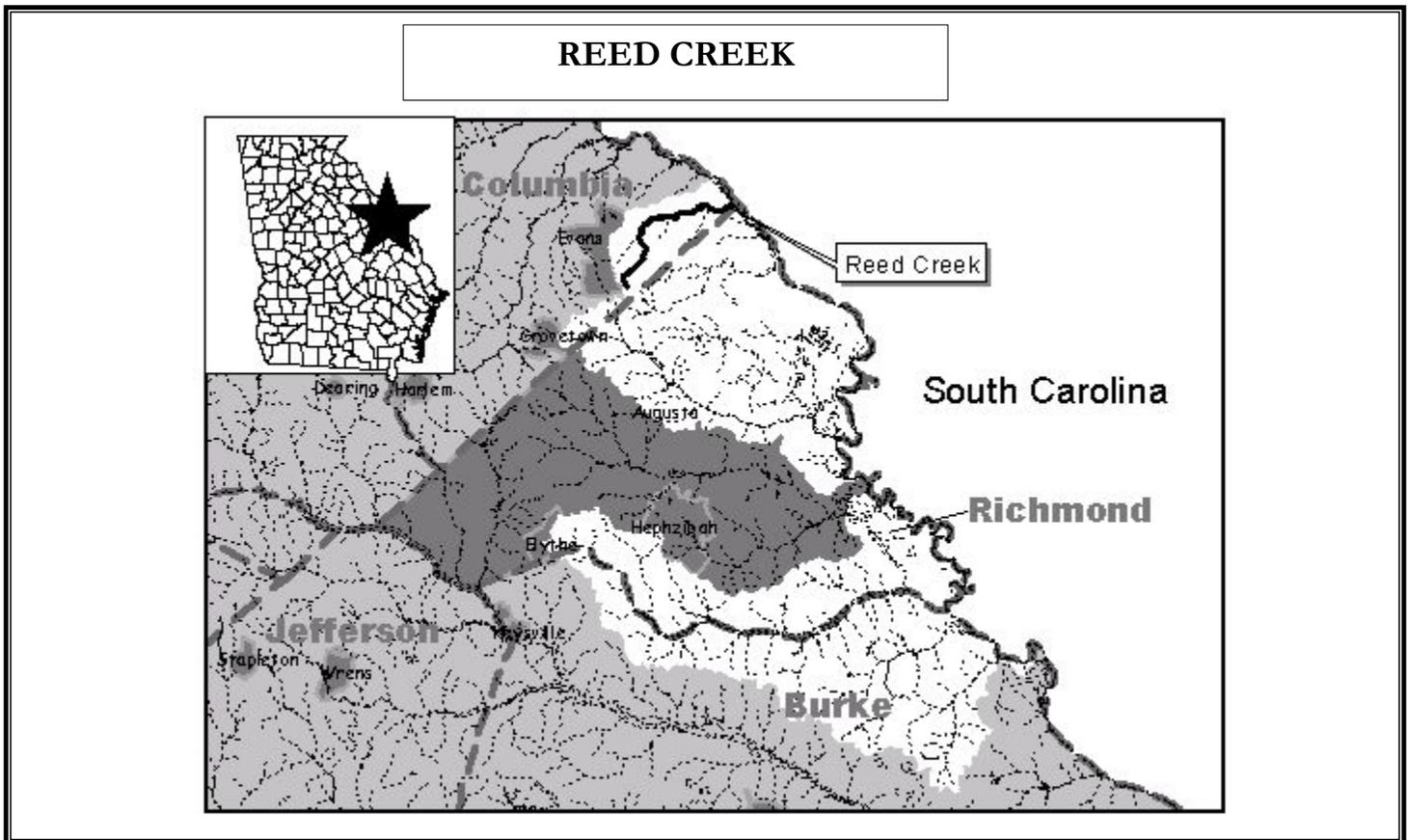


**STATE OF GEORGIA
TMDL IMPLEMENTATION PLAN**

**REED CREEK
(Fecal Coliform)**

Prepared by
**The Georgia Department of Natural Resources
Environmental Protection Division
Atlanta, GA**

TMDL Implementation Plans are platforms for establishing a course of actions to restore the quality of impaired water bodies in a watershed. They are intended as a continuing process that may be revised as new conditions and information warrant. Procedures will be developed to track and evaluate the implementation of the management practices and activities identified in the plans. Once restored, appropriate management practices and activities will be continued to maintain the water bodies. The overall goal of the Plan is to define a set of actions that will help achieve water quality standards in the state of Georgia. This plan was originally prepared as an implementation inventory by the Central Savannah River Area RDC with a Section 604(b) Grant. TMDL load allocation information has been updated to reflect the approved TMDL.



Impaired Waterbody*	Impaired Stream Location	River Basin	Miles/Area Impacted	Partially Supporting/ Not Supporting
Reed Creek	Rd. S1727 to Bowen Pond near Martinez	Savannah	8	Not Supporting

**STATE OF GEORGIA
TMDL IMPLEMENTATION PLAN
FOR REED CREEK, COLUMBIA COUNTY, GEORGIA**

Background

Reed Creek in Columbia County, Georgia has a beneficial water use classification of fishing and is currently listed as an impaired water body. The degree of impairment is classified as a partially supporting use and the TMDL for Reed Creek is set at a target level of 200 cfu/100 ml of water May through October and 1000 cfu/100 ml November through April, a level that will allow the water body to achieve water quality standards necessary for the beneficial use classification of fishing.

A Total Maximum Daily Load (TMDL) is a calculation of the maximum amount of a pollutant, from both point and non-point sources, that a waterbody can receive and still meet water quality standards. The Clean Water Act, section 303, establishes the water quality standards and the TMDL programs. TMDLs are simply the implementation of rules included in Section 303(d) of the Clean Water Act of 1972. The resulting inventory of impaired streams and water bodies – called the 303(d) list – provides a basis for decisions related to restoring water quality. Although some TMDLs are aimed at managing all sources of pollution which affect beneficial uses of water, the focus of the implementation inventory discussed here relates primarily to nonpoint water sources including contamination from diffuse sources such as agricultural and urban runoff.

Methods of measuring pathogens directly are costly and time-consuming. In most cases, indicator organisms are used instead of analyzing the pathogens themselves. These indicator organisms are bacteria that also occur in human and animal waste, but generally are not pathogens themselves. In contrast to pathogens, the coliforms are easy to collect and count, and often provide at least an indication of whether or not fecal matter has entered the water body. The downside of using indicator organisms like coliforms is that coliform tests are generally nonspecific; they do not distinguish between human and other animal coliform. However, at present, this is our best source of indication. Loads are expressed in terms of cells per 100 ml of water.

The purpose of this plan is to reduce or eliminate the pollutants contained in the runoff into Reed Creek. See the attached Reed Creek Study Area map to determine the location of the impaired water body.

Existing TMDL and Monitoring Data

Currently, one source of data is available for the one-mile impaired segment of Reed Creek. This data is included in Appendix A.

More data is needed to identify sources of nonpoint source pollution within the watershed. Local expertise and involvement from environmental agencies, federal agencies, schools and universities, and other sources will play critical roles in identifying sources and reducing fecal coliform levels in Reed Creek. The TMDL Document can be found in Appendix B.

Land Use

The Reed Creek drainage basin is of mixed land use development. While its residential land use is fairly high, there are some areas of rural development. Portions of the residential areas in the drainage basin rely on septic tanks.

Possible causes of increased levels of fecal coliform in Reed Creek include: human waste from sewage leaks or septic tank leaks, domestic animals, urban wildlife, livestock, or rural wildlife. Monitoring and analysis of data collected as a part of the implementation plan will be necessary to determine the actual source of the fecal coliform bacteria. The location of the Reed Creek Project Area can be seen in Appendix C.

Stakeholder Meetings

To look into the problem further, local stakeholders were advised of the problem. These stakeholders were notified through contact with the involved county officials, and through an advertisement published in the Columbia News Times newspaper. A meeting of the stakeholders was held both August 2, 2001 and August 6, 2001 to gather information about possible causes of and potential solutions the problem. A list of stakeholders is included in Appendix D.

This meeting was conducted by Shelby Powell, CSRA RDC Regional Planner and Mary Huffstetler, CSRA RDC Transportation Planner. At the meeting, the goal of this plan was explained to the stakeholders, and stakeholders were invited to comment on ideas of sources of pollution and offer suggestions to reduce or prevent increases in fecal coliform bacteria. The main concerns of stakeholders at the meeting were leaking sanitary sewer pipes traversing Reed Creek, and leaking septic tanks in the drainage basin. It was recommended that the sewer line and septic systems be inspected for leaks.

Stakeholders also pointed out the necessity for specific testing to determine whether or not the fecal coliform was of a human or animal origin. A concern for the domestic animal populations in the area, as well as wild birds and other wild animals, was expressed. The Sierra Club recommended increasing the buffer adjacent to streams from 25 feet to 100 feet where possible. Natural habitat restoration along the banks of Reed Creek was suggested to serve as a natural buffer to the stormwater runoff as it enters the creek. Also, a hydrologist was recommended to work closely with Columbia County to aid in solutions to stormwater channelization.

The stakeholders were invited on September 6, 2001 to an advertised public meeting to view the draft implementation plan. Several minor changes to language and terminology used in the plan were suggested, but overall the stakeholders were receptive to the implementation plan's ability to meet TMDL goals.

Existing Regulatory or Voluntary Actions

The Columbia County Water Works Department is active in preventing and reacting to spills and leaks that may occur in the sanitary sewer lines throughout the county. Spills sometimes result from clogged sewer lines or vandalism that has occurred to the system.

The County currently monitors illicit connections to the system and responds immediately to any problems within the system that may result in a spill or leak of sewage. If a spill does occur, drainage ponds in the area of the spill are aerated to ensure the decomposition of harmful bacteria that may be present in the water.

Columbia County has maintained a strict Land Development Review process since April, 1994. This process ensures compliance with land use, engineering, and environmental regulations throughout the County. Columbia County has also applied for a Municipal Separate Storm Sewer System (MS4) Permit which establishes legal authority for Columbia County to detect and eliminate all illicit connections to the storm sewer system. The permit also has requirements to develop and enforce a stormwater management program that encompasses water quality monitoring, engineering controls, comprehensive land planning, and public participation. This permit has been applied for and approval is expected in Spring of 2001.

Another tool in place in Columbia County is the Soil Erosion and Sedimentation Control Ordinance. This ordinance protects streams in Columbia County by establishing a 25-foot protective buffer along each side of the streams. The ordinance takes the same steps to protect streams as the River Corridor Protection Ordinance takes to protect rivers in Columbia County. By limiting septic tank usage within these stream buffers, the possibility of leakage is reduced; thus the potential for loading of fecal coliform bacteria from leaking septic tanks is lessened.

Columbia County has recently completed a Greenspace Plan, a result of the passage of Senate Bill 399, which officially created the Georgia Greenspace Program. The Greenspace plan includes an inventory of greenspace, identifies desirable parcels of land and water for protection, and requires appropriate changes to the county's comprehensive plan. Ultimately, a minimum of twenty (20) percent of natural greenspace, including lands adjacent to Reed Creek, in Columbia County will be preserved. The Greenspace Plan is complete and is awaiting approval from the Georgia Department of Natural Resources. The plan should be approved during Spring, 2001.

Georgia is in the process of implementing a watershed approach to water resource management through River Basin Management Planning. River basin planning is the foundation for implementation of water protection strategies in Georgia. This approach provides the framework and schedule for actions to address the waters on the Georgia 303(d) list. The basin planning program is based on legislation in 1992 (O.C.G.A. 12-5-520) by the Georgia Assembly which calls for EPD to develop river basin management plans for each of the major river basins in Georgia. The Savannah River Basin Management Plan should be adopted in April, 2001.

Another project underway involving water quality is the Central Savannah River Area (CSRA) Source Water Assessment. The Augusta Utilities Department is responsible for coordinating this effort, and is working with consulting firm Parsons Brinkerhoff. This study includes determining levels and sources of pollution, and the development of an action plan to protect source waters in the CSRA. This study involves several counties in

the CSRA region. Some results from this plan are expected in October 2001. The action plan developed as part of this project will be useful in determining what measures need to be taken lower fecal coliform levels in Reed Creek.

Three environmental protection ordinances are scheduled for implementation in Columbia County by February of 2002. These ordinances include Groundwater Recharge Protection, Water Supply/ Watershed Protection, River Corridor Protection Ordinance, and Wetlands Protection Ordinance. The Groundwater Recharge Area Protection Ordinance protects lands within recharge areas by limiting the number and density of septic tank drainfields, hazardous waste storage, disposal, and handling facilities, and chemical storage facilities. Some of the types of development regulated by this ordinance directly relate to fecal coliform levels. Thus, the enforcement of this ordinance keeps fecal coliform levels lower in groundwater recharge areas.

The Water Supply/ Watershed Protection Ordinance will limit types and density of development that would impair the water supply or watershed. This ordinance will allow for the establishment of protective buffers around streams where septic tanks are not allowed to be placed. This ordinance will also limit impervious surface adjacent to streams.

The River Corridor Protection Ordinance protects land within 100 feet horizontally on both sides of the Savannah River. Since the impaired Reed Creek flows directly into the Savannah River, it is directly affected by this ordinance. New construction is prohibited in the river corridor except for single family houses on two-acre or larger lots. Septic tanks and septic tank drainfields are prohibited in the river corridor, as are hazardous waste and solid waste landfills. These provisions help to keep pollution flowing into the river at a minimum. Potential for fecal coliform bacteria caused by leaking septic tanks is decreased by this ordinance.

The Wetlands Protection Ordinance protects wetlands in Columbia County from alterations that will significantly affect or reduce their primary functions for water quality control, floodplain and erosion control, groundwater recharge, aesthetic nature, and wildlife habitat. This protection is achieved through land use controls on lands surrounding wetlands. The floodplain control measures contained in the ordinance also serve to indirectly control fecal coliform bacteria levels because of the direct correlation between fecal coliform bacteria levels and flow rates. Less unnatural flooding and water diversion means lower flow rates, and therefore, lower fecal coliform levels.

The Georgia Adopt-A-Stream program maintains four underlying principles: to increase public awareness of the state's nonpoint source pollution and water quality issues, to provide citizens with the tools and training to evaluate and protect their local waterways, to encourage partnerships between citizens and their local government, and to collect quality baseline water quality data. The Georgia Adopt-A-Stream has been a successful program in Columbia County. A partnership between Grovetown Elementary School, Harlem Middle School, Greenbrier High School, and Baker Road Landfill in Columbia County has proven to be very successful in maintaining quality monitoring of Euche

Creek in Columbia County. The program is not currently active in the Reed Creek drainage basin; however, the coordinator for Columbia County, Ginny Brady, is making plans to incorporate Reed Creek into the Adopt-A-Stream program in Columbia County.

The Sierra Club, with over 600,000 members, has an active chapter in the Reed Creek area. The mission of the Sierra Club is as follows: explore, enjoy, and protect the wild places of the earth; practice and promote the responsible use of the earth's ecosystems and resources; educate and enlist humanity to protect and restore the quality of the natural and human environment; and use all lawful means to carry out these objectives. The presence of a group with strong dedication to the protection of the environment is positive for the area. The Sierra Club should take an active role in helping in the implementation of the strategies identified in this inventory.

A new volunteer activist group has formed recently in the area. The Savannah Riverkeeper, Inc. is a part of the national Riverkeepers program. This group is concerned with protecting the water quality of the Savannah River watershed. The group's efforts will be mainly concentrated around the Augusta area, which will be beneficial in terms of the water quality of streams and creeks flowing into the Savannah River. This group should also take an active role in the implementation of strategies identified in this inventory.

Metro Augusta Clean and Beautiful works each year in conjunction with the Jefferson and Columbia County Clean and Beautiful organizations to conduct the Rivers Alive annual volunteer river clean-up. This statewide event occurs annually in September or October. Georgia's rivers are targeted for cleaning by the volunteers in the community. The mission of this program is to create awareness of and involvement in preserving Georgia's waters. Although this type of clean-up effort does not directly reduce the level of fecal coliform bacteria in the water, it does bring attention to the issue of water quality. This event should be used to raise awareness of specific pollutants in the water, such as fecal coliform bacteria, and solutions to the pollution problems.

The educational outreach at the Southeastern Natural Sciences Academy's Phinizy Swamp Nature Park is targeted at area teachers and students. The park offers teacher orientation, field trips for students, and other educational opportunities for area citizens. This program could incorporate the fecal coliform problem in Reed Creek into a workshop for school children in Columbia County. This resource is invaluable to the area, and should be utilized appropriately during the implementation phase of this inventory.

Recommended Regulatory or Voluntary Actions

Implementation of measures to address the TMDL involves the cooperation of all landowners and land users in the watershed; therefore, broad awareness and involvement are very important to the success of the implementation plan. Through careful land use planning and the use of best management practices, impacts of stormwater runoff can be minimized. Stormwater runoff can be improved through methods like erosion control and the establishment of green spaces, park lands, and stream buffers.

The Columbia County Board of Education should also get involved in the process of reducing fecal coliform bacteria by including educational programs in the curriculums of local schools. The River Kids program (See Appendix E) or a program called Enviroscape (See Appendix F) could be effective if implemented in Columbia County schools. Through these programs, children take water samples and learn how to keep water bodies clean as a part of their regular schoolwork. Introducing water quality issues to children at a young age, and following up with the program through middle school and high school can lead to long-term action and dedication on the part of the citizens of Columbia County.

The expansion of the Adopt-a-Stream program to include the monitoring of Reed Creek could be accomplished through a partnership of the local chapter of the Sierra Club and the already active school system in Columbia County. The formation of this partnership would depend on local interest in water quality and other environmental issues. The local Sierra Club chapter should promote the Adopt-a-Stream program in Columbia County. The local chapter of the club should serve to educate other citizens and officials of Columbia County and arouse further interest in clean water. For effective TMDL compliance, all landowners and land users in the drainage basin must be educated about water quality and the steps necessary to minimize the impacts of stormwater runoff.

Another program to explore for inclusion in the Columbia County school system is the Global Learning and Observation to Benefit the Environment (GLOBE) Program. This program brings together K-12 students, teachers, and scientists from around the world who work together to help us learn more about the environment. This program would be helpful in raising environmental awareness in Columbia County.

The Water Environment Federation (WEF) offers training and an annual WEFTEC conference (See Appendix G). The conference offers training workshops and technical sessions on a wide variety of water quality topics, including TMDL issues, monitoring for water quality, watershed management, and stormwater management. WEF also offers various workshops and sessions throughout the year. These training sessions could be beneficial to city and county officials that deal with water quality issues, as well as teachers who wish to incorporate some environmental aspects into their lessons. Involvement with this organization could bring about awareness of water quality and give county officials tools to implement some strategies to ensure clean water throughout the county.

Columbia County should conduct a septic tank survey to identify those locations with septic tanks in use. Once the locations of the septic tanks are determined, a “Septic to Sewer” incentive program should be implemented to encourage conversion from the use of a septic tank to the use of Columbia County’s sewer system. An educational program teaching citizens about the importance of septic tank repair and maintenance could help reduce leaks from septic tanks.

The development of a system to treat stormwater runoff before it enters Reed Creek should be explored. As a part of the Municipal Separate Storm Sewer System (MS4) Permit, Columbia County is likely to explore the possibility of treating storm water before it enters Reed Creek. This treatment may be in the form of physical structures like ponds or devices installed in the storm water traps to facilitate the fallout of pollution before it enters Reed Creek. The use of any chemicals that may be harmful to wildlife in the area should be avoided.

The Columbia County Water Works Department plans to develop additional proactive measures to ensure that leaks and spills from the sanitary sewer system are prevented. The Water Works Department has a camera system that is used to explore the sewer system to detect any areas the need to be repaired or replaced. Often, roots intrude into the sewer line and this can lead to clogging of the sewer line. The Water Works Department plans to rely on outside contractors to correct the root intrusion problem by treating roots with a foaming agent to physically rot the root in the sewer system. Global Positioning Systems (GPS) will be used to identify the location of the main trunk lines adjacent to the creeks in Columbia County. This will provide a tool for identifying the location of potential problems with the trunk lines as they occur.

Columbia County should adopt the Georgia Stormwater Management Manual as a policy for local development. This manual was developed by the Atlanta Regional Commission to address water quality by addressing BMPs and other development measures. The manual contains three sections: one on policy issues, one on technical and design standards, and one on rules and regulations. This manual, although still in draft form, would be beneficial in regulating stormwater flow in developing areas of the county. Slower stormwater flow results in lower fecal coliform levels.

The Spirit Creek Educational Forest is located in Richmond County. This site trains teachers on monitoring and testing methods for a variety of parameters. The site does not currently have testing equipment for fecal coliform bacteria, but would be willing to obtain the necessary equipment if there was an interest in the community for such a program. The program uses Spirit Creek as a model for hands-on teacher training. The teachers can then carry their knowledge into other streams in the area, and teach students the value of water quality testing and monitoring with hands-on projects.

The National Science Center's Fort Discovery hosts a satellite television program called "Teltrain" that is used in middle school classrooms around the nation (See Appendix H). This program frequently focuses on science issues, and could be used as a vehicle to raise water quality awareness in area schools. This program could be used in conjunction with the River Kids program, the Enviroscape program, Spirit Creek Educational Forest, or other hands-on lessons focusing on water quality.

Schedule for Implementing Management Measures

In order to establish an effective TMDL implementation plan, an implementation schedule must be carefully adhered to. A stakeholder group for the Reed Creek drainage basin has been established and this group has been instrumental in the identification of potential sources of fecal coliform in the Reed Creek area and in the development of potential measures to reduce or eliminate the excessive levels of fecal coliform present in the creek. A stakeholder group of land owners, business owners, government officials, elected officials, and environmental activists has been formed to help identify the problem and to help implement identified solutions. The list of Stakeholders is attached in Appendix D.

During the first year, this group of stakeholders must actively work together to continue to identify remedial measures and potential funding sources necessary to implement these remedial measures. Initial management controls and best management practices must be established and initial implementation must begin in the first year. Educational programs in the schools and throughout the community must be implemented as soon as possible during the first year of the plan. Monitoring and status reports of any improvement or worsening of the fecal coliform levels must be implemented within the first year. Any illicit discharges must be detected and eliminated as soon as possible.

By the second year of the implementation plan, data from the summer season and winter season will be available and preliminary sources of the fecal coliform should be identified and analyzed. Management programs, best management practices, monitoring and evaluation of data, and periodic status reports must continue throughout the five-year implementation plan. If the fecal coliform levels remain above the targeted level of 200cfu/100ml May through October and 1000cfu/ 100ml November through April during the fifth year of the plan, the process to develop a more stringent Phase II plan should begin during year five. The projected attainment date is ten years from the acceptance of this implementation plan by EPA.

Monitoring Plan

Water quality monitoring is a critical component in determining the success of the implementation plan. Monitoring helps determine compliance with regulations, major sources of loadings, and the effect of the regulatory and voluntary measures implemented in the drainage basin. No two watersheds are alike. Therefore, the monitoring of the particular watershed, rather than relying on computer model data, is critical to determine the fecal coliform levels actually present in the impaired water body.

Levels of fecal coliform in Reed Creek will be monitored by standard periodic grab sampling to calculate an instream 30-day geometric mean fecal coliform. Sampling should be scheduled, at a minimum, biannually. Samples should be obtained during the summer season (May through October) and during the winter season (November through April) to provide a complete inventory of the conditions in the Reed Creek basin. In addition, sampling should represent periods of dry weather and post-rainfall monitoring. Levels of fecal coliform have been recorded at higher levels directly after rainfall, so this monitoring is key in identification of sources of fecal coliform bacteria. If a source of the

fecal coliform bacteria has not been determined after periodic monitoring, the smaller tributaries to Reed Creek should be monitored to help identify the source.

Funding

There are currently several funding sources available for the county to engage in a stable monitoring schedule. Grant funding from Section 319(h) of the Clean Water Act, Nonpoint Source Implementation Grants, may be used for the installation of best management practices (BMPs) for animal waste and landowner education programs. Capitalization Grants for Clean Water State Revolving Funds is a potential source of funding used to aid in urban runoff control, stormwater overflows, riparian buffers, and other water protection activities. Watershed Assistance Grants are also available through the EPA to aid in the development of partnerships to address water quality issues. Other matching grants may be available through the Environmental Protection Agency's Office of Water for both non-point source mitigation and water quality testing.

There has been some discussion about the possibility of the Department of Natural Resources, Environmental Protection Division contributing to the cost of monitoring these impaired water bodies. Further research into possible funding sources should be continually conducted over the five-year implementation period. Additional information and contact information for the funding mentioned above is listed in Appendix I.

Criteria to Determine Progress

Progress on the implementation plan will be determined through analysis of water quality sampling results. Periodic monitoring will show the trends of fecal coliform levels throughout the five-year period. The number of regulatory controls or best management practices implemented in the Reed Creek drainage basin will also serve as a measure of progress. The implementation plan will be ultimately deemed successful if, at the end of the five-year implementation period, the fecal coliform levels in Reed Creek are below the of 200cfu/100ml May through October and 1000cfu/ 100ml November through April recommended in the TMDL document and the stream is removed from the 303(d) list.

Conclusion

The establishment of an effective TMDL implementation plan is essential to the environmental and economic health of Columbia County. In order for Columbia County to continue to grow, any drainage basin that has been determined to have excessive levels of fecal coliform must establish a TMDL implementation plan and make a good faith effort to meet the requirements set forth in the plan. As stated in the Clean Water Act, if the implementation plan is not efficiently executed, Columbia County could face difficulties in such development as expansion of wastewater treatment facilities and certain industries that could contribute to increased levels of fecal coliform.

The implementation of regulatory and voluntary management measures, coupled with the regular monitoring of Reed Creek, should reduce the levels of fecal coliform bacteria present in the water body. The plan has a five-year horizon for the restoration of acceptable levels of bacteria. If the fecal coliform levels in Reed Creek are not at an

acceptable level by the end of the fourth year of the plan, a second phase of the implementation plan will be developed.

STATE OF GEORGIA

TMDL IMPLEMENTATION PLAN FOR: Reed Creek
(STREAM)

Fecal Coliform
(PARAMETER)

RIVER BASIN: Savannah
PLAN DATE: _____

Prepared by: Central Savannah River Area Regional Development Center Address: P. O. Box 2800 City: Augusta State: GA Zip: 30914 e-mail: lsand@csrardc.org Date Submitted to EPD: September 21, 2001		Or Prepared By: _____ Address: _____ City: _____ State: _____ Zip: _____ e-mail: _____ Date Submitted to EPD: _____			
General Information Obtain this information from the TMDL document or other information. When completed, this document will be a self-contained report independent of the TMDL document.		Significant Stakeholders Identify local governments, agricultural organizations or significant land holders, commercial forestry organizations, businesses and industries, and local organizations including environmental groups with a major interest in this water body.			
TMDL ID (to be entered by EPD)	SAV0000005	Name/Organization	SEE APPENDIX D		
Water body name	Reed Creek	Address			
HUC basin name	Savannah	City	State	Zip	
HUC number	030601060501	Phone	e-mail		
Primary county	Columbia	Name/Organization			
Secondary county	None	Address			
Primary RDC	CSRA	City	State	Zip	
Secondary RDC	None	Phone	e-mail		
Water body location	Upstream 8 miles of Bowen Pond to Bowen Pond	Name/Organization			
		Address			
Miles or area impacted	8 miles	City	State	Zip	
Parameter addressed in plan	Fecal Coliform	Phone	e-mail		
Water use classification	Fishing	Name/Organization			
Degree of impairment	Partially supporting use <input type="checkbox"/>	Address			
	Not supporting use <input checked="" type="checkbox"/>	City	State	Zip	
Date TMDL approved by EPA		Phone	e-mail		
Impairment due to: Urban Runoff	Point Sources <input type="checkbox"/>	Name/Organization			
	Nonpoint sources <input checked="" type="checkbox"/>	Address			
	Both <input type="checkbox"/>	City	State	Zip	
Point source-Form A; Nonpoint source-Form B; Both-Form A+B+C		Phone	e-mail		

FORM B

SUMMARY OF ALLOCATION MODEL RESULTS FROM TMDL DOCUMENT (existing load, target TMDL, and needed reduction)

EXISTING LOAD	TARGET TMDL	NEEDED REDUCTION
Unknown*	200 cfu/100 ml (May- October)	Unknown**
Unknown*	1000 cfu/100 ml (November-April)	Unknown**

*TMDL Document does not specify an existing load of fecal coliform.

**Unable to determine needed reduction due to lack of existing load data.

I. IDENTIFY **NONPOINT SOURCE** CATEGORIES AND SUBCATEGORIES OR INDIVIDUAL SOURCES WHICH MUST BE CONTROLLED TO IMPLEMENT LOAD ALLOCATIONS:

List major nonpoint sources contributing to impairment including those identified in TMDL document.

SOURCE	DESCRIPTION OF CONTRIBUTION TO IMPAIRMENT	RECOMMENDED LOAD REDUCTION (FROM TMDL)
Urban Pervious and Impervious	Paved and developed urban lands contribute to increased urban runoff	
Sewer Systems	Failure in sewer collection systems	

II. DESCRIBE ANY REGULATORY OR VOLUNTARY ACTIONS INCLUDING MANAGEMENT MEASURES OR OTHER CONTROLS BY GOVERNMENTS OR INDIVIDUALS THAT SPECIFICALLY APPLY TO THE POLLUTANT AND THE WATERBODY FOR WHICH THE TMDL WAS WRITTEN, THAT WILL BE ACCOMPLISHED THROUGH RELIABLE AND EFFECTIVE DELIVERY MECHANISMS, AND THAT WILL HELP ACHIEVE THE LOAD ALLOCATIONS IN THE TMDL:

Existing or required regulatory actions

RESPONSIBLE GOVERNMENT, ORGANIZATION OR ENTITY	NAME OF REGULATION/ ORDINANCE	DESCRIPTION	ENACTED OR PROJECTED DATE	STATUS
Columbia County Water Works	Sanitary Sewer Maintenance	Measures are taken to ensure that spills and leaks are addressed as soon as they are detected.	1960	Active
Columbia County	Land Development Review Process	Ensures compliance with land use, engineering, and environmental regulations	April, 1994	Active
Columbia County	Soil Erosion and Sedimentation	Provides a 25 foot minimum protective buffer along Reed Creek.	October, 1995	Active

	Control Ordinance			
RESPONSIBLE GOVERNMENT, ORGANIZATION OR ENTITY	NAME OF REGULATION/ ORDINANCE	DESCRIPTION	ENACTED OR PROJECTED DATE	STATUS
Columbia County	Greenspace Plan	A Plan to protect a minimum of 20 % of natural greenspace in Columbia County by targeting preservation of natural resources including rivers and creeks.	March, 2001	Active
Georgia DNR, EPD	Savannah River Basin Management Plan 2000	Program to protect, enhance, and restore the waters of the Savannah River Basin by monitoring, regulating, allocating, and managing land uses in the river basin.	April 2001	Ongoing
Columbia County/ EPD/ Citizens Advisory Group/ Technical Advisory Committee	Central Savannah River Area Source Water Assessment	A study of 10 intakes in the Savannah River Basin to determine levels and causes of pollution and development of an action plan to protect source water.	Results Expected October, 2001	Underway
Columbia County	Groundwater Recharge Protection Ordinance	Limits density and types of land uses in groundwater recharge areas, including waste disposals and septic tank drainfields to protect groundwater quality.	February 2002	Underway
Columbia County	Water Supply/ Watershed Protection	Limits types and density of development that would impair the water supply or watershed.	February 2002	Underway
Columbia County	River Corridor Protection Ordinance	Established measures to guide and control growth in areas along the Savannah and Ogeechee Rivers to protect the water quality and the river corridors' plant and wildlife habitats.	February 2002	Underway
Columbia County	Wetlands Protection Ordinance	Establishes boundaries around wetlands within the county and limits types and density of development to protect water quality and habitats within these areas.	February 2002	Underway
Columbia County	Municipal Separate Storm Sewer System (MS4) Permit	Establishes legal Authority for Columbia County to detect and eliminate all illicit connections to the storm sewer system. The permit also has requirements to develop and enforce a storm water management program that encompasses water quality monitoring, engineering controls, comprehensive land planning, and public participation.	2002	Part II Permit Application submitted June 2000. Approval Pending.

Existing voluntary actions

RESPONSIBLE ORGANIZATION OR ENTITY	NAME OF ACTION	DESCRIPTION	ENACTED OR PROJECTED DATE	STATUS
Citizens of Columbia County/ Columbia County/ Georgia State Data and Research Center/ National Science Center, Fort Discovery/ Columbia County School System.	Adopt-a-Stream Program (ECO Partners) Contact – Ginny Brady (706) 821-0632.	A Georgia Department of Natural Resources, Environmental Protection Division, Program designed to raise public awareness about water quality. The program enlists the public's support and action in monitoring and protecting water resources.	Ongoing	
Citizens of Columbia County	Local Sierra Club Chapter	Group of citizens interested in protection of water bodies and other environmental concerns.	Ongoing	
Citizens of Columbia County	Savannah Riverkeeper, Inc.	Citizen group protecting water quality of the Savannah River Watershed	Ongoing	
Metro Augusta Clean and Beautiful, Jefferson Co. Clean and Beautiful, Columbia Co. Clean and Beautiful, Augusta Dive Club	Rivers Alive annual volunteer river clean up	A statewide event that targets cleanups across all waterways in the State of Georgia including streams, rivers, lakes, and wetlands. The mission of Rivers Alive is to create awareness of and involvement in the preservation of Georgia's water resources.	September, October	Annual
Southeastern Natural Sciences Academy	Phinizy Swamp Nature Park - Educational Outreach	Offers teacher orientation, field trips, and other educational opportunities for children and adults at the 1100 acre swamp.	Ongoing	

Additional recommended regulatory or other measures which should be implemented to reduce the loads of the TMDL parameter

ENTITY/ ORGANIZATION RESPONSIBLE	NAME OF PROPOSED REGULATION/ ORDINANCE/ OTHER	DESCRIPTION	ENACTED OR PROJECTED DATE	STATUS
Columbia County Schools/ Metro Augusta Clean and Beautiful	Enviroscape Contact – Beth Schussler 828-2109	A program to be implemented in the schools which educates children of the effects of stormwater runoff. The program provides training for teachers, also.	TBA	TBA
Columbia County School System	River Kids Program	A statewide curriculum incorporated into the School System to exchange data and ideas.	TBA	TBA

ENTITY/ ORGANIZATION RESPONSIBLE	NAME OF PROPOSED REGULATION/ ORDINANCE/ OTHER	DESCRIPTION	ENACTED OR PROJECTED DATE	STATUS
Columbia County School System	Global Learning and Observation to Benefit the Environment (GLOBE).	A program for K-12 students, teachers, and scientists from around the world working together to learn about the environment. GLOBE is available in the State of Georgia in the DeKalb County School System, at Georgia Tech, and at the State University of West Georgia, Carrollton.	TBA	TBA
Columbia County School System	Water Environment Federation	This is a not-for-profit technical and educational organization that researches and publishes the latest information wastewater treatment and water quality protection. The organization provides technical expertise and training on issues including nonpoint source pollution.	TBA	TBA
Columbia County or Other Interested Group	Septic Tank Survey	A survey should be conducted in the Reed Creek Drainage Basin to determine the number and location of homes using septic tanks.	TBA	TBA
Columbia County	Septic to Sewer Incentive Program	An educational and/or incentive program to encourage conversion of septic tank to Columbia County's sewer system. Septic tank maintenance/ repair education would be beneficial, also.	TBA	TBA
Columbia County	Stormwater treatment	This may occur as a result of the MS4 Permit. A combination of physical structures such as ponds or devices to facilitate pollutant fallout prior to entering the stream may be developed to treat stormwater runoff.	TBA	TBA
Columbia County Water Works	Sanitary Sewer Maintenance	Plans to develop additional proactive measures to prevent spills and leaks from the sanitary sewer system.	TBA	TBA
Columbia County	Public Education Program on Septic Tank Issues	TV/radio/print ads explaining importance of repairing leaky septic tanks and properly maintaining septic tanks	TBA	TBA
Columbia County	Georgia Stormwater Management Manual	County should adopt this manual developed by the Atlanta Regional Commission to address water quality by establishing BMPs and other development measures.	TBA	TBA
Columbia County School System	Participate in Spirit Creek Educational Forest	Currently trains teachers on monitoring and testing methods using Spirit Creek as a training ground; program could expand to include fecal coliform testing	TBA	TBA
Fort Discovery, County Board of Education	Teltrain Educational Program	Satellite program broadcasted by the National Science Center at Fort Discovery. Program is geared towards middle school children, and focuses on science, math, and technology subjects.	TBA	TBA

III. SCHEDULE FOR IMPLEMENTING MANAGEMENT MEASURES OR OTHER CONTROL ACTIONS:

These must be implemented as expeditiously as practicable within five years of when the implementation plan is accepted by EPA.

IMPLEMENTATION ACTION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Form stakeholders group	x				
Organize implementation work with stakeholders and local officials to identify remedial measures and potential funding sources	x	x	x	x	x
Identify sources of TMDL parameter		x*	x	x	x
Develop management programs to control runoff including identification and implementation of BMPs (Phase I):					
Agriculture	x**	x	x	x	x
Forestry	x**	x	x	x	x
Urban	x**	x	x	x	x
Mining					
Organize and implement education and outreach programs	x				
Detect and eliminate illicit discharges	x	x	x	x	x
Evaluate additional management controls needed	x	x	x	x	x
Monitor and evaluate results	x	x	x	x	x
Reassess TMDL allocations		x	x	x	x
Provide periodic status reports on implementation of remedial activities	x	x	x	x	x
If needed, begin process for Phase II (next 5 years) and subsequent phases					x

*After completion of a full year of sampling data preliminary identification of sources of fecal coliform bacteria will be made.

**Programs and BMPs will be implemented as possible and as necessary throughout the 5-year period.

IV. PROJECTED ATTAINMENT DATE AND BASIS FOR THAT PROJECTION:

The projected attainment date is 10 years from acceptance of the implementation plan by EPA.

V. MEASURABLE MILESTONES:

- Number of management controls and activities already implemented 11
- Number of management controls and activities proposed in five-year work program 11
- Number of management controls and activities actually implemented in five-year work period _____ (to be completed after 5 years)

- Stream sampled to identify areas of concern

See monitoring plan

- Other _____

- Other _____

VI. MONITORING PLAN:

Monitoring data that placed stream on 303(d) list will be provided if requested.

Describe previous or current sampling activities or other surveys to detect sources or to measure effectiveness of management measures or other controls.

ORGANIZATION	TIME FRAME	PARAMETERS	PURPOSE	STATUS
Columbia County Water Department	3-99 to 8-01	Fecal Coliform	To Monitor Fecal Coliform Levels	Continuing See Attached Data

Describe any planned or proposed sampling activities or other surveys. (Scheduled EPD sampling can be found in the Basin Planning document.)

ORGANIZATION	TIME FRAME	PARAMETERS	PURPOSE	STATUS
EPD			Basin Planning	Plan is under Development
Columbia County Water Department	2001 until problem is resolved. Samples should represent the warm and cool season and should be taken on both dry and post-rain days.	Fecal coliform	To monitor levels of fecal coliform and to determine success of plan implementation.	

VII. CRITERIA TO DETERMINE WHETHER SUBSTANTIAL PROGRESS IS BEING MADE:

- % concentration or load change (monitoring program) – Goal of a 10% reduction in loading and/or resultant concentrations from urban pervious and impervious land uses
- Categorical change in classification of the stream (delisting the stream is the goal)
- Regulatory controls or activities installed (ordinances, laws) – Monitor the number of regulatory and voluntary programs implemented during the five year program
- Best management practices installed (agricultural, forestry, urban) – Ensure that BMPs are being implemented in the Reed Creek drainage basin.

COMMENTS

The local Sierra Club chapter has expressed concern about the number of new power plants proposed in the State of Georgia. The power plants may extract more water from the impaired water bodies than they return, which would raise the concentration of fecal coliform in the impaired sections.