



SPARTANBURG COUNTY

TMDL MONITORING AND ASSESSMENT PLAN TYGER RIVER WATERSHED

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**PREPARED IN ACCORDANCE WITH SCDHEC PERMIT
#SCR030000**

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List of Acronyms and Abbreviations

CFU	Colony Forming Units
MEP	Maximum Extent Practicable
MPN	Most Probable Number
POC	Pollutant of Concern
SCDHEC	South Carolina Department of Health and Environmental Control
TMDL	Total Maximum Daily Load
WLA	Wasteload Allocation
WQMS	Water Quality Monitoring Stations
WWTP	Waste Water Treatment Plant

SPARTANBURG COUNTY

TMDL MONITORING AND ASSESSMENT PLAN

The following monitoring and assessment plan was developed to meet the requirements of Section 3 of SCDHEC SMS4 permit number SCR030000.

3.2 TMDL Monitoring and Assessment

3.2.1 Introduction

A Total Maximum Daily Load (TMDL) has been developed for fecal coliform bacteria in the Tyger River watershed, which includes portions of the urbanized area within Spartanburg County. The TMDL became effective in September 2004 and includes wasteload allocations for non-point source runoff that thereby includes these urbanized areas. Due to the recent change in preferred indicator bacteria by SCDHEC, from fecal coliform bacteria to *Escherichia coli* (*E. coli*) for fresh water, the proposed pollutant of concern (POC) to be sampled by the County at a representative location(s) within the urbanized area is *E. coli*.

3.2.1.2 Monitoring Plan Requirements

3.2.1.2.1 .b Requirements to Monitor the Pollutants of Concern

As stated in Permit Number SCR030000, the following topics will be addressed in Table 1 and Table 2.

- i. Samples and measurements taken for the purpose of the TMDL Monitoring Plan shall:
 - (1) Be representative of the SMS4 discharges,
 - (2) Be reasonably distributed in time, while maintaining representative sampling,
 - (3) Not be terminated for the purpose of preventing the analysis results from a permit or water quality violation,
 - (4) Describe and consider frequency, mass and/or rate of discharge, as appropriate, and,
 - (5) Be expressed in terms of units or measurements consistent with the requirements contained in the WLA.

- ii. The information contained in the TMDL Monitoring Plan shall include:
 - (1) Monitoring locations, appropriate for representative data collection,
 - (2) Explanation of why monitoring is being conducted for selected locations,
 - (3) A description of whether the location(s) are representative and contribute to pollutant loads,
 - (4) An indication the seasons during which sampling is intended,
 - (5) The pollutant of concern, or its surrogate(s), as a sampling parameter,
 - (6) Description of the sampling equipment, and,
 - (7) A rationale supporting the proposed monitored location(s) as reflective of water quality concerns to the Maximum Extent Practicable (MEP).

3.2.1.2.1 .b.i-ii Monitoring and Assessment Plan Details

Table 1: Monitoring Plan Details

<p>3.2.1.2.1.b.ii.(1) Monitoring location(s) and details on site selection:</p>
<p>In order to better determine Spartanburg County’s contribution to the Tyger River watershed, two monitoring stations will be installed along the Middle Tyger River. One station will be located near the Spartanburg/Greenville County boundary. This location is also near the northwest boundary of the Spartanburg County urbanized area where Mt. Lebanon Church Road (S-42-487) crosses the Middle Tyger River. The second monitoring station will be located where Anderson Mill Road (S-42-64) crosses the Middle Tyger River, near the southern extent of the urbanized area boundary.</p>
<p>3.2.1.2.1.b.ii.(2) Explanation of why monitoring is being conducted for selected locations:</p>
<p>Due to the large size of the Tyger River watershed and the presence of three major rivers, multiple entities discharge into the watershed and contribute to the TMDL. Due to more concentrated development in the central portion of the watershed, the County has chosen to focus on the Middle Tyger River. In order to account for discharges coming from Greenville County, a monitoring station will be installed where the Middle Tyger River first enters the County. An additional monitoring station will be installed approximately 20-miles downstream near the urbanized area boundary on the Middle Tyger River. The difference between the results from the two stations will provide a general assessment of bacteria within the Spartanburg County urbanized area and the County’s co-permittee areas.</p>
<p>3.2.1.2.1.b.ii.(3) Description of whether the location(s) are representative of the MS4 discharge and contribute to pollutant loads:</p>
<p>The selected locations provide the most representative data for the County urbanized area in the Middle Tyger watershed due to the size of the subwatershed and the extent of urbanized area between the two stations. The proposed monitored subwatershed area is over 48 square miles, of which approximately 64% is within Spartanburg County. Approximately 95% of the urbanized area within the Middle Tyger River watershed (within Spartanburg County) also drains to the river between the proposed stations.</p> <p>Furthermore, available landcover data shows that the monitored subwatershed area is comparable to the landcover of the overall Tyger River watershed.</p>
<p>3.2.1.2.1.b.ii.(4) Indication of the seasons during which sampling is intended:</p>
<p>Multiple samples will be collected for storm events at least once per season. Seasons will be described as:</p> <p style="padding-left: 40px;">Winter: January 1 to March 31</p> <p style="padding-left: 40px;">Spring: April 1 to June 30</p> <p style="padding-left: 40px;">Summer: July 1 to September 30</p> <p style="padding-left: 40px;">Fall: October 1 to December 31</p> <p>Samples taken for each storm event will be reasonably distributed in time, pending appropriate weather conditions, watershed hydrologic response, and sample holding times.</p>
<p>3.2.1.2.1.b.ii.(5) The pollutant of concern, or its surrogate(s), as a sampling parameter:</p>

<p>Due to the recent change in preferred indicator bacteria by SCDHEC, from fecal coliform bacteria to <i>E. Coli</i> for fresh water, the proposed pollutant of concern (POC) to be sampled by the County is <i>E. coli</i>. The <i>E. coli</i> samples will be collected at both the Mt. Lebanon Church Road and Anderson Mill Road monitoring stations.</p> <p>To supplement the grab samples, the County will install YSI datasondes with sensors to collect continuous data for turbidity, specific conductivity, dissolved oxygen, temperature, and pH. These additional parameters will supplement the detection of discharges that may contain the POC.</p>
<p>3.2.1.2.1.b.ii.(6) Description of the sampling equipment:</p>
<p>The County will use sealed, sterile sample bottles provided by the contracted, SCDHEC certified laboratory to collect manual grab samples.</p> <p>The County will also use EXO2 multiparameter datasondes, from YSI, to collect continuous data for turbidity, specific conductivity, dissolved oxygen, temperature, and pH.</p>
<p>3.2.1.2.1.b.ii.(7) Rationale supporting the proposed monitored location(s) as reflective of water quality concerns to the MEP:</p>
<p>Regardless of the location(s) selected for sampling, the contributing watershed will always include sources of bacteria that are unrelated to the MS4 and are not within the authority of the MS4 to control. However, as discussed above in 3.2.1.2.1.b.ii.(3), due to the size of the watershed and the landuse makeup, these proposed stations will be reflective of the urbanized contributions to the MEP within Spartanburg County's urbanized area and the County's co-permittees.</p>

Table 2 discusses how samples and measurements taken for the purpose of the TMDL Monitoring Plan shall meet the five points listed in section 3.2.1.2.1.b.i of the SMS4 permit number SCR030000.

Table 2: 3.2.1.2.1.b.i .1-5 Samples and Measurements

3.2.1.2.1.b.i.1	Be representative of the SMS4 discharges:
The proposed monitoring locations in tandem will provide representative data from the MS4, as 95% of the urbanized area in the Middle Tyger River watershed, in Spartanburg County, discharges between the two stations.	
3.2.1.2.1.b.i.2	Be reasonably distributed in time, while maintaining representative sampling:
Multiple samples will be collected during each event, distributed through time, to characterize each sampled event. Samples will be collected, at a minimum, once per season per year. Samples will be collected in various sized storm events so that different flow rates and storm events are characterized, to the MEP.	
3.2.1.2.1.b.i.3	Not be terminated for the purpose of preventing the analysis results from a permit or water quality violation:
Spartanburg County will not terminate sampling for the purpose of preventing the analysis results from a permit or water quality violation.	
3.2.1.2.1.b.i.4	Describe and consider frequency, mass and/or rate of discharge, as appropriate:
Spartanburg County will develop rating curves for each station to approximate continuous flow rates.	
3.2.1.2.1.b.i.5	Be expressed in terms of units or measurements consistent with the requirements contained in the WLA:
<i>E. coli</i> sample concentrations will be expressed by the certified laboratory as MPN/100 mL. The County will utilize guidance from SCDHEC to convert the Tyger River TMDL targeted loads from fecal coliform to <i>E. coli</i> for comparison to the sampled concentrations and approximated loads.	

3.2.1.2.1 .b.iii Monitoring and Assessment Plan Strategy

The TMDL monitoring plan for Spartanburg County is focused on *E. coli*. Samples and measurements collected will be used to characterize the quality and quantity of the permitted discharges to evaluate the progress toward the WLA and/or WQS attainment. In order to do this, Spartanburg County will implement the following strategies to the MEP:

- In-stream monitoring,
- Outfall monitoring.

The monitoring location(s) discussed above in Table 2 was selected based on the following checked boxes: Monitoring locations must include one/all/a combination of the following:

- % MS4 area draining to the WQMS, at least 25%,
- Collection of a representative contributing watershed,
- Inclusion of the entire TMDL watershed within the MS4.

Table 3 discusses how samples and measurements taken for the purpose of the TMDL Monitoring Plan shall meet the requirements of 3.2.1.2.1.b.iv-x of the SMS4 permit number SCR030000.

Table 3: 3.2.1.2.1.b.iv-x Sampling Details

3.2.1.2.1.b.vi	Method descriptions, if not approved under 40 CFR 136:
Not applicable	
3.2.1.2.1.b.vii	When no approved analytical method is used:
Not applicable	
3.2.1.2.1.b.viii	Sampling minimum:
For each monitoring location, samples of stormwater discharges shall be collected, at a minimum, of once per season per year.	
3.2.1.2.1.b.ix	Sample analysis:
Samples collected for laboratory analysis shall be analyzed for <i>E. coli</i> , the POC.	
3.2.1.2.1.b.x	Tidal waters:
Not applicable	

3.2.1.2.1 .d Reporting

Spartanburg County will report on the progress of the characterization of the POC in the Tyger River watershed. Resulting data will be included in every annual report following the commencement of monitoring for TMDL pollutant characterization.

Appendix A
Spartanburg County
Middle Tyger River Monitoring Map

