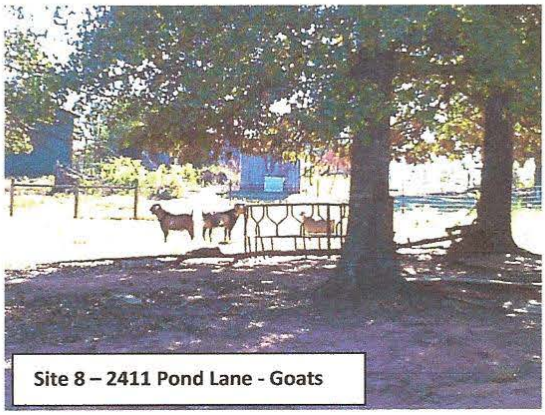
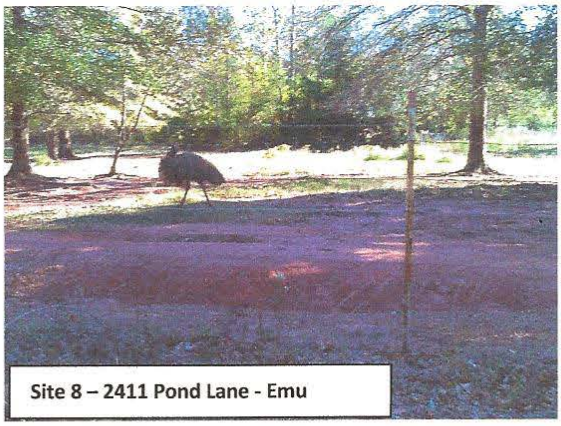
Site 6 – 5422 Willow Wind Court - Kennel

Site 7 – 5442 Willow Wind Court – Fenced Goats

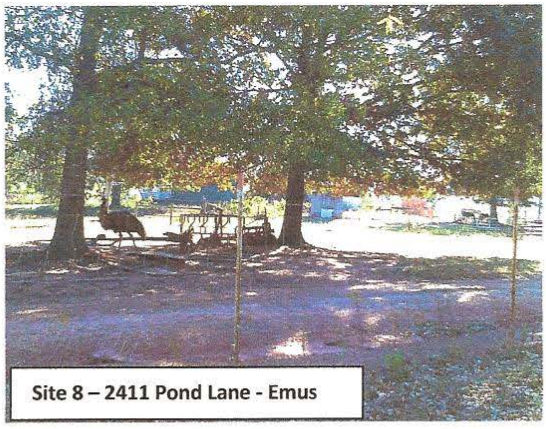
Site 7 – 5442 Willow Wind Court



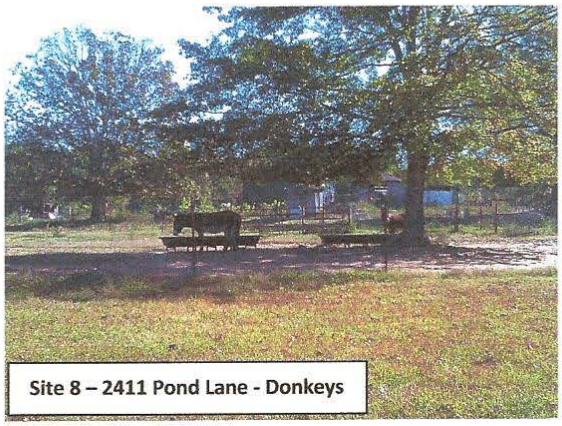
Site 8 – 2411 Pond Lane - Goats



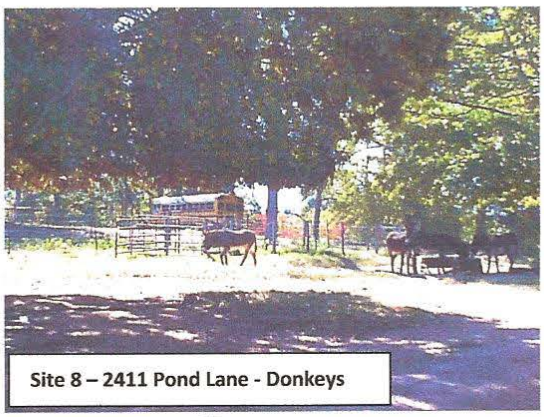
Site 8 – 2411 Pond Lane - Emu



Site 8 – 2411 Pond Lane - Emus



Site 8 – 2411 Pond Lane - Donkeys



Site 8 – 2411 Pond Lane - Donkeys

1. North is toward the top of each aerial photograph.
2. Photographs have no scale.

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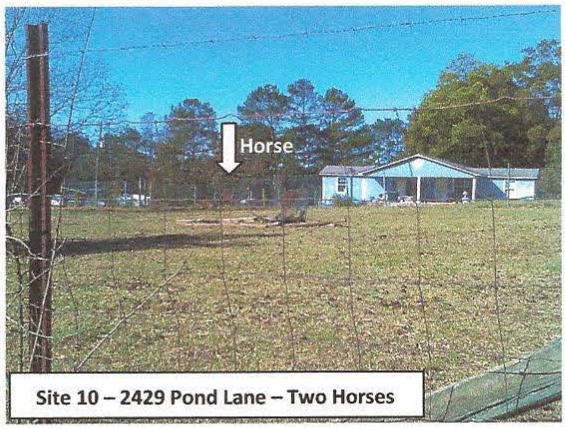
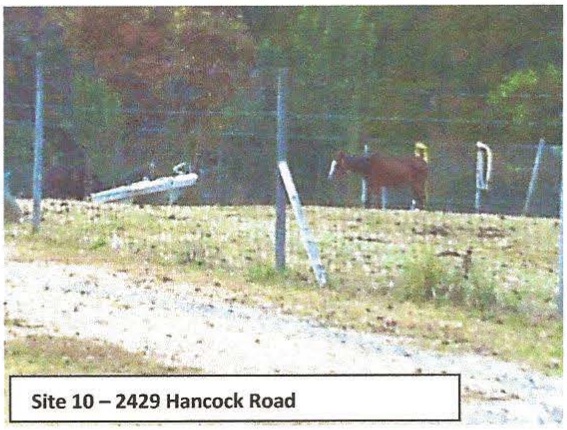
Site 9 – 2409 Pond Lane – Two Horses

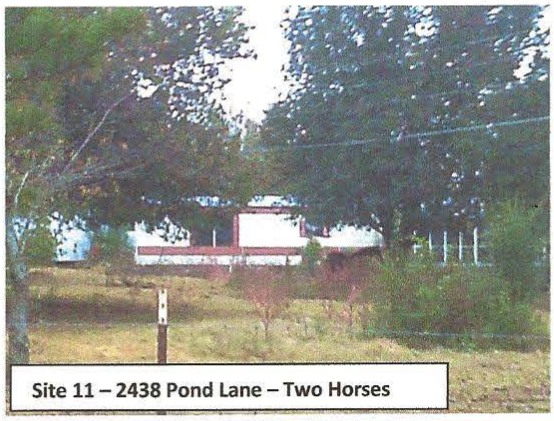
Site 9 – 2409 Pond Lane - Horses



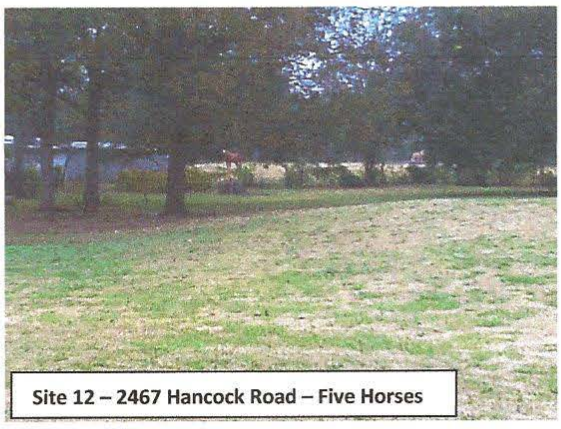
Site 10 – 2429 Pond Lane – Two Horses



Site 10 – 2429 Hancock Road



Site 11 – 2438 Pond Lane – Two Horses



Site 12 – 2467 Hancock Road – Five Horses

1. North is toward the top of each aerial photograph.
2. Photographs have no scale.

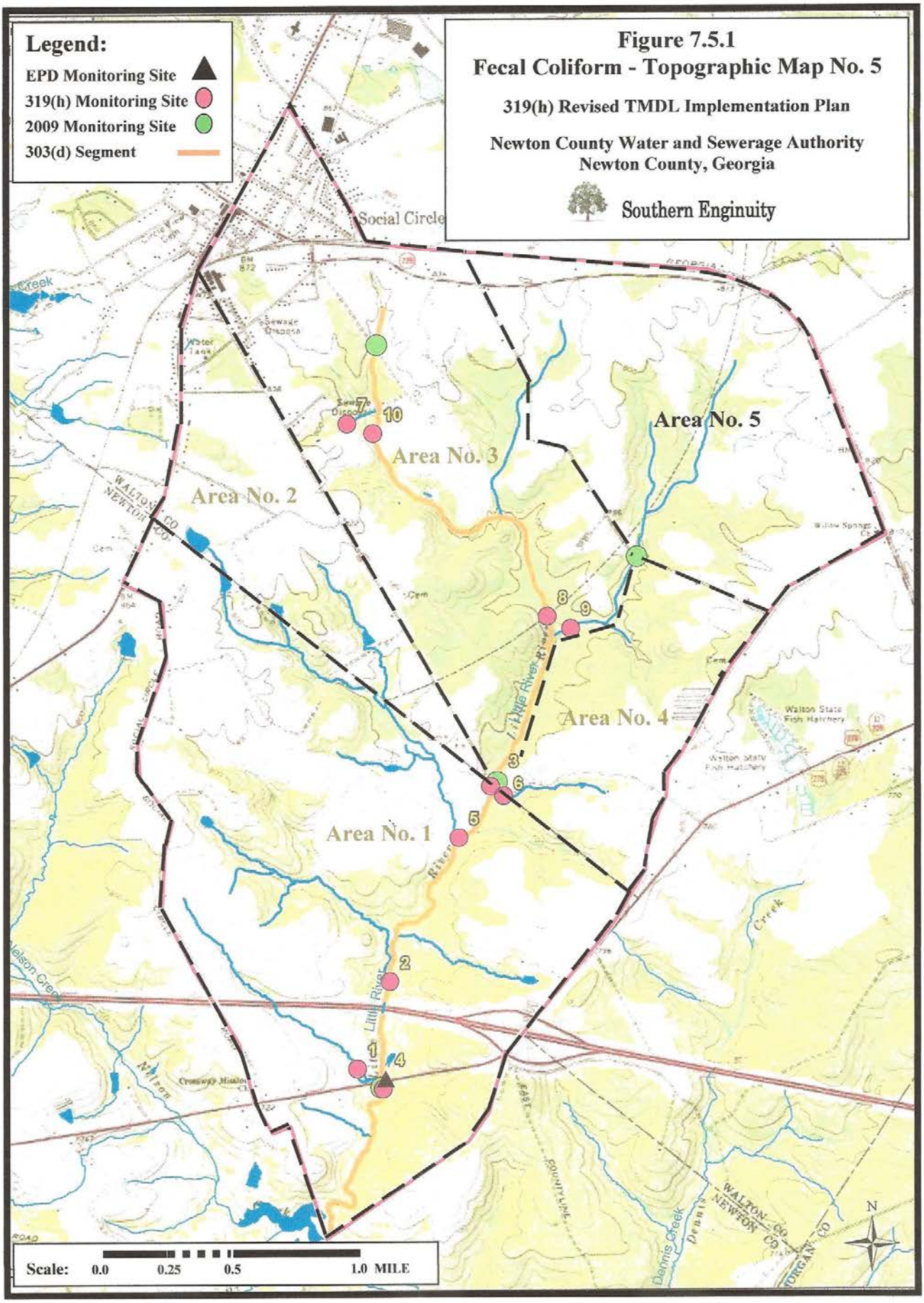
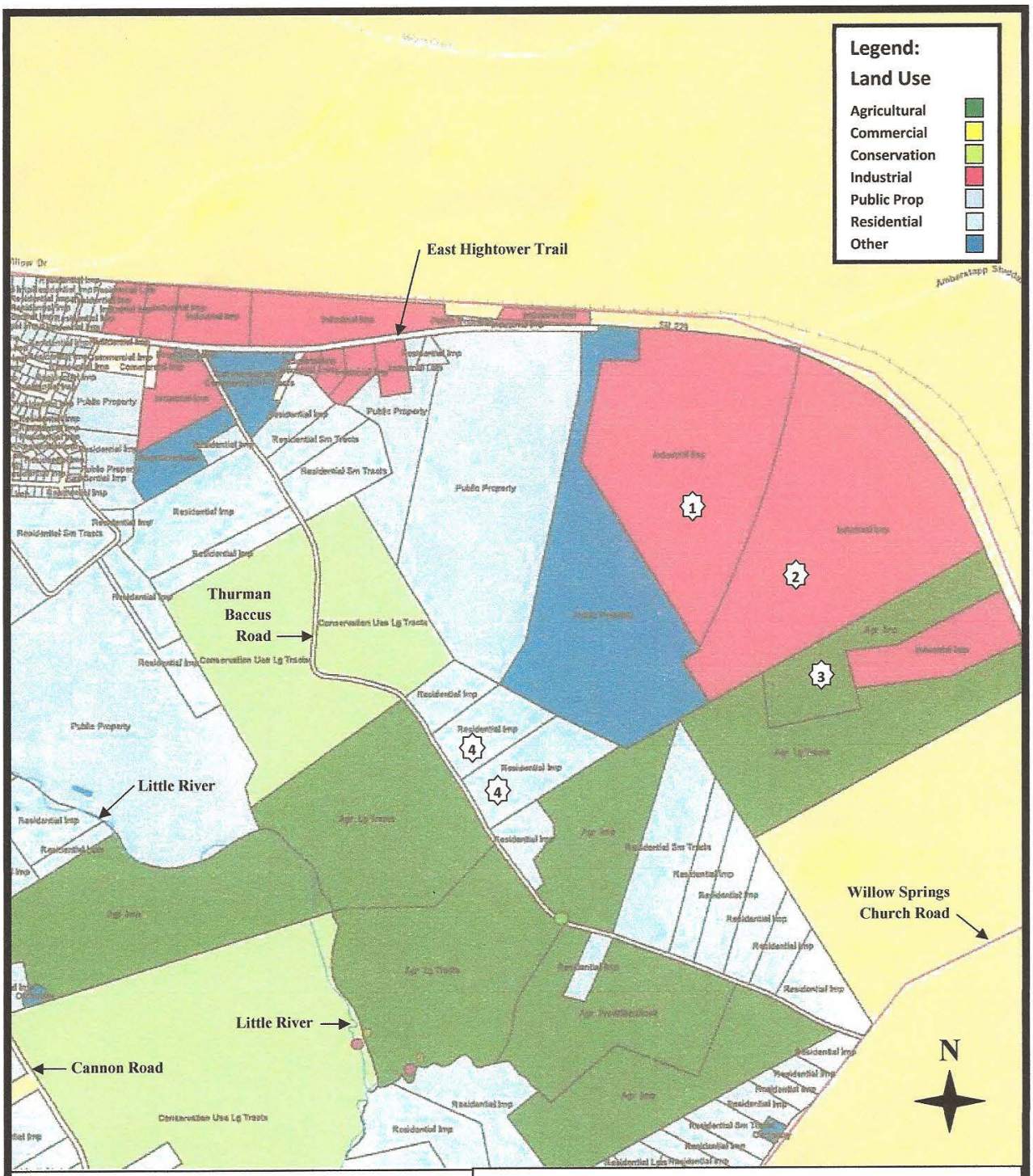

Legend:
EPD Monitoring Site
319(h) Monitoring Site
2009 Monitoring Site
303(d) Segment
Figure 7.5.1
Fecal Coliform - Topographic Map No. 5
319(h) Revised TMDL Implementation Plan
Newton County Water and Sewerage Authority
Newton County, Georgia
Southern Enginuity
Area No. 1
Area No. 2
Area No. 3
Area No. 4
Area No. 5
Little River
Social Circle
Walton State Fish Hatchery
Scale: 0.0 0.25 0.5 1.0 MILE
N

Table 7.5.1

Source Sites - Fecal Coliform - Area No. 5

County	Area	Location	Relative Load	% Removal			Load Score	Direct Stream Access	Parcel	Street	Comments
				On-site	Pond	Overland					
Walton	5	1	0	0	0	0	0.0	-		East Hightower Trail	Fenced Pasture
Walton	5	2	0	0	0	0	0.0	-		East Hightower Trail	Fenced Pasture
Walton	5	3	1600	90	30	50	56.0	-	SC230013000	East Hightower Trail	Grazing Cattle
Walton	5	4	573	80	0	50	57.3	-	SC230008000 SC230009000	348 Thurman Baccus Road	Grazing Livestock



Legend:

Site Location/No. 4

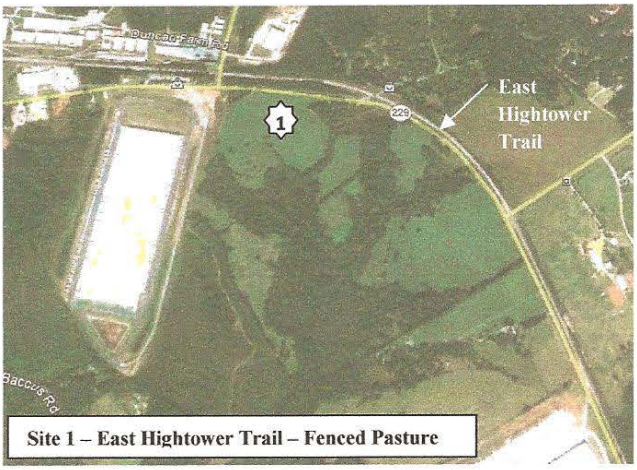
Scale: None

Southern Enginuity

Figure 7.5.2
Fecal Coliform – Property Map No. 5

319(h) Revised TMDL Implementation Plan

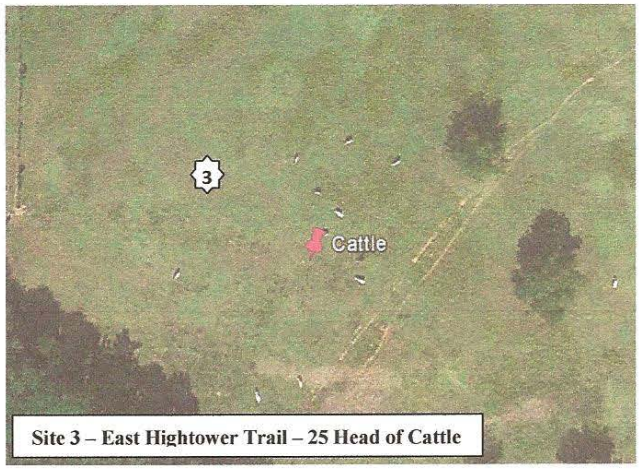
Newton County Water and Sewerage Authority
Newton County, Georgia



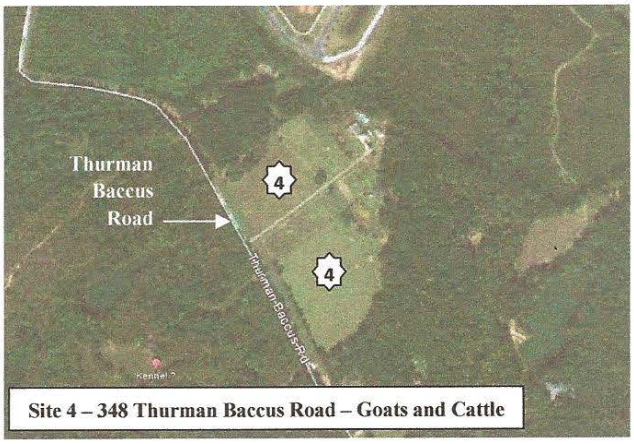
Site 1 – East Hightower Trail – Fenced Pasture

Site 2 – East Hightower Trail – Fenced Pasture

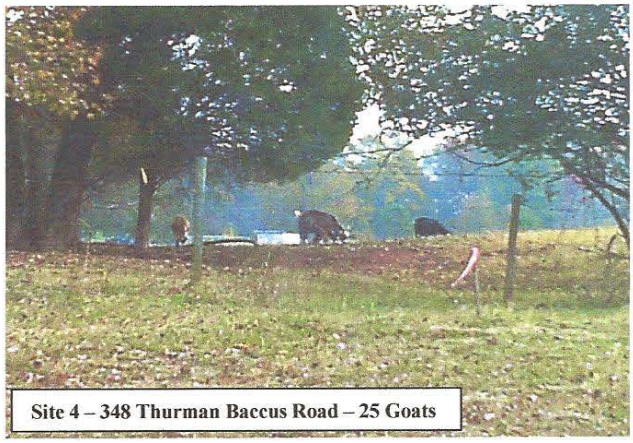
Site 3 – East Hightower Trail

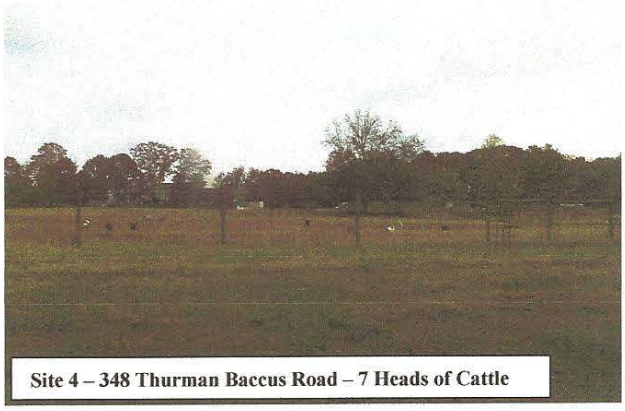


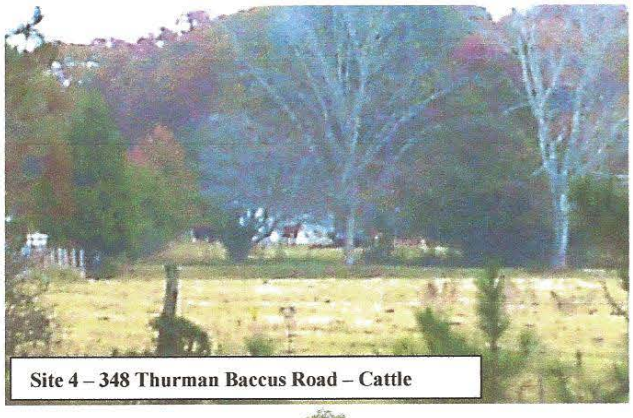
Site 3 – East Hightower Trail – 25 Head of Cattle



Site 4 – 348 Thurman Baccus Road – Goats and Cattle


Site 4 – 348 Thurman Baccus Road – 25 Goats


Site 4 – 348 Thurman Baccus Road – 7 Heads of Cattle


Site 4 – 348 Thurman Baccus Road – Cattle

1. North is toward the top of each aerial photograph.
2. Photographs have no scale.

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