Total Maximum Daily Load (TMDL)
Little Eastatoe Creek, South Carolina

Hydrologic Unit
03060101-030

South Carolina Water Quality Monitoring Station
SV-341

South Carolina Department of
Health and Environmental Control
Bureau of Water

September 19, 2000

Prepared by: Denise C. Ernst

Table of Contents

Abstract

Levels of fecal coliform bacteria can be elevated in water bodies as the result of both point and nonpoint sources of pollution. Little Eastatoe Creek (class freshwater, FW) is currently in violation of the fecal coliform bacteria water quality standard, as more than 10% of the samples collected at SV-341 during 1992-1996 exceed the 400 colonies/100ml standard. Agriculture and forest are two major land uses in the Little Eastatoe Creek watershed. Both can be sources of fecal coliform bacteria. Targeting agricultural land for reduction of bacteria is the most effective strategy for this watershed.

The geometric mean for this site is 213.9 colonies/100ml. Flow information for Little Eastatoe Creek was estimated using flow data from USGS gauge station 02186645 on Coneross Creek near Seneca. Using a target level of bacteria of 175 colonies/100ml, the target loading for Little Eastatoe Creek is 9.40×10^{10} colonies/day. This translates to an agricultural reduction of 21% or a final agricultural loading of 7.82×10^{10} colonies/day. Forested lands are not targeted for reduction, as there are currently no acceptable means of reducing fecal coliform sources within that land use.

There are several tools available for implementing this TMDL, including an ongoing Section 319 funded project, as well as other NPS pollution outreach materials. DHEC will continue to monitor water quality in Little Eastatoe Creek to evaluate the effectiveness of these measures.

List of Figures and Tables

SC 2000 303(d) LIST
AQUATIC LIFE AND RECREATIONAL USES
LISTED ALPHABETICALLY

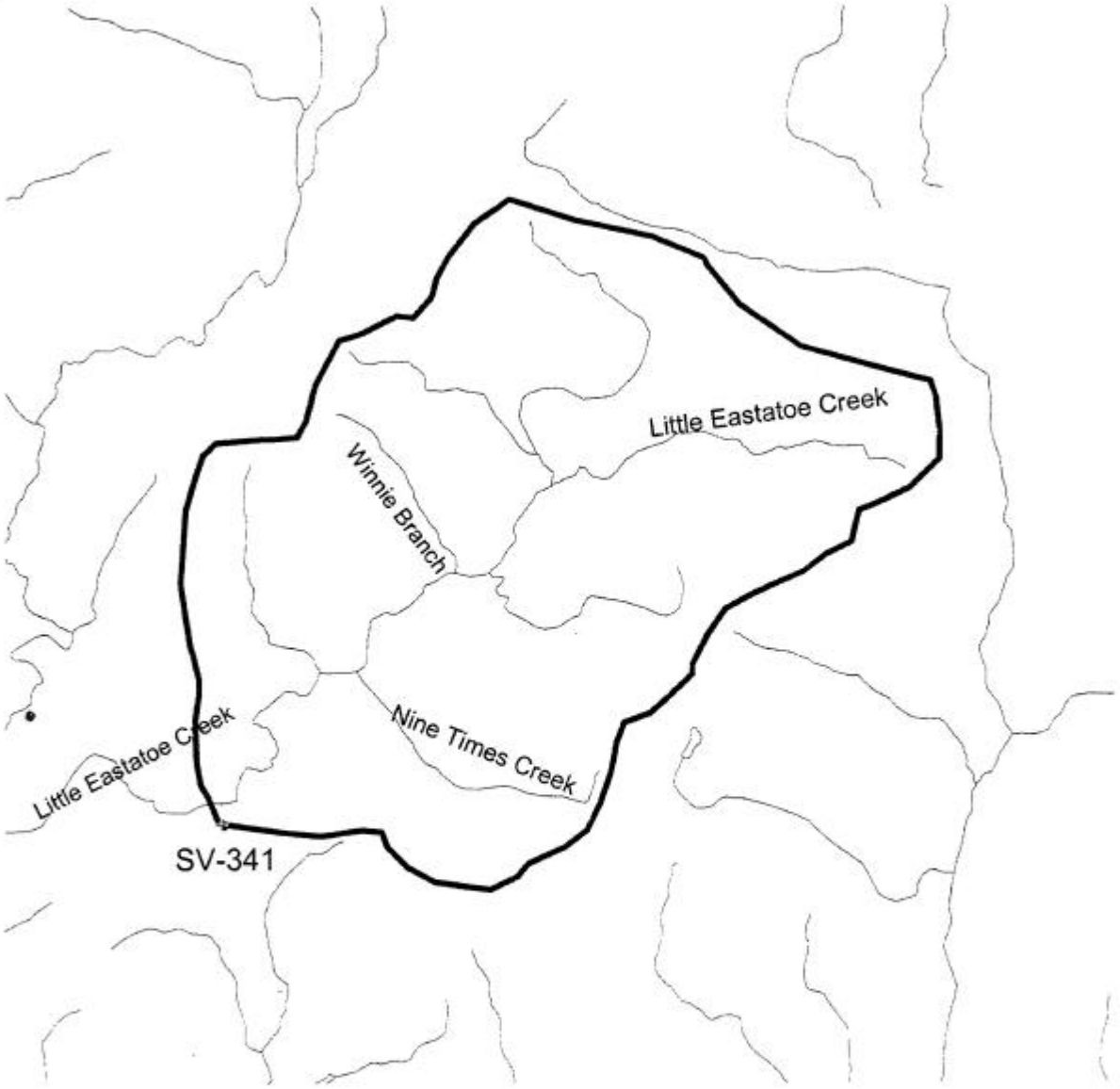
	WATERBODY	IMPAIRED SITE	STATION NUMBER	BASIN	COUNTY	HYDROLOGIC UNIT	IMPAIRED USE	CAUSE	PRIORITY
		LAKE MOULTRIE IN NW QUADRANT	SC-028	SANTEE	BERKELEY	03050201010	AL	CU	2
	LAKE MURRAY	LK MURRAY AT DAM AT SPILLWAY (MARKER 1)	S-204	SALUDA	LEXINGTON	03050109190	AL	CU	3
		BLACKS BR, LK MURRAY AT SC 391	S-223	SALUDA	NEWBERRY	03050109150	AL	CU	3
		LK MURRAY AT MARKER 166	S-273	SALUDA	LEXINGTON	03050109190	AL	CU	3
		LK MURRAY AT MARKER 143	S-274	SALUDA	LEXINGTON	03050109190	AL	CU	3
		LK MURRAY AT MARKER 63	S-279	SALUDA	LEXINGTON	03050109190	AL	P	2
		LK MURRAY AT MARKER 63	S-279	SALUDA	LEXINGTON	03050109190	AL	CU	3
		LAKE MURRAY, BUSH RVR ARM, 4.6 KM US SC 391	S-309	SALUDA	NEWBERRY	03050109150	AL	P	2
		LAKE MURRAY, BUSH RVR ARM, 4.6 KM US SC 391	S-309	SALUDA	NEWBERRY	03050109150	AL	PH	2
	LAKE OLIPHANT	LAKE OLIPHANT, FOREBAY EQUIDISTANT FROM DAM AND SHORELINES	CL-021	CATAWBA	CHESTER	03050103060	AL	P	3
		LAKE OLIPHANT, FOREBAY EQUIDISTANT FROM DAM AND SHORELINES	CL-021	CATAWBA	CHESTER	03050103060	AL	pH	3
	LAKE WARREN	LK WARREN, BLACK CK ARM, AT S-25-41 5 MI SW OF HAMPTON	CSTL-075	SALKEHATCHIE	HAMPTON	03050208060	AL	DO	3
	LAKE WATEREE	LAKE WATEREE, WATEREE CREEK ARM	CL-091	CATAWBA	FAIRFIELD	03050104010	AL	P	3
		LK WATEREE AT END OF S-20-291	CW-207	CATAWBA	FAIRFIELD	03050104010	AL	P	3
		LK WATEREE AT S-20-101 11 MI ENE WINNSBORO	CW-208	CATAWBA	FAIRFIELD	03050104010	AL	P	3
		LK WATEREE AT S-20-101 11 MI ENE WINNSBORO	CW-208	CATAWBA	FAIRFIELD	03050104010	AL	pH	3
		LK WATEREE AT SMALL ISLAND 2.3 MI N OF DAM	CW-209	CATAWBA	KERSHAW	03050104010	AL	P	3
	LAKE WYLIE	LK WYLIE, CROWDERS CK ARM AT SC 49 AND SC 274	CW-027	CATAWBA	YORK	03050101190	REC	FC	3
	LANGSTON CREEK	LANGSTON CK AT SC 253	S-264	SALUDA	GREENVILLE	03050109100	AL	CR	2
		LANGSTON CK AT SC 253	S-264	SALUDA	GREENVILLE	03050109100	REC	FC	2
	LAWSONS FORK CREEK	LAWSONS FORK CK AT S-42-218 2.7 MI SSE OF INMAN	B-277	BROAD	SPARTANBURG	03050105180	REC	FC	3
		LAWSONS FORK CK AT S-42-40 BL INMAN MILL EFF	B-221	BROAD	SPARTANBURG	03050105180	AL	BIO	2
		LAWSONS FORK CK AT S-42-40 BL INMAN MILL EFF	B-221	BROAD	SPARTANBURG	03050105180	REC	FC	2
		LAWSONS FORK CK AT UN# RD BL MILLIKEN CHEM.	B-278	BROAD	SPARTANBURG	03050105180	REC	FC	3
		LAWSONS FORK CK AT S-42-108	BL-001	BROAD	SPARTANBURG	03050105180	AL	BIO	3
		LAWSONS FORK CK AT S-42-108	BL-001	BROAD	SPARTANBURG	03050105180	REC	FC	3
		LAWSONS FORK CK AT S-42-79 AT VALLEY FALLS	BL-005	BROAD	SPARTANBURG	03050105180	REC	FC	3
*	LEMON CREEK	LEMON CREEK AT S-05-541	CSTL-116	SALKEHATCHIE	BAMBERG	03050207070	REC	FC	3
	LICK CREEK	LICK CK AT S-42-118 1 1/4 MI SW WOODRUFF	B-038	BROAD	SPARTANBURG	03050108010	REC	FC	3
	LIMESTONE CREEK	LIMESTONE CK AT S-11-301	B-128	BROAD	CHEROKEE	03050105130	REC	FC	3
	LITTLE BUCK CREEK	LITTLE BUCK CK AT UN# CO RD 2.3 MI SW OF CHESNEE	B-259	BROAD	SPARTANBURG	03050105170	REC	FC	2
	LITTLE BULL CREEK	LITTLE BULL CK AT SC 33-BL UTICA TOOL CO	E-076	EDISTO	ORANGEBURG	03050206010	AL	BIO	3
		LITTLE BULL CK CK AT SC 33-BL UTICA TOOL CO	E-076	EDISTO	ORANGEBURG	03050206010	AL	DO	3
		LITTLE BULL CK CK AT SC 33-BL UTICA TOOL CO	E-076	EDISTO	ORANGEBURG	03050206010	REC	FC	3
*	LITTLE CANE CREEK	LITTLE CANE CREEK AT S-37-133	SV-343	SAVANNAH	OCONEE	03060101050	REC	FC	1
*	LITTLE EASTATOE CREEK	LITTLE EASTATOE CREEK AT S-39-49	SV-341	SAVANNAH	PICKENS	03060101030	REC	FC	2
		LITTLE FORK CK AT S-13-265 1.5 MI SW JEFFERSON	PD-215	PEE DEE	CHESTERFIELD	03040202050	AL	BIO	2
*	LITTLE LYNCHES RIVER	LITTLE LYNCHES RVR AT US 601 2 MI NE KERSHAW	PD-006	PEE DEE	LANCASTER	03040202070	REC	FC	3
*		LITTLE LYNCHES RIVER AT S-28-42	PD-343	PEE DEE	KERSHAW	03040202070	REC	FC	3
	LITTLE RIVER	LITTLE RVR AT S-20-60 3.1 MI SW OF JENKINSVILLE	B-145	BROAD	FAIRFIELD	03050106070	REC	FC	3
	LITTLE RIVER	LITTLE RVR AT S END OF ISL DUE E OF TOWN (IN RVR)	MD-162	PEE DEE	HORRY	03040207030	AL	PH	3
	LITTLE RIVER	LITTLE RVR AT US 76 BUS IN LAURENS ABOVE STP	S-034	SALUDA	LAURENS	03050109160	REC	FC	3
		LITTLE RVR AT SC 560	S-038	SALUDA	LAURENS	03050109160	REC	FC	3
		LITTLE RVR AT S-36-22 8.3 MI NW SILVERSTREET	S-099	SALUDA	NEWBERRY	03050109160	REC	FC	3
		LITTLE RVR AT SC ROUTE 127	S-297	SALUDA	LAURENS	03050109160	REC	FC	3
		LITTLE RVR AT SC 34	S-305	SALUDA	NEWBERRY	03050109160	REC	FC	3
	LITTLE RIVER	LITTLE RIVER AT S-01-24	SV-164	SAVANNAH	ABBEVILLE	03060103140	REC	FC	3
*	LITTLE SALKEHATCHIE RIVER	LITTLE SALKEHATCHIE RIVER AT U.S. 601	CSTL-115	SALKEHATCHIE	BAMBERG	03050207060	REC	FC	3
*		LITTLE SALKEHATCHIE RIVER AT SC 64	CSTL-117	SALKEHATCHIE	COLLETON	03050207080	REC	FC	2
*		LITTLE SALKEHATCHIE RIVER AT SC 63	CSTL-120	SALKEHATCHIE	COLLETON	03050207110	REC	FC	3
	LITTLE SALUDA RIVER	LITTLE SALUDA RVR AT US 378 E SALUDA	S-050	SALUDA	SALUDA	03050109170	AL	DO	2
*		LITTLE SALUDA RVR AT US 378 E SALUDA	S-050	SALUDA	SALUDA	03050109170	REC	FC	2
		LITTLE SALUDA RVR AT S-41-39 5.2 MI NE SALUDA	S-123	SALUDA	SALUDA	03050109170	AL	DO	3
*		LITTLE SALUDA RVR AT S-41-39 5.2 MI NE SALUDA	S-123	SALUDA	SALUDA	03050109170	REC	FC	3
	LITTLE WATEREE CREEK	LITTLE WATEREE CK AT S-20-41 5 MI E OF WINNSBORO	CW-040	CATAWBA	FAIRFIELD	03050104010	AL	DO	3

*** Indicates TMDLs will be done within 2 years**

See Key

Figure 1

Little Eastatoe Creek (SV-341) Watershed



Water Quality Monitoring Station
Little Eastatoe Creek Watershed Boundary
Streams

0.5 0 0.5 1 1.5 Miles

D H E C
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

Little Eastatoe Creek
03060101-030

BASIS FOR 303(d) LISTING

INTRODUCTION:

Levels of fecal coliform bacteria can be elevated in water bodies as the result of both point and nonpoint sources of pollution. Section 303(d) of the Clean Water Act and EPA's Water Quality Planning and Management Regulations (40 CFR Part 130) require states to develop total maximum daily loads (TMDLs) for water bodies that are not meeting designated uses under technology-based pollution controls. The TMDL process establishes the allowable loadings of pollutants or other quantifiable parameters for a water body based on the relationship between pollution sources and in stream water quality conditions so that states can establish water quality-based controls to reduce pollution and restore and maintain the quality of water resources (USEPA 1991).

PROBLEM DEFINITION:

Impaired Waterbody: Little Eastatoe Creek
Pickens County
Latitude: 34° 56' 57"
Longitude: -82° 49' 59''

Water Classification: Freshwater

Little Eastatoe Creek is designated as Class Freshwater. Waters of this class are described as follows:

> "Freshwaters suitable for primary and secondary contact recreation and as a source for drinking water supply after conventional treatment in accordance with the requirements of the Department. Suitable for fishing and the survival and propagation of a balanced indigenous aquatic community of fauna and flora. Suitable also for industrial and agricultural uses." (R.61-68)

Water Quality Standard Being Violated: Fecal Coliform Bacteria

Pollutant of Concern: Fecal Coliform Bacteria

Fecal Coliform Criteria:

> "Not to exceed a geometric mean of 200/100 ml, based on five consecutive samples during any 30 day period; nor shall more than 10% of the total samples during any 30 day period exceed 400/100 ml." (R.61-68)

The South Carolina Watershed Water Quality Assessment: Savannah and Salkehatchie River Basins (SCDHEC 1997) was used to identify this stream segment as impaired and for listing the water body on the 1998 South Carolina 303(d) list. This segment has been listed again on the 2000 303 (d) list. Waters in which no more than 10% of the samples collected over a five year period are greater than 400 colonies/100 ml are considered to comply with the South Carolina water quality standard for fecal coliform bacteria. Waters with more than 10 percent of samples greater than 400 colonies/100 ml are considered impaired and listed for fecal coliform bacteria on South Carolina's 303(d) List. There is one SCDHEC ambient monitoring station, SV-341, on Little Eastatoe Creek. Data from this station show that recreational uses are only partially supported due to violations of the 400/100 ml fecal coliform criterion. Using data from the years 1992-1996, 25% of the samples did not meet the fecal coliform criterion.

TMDL TECHNICAL BASIS

TARGET IDENTIFICATION:

Target levels for fecal coliform bacteria in water bodies are those levels established in South Carolina's Water Quality Standards, Regulation 61-68, as described earlier. The criterion used in this TMDL will be "not to exceed a geometric mean of 175/100 ml" allowing an explicit margin of safety of 25/100 ml to ensure that the 200/100 ml criterion will be met.

This target of a geometric mean of 175/100 ml is expected also to satisfy the criterion, "nor shall more than 10% of the total samples during any 30 day period exceed 400/100 ml." Based on a review of water quality assessments in South Carolina, over 75% of waters that have a fecal coliform geometric mean of less than 175/100ml also meet the criterion "not more than 10% of samples exceed 400/100ml" (SCDHEC unpublished data). Most of the data in those assessments, however, reflect fecal coliform concentrations in areas that do not have sufficient best management practices (BMPs) in place. Thus, implementation of BMPs as described in this TMDL will likely achieve an even greater rate of compliance with the latter criterion since the BMPs are generally focused on reducing fecal loadings during runoff events, the condition most likely to result in an exceedence of the 400/100ml criterion.

Source Assessment:

General Sources of Fecal Coliform:

Both point and nonpoint sources may contribute fecal coliform to a given water body. Potential sources of fecal coliform are numerous and often occur in combination. Nationwide, poorly treated municipal sewage is a major source of fecal coliform, but data presented below show that this is not the case here. Urban storm water runoff and sanitary sewer overflows can be sources of fecal coliform. Rural storm water runoff can

transport significant loads of fecal coliform from livestock pastures and animal feedlots. Failing septic systems and wildlife can also be sources of bacteria. Sources of fecal coliform loads to water bodies can be assigned to two broad classes: point source loads and nonpoint source loads.

Point Sources in the Little Eastatoe Creek Watershed:
There are no point sources in the Little Eastatoe Creek watershed upstream of station SV-341.

Nonpoint Sources in the Little Eastatoe Creek Watershed:

As there are no point sources, fecal coliform loadings in this watershed can be attributed to nonpoint sources. The land use in the watershed is 0.11% urban, 97.90% forested, and 1.99% agricultural.

Agricultural land can be a major source of fecal coliform bacteria. Runoff from pastures, animal operations, improper handling and land application of animal wastes, and animals having access to creeks are all sources of fecal coliform. Agricultural best management practices (BMPs) such as buffer strips, alternative watering sources, fencing cattle out of creeks, and proper land application of animal wastes reduce fecal coliform loading to water bodies. Proper siting and maintenance of these systems can drastically reduce their contributions of bacteria to water bodies.

Fecal coliform bacteria also originate in forested areas. Sources are generally wild animals such as deer, raccoons, wild turkeys, waterfowl, etc. The primary means for directly controlling fecal coliform from forested lands would include relocating or killing wildlife. These are generally not acceptable management alternatives.

Linkage Between Numeric Targets and Sources:

Land use in this watershed and field reconnaissance indicates that the major sources of fecal coliform are forested areas and agricultural areas. As previously described, wildlife is the main source of fecal coliform in forested areas, and there are no acceptable management tools for controlling fecal coliform from wildlife sources at this time. On the other hand, there are steps that can be taken on agricultural lands that can successfully reduce fecal coliform levels in adjacent water bodies. Therefore, load reductions in this TMDL will be allocated to agricultural lands.

The loading from forested lands will be considered background conditions. The geometric mean of fecal coliform concentration in water bodies flowing through forested areas in South Carolina during all flow conditions is estimated to be 30 colonies/100 ml (SCDHEC unpublished data). The 30 colonies/100 ml observed in South Carolina falls well within the range reported by Schueler (1999) of 10 to 100 colonies/100 ml of fecal coliform from forested lands. Thus, 30 colonies/ 100 ml will be considered the background condition.

Data Availability and Analysis:

Watershed Characteristics:
Little Eastatoe Creek drains into Eastatoe Creek, near Pickens, South Carolina. The drainage area of concern for this TMDL is located in watershed 03060101-030 in Pickens County and consists of the area of land draining to station SV-341. All references to the Little Eastatoe Creek watershed in this TMDL refer specifically to the area draining to SV-341. This includes 6785 acres in the Blue Ridge region of South Carolina.

Table 1. Little Eastatoe Creek Watershed Land Use

Land Use	Acres	Percentage
Urban	7.18	0.11%
Forest	6642.65	97.90%
Agricultural	135.21	1.99%

Fecal Coliform
SCDHEC monitors water quality in Little Eastatoe Creek at ambient monitoring station SV-341 monthly for one year, every five years, according to the basin planning cycle. Existing data from this monitoring station are available through STORET and included in the data appendix. The geometric mean of fecal coliform using the most recent available data (1992-1996) is 213.9 colonies/100ml.

Flow
Flow information for Little Eastatoe Creek was estimated using flow data for water years 1989-1998 from USGS gauge station 02186645 on Coneross Creek, near Seneca, SC. A generation coefficient was established by dividing the average flow at the USGS station by the drainage area for the station. The generation coefficient (Gc) is established as follows:

$$Gc = \frac{\text{Mean flow in cfs}}{\text{Drainage area in square miles}}$$

Gc = 135.4 cfs/65.4 square miles = 2.07 cfs/square mile

The generation coefficient is multiplied by Little Eastatoe Creek drainage area (10.59 square miles) to obtain the average flow for Little Eastatoe Creek of 21.94 cfs.

Load Calculations:

With the observed geometric mean of 213.9 colonies/100 ml and the average flow of 21.94 cfs, the current loading at SV-341 is determined to be 1.15×10^{11} colonies/day using the equation below.

Fecal Coliform * Qa * Factor = Loading

where: Fecal Coliform = # colonies/100ml
Qa = average flow in cfs
Factor = conversion factor = 24468984
Loading = # fecal coliform colonies/day

Using a geometric mean of 200 colonies/100 ml, the allowable load during average flow is 1.07×10^{11}.

Assuming the flow attributable to forest lands is proportional to the percent of forest land in the watershed, the loading from forest lands was calculated to be 1.58×10^{10} colonies/day (using the equation above and the geometric mean of 30 colonies/100 ml). The remaining fecal loading from the watershed, 9.91×10^{10} colonies/day, is the load attributable to agricultural land.

TMDL Development:

A total maximum daily load (TMDL) for a given pollutant and waterbody comprises the sum of individual wasteload allocations (WLAs) for point sources, and load allocations (LAs) for both nonpoint sources and natural background levels. In addition, the TMDL must include a margin of safety (MOS), either implicitly or explicitly, to account for the uncertainty in the relationship between pollutant loads and the quality of the receiving water body. Conceptually, this definition is represented by the equation:

$$TMDL = \Sigma WLAs + \Sigma LAs + \Sigma MOS$$

The TMDL is the total amount of pollutant that can be assimilated by the receiving water body while still achieving water quality standards. In TMDL development, allowable loadings from all pollutant sources that cumulatively amount to no more than the TMDL must be established and thereby provide the basis to establish water quality-based controls.

For some pollutants, TMDLs are expressed on a mass loading basis (e.g., pounds per day). For bacteria, however, TMDLs can be expressed in terms of organism counts (or resulting concentration), in accordance with 40 CFR 130.2(l).

Since there are no contributing point sources, the TMDL for Little Eastatoe Creek is equal to the load allocations from nonpoint sources and background conditions plus the MOS.

Rawls Creek TMDL = Σ LAs + MOS

Margin of Safety:
There are two basic methods for incorporating the MOS (USEPA 1991): 1) implicitly incorporate the MOS using conservative model assumptions to develop allocations, or 2) explicitly specify a portion of the total TMDL as the MOS; use the remainder for allocations.

An explicit MOS is used for this TMDL by establishing a target concentration level of 175 colonies/ 100 ml. This level is below the state standard of 200 colonies/ 100 ml.

TMDL

TMDL calculation:

The target level of fecal coliform bacteria is 175 colonies/100ml. For the Little Eastatoe Creek watershed, this is equivalent to a loading of 9.40×10^{10} colonies/day. The load from agricultural lands plus the load from forested lands must equal this target of 175 colonies/100ml.

Allocation of Load:

The existing 1.58×10^{10} colonies/day load from forested land cannot reasonably be targeted for reduction. Thus, the existing load of 9.91×10^{10} colonies/day from agricultural lands must be reduced by 21% (to 7.82×10^{10}) to obtain the TMDL of 9.40×10^{10} colonies/day. So, an allocation strategy that will allow the target TMDL to be maintained is as follows:

Table 2. Allocation of Load

Little Eastatoe Creek Land Use	Current Loading	% Reduction	Final Loading
Forest (Background)	1.58×10^{10}	0%	1.58×10^{10}
Agricultural	9.91×10^{10}	21%	7.82×10^{10}
Total	1.15×10^{11}	18.20%	9.40×10^{10}

Implementation Strategy:

There are several tools already in place to help implement this TMDL. Members of FOLKS (Friends of Lake Keowee Society) have formed the Oconee-Pickens Clean Water Action Team and are leading an effort to locate and reduce the sources of pollutants for impaired waterways in the Lake Keowee watershed, including Little Eastatoe Creek. A public outreach and education program is also being developed as part of this project. This project is funded in part by Section 319 money and will be completed by June 30, 2004.

As discussed in the *Implementation Plan for Achieving Total Maximum Daily Load Reductions from Nonpoint Sources for the State of South Carolina* (SCDHEC 1998), there are other tools available for implementing this TMDL. Sources of nonpoint source education include Clemson University Extension Service, the Natural Resource Conservation Service (NRCS), and the South Carolina Department of Natural Resources. Clemson Extension Service offers a Farm-A-Syst package to farmers. Farm-A-Syst is a guide that allows farmers to evaluate practices on their property for potential NPS impacts and recommends BMPs to correct these NPS problems on the farm. NRCS can provide cost share money to land owners installing BMPs. In addition, Clemson Extension has developed a Home-A-Syst handbook that can help urban or rural homeowners reduce sources of NPS pollution on their property. SCDHEC also employs a nonpoint source educator who can assist with distribution of these tools as well as provide additional BMP information.

It should be noted that the water quality data available for the 1999-2000 monitoring cycle is showing a decrease in fecal coliform bacteria concentrations. Agricultural land use has declined somewhat over the past few years in this watershed, which could account for some of this improvement. DHEC will continue to monitor water quality in Little Eastatoe

Creek according to the basin monitoring schedule in order to evaluate use support and the effectiveness of implementation measures. If it is determined that these implementation actions are not sufficient and that conditions do not continue to improve, this TMDL will be revised, incorporating more extensive water quality modeling.

References

Doran, J.W., J.S. Schepers, and N.P. Swanson. 1981. Chemical and Bacteriological Quality of Pasture Runoff. J. Soil Water Conserv. May-June: 166-171.

Novotny, Vladimir. Olem, Harvey. 1994. Water Quality Prevention, Identification, and Management of Diffuse Pollution. Van Nostrand Reinhold, New York.

SCDHEC. 1998. Implementation Plan for Achieving Total Maximum Daily Load Reductions From Nonpoint Sources for the State of South Carolina.

SCDHEC. 1997. Watershed Water Quality Assessment: Savannah and Salkehatchie River Basins. Technical Report No. 003-97.

Scheuler, T. R. 1999. Microbes and Urban Watersheds: Concentrations, Sources, and Pathways. Watershed Protection Techniques 3(1): 554-565.

United States Environmental Protection Agency (USEPA). 1991. Guidance for Water Quality-Based Decisions: The TMDL Process. Office of Water, EPA 440/4-91-001.

Public Participation

The public notice on page 11 was sent to a mailing list of over 300 individuals statewide interested in water quality issues. In addition, the notice was sent to local watershed organizations and posted on SCDHEC's website at www.state.sc.us/dhec/eqc/water/html/eqpnbow.html#tmdl.

This public notice was also published in Columbia's newspaper, *The State*, and in Anderson, SC's *Anderson-Independent* on August 14, 2000.

Comments Received and Responsiveness Summary

No comments were received.

AVAILABILTY OF PROPOASED TOTAL MAXIMUM DAILY LOAD FOR WATERS AND POLLUTANTS OF CONCERN IN THE STATE OF SOUTH CAROLINA

Cedar Creek in Fairfield and Richland Counties
Coneross Creek in Oconee County
Lake Edgar Brown in Barnwell County
Little Eastatoe Creek in Pickens County
Rawls Creek in Richland and Lexington Counties

Section 303(d)(1) of the Clean Water Act (CWA), 33 U.S.C. §1313(d)(1)(C), and the US Environmental Protection Agency's (EPA) implementing regulation, 40 C.F.R. § 130.7(c) (1), require the establishment of total maximum daily loads (TMDLs) for waters identified as impaired pursuant to § 303(d)(1)(A) of the CWA. Each of these TMDLs is to be established at a level necessary to implement applicable water quality standards with seasonal variations and a margin of safety, accounting for lack of knowledge concerning the relationship between effluent limitations and water quality. At this time, the South Carolina Department of Health and Environmental Control (DHEC) has developed proposed TMDLs for the § 303(d)(1)(A) waters:

Cedar Creek, Fairfield and Richland Counties, Fecal Coliform, 03050106-090; Coneross Creek, Oconee County, Fecal Coliform, 03060101-080; Lake Edgar Brown, Barnwell County, Phosphorus, 03050207-020; Little Eastatoe Creek, Pickens County, Fecal Coliform, 03060101-030; Rawls Creek, Richland and Lexington Counties, Fecal Coliform, 03050109-210.

Upon review of any public comment and revision, if necessary, the Department will submit these TMDLs to EPA for approval as final TMDLs.

Persons wishing to comment on the proposed TMDLs or to offer new data regarding the proposed TMDLs are invited to submit the same in writing no later than September 13, 2000, to:

South Carolina Department of Health and Environmental Control
Bureau of Water
2600 Bull St.
Columbia, S.C. 29201
Attn: Andy Miller

Mr. Miller's phone number is 803-898-4031. His E-mail address is millerca@columb32.dhec.state.sc.us.

Copies of individual TMDLs can be obtained by calling, writing, or e-mailing Mr. Miller at the address above. The administrative record, including technical information, data and analyses supporting the proposed TMDLs, are available for review. Requests to review this information must be submitted in writing to DHEC's Freedom of Information Office at 2600 Bull Street, Columbia, SC 29201 or requests can be submitted via FAX to the Freedom of Information Office at 803.898.3816. Reproduction of documents is available at a cost of $0.25 per page.

Appendix A: Data

Date	Time	FC colonies/100ml
11/17/95	1315	31 @
12/11/95	1315	97 @
1/11/96	1010	54 @
2/2/96	940	1100 J
3/6/96	945	1600 J
4/3/96	935	46 @
5/29/96	1320	280 @
6/21/96	1120	360 @
7/10/96	1110	170 @
8/23/96	1035	300 @
9/6/96	1040	2000 @
10/22/96	1105	68 @
Nov-99		140
Dec-99		250
Jan-00		80
Feb-00		270
Mar-00		44
Apr-00		102

Little Eastatoe Creek Drainage Area Flow Calculations

Coneross creek guage station used:
Guage #02186645

Drainage area of gauge station
65.4 sq miles

Monthly mean data for water years 1989-1998

	cfs
January	185
February	202
March	209
April	145
May	121
June	108
July	89.8
August	125
September	82
October	126
Nov	112
Dec	120
avg	135.4

generation coefficient **(flow for Coneross Creek)**
Gc=mean flow cfs/guage station drainage area
Gc= 135.4/65.4
Gc = 2.070336 cfs/square mile

Little Eastatoe Drainage area: 6785.079 acres

acres		sq miles
6785.076	0.001562	**10.59828871**

Average flow for Little Eastatoe Creek
= Gc* Little Eastatoe Drainage area
= **21.94202 cfs**

Little Eastatoe Creek Loading Allocations

Forest

Little Eastatoe Creek Drainage	Forest Acres		sq mi.
	6642.647	0.001562	10.37581461

Coneross Creek

Avg flow	135.4	cfs
drainage area (sq mi.)	65.4	sq mi
generation coefficient (135.4/65.4)	2.070336391	cfs

forest generation coefficient (flow)

(=gen coef*forest sq mi)	21.48142659	cfs

Current forest loading

(background geo mean =30/100ml)	conversion factor	forest flow	
30	24468984	21.48142659	1.58E+10

Total Current Loading (geo mean=213.9, current flow for L. Eastatoe = 21.94202) *total allowable loading (geo mean of 200/100mL)*

213.9	24468984	21.94202281	1.15E+11	200	24468984	21.94202	**1.07E+11**

Current Agricultural Loading (= total current loading - current forest loading)

1.15E+11	1.58E+10	9.91E+10	current ag loading

Target Loading (target geometric mean=175)

175	24468984	21.94202281	**9.40E+10**

Loading Allocation

(Target-forest=agricultural allocation)	7.82E+10	**Agricultural Loading Allocation**
	21.08%	%reduction needed in Ag land in order to meet target…

To maintain target loading, use this allocation strategy			
Little Eastatoe Creek Land Use	**Current Loading**	**% Reduction**	**Final Loading**
Forest (background)	1.58E+10	0%	1.58E+10
Agricultural	9.91E+10	27%	7.82E+10
Total	1.15E+11	22.23%	9.40E+10

Appendix B:

Public Comments Received

No comments were received.