

City of Charlotte NPDES MS4 Permit Program

Water Quality Recovery Program

McKee Creek Fecal Coliform TMDL



CHARLOTTESM

Permit Number NCS000240

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Table of Contents

| | |
|---|----|
| Purpose | 1 |
| Background | 1 |
| TMDL WQRP Implementation Team | 3 |
| Public Education and Outreach Program | 3 |
| Pollutant of Concern | 4 |
| MS4 Major Outfall Identification | 4 |
| Monitoring Plan | 5 |
| BMP Identification & Associated Cost | 5 |
| Program Implementation Schedule | 6 |
| Implementation of the Program to MEP | 7 |
| WQRP Assessment | 7 |
| WQRP Reporting | 7 |
| References | 10 |

List of Figures:

| | | |
|-----------|--|---|
| Figure 1: | Charlotte-Mecklenburg Watersheds | 2 |
| Figure 2: | McKee Creek Watershed..... | 2 |
| Figure 3: | McKee Creek Watershed Land Uses | 3 |
| Figure 4: | WQRP Life Cycle | 9 |



Purpose

The purpose of this Water Quality Recovery Program (WQRP) Plan is to reduce the levels of fecal coliform, to the maximum extent practicable, in accordance with the assigned MS4 NPDES regulated Waste Load Allocation (WLA) identified in the approved Fecal Coliform Total Maximum Daily Load (TMDL) for McKee Creek.

The goals of this Water Quality Recovery Program (WQRP) are to identify BMPs, management strategies, time frames and costs necessary to address the MS4 NPDES regulated Waste Load Allocation (WLA) identified in the TMDL, which in turn will assist in returning the impaired segments to compliance with state water quality standards.

Background

The McKee and Clear Creek watersheds are located within Mecklenburg and Cabarrus Counties, in the eastern part of the Greater Charlotte Metropolitan Area, North Carolina. Of the total 5516 acres in the McKee Watershed, 4008 acres or 73 percent of the watershed lie within Mecklenburg County and the remaining 1508 acres or 27 percent lie within Cabarrus County. The watershed is within the Hydrologic Unit Code 03040105, as designated by the U.S. Geological Survey (DWQ sub basin 03-07-11). McKee Creek originates in Mecklenburg County and flows north-northeast to its confluence with Reedy Creek in Cabarrus County. Reedy Creek discharges to the Rocky River, which in turn discharges to the Yadkin River. Clear Creek is relatively short (1.6 miles), lies entirely in the McKee Creek watershed, and is largely contained within Cabarrus County. Clear Creek flows approximately northwest to its confluence with McKee Creek (NCDENR 2003).¹

In addition, McKee and Clear Creeks are located in the lower portion of the Yadkin River Basin. The drainage area of the combined watershed, as measured from the headwaters to the confluence with Reedy Creek, is only 8.6 square miles. From its headwaters in northeastern Mecklenburg County, North Carolina, McKee Creek flows northward from the more urban area of northeast Charlotte into the more rural countryside of Cabarrus County. Both McKee and Clear Creeks are listed as partially supporting the designated use of secondary recreation (NCDENR 2003).¹

Urban runoff can contribute significant amounts of pollutants to water bodies. However, much of this runoff is regulated in compliance with the NPDES Storm Water Phase I and Phase II program (EPA, 2000). This rule applies to a unit of government such as a city or county, which owns or operates a municipal separate storm sewer system (MS4). The MS4 is required to obtain a National Point Source Discharge Elimination System (NPDES) permit for their stormwater discharges to surface waters. As such, stormwater runoff from areas within an MS4 is considered a point source. The City of Charlotte, Mecklenburg County, and NCDOT fall under the NPDES stormwater rules and therefore maintain stormwater management programs (NCDENR 2005).¹

North Carolina's 2002 Integrated Report includes two stream segments totaling a linear distance of 8.1 miles in the McKee Creek watershed as impaired due to elevated fecal coliform

concentrations. Clear Creek is a small tributary to McKee Creek within the same watershed. As stated above, McKee and Clear creeks are located within Division of Water Quality (DWQ) sub basin 03-07-11 (NCDENR 2003).¹

The McKee Creek Fecal Coliform TMDL document was prepared by the North Carolina Department of Environment and Natural Resources (NCDENR), Division of Water Quality (DWQ) during 2003 and was approved on August 1, 2003.

Figures 1, 2, and 3 below show the location of McKee Creek watershed within the Charlotte-Mecklenburg area, the McKee Creek watershed impaired reach and tributary streams, and the McKee Creek watershed land uses, respectively. Figure 4 on page 9 shows the WQRP life cycle process.

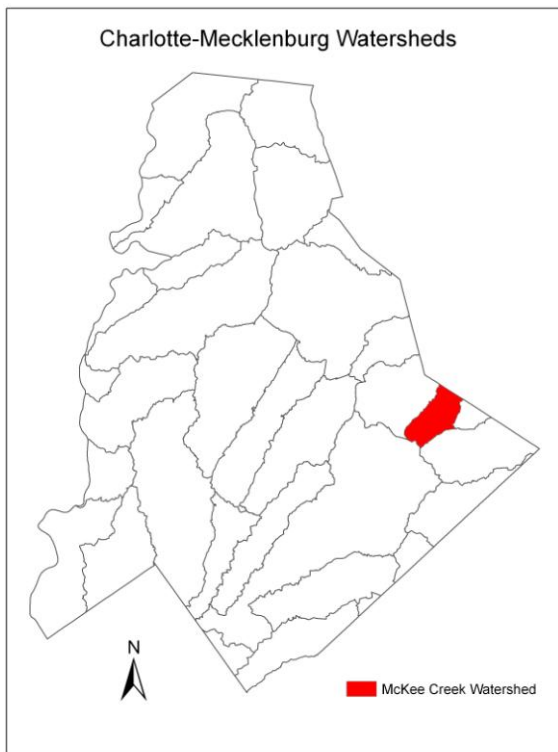


Figure 1: Charlotte-Mecklenburg Watersheds

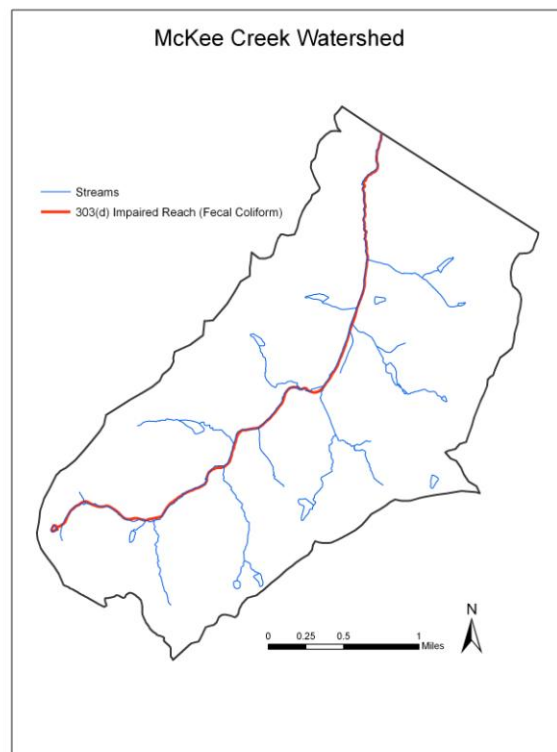


Figure 2: McKee Creek Watershed

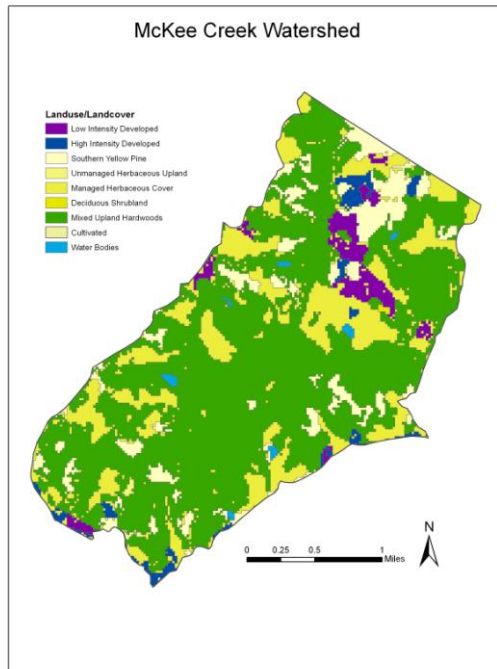


Figure 3: McKee Creek Watershed Land Uses

TMDL WQRP Implementation Team

During WQRP year 3, a team of staff representatives will be assembled from affected municipal agencies that conduct activities within the TMDL watershed. In addition, other potential staff resources will be identified as necessary to serve on TMDL WQRP Implementation Team. Based on the pollutant of concern, municipal agencies could include stormwater, wastewater, public works, street maintenance, solid waste, animal control, and others. The NPDES MS4 Permittee will be responsible for interpreting data, judging BMP effectiveness, reporting to DWQ, and coordinating activities and reviews with the Implementation Team to meet the components and goals of the WQRP.

Public Education and Outreach Program

During WQRP year 3, a Public Education and Outreach Program will be established to provide information concerning the WQRP. At a minimum, a website will be established to document and disseminate information and results. In addition, the program may include items such as:

- Pollutant of concern specific information in brochures, bill inserts, etc.
- Adopt-a-Stream or Storm Drain Marking activities
- Presentations to groups
- Participation in public events

Pollutant or Pollutants of Concern

The pollutant of concern and the focus of this WQRP is the MS4 WLA for fecal coliform. Over the past 10 years, the McKee Creek watershed has seen increased residential and commercial development including the construction of I-485, all of which has impacted several acres in the watershed.

Non-point and wet weather sources of fecal coliform are discussed in this section with the focus of this WQRP aimed at the WLA for the MS4 wet weather point sources. Large and medium MS4s serving populations greater than 100,000 people are required to obtain an NPDES storm water permit and are covered by a Phase I MS4 Permit. As of February 2003, the City of Charlotte already has one MS4 permit regulated by the NPDES program that extends to the City Limits plus some of the ETJ area of Mecklenburg County, including the upper McKee-Clear Creek watershed. The portion of the McKee-Clear Creek watershed in Cabarrus County is not affected by current MS4 requirements (Rowell, 2003). Only the portion of the watershed within Mecklenburg County is, therefore, included in the WLA portion of this TMDL (NCDENR 2003).¹

Non-point sources of fecal coliform bacteria are diffuse sources that cannot be identified as entering the water body at a single location. Wet weather point sources are similar except they are conveyed to streams through pipes or open ditches in areas subject to MS4 NPDES permits. Both these sources generally involve land activities that contribute fecal coliform bacteria to streams during rainfall runoff events. Nonpoint sources are all sources not regulated by the NPDES program. The TMDL must provide a load allocation (LA) for these sources and a waste load allocation (WLA) for the wet weather point sources. Typical nonpoint and wet weather point sources of fecal coliform bacteria include, (NCDENR 2003)¹:

- Agricultural runoff
- Septic systems
- Urban runoff
- Wildlife.

The McKee Creek Fecal Coliform TMDL uses 400 cfu/day as the water quality target with an 85% load reduction specified at the compliance point for success. As such, the MS4 regulated waste load allocation identified in the TMDL for fecal coliform is 7.92E+09 cfu/day.

MS4 Major Outfall Identification

During WQRP year 3, an inventory and map will be developed detailing the location of known major outfalls (as defined in the MS4 NPDES permit) within the watershed NPDES MS4 jurisdictional area that have the possibility of discharging the pollutant of concern to the impaired segments as defined by the MS4 permit, its tributaries or to segments and tributaries within the watershed contributing to the impaired segments.

During WQRP year 4, a schedule will be developed to locate the position of unknown major outfalls within the watershed that may discharge the pollutant of concern to the impaired

segment, its tributaries or to segments and tributaries within the watershed contributing to the impaired segments.

Monitoring Plan

During WQRP year 5, a monitoring plan will be developed for fecal coliform and submitted to DWQ for approval.

The goals of the WQRP monitoring plan will be to:

1. Identify the significant sources of the pollutant of concern related to MS4 regulated WLA.
2. Evaluate the performance of BMPs utilized in the WQRP, where possible.
3. Assess progress toward the goals of the WQRP at the TMDL identified compliance point.

The monitoring plan will include components such as:

1. Written description and GIS map of sample locations
2. Monitoring methods
3. Sample type and frequency
4. Seasonal considerations
5. Sample analytical methods
6. Quality assurance
7. Record keeping

The monitoring plan shall include in-stream and/or major outfall monitoring at locations deemed necessary to support assessment of activities in the WQRP to address the MS4 NPDES regulated Waste Load Allocation (WLA) identified in the TMDL. Where appropriate, the permittee may reduce the monitoring burden by proposing to monitor in-stream sites and/or major outfalls that the Division would consider substantially similar to other in-stream sites and/or major outfalls in the defined TMDL watershed. The monitoring plan shall be adjusted as additional in-stream sites and/or major outfalls are identified in accordance with the schedule required in the Storm Water Management Plan and as accumulating data may suggest.

BMP Identification & Associated Cost

During WQRP year 4, the results of the watershed and water quality data analysis and outfall identification will be utilized to develop initial BMP strategies aimed at addressing the MS4 NPDES regulated Waste Load Allocation (WLA) identified in the TMDL. As part of the BMP identification, existing programs, ordinances, initiatives, etc., will be evaluated for applicability and use within the WQRP. Further assessment in future WQRP years will evaluate if any additional BMPs should be employed to address the MS4 NPDES regulated Waste Load Allocation identified in the TMDL to the maximum extent practicable. This assessment will be based on factors such as cost/benefit analysis, MEP standards, water quality data trends, status of activities & accomplishments relative to defined end-point in the WQRP, etc.

Initial BMP strategies may include:

- Existing regulatory strategies and ordinances
- Targeted public education and outreach programs
- Development of a WQRP specific webpage
- Targeted public participation programs
- Increased IDDE efforts
- Targeted municipal storm system maintenance activities
- Increased site inspections where applicable
- Targeted monitoring and complaint response
- Existing strategies/requirements for structural BMPs
- Non-regulatory strategies such as LID

During WQRP year 7, an assessment of available data and cost benefit analysis will be performed to determine effectiveness of BMP strategies.

Program Implementation Schedule

Program elements and associated activities identified in the WQRP will be conducted in various permit years within the current and future MS4 NPDES 5-year permit terms. The proposed implementation schedule for this WQRP is as follows:

1. Identify the purpose and goals of the TMDL Water Quality Recovery Program (WQRP) by the end of year 2, (June 30, 2009).
2. Identify the watershed and provide brief description by the end of year 2, (June 30, 2009).
3. Assemble a team of staff representatives from affected municipal agencies by the end of year 3, (June 30, 2010).
4. Establish a Public Education and Outreach Program by the end of year 3, (June 30, 2010).
5. Identify location and map major known outfalls in TMDL watershed by the end of year 3, (June 30, 2010).
6. Conduct an assessment of the available data by the end of year 3, (June 30, 2010).
7. Develop and submit a schedule to discover and locate all other MS4 major outfalls within the MS4 jurisdictional area that may be discharging the pollutant(s) of concern to the impaired stream segments, to their tributaries, and to segments and tributaries within the watershed contributing to the impaired segments by the end of year 4, (June 30, 2011).
8. Develop non-structural and structural BMP strategies by the end of year 4, (June 30, 2011).

9. Develop a WQRP monitoring plan for the pollutant of concern and submit to DWQ for approval by the end of year 5, (June 30, 2012).
10. Develop a schedule to implement appropriate regulatory strategies, non-structural BMPs, and structural BMPs to control the pollutant(s) of concern to the maximum extent practicable by the end of year 5, (June 30, 2012).
11. Conduct Year 6 WQRP assessment by the end of year 7, (June 30, 2014 and annual thereafter).
12. Conduct a cost-benefit analysis by the end of year 7, (June 30, 2014 and annual thereafter).
13. Define the end point of the WQRP within MEP standards by the end of year 7, (June 30, 2014).

Implementation of the Program to the Maximum Extent Practicable

During WQRP year 7, an assessment of available data, BMP strategies, cost benefit analysis, and WQRP effectiveness will be conducted and utilized to define the end point of the WQRP within MEP standards.

As part of this, activities being conducted to address the MS4 NPDES regulated Waste Load Allocation (WLA) identified in the TMDL will be evaluated and defined as to their contribution toward reaching the end point in the WQRP. The results of the analysis and definition will be used to prioritize locally limited funding aimed at elimination of the greatest MS4 waste load allocation reduction for the least amount of expenditure.

WQRP Assessment

During WQRP year 3, an assessment of available watershed and water quality data will be performed and utilized to assist in developing initial BMP strategies. Subsequently during WQRP year 7, an assessment of activities conducted under the WQRP will be performed to evaluate the overall progress of the WQRP. The assessment will include a review of programmatic management measures, existing water quality data, watershed data, cost benefit analysis, monitoring data and other relevant data. The assessment will be used, where possible, to evaluate the performance of existing BMPs and identify additional BMP strategies as necessary.

WQRP Reporting

Activities and assessments conducted under the WQRP will be reported to DWQ along with the annual report submitted each year for the MS4 NPDES permit. Annual compliance with the WQRP implementation schedule will constitute compliance with the overall WQRP. The annual

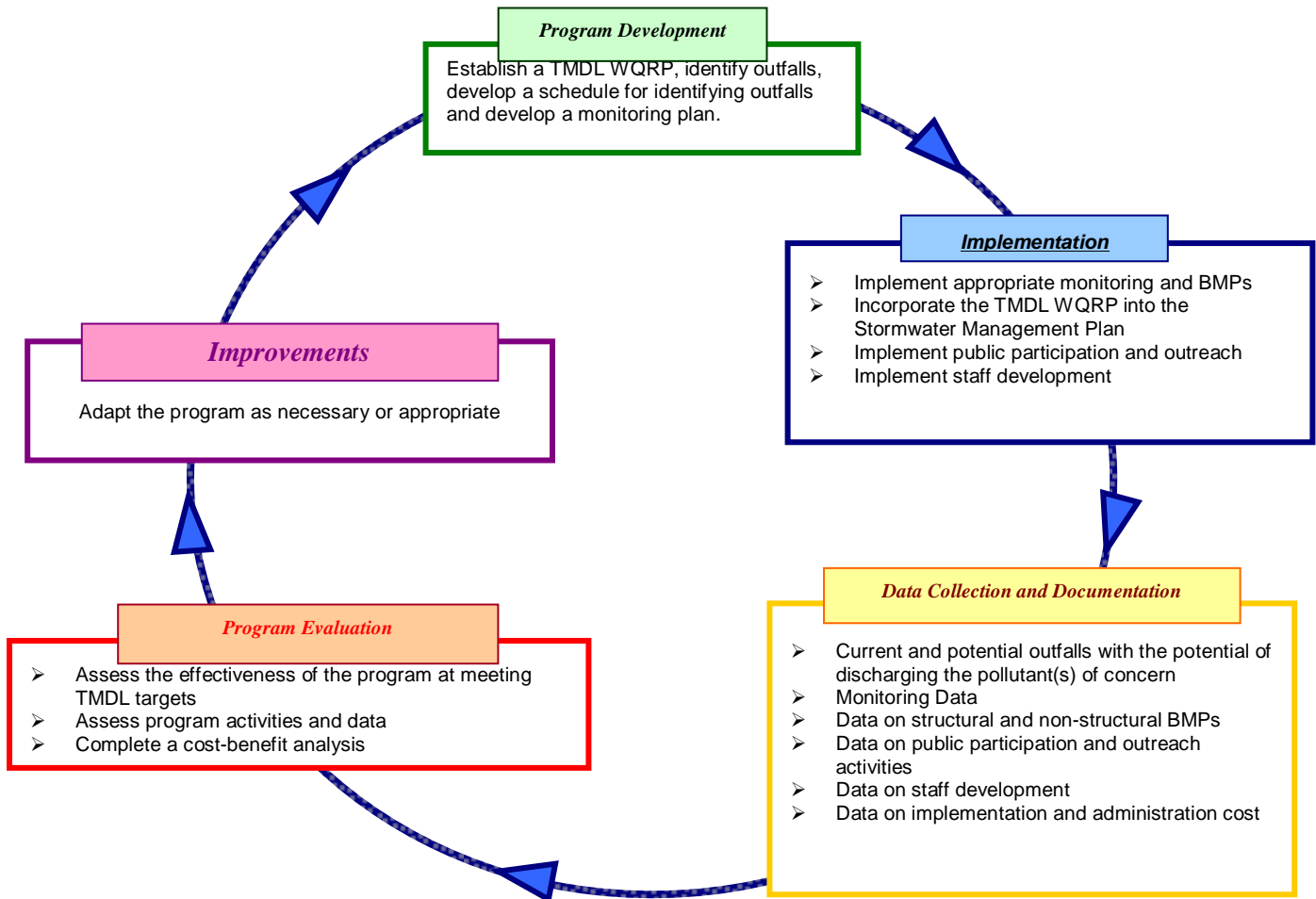
report for the WQRP will include, as applicable per WQRP schedule, the following:

- The initial WQRP and subsequent components based on Implementation Schedule.
- Discussion on the status of the WQRP and schedule.
- Discussion of activities conducted for WQRP and progress made toward meeting program elements during report year.
- Annual cost of WQRP.
- An assessment of available data collected under the monitoring plan for each pollutant of concern.
- An assessment of the performance of BMPs employed, where possible.
- A map showing the location of major outfalls in TMDL watersheds with the potential for discharging the pollutant of concern.
- A schedule for locating currently unknown major outfalls that may potentially discharge the POC in TMDL watersheds.
- Identification of in-stream and outfall sampling locations.
- Identification of additional BMPs, if necessary.

Following any review and comment by the Division on the TMDL Water Quality Recovery Program, the permittee shall incorporate any necessary changes into the program. The permittee shall incorporate the revised TMDL WQRP into the Stormwater Management Plan.

Figure 4

Water Quality Recovery Program Life Cycle



REFERENCES

1. NCDENR - Division of Water Quality, June 2003. Fecal Coliform Total Maximum Daily Load for the McKee and Clear Creek Watersheds, Mecklenburg and Cabarrus Counties, North Carolina.

NCDENR - Division of Water Quality, January 2005. Total Maximum Daily Loads (TMDLs) for Turbidity in Long Creek, McAlpine Creek, Sugar Creek, Little Sugar Creek, Irwin Creek, Henry Fork, and Mud Creek in North Carolina

United States. Environmental Protection Agency (USEPA). October 1999. Protocols for Developing Sediment TMDLs – First Edition. EPA 841-B-99-004. Washington, DC.

United States Environmental Protection Agency (USEPA). 2000. Revisions to the Water Quality Planning and Management Regulation and Revisions to the National Pollutant Discharge Elimination System Program in Support of Revisions to the Water Quality Planning and management Regulation; Final Rule. Fed. Reg. 65:43586-43670 (July 13, 2000).