

# FECAL COLIFORM TMDL IMPLEMENTATION SUCCESS STORIES IN TWO WATERSHEDS

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**Abstract.** Twelve beef cattle farmers, one horse farmer, and three landowners with septic system failures in Rocky Creek Watershed (Catawba River Basin, Chester and Fairfield Counties, SC) participated in non-point source (NPS) cost-share grant programs under Section 319 of the Clean Water Act from 2000-2007. Four additional beef cattle farmers participated in a Section 319 Grant in Big Wateree Creek Watershed (Catawba River Basin, Fairfield County, SC) from 2005-2008. Research Planning, Inc. (RPI), an environmental consulting firm based out of Columbia, SC, teamed with Clemson Cooperative Extension Agents in Chester and Fairfield Counties on these two cost-share grant programs, as well as four others in adjacent watersheds, to provide guidance on implementing effective nonpoint source (NPS) measures and to facilitate cost-share agreements that would benefit both the participating landowners and water quality in the region. The goals of these projects were to identify, mitigate, and reduce NPS fecal coliform pollution, and to implement Total Maximum Daily Loads for fecal coliform and turbidity. In both Rocky Creek and Big Wateree Creek Watersheds, participating farms covered nearly 2000 total acres, and Best Management Practices (BMPs) were implemented in order to exclude 600-700 animals per watershed from impaired waterbodies by providing alternative sources of clean water. In order to qualify for cost-shared funds and participation in the projects, interested landowners had to meet the following criteria: a) the property must be located within the watershed boundaries; b) there must be potential stream impacts by livestock or septic systems; c) the landowner must be able to cost-share on BMPs; and, d) participants must be able and willing to maintain all installed BMPs beyond the life of the cost-share project. Common issues observed when evaluating properties included: cattle drinking out of streams and resting in the shade provided by riparian habitat; trampled and highly eroded banks; animals standing in stagnant pools of water; and a basic lack of a clean drinking water option, particularly in times of drought. If the criteria were met, RPI and Clemson staff held onsite

meetings with the interested landowners to analyze and rank each farm in order to most effectively utilize available 319 funds. After the initial onsite meeting, project staff generated a cost agreement, which was then approved by SC DHEC. Following approval, the landowner began implementing BMPs. Periodic site visits were required, and participants were reimbursed quarterly. Common BMPs implemented included: animal exclusion via creek fencing; installation of alternative water sources (wells, waterlines, and concrete water troughs); trampling protection at creek crossings and heavily used areas; wildlife habitat planting; riparian buffers; waste storage facilities; property grading; water berm construction; and pond improvements (Table 1). At the conclusion of the Rocky Creek Watershed project in 2007, the South Carolina Department of Health and Environmental Control (SCDHEC) reported to the Environmental Protection Agency (EPA) that: "Following these efforts, water quality improvements have been observed at 3 monitoring sites in the watershed. [These 3 stations] have all improved from non-support to partial support". At the conclusion of the Big Wateree Creek Watershed in March 2008, SCDHEC reported that water quality standards had not been exceeded at the water quality monitoring station in the watershed since February of 2007. These project successes were not only beneficial to the overall goals of the State and Federal 319 Programs, but helped garner interest for implementing additional fecal coliform TMDLs in Chester, Fairfield, and York counties in subsequent grants managed by RPI, Clemson, and partner agencies. Several target groups were chosen as the focus for the community and public awareness component of the project, including school-aged children, members of the local community, and livestock owners. During training meetings targeted at urban and rural residents, participants were encouraged to investigate specific sources of water quality impairments and to implement practices to correct problems related to fecal coliform pollution from septic systems. Interest from these training meetings resulted in several septic repair cost-

share projects aimed at reducing contaminant loading. Following completion of successful agricultural projects, RPI and partners sponsored annual tours to showcase water quality BMPs in the agricultural community. Approximately 250 participants from five or more counties participated in each tour. Project staff also gave powerpoint presentations at several Tri-County Livestock Association meetings. The presentations showed before and after photos of the participating farms to explain how BMPs improve both water quality and farm operations. Clemson Extension also led youth outreach programs in the classroom and outdoors. The EnviroScape, a watershed/nonpoint source pollution model, illustrates pollution and runoff on agricultural, urban, and rural landscapes using household items (e.g. cocoa, water, powdered drink mix) as ‘pollutants’ moving through the physical environment. Over 200 children and 23 teachers were led on multi-day field trips in Rocky Creek and other local water bodies. Some highlights of the programs were: drainage basin and watershed identification and use of the hydrologic map, discussions on causes of watershed impairment, water sampling for fecal coliform bacteria, and turbidity testing. Project

into Rocky Creek from rural sources. staff also led teams of Junior Palmetto Leadership Program youth in a Stormwater Decal Installation Project in Chester. Customized decals were installed on stormwater drains to educate the public that stormwater and/or any other substance disposed into the drainage system is not treated by a sewer system or any other means before it is released into surrounding streams. GIS components were also included in the Rocky and Big Wateree Creek deliverables to SC DHEC and EPA. Several data layers were created to illustrate the work completed during the course of the watershed projects, including: participating landowner locations, property boundaries of participating landowners, and BMP installation sites (e.g. locations of fencing, wells, troughs, etc.). The goal of the GIS product was to allow SC DHEC to utilize the information that was collected over the course of the projects for further analysis of how BMP installation in impaired watersheds may contribute to a reduction in fecal coliform and sediment loading. Beyond providing a visualization tool, the hydrology, soil, and BMP site information can be used to further explore sources of NPS pollution in the watersheds.

**Table 1. Summary Metrics of Best Management Practices (BMPs) Implemented on Rocky Creek and Big Wateree Creek Watershed Farms From 2000-2007**

<b>PROJECT</b>	<b># of Farms</b>	<b># of livestock</b>	<b>Total Acreage (acres)</b>	<b>Exclusion and cross-fencing (LnFt)</b>	<b>Waterlines from wells to troughs (LnFt)</b>	<b>Troughs and trampling protection (#)</b>	<b>Creek crossings (#)</b>	<b>Buffer zones (acres)</b>
<b>Rocky Creek Phase I</b>	5	350	600	57,200	15,200	9	4	36
<b>Rocky Creek Phase II</b>	7	400	1400	52,600	14,600	31	11	388
<b>Big Wateree Creek</b>	4	600	2000	31,800	23,500	36	3	31
<b>TOTAL</b>	<b>16</b>	<b>1350</b>	<b>4000</b>	<b>141,600</b>	<b>53,300</b>	<b>76</b>	<b>18</b>	<b>455</b>