CHAPTER 6

RESTORATION STRATEGIES IN THE BARREN RIVER WATERSHED

6.1. BACKGROUND.

The Watershed Water Quality Management Plan serves as a comprehensive inventory of resources and stressors in the watershed, a recommendation for control measures, and a guide for planning activities in the next five-year watershed cycle and beyond. Water quality improvement will be a result of implementing both regulatory and nonregulatory programs.

In addition to the NPDES program, some state and federal regulations, such as the TMDL and ARAP programs, address point and nonpoint issues. Construction and MS4 storm water rules (implemented under the NPDES program) have transitioned from Phase 1 to Phase 2. More information on storm water rules may be found at: http://www.state.tn.us/environment/wpc/stormh2o/.

This Chapter addresses point and nonpoint source approaches to water quality problems in the Tennessee portion of the Barren River Watershed.

6.2. COMMENTS FROM PUBLIC MEETINGS. Watershed meetings are open to the public, and most meetings were represented by citizens who live in the watershed, NPDES permitees, business people, farmers, and local river conservation interests. Locations for meetings were chosen after consulting with people who live and work in the watershed. Everyone with an interest in clean water is encouraged to be a part of the public meeting process. The times and locations of watershed meetings are posted at: http://www.state.tn.us/environment/wpc/watershed/public.shtml.

6.2.A. Year 1 Public Meeting. The first Barren River Watershed public meeting was held October 5, 1999 as a joint meeting with the Old Hickory Lake Watershed at the Volunteer State Community College Gallatin campus. The goals of the meeting were to: (1) present, and review the objectives of, the Watershed Approach, (2) introduce local, state, and federal agency and nongovernmental organization partners, (3) review water quality monitoring strategies, and (4) solicit input from the public.

Major Concerns/Comments

- Silt from Construction
- Rapid Development
- Low Dissolved oxygen in Old Hickory Lake, especially near Hendersonville
- Litter

6.2.B. Year 3 Public Meeting. The second Barren River Watershed public meeting was held November 26, 2001 as a joint meeting with the Old Hickory Lake Watershed at the Volunteer State Community College Gallatin campus. The goals of the meeting were to: (1) provide an overview of the watershed approach, (2) review the monitoring strategy, (3) summarize the most recent water quality assessment, (4) discuss the TMDL schedule and citizens' role in commenting on draft TMDLs, and (5) discuss BMPs and other nonpoint source tools available through the Tennessee Department of Agriculture 319 Program and NRCS conservation assistance programs.

Major Concerns/Comments

- Hendersonville (Gallatin Road and Indian lake Road) lift stations have a bad odor and some fecal matter in stream
- The Waste Water Treatment Plant at Town Creek and East Fork Station Creek (Gallatin) bypasses after a heavy rain
- Increased silt in Old Hickory Lake and main tributaries
- Silt in Town Creek over the past 20 years
- Construction on Bartons and Bledsoe Creeks
- Municipal dischargers of "acceptable" levels of pollutants. It is not "acceptable" if there are water quality violations

6.2.C. Year 5 Public Meeting. The third scheduled Barren River Watershed public meeting was held October 16, 2007 at the Smith County Chamber of Commerce Building in Carthage. The meeting was held jointly with the Cordell Hull Lake and Upper Cumberland River Watersheds and featured nine educational components:

- Overview of watershed approach flash video
- Benthic macroinvertebrate specimens and interpretation
- SmartBoard™ with interactive GIS maps
- "Is Your Stream Healthy" self-guided slide show
- "Why We Do Biological Sampling" self-guided slide show
- Water supply and ground water protection educational display
- Smith County Beautiful display
- Nonpoint Source pollution self-guided slide show
- Water quality and land use maps

In addition, citizens had the opportunity to make formal comments on the draft Watershed Water Quality Management Plan.

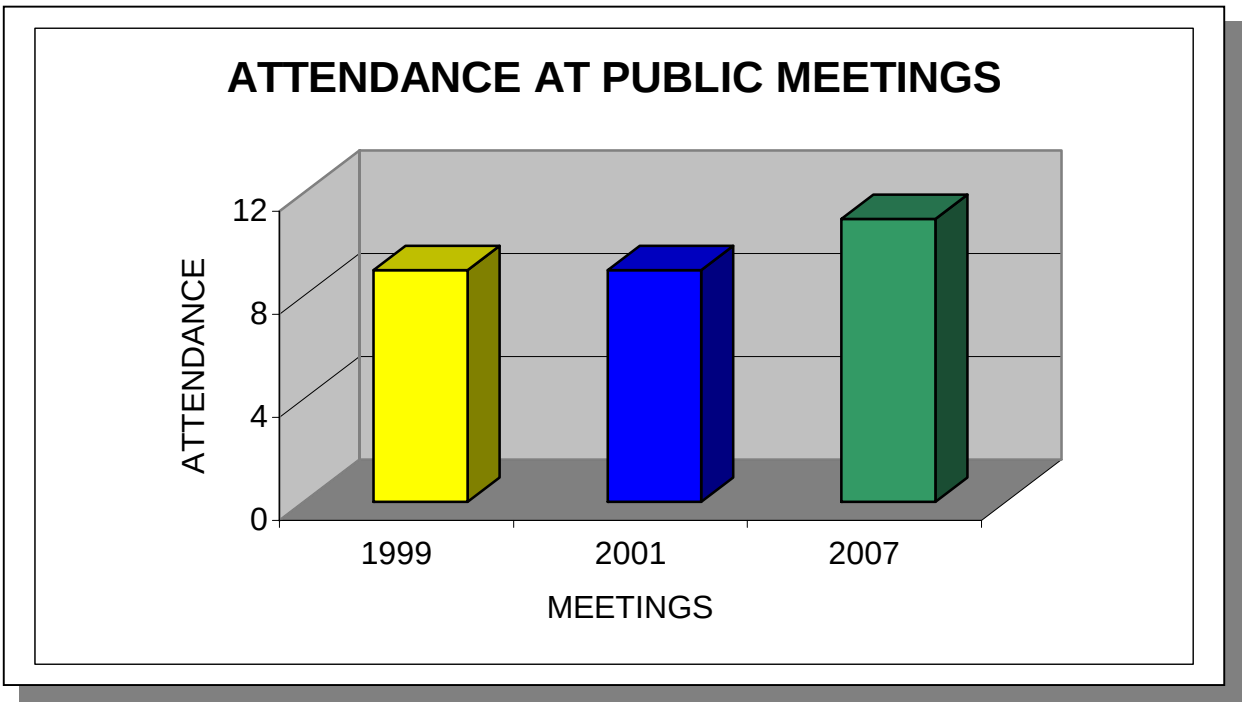

Figure 6-1. Attendance at the Barren River Watershed Public Meetings. *Attendance numbers do not include TDEC personnel. Meetings in 1999 and 2001 represent Barren River and Old Hickory Lake Watersheds joint public meetings. Meting in 2007 represents Barren River, Upper Cumberland River, and Cordell Hull Lake Watersheds joint public meeting.*

Figure 6-2. The SmartBoard™ is an Effective Interactive Tool to Teach Citizens About the Power of GIS.

Figure 6-3. Watershed Meetings are an Effective Way to Facilitate Networking Among Consultants, Local Officials, Non-Government Organizations, Government Agencies, and Staff.

Figure 6-4. Scotty Sorrells (Division of Water Supply) explains the complicated issues involved with groundwater as a source of drinking water.

6.3. APPROACHES USED.

6.3.A. Point Sources. Point source contributions to stream impairment are primarily addressed by NPDES and ARAP permit requirements and compliance with the terms of the permits. Notices of NPDES and ARAP draft permits available for public comment can be viewed at http://www.state.tn.us/environment/wpc/wpcppo/. Discharge monitoring data submitted by NPDES-permitted facilities may be viewed at http://www.epa.gov/enviro/html/pcs/pcs_query_java.html.

The purpose of the TMDL program is to identify remaining sources of pollution and allocate pollution control needs in places where water quality goals are still not being achieved. TMDL studies are tools that allow for a better understanding of load reductions necessary for impaired streams to return to compliance with water quality standards. More information about Tennessee's TMDL program may be found at: http://www.state.tn.us/environment/wpc/tmdl/.

TMDLs are prioritized for development based on many factors.

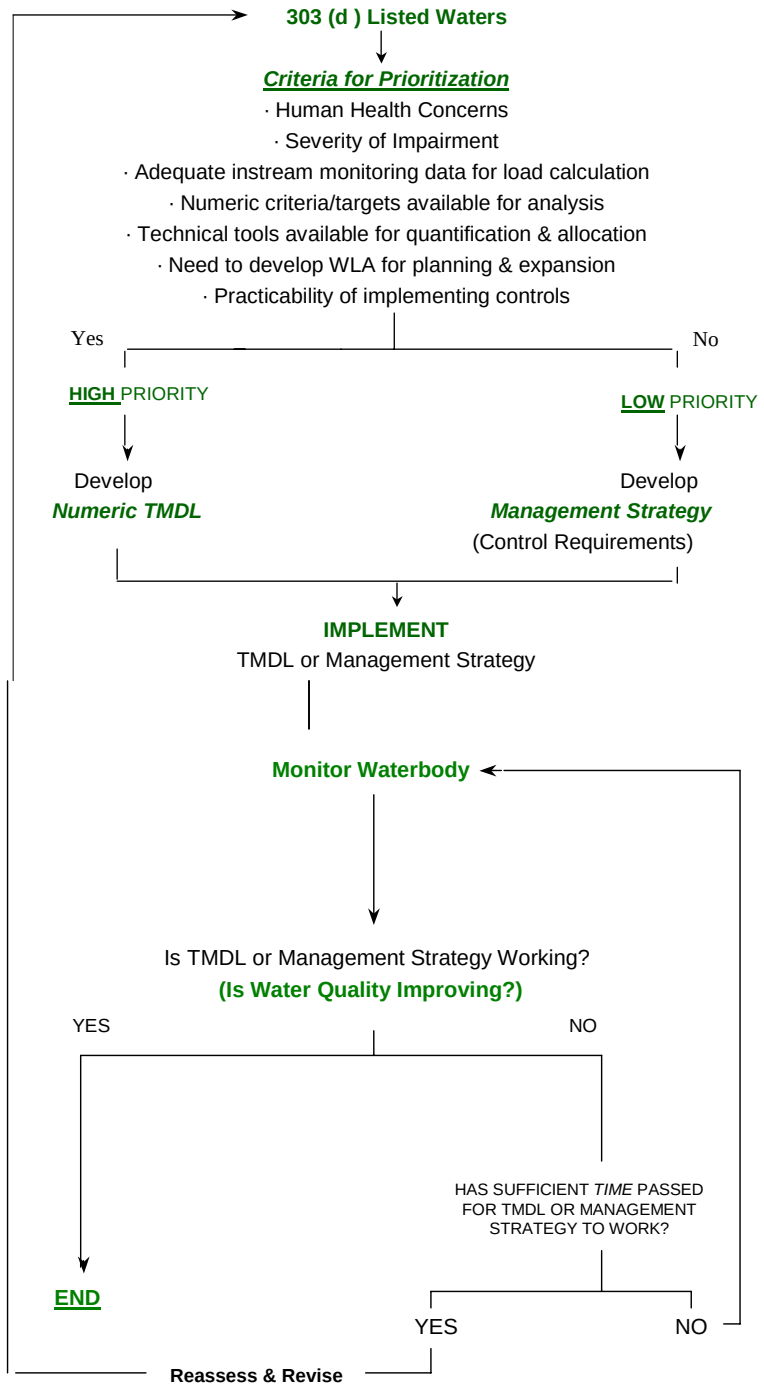

Figure 6-5. Prioritization Scheme for TMDL Development.

6.3.B. Nonpoint Sources

Common nonpoint sources of pollution in the Barren River Watershed include urban storm water runoff, riparian vegetation removal and other habitat alterations, as well as inappropriate land development, road construction, and agricultural practices. Since nonpoint pollution exists essentially everywhere rain falls, existing point source regulations can have only a limited effect. Other measures are, therefore, necessary.

There are several state and federal regulations that address contaminants impacting waters in the Barren River Watershed. Most of these are limited to point sources: a pipe or ditch. Often, controls of point sources are not sufficient to protect waters, so other measures are necessary. Some measures include efforts by landowners and volunteer groups and the possible implementation of new regulations. Many agencies, such as the Tennessee Department of Agriculture (TDA) and the Natural Resources Conservation Service (NRCS), offer financial assistance to landowners for corrective actions (like Best Management Practices) that may be sufficient for recovery of impacted streams. Many nonpoint problems will require an active civic involvement at the local level geared towards establishment of improved zoning guidelines, building codes, streamside buffer zones and greenways, and general landowner education.

The following text describes types of impairments, possible causes, and suggested improvement measures. Restoration efforts should not be limited to only those streams and measures suggested below.

6.3.B.i. Sedimentation.

6.3.B.i.a. From Construction Sites. Construction activities have historically been considered “nonpoint sources.” In the late 1980’s, EPA designated them as being subject to NPDES regulation if more than 5 acres were being disturbed. In the spring of 2003, that threshold became 1 acre. The general permit issued for such construction sites establishes conditions for maintenance of the sites to minimize pollution from storm water runoff, including requirements for installation and inspection of erosion prevention and sediment controls. Also, the general permit imposes more stringent inspection, design criteria, sediment control measures, and self-monitoring requirements on sites in the watershed of streams that are already impaired due to sedimentation or are considered high quality. Regardless of the size, no construction site is allowed to cause a condition of pollution.

Beginning in 2003, the state began requiring some municipalities to obtain coverage under a permit designed to address nonpoint runoff issues: the General NPDES Municipal Separate Storm Sewer System Permit, commonly known as MS4. This permit requires the holder to develop a comprehensive storm water management program, including the adoption of local regulatory ordinances, regular inspection of construction sites and other discharges into their storm sewers, and a variety of educational, mapping, and monitoring activities. The state audits and oversees these local MS4 programs. Due to the rural nature of much of the area, and lack of large high density population centers, the only portion of the Barren River Watershed in Tennessee currently covered by an active MS4 program is Sumner County.

Construction sites within a sediment-impaired watershed may also have higher priority for inspections by WPC and MS4 personnel, and are likely to have enforcement actions for failure to control erosion.

6.3.B.i.b. From Channel and/or Bank Erosion. Many streams within the Barren River Watershed suffer from varying degrees of streambank erosion. When steam channels are altered, banks can become unstable and highly erodable. Heavy livestock traffic can also severely disturb banks. When large tracts of land are cleared of vegetation (especially trees) and replaced with impermeable surfaces like asphalt and rooftops, the large increases in the velocities and volumes of storm water runoff can also overwhelm channel and bank integrity because destabilized banks contribute to sediment loadings and to the loss of beneficial riparian vegetation.

Some inappropriate agricultural practices and overzealous land development have impacted the hydrology and morphology of stream channels in this watershed, although none severely enough to cause a loss of use impairment at this time.

Several agencies such as the NRCS and TDA, as well as citizen watershed groups, are working to stabilize portions of stream banks using bioengineering and other techniques. Many of the affected streams, like Long Creek and Trammel Creek, would benefit from these types of projects.

Some methods or controls that might be necessary to address common problems are:

Voluntary Activities

- Re-establish bank vegetation.
- Establish off-channel watering areas for livestock by moving watering troughs and feeders back from stream banks, or at least limit cattle access to restricted areas with armored banks entry (tributaries to Trammel Creek and Long Creek).
- Limit cattle access to streams and bank vegetation (West Fork long Creek, Long Fork, Long Hungry Creek).

Additional Strategies

- Better community planning and MS4 oversight for the impacts of development on small streams, especially development in growing areas such as the Highway 52 corridor from Portland to Lafayette.
- Require post-construction run-off rates to be no greater than pre-construction rates in order to avoid in-channel erosion (all MS4 areas should establish these ordinances).
- Encourage or require strong local buffer ordinances.
- Implement additional restrictions on logging in streamside management zones.
- Limit clearing of stream and ditch banks or other alterations (Long Creek, West Fork Long Creek, Trammel Creek). *Note: Permits may be required for any work along streams.*
- Limit road and utility crossings of streams through better site design.
- Restrict the use of off-highway vehicles on stream banks and in stream channels.

6.3.B.i.c. From Agriculture and Silviculture. The Water Quality Control Act exempts normal agricultural and silvicultural practices that do not result in a point source discharge. Nevertheless, efforts are being made to address impacts due to these exempted practices.

The Master Logger Program has been in place for several years to train loggers how to install Best Management Practices that lessen the impact of logging activities on streams. Recently, laws and regulations established the authority for the Commissioners of the Departments of Environment and Conservation and of Agriculture to stop the logging operation that, upon failing to install these BMPs, is causing impacts to streams.

Since the Dust Bowl era, the agriculture community has strived to protect the soil from wind and water erosion. Agencies such as the Natural resources Conservation Service (NRCS), the University of Tennessee Agricultural Extension Service, and the Tennessee Department of Agriculture are striving to identify better ways of farming, to educate the farmers, and to install the methods that address the sources of some of the impacts due to agriculture. Cost sharing is available for many of these measures.

Many sediment problems traceable to agricultural practices also involve riparian loss due to close row cropping or pasture clearing for grazing. Lack of vegetated buffers along stream corridors is a problem in some areas of the Barren River Watershed, due both to agricultural and residential/commercial land uses. Many streams, like tributaries to West Fork Long Creek and Trammel Creek, could benefit from the establishment of more extensive riparian buffer zones.

6.3.B.ii. Pathogen Contamination.

Possible sources of pathogens in streams are inadequate or failing septic tank systems, overflows or breaks in public sewer collection systems, poorly disinfected discharges from sewage treatment plants, and fecal matter from pets, livestock and wildlife washed into streams and storm drains. When fecal bacterial levels are shown to be consistently elevated to dangerously high levels, especially in streams with high potential for recreational uses, the division must post signage along the creek warning the public to avoid contact. Once pathogen sources have been identified and corrected, and pathogen level reductions are documented, the posting is lifted.

Permits issued by the Division of Water Pollution Control regulate discharges from point sources and require adequate control for these sources. Individual homes are required to have subsurface, on-site treatment (i.e., septic tank and field lines) if public sewers are not available. The Division of Ground Water Protection within the Cookeville and Nashville Environmental Field Offices and delegated county health departments regulate septic tanks and field lines. In addition to discharges to surface waters, businesses may employ subsurface treatment for domestic wastewater or surface discharge of treated process wastewater. The Division of Water Pollution Control regulates surface water discharges and near-surface land application of treated wastewater.

Currently, only two stream systems in the Tennessee portion of the Barren River Watershed are known to have excessive pathogen contamination. Donaho Branch and

Town Branch are impacted by the urban areas of Portland and Lafayette, with contributions of bacterial contamination coming from storm water runoff, sewage collection system leaks, and treatment plant operation failures.

Some measures that may be necessary to control pathogens are:

Voluntary Activities

- Clean up pet waste.
- Repair failed septic systems.
- Establish off-channel watering of livestock.
- Limit livestock access to streams and restrict stream crossings.
- Improve and educate on the proper management of animal waste from confined feeding operations.

Regulatory Strategies

- Strengthen enforcement of regulations governing on-site wastewater treatment.
- Determine timely and appropriate enforcement for non-complying sewage treatment plants, large and small, and their collection systems.
- Identify Concentrated Animal Feeding Operations not currently permitted.

Additional Strategies

- Develop intensive planning in areas where sewer is not available and treatment by subsurface disposal is not an option due to poor soils, floodplains, or high water tables.
- Develop and enforce leash laws and controls on pet fecal material.
- Greater efforts by sewer utilities to identify leaking lines or overflowing manholes.
- Review the pathogen limits in discharge permits to determine the need for further restriction.

6.3.B.iii. Excessive Nutrients and/or Dissolved Oxygen Depletion.

These two impacts are usually listed together because high nutrients often contribute to low dissolved oxygen within a stream. Since nutrients often have the same source as pathogens, the measures previously listed can also address many of these problems. Elevated nutrient loadings are also often associated with urban runoff from impervious surfaces, from fertilized lawns and croplands, and faulty sewage disposal processes. Nutrients are often transported with sediment, so many of the measures designed to reduce sediment runoff will also aid in preventing organic enrichment of streams and lakes.

Dissolved oxygen depletion can also be due to the discharge of other biodegradable materials. These are limited in NPDES permits as ammonia and as either Biological Oxygen Demand (BOD) or Carbonaceous Oxygen Demand (CBOD).

Some sources of nutrients can be addressed by:

Voluntary Activities

- Educate homeowners and lawn care companies in the proper application of fertilizers.
- Encourage landowners, developers, and builders to leave stream buffer zones. Streamside vegetation can filter out many nutrients and other pollutants before they reach the stream. These riparian buffers are also vital along livestock pastures. Many streams in the Barren River Watershed within agricultural areas would benefit from additional riparian buffers.
- Use grassed drainage ways that can remove fertilizer before it enters streams.
- Use native plants for landscaping since they don't require as much fertilizer and water.
- Develop better overall storm water management in urban and residential areas, including retrofitting existing commercial lots, homes, and roadways with storm water quality and quantity BMPs. This would especially improve the urban streams and lakes currently polluted by excessive nutrient inputs, such as Donaho Branch, Town Creek, City Lake Portland, and City Lake Westmoreland.

Physical changes to streams can prevent them from providing enough oxygen to biodegrade the materials that are naturally present. A few additional actions can address this problem:

- Maintain shade over a stream. Cooler water can hold more oxygen and retard the growth of algae. As a general rule, all stream channels suffer from some canopy removal. An intact riparian zone also acts as a buffer to filter out nutrient loads before they enter the water.
- Discourage impoundments. Ponds and lakes do not aerate water, and cause many water quality problems downstream. *Note: Permits may be required for any work on a stream, including impoundments.*

Regulatory Strategies.

- Strengthen enforcement of regulations governing on-site wastewater treatment.
- Impose more stringent permit limits for nutrients discharged from sewage treatment plants (including into Little Trammel Creek and Town Branch).
- Impose timely and appropriate enforcement for noncomplying sewage treatment plants, large and small, and their collection systems (examples: Portland and Lafayette).
- Identify Concentrated Animal Feeding Operations (CAFO) not currently permitted.
- Encourage TDA- and NRCS-sponsored educational programs targeted to agricultural landowners and aimed at better nutrient management, as well as information on technology-based application tools.
- Identify any Animal Feeding Operations (AFO) that contribute to stream impacts and declare them as a CAFO requiring a permit.
- Support and train local MS4 programs within municipalities to deal with storm water pollution issues and require additional storm runoff quality control measures.
- Require nutrient management plans for all golf courses.

6.3.B.iv. Toxins and Other Materials.

Although some toxic substances are discharged directly into waters of the state from a point source, much of these materials are washed in during rainfalls from an upland location, or via improper waste disposal that contaminates groundwater. In the Tennessee portion of the Barren River Watershed, a relatively small number of streams are damaged by toxins in storm water runoff from industrial facilities or urban areas. More stringent inspection and regulation of permitted industrial facilities, and local storm water quality initiatives and regulations, could help reduce the amount of contaminated runoff reaching state waters. Examples of streams that would benefit from these measures are Long Hungry Creek, West Fork Long Creek, and Long Fork in western Macon County.

Individuals may also cause contaminants to enter streams by activities that may be attributed to apathy or the lack of knowledge or civility. Litter in roadside ditches, garbage bags tossed over bridge railings, paint brushes washed off over storm drains, and oil drained into ditches are all blatant examples of pollution in streams. To lessen the future impact to the waters of the state, each community can strive to raise its awareness for better conservation practices and prosecution of violators.

Some of these problems can be addressed by:

Voluntary Activities

- Provide public education.
- Paint warnings on storm drains that connect to a stream.
- Sponsor community clean-up days.
- Landscape public areas.
- Encourage public surveillance of their streams and reporting of dumping activities to their local authorities.

Regulatory Strategies

- Continue to prohibit illicit discharges to storm drains and to search them out.
- Strengthen litter law enforcement at the local level.
- Increase the restrictions on storm water runoff from industrial facilities.

6.3.B.v. Habitat Alteration.

The alteration of the habitat within a stream can have severe consequences. Whether it is the removal of the vegetation providing a root system network for holding soil particles together, the release of sediment, which increases the bed load and covers benthic life and fish eggs, the removal of gravel bars, “cleaning out” creeks with heavy equipment, or the impounding of the water in ponds and lakes, many alterations impair the use of the stream for designated uses. Habitat alteration also includes the draining or filling of wetlands.

Many streams within the Barren River Watershed suffer from some degree of habitat alteration, especially riparian loss and bank disturbances from agricultural practices. Some notable streams in the watershed that have suffered significant harm from being

impounded include Davis Branch, Little Trace Creek, and a tributary to West Fork Drakes Creek.

Illicit gravel dredging is a particularly widespread and serious problem in the Barren River Watershed due to the abundance of gravel substrate in streams in this area and their relative remoteness. “Wildcat” dredgers can do a devastating amount of damage to a localized area, then pack up and leave within a short period of time, making enforcement difficult. Streams affected by chronically recurring dredging operations include Big Trammel Creek, Long Hungry Creek, Long Creek, Little salt Creek, and sites within the Drakes Creek Watershed.

Although large-scale public projects such as highway construction can alter significant portions of streams, individual landowners and developers are responsible for the vast majority of stream alterations. Some measures that can help address these problems are:

Voluntary Activities

- Sponsor litter pickup days to remove litter that might enter streams
- Organize stream cleanups removing trash, limbs and debris before they cause blockage.
- Avoid use of heavy equipment to “clean out” streams. Instream work other than debris removal will require an Aquatic Resource Alteration Permit (ARAP).
- Plant native vegetation along streams to stabilize banks and provide habitat
- Encourage developers to avoid extensive use of culverts in streams.

Regulatory Strategies

- Restrict modification of streams by means such as culverting, lining, or impounding.
- Require mitigation for impacts to streams and wetlands when modifications are allowed.
- Require permitting of all rock harvesting operations.
- Increased enforcement may be needed when violations of current regulations occur, especially for illicit gravel dredging.

6.3.B.vi. Storm Water.

MS4 discharges are regulated through the Phase I or II NPDES-MS4 permits. These permits require the development and implementation of a Storm Water Management Program (SWMP) that will reduce the discharge of pollutants to the maximum extent practicable and not cause or contribute to violations of state water quality standards. The NPDES General Permit for Discharges from Phase I and II MSF facilities can be found at:

http://www.state.tn.us/environment/wpc/stormh2o/.

For discharges into impaired waters, the MS4 General Permit requires that SWMPs include a section describing how discharges of pollutants of concern will be controlled to ensure that they do not cause or contribute to instream exceedances of water quality standards. Specific measurements and BMPs to control pollutants of concern must also be identified. In addition, MS4s must implement the proposed waste load allocation provisions of an applicable TMDL (i.e., siltation/habitat alteration, pathogens) and describe methods to evaluate whether storm water controls are adequate to meet the waste load allocation. In order to evaluate SWMP effectiveness and demonstrate compliance with specified waste load allocations, MS4s must develop and implement appropriate monitoring programs.

Some storm sewer discharges are not regulated through the NPDES MS4 program. Strategies to address runoff from in these urban areas include adapting Tennessee Growth Readiness Program (TGRP) educational materials to the watershed. TGRP is a statewide program built on existing best management practices from the Nonpoint Education for Municipal Officials program and the Center for Watershed Protection. TGRP developed the program to provide communities and counties with tools to design economically viable and watershed friendly developments. The program assists community leaders in reviewing current land use practices, determining impacts of imperviousness on watershed functions, and allowing them to understand the economics of good watershed management and site design.

6.4. PERMIT REISSUANCE PLANNING

Under the *Tennessee Water Quality Control Act*, municipal, industrial and other dischargers of wastewater must obtain a permit from the Division. Approximately 1,700 permits have been issued in Tennessee under the federally delegated National Pollutant Discharge Elimination System (NPDES). These permits establish pollution control and monitoring requirements based on protection of designated uses through implementation of water quality standards and other applicable state and federal rules.

The following three sections provide specific information on municipal, industrial, and water treatment plant active permit holders in the Barren River Watershed. Compliance information was obtained from EPA's Permit Compliance System (PCS). All data was queried for a five-year period between August 1, 2002 and July 31, 2007. PCS can be accessed publicly through EPA's Envirofacts website. This website provides access to several EPA databases to provide the public with information about environmental activities that may affect air, water, and land anywhere in the United States:

http://www.epa.gov/enviro/html/ef_overview.html

Stream Segment information, including designated uses and impairments, are described in detail in Chapter 3, *Water Quality Assessment of the Barren River Watershed.*

6.4.A. Municipal Permits

TN0067547 Red Boiling Springs STP

Discharger rating: Major
City: Red Boiling Springs
County: Macon
EFO Name: Cookeville
Issuance Date: 5/1/07
Expiration Date: 9/30/09
Receiving Stream(s): Salt Lick Creek at mile 15.7
HUC-12: 051100020501
Effluent Summary: Treated municipal wastewater from Outfall 001
Treatment system: Lagoon system

Segment	TN05110002027_0999
Name	Misc Tribs to Salt Lick Creek
Size	28.6
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Fish and Aquatic Life (Not Assessed), Recreation (Not Assessed), Irrigation (Not Assessed), Livestock Watering and Wildlife (Not Assessed)
Causes	N/A
Sources	N/A

Table 6-1. Stream Segment Information for Red Boiling Springs STP.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
48hr LC50: Ceriodaphnia Dubia	Summer	42	Percent	DMin Conc	Quarterly	Grab	Effluent
48hr LC50: Ceriodaphnia Dubia	Winter	83	Percent	DMin Conc	Quarterly	Grab	Effluent
48hr LC50: Fathead Minnows	Summer	42	Percent	DMin Conc	Quarterly	Grab	Effluent
48hr LC50: Fathead Minnows	Winter	83	Percent	DMin Conc	Quarterly	Grab	Effluent
Ammonia as N (Total)	All Year	10	mg/L	DMax Conc	Weekly	Grab	Effluent
Ammonia as N (Total)	All Year	27	lb/day	DMax Load	Weekly	Grab	Effluent
Ammonia as N (Total)	All Year	7	mg/L	MAvg Conc	Weekly	Grab	Effluent
Ammonia as N (Total)	All Year	25	lb/day	WAvg Load	Weekly	Grab	Effluent
Ammonia as N (Total)	All Year	19	lb/day	MAvg Load	Weekly	Grab	Effluent
Ammonia as N (Total)	All Year	9	mg/L	WAvg Conc	Weekly	Grab	Effluent
Bypass of Treatment (occurrences)	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Wet Weather
CBOD % Removal	All Year	65	Percent	MAvg % Removal	Weekly	Calculated	Percent Removal
CBOD5	All Year		mg/L	MAvg Conc	Weekly	Composite	Influent (Raw Sewage)
CBOD5	All Year	40	mg/L	MAvg Conc	Weekly	Grab	Effluent
CBOD5	All Year	109	lb/day	MAvg Load	Weekly	Grab	Effluent
CBOD5	All Year	50	mg/L	WAvg Conc	Weekly	Grab	Effluent

Table 6-2a.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
CBOD5	All Year	136	lb/day	WAvg Load	Weekly	Grab	Effluent
CBOD5	All Year		mg/L	DMax Conc	Weekly	Composite	Influent (Raw Sewage)
CBOD5	All Year	60	mg/L	DMax Conc	Weekly	Grab	Effluent
CBOD5	All Year	163	lb/day	DMax Load	Weekly	Grab	Effluent
D.O.	All Year	6	mg/L	DMin Conc	Weekdays	Grab	Effluent
E. coli	All Year	487	#/100mL	DMax Conc	Weekly	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Geo Mean	Weekly	Grab	Effluent
Flow	All Year		MGD	MAvg Load	Daily	Continuous	Effluent
Flow	All Year		MGD	MAvg Load	Daily	Continuous	Influent (Raw Sewage)
Flow	All Year		MGD	DMin Conc	Daily	Continuous	Instream Monitoring
Flow	All Year		MGD	DMax Load	Daily	Continuous	Influent (Raw Sewage)
Flow	All Year		MGD	DMax Load	Daily	Continuous	Effluent
Flow	All Year		MGD	MAvg Load	Daily	Continuous	Instream Monitoring
Overflow Use Occurrences	All Year		Occurrences/Month	MAvg Load	Continuous	Visual	Non Wet Weather
Overflow Use Occurrences	All Year		Occurrences/Month	MAvg Load	Continuous	Visual	Wet Weather
Settleable Solids	All Year	1	mL/L	DMax Conc	2/Week	Grab	Effluent
TRC	Summer	0.17	mg/L	DMax Conc	Weekdays	Grab	Effluent
TRC	Winter	0.1	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	120	mg/L	DMax Conc	Weekly	Grab	Effluent
TSS	All Year	325	lb/day	DMax Load	Weekly	Grab	Effluent
TSS	All Year	298	lb/day	WAvg Load	Weekly	Grab	Effluent
TSS	All Year	110	mg/L	WAvg Conc	Weekly	Grab	Effluent
TSS	All Year	271	lb/day	MAvg Load	Weekly	Grab	Effluent
TSS	All Year	100	mg/L	MAvg Conc	Weekly	Grab	Effluent
pH	All Year	9	SU	DMax Conc	Weekdays	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Weekdays	Grab	Effluent

Table 6-2b.

Tables 6-2a-b. Permit Limits for Red Boiling Springs STP.

Compliance History:
The following numbers of exceedences were noted in PCS:

2 Overflows
2 Bypasses
24 Dissolved Oxygen
7 pH
3 Ammonia
7 Total Chlorine
3 Carbonaceous Oxygen Demand
1 Escherichia coli
3 Biological Oxygen Demand
2 Total Suspended Solids

Enforcement:
3/19/07: Notice of Violation for non-compliant influent sampling.

6/19/07: Notice of Violation for failure to meet the reporting requirement as specified in their NPDES permit and as a notification that City of Red Boiling Springs will appear on the EPA Quarterly Non-Compliance Report

Comments:
The city STP is currently believed to be hydraulically overloaded with a high volume dilute wastewater discharge from the Nestle' Waters Corporation. The City is working with BWSC Engineering to improve operations at the STP. Dissolved Oxygen at the discharge is low. Dissolved Oxygen violations are occurring (largely due to poor past design). The effluent discharge is over a mile from the STP. Work has been performed at the plant (by the previous operator) without Division of WPC approval. Improved flow monitoring is needed in the Nestle' waste stream and in the STP discharge. Mixing of the waste streams prior to the stream discharge is being considered in order to prevent hydraulic loading in the primary lagoons at the plant. Stream flow monitoring and reporting needs improvement. The STP now has a new operator.

1/9/07: Pretreatment Compliance Inspection. Facility did not submit required monitoring reports.

3/19/07: Compliance Evaluation Inspection: Effluent D.O. problems persist. Design capacity is sometimes exceeded.

3/22/07: Pretreatment Technical Assistance Follow-Up Visit: It was observed that the main industrial user had a modification to their permit. Permit modification that reduces the frequency of self-monitoring is considered to be a "substantial modification," and must be approved by the Division

7/13/07: Pretreatment Technical Assistance Follow-Up Visit

- The City of Red Boiling Springs did not complete and did not submit the Industrial Waste Survey as required in the NPDES permit by June 1, 2007.

- The City submitted new local limits to the Division for approval. A new industrial user permit may not be issued until the local limits are approved. However, start working on developing a draft of the permit for Nestle and submit it for approval once the local limits are approved.

- The city is in a planning stage of wastewater plant alteration to handle hydraulic wastewater load from Nestle.

TN0024058 Hermitage Springs Elementary School

Discharger rating: Minor
City: Red Boiling Springs
County: Clay
EFO Name: Nashville
Issuance Date: 8/1/04
Expiration Date: 6/30/09
Receiving Stream(s): Trace Creek at mile 2.6
HUC-12: 051100020403
Effluent Summary: Treated domestic wastewater from Outfall 001
Treatment system: Extended aeration

Segment	TN05110002031_0300
Name	Trace Creek
Size	30
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Fish and Aquatic Life (Supporting), Livestock Watering and Wildlife (Supporting), Recreation (Supporting), Irrigation (Supporting)
Causes	N/A
Sources	N/A

Table 6-3. Stream Segment Information for Hermitage Springs Elementary School.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Ammonia as N (Total)	Summer	4	mg/L	DMax Conc	2/Month	Grab	Effluent
Ammonia as N (Total)	Summer	2	mg/L	MAvg Conc	2/Month	Grab	Effluent
Ammonia as N (Total)	Winter	10	mg/L	DMax Conc	2/Month	Grab	Effluent
Ammonia as N (Total)	Winter	5	mg/L	MAvg Conc	2/Month	Grab	Effluent
CBOD5	All Year	20	mg/L	DMax Conc	2/Month	Grab	Effluent
CBOD5	All Year	10	mg/L	MAvg Conc	2/Month	Grab	Effluent
D.O.	All Year	6	mg/L	DMin Conc	Weekdays	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Ari Mean	2/Month	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	2/Month	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Ari Mean	2/Month	Grab	Effluent
Flow	All Year		MGD	DMax Load	Weekdays	Instantaneous	Effluent
Flow	All Year		MGD	MAvg Load	Weekdays	Instantaneous	Effluent
Settleable Solids	All Year	1	mL/L	DMax Conc	2/Week	Grab	Effluent
TRC	All Year	0.5	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	2/Month	Grab	Effluent
TSS	All Year	30	mg/L	MAvg Conc	2/Month	Grab	Effluent
pH	All Year	9	SU	DMax Conc	2/Week	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	2/Week	Grab	Effluent

Table 6-4. Permit Limits for Hermitage Springs Elementary School.

Comments:
The school has an aging system. An in-ground steel package plant with a sand filter is operated during the school year. Additional air lines have been added to improve dissolved oxygen levels at discharge. The school itself is aging and is in an area where city sewer will not be available for many years.

11/30/05: Compliance Evaluation Inspection. The existing treatment works is operational. During the site visit, it was noted that the WWTP was well kept. The WWTP is intermittently violating the Dissolved Oxygen parameter. The school is to check the operation of the D.O. meter. In addition, installation of an air line from the blower line was requested by State personnel. The installation of the air line may increase the effluent D.O. levels. Sludge handling was also discussed. Sludge removal from the clarifier was recently performed. The school has improved the maintenance of the wastewater treatment works. Laboratory bench sheets are needed and calibration bench are needed.

TN0020877 Lafayette Sewage Treatment Plant

Discharger rating: Major
City: Lafayette
County: Macon
EFO Name: Cookeville
Issuance Date: 6/1/05
Expiration Date: 4/30/09
Receiving Stream(s): Town Creek at mile 1.3
HUC-12: 051100020502
Effluent Summary: Treated municipal wastewater from Outfall 001
Treatment system: WAS to aerobic digester to land application or dry beds

Segment	TN05110002027_0421
Name	Town Creek
Size	3.7
Unit	Miles
First Year on 303(d) List	1990
Designated Uses	Recreation (Non-Supporting), Irrigation (Supporting), Fish and Aquatic Life (Non-Supporting), Livestock Watering and Wildlife (Supporting)
Causes	Nitrates, Escherichia coli, Dissolved Oxygen, Ammonia (Un-ionized), Phosphate
Sources	Municipal Point Source Discharges, Municipal (Urbanized High Density Area)

Table 6-5. Stream Segment Information for Lafayette STP.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Ammonia as N (Total)	Summer	1.8	mg/L	DMax Conc	Weekdays	Composite	Effluent
Ammonia as N (Total)	Summer	0.9	mg/L	MAvg Conc	Weekdays	Composite	Effluent
Ammonia as N (Total)	Summer	11.7	lb/day	MAvg Load	Weekdays	Composite	Effluent
Ammonia as N (Total)	Summer	17.5	lb/day	WAvg Load	Weekdays	Composite	Effluent
Ammonia as N (Total)	Summer	1.4	mg/L	WAvg Conc	Weekdays	Composite	Effluent
Ammonia as N (Total)	Winter	2.8	mg/L	DMax Conc	Weekdays	Composite	Effluent
Ammonia as N (Total)	Winter	1.4	mg/L	MAvg Conc	Weekdays	Composite	Effluent
Ammonia as N (Total)	Winter	2.1	mg/L	WAvg Conc	Weekdays	Composite	Effluent
Ammonia as N (Total)	Winter	26.3	lb/day	WAvg Load	Weekdays	Composite	Effluent
Ammonia as N (Total)	Winter	17.5	lb/day	MAvg Load	Weekdays	Composite	Effluent
CBOD % Removal	All Year	40	Percent	DMin % Removal	Weekdays	Calculated	%Removal
CBOD % Removal	All Year	85	Percent	MAvg % Removal	Weekdays	Calculated	%Removal
CBOD5	Summer	14	mg/L	DMax Conc	Weekdays	Composite	Effluent
CBOD5	Summer		mg/L	MAvg Conc	Weekdays	Composite	Influent (Raw Sewage)
CBOD5	Summer	117	lb/day	MAvg Load	Weekdays	Composite	Effluent
CBOD5	Summer	9.4	mg/L	MAvg Conc	Weekdays	Composite	Effluent
CBOD5	Summer		mg/L	DMax Conc	Weekdays	Composite	Influent (Raw Sewage)
CBOD5	Summer	11.7	mg/L	WAvg Conc	Weekdays	Composite	Effluent
CBOD5	Summer	146	lb/day	WAvg Load	Weekdays	Composite	Effluent
CBOD5	Winter	20	mg/L	DMax Conc	Weekdays	Composite	Effluent
CBOD5	Winter		mg/L	DMax Conc	Weekdays	Composite	Influent (Raw Sewage)
CBOD5	Winter	146	lb/day	MAvg Load	Weekdays	Composite	Effluent
CBOD5	Winter	16.3	mg/L	WAvg Conc	Weekdays	Composite	Effluent
CBOD5	Winter		mg/L	MAvg Conc	Weekdays	Composite	Influent (Raw Sewage)
CBOD5	Winter	11.7	mg/L	MAvg Conc	Weekdays	Composite	Effluent
CBOD5	Winter	204	lb/day	WAvg Load	Weekdays	Composite	Effluent
Copper Total Recoverable	All Year	0.01	mg/L	MAvg Conc	Semi-annually	Composite	Effluent
Cyanide, Total (CN-)	All Year	0.005	mg/L	MAvg Conc	Semi-annually	Composite	Effluent
D.O.	All Year	6	mg/L	DMin Conc	Weekdays	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Geo Mean	Weekly	Grab	Effluent
E. coli	All Year	941	#/100mL	DMax Conc	3/Week	Grab	Effluent
Flow	All Year		MGD	DMax Load	Daily	Continuous	Effluent
Flow	All Year		MGD	MAvg Load	Daily	Continuous	Influent (Raw Sewage)
Flow	All Year		MGD	MAvg Load	Daily	Continuous	Effluent
Flow	All Year		MGD	DMax Load	Daily	Continuous	Influent (Raw Sewage)
IC25 7day Ceriodaphnia Dubia	All Year	100	Percent	DMin Conc	Quarterly	Composite	Effluent
IC25 7day Fathead Minnows	All Year	100	Percent	DMin Conc	Quarterly	Composite	Effluent
Lead Dissolved (as Pb)	All Year	0.003	mg/L	MAvg Conc	Semi-annually	Composite	Effluent
Nitrogen Total (as N)	Summer	5	mg/L	MAvg Conc	Weekly	Composite	Effluent
Nitrogen Total (as N)	Summer	86.3	mg/L	WAvg Load	Weekly	Composite	Effluent
Nitrogen Total (as N)	Summer	62.6	lb/day	MAvg Load	Weekly	Composite	Effluent
Nitrogen Total (as N)	Winter	5	mg/L	MAvg Conc	2/Month	Composite	Effluent
Nitrogen Total (as N)	Winter	6.9	mg/L	WAvg Conc	2/Month	Composite	Effluent
Nitrogen Total (as N)	Winter	86.3	mg/L	WAvg Load	2/Month	Composite	Effluent
Nitrogen Total (as N)	Winter	62.6	lb/day	MAvg Load	2/Month	Composite	Effluent
Phosphorus, Total	Summer	0.5	mg/L	MAvg Conc	Weekly	Composite	Effluent
Phosphorus, Total	Summer	6.2	lb/day	MAvg Load	Weekly	Composite	Effluent

Table 6-6a.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Nitrogen Total (as N)	Summer	6.9	mg/L	WAvg Conc	Weekly	Composite	Effluent
Phosphorus, Total	Summer	8.6	lb/day	WAvg Load	Weekly	Composite	Effluent
Phosphorus, Total	Summer	0.7	mg/L	WAvg Conc	Weekly	Composite	Effluent
Phosphorus, Total	Winter	0.5	mg/L	MAvg Conc	2/Month	Composite	Effluent
Phosphorus, Total	Winter	6.2	lb/day	MAvg Load	2/Month	Composite	Effluent
Phosphorus, Total	Winter	8.6	lb/day	WAvg Load	2/Month	Composite	Effluent
Phosphorus, Total	Winter	0.7	mg/L	WAvg Conc	2/Month	Composite	Effluent
Settleable Solids	All Year	1	mL/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	Weekdays	Composite	Effluent
TSS	All Year	30	mg/L	MAvg Conc	Weekdays	Composite	Effluent
TSS	All Year	175	lb/day	MAvg Load	Weekdays	Composite	Effluent
TSS	All Year	234	lb/day	WAvg Load	Weekdays	Composite	Effluent
TSS	All Year	40	mg/L	WAvg Conc	Weekdays	Composite	Effluent
TSS	Summer		mg/L	DMax Conc	Weekdays	Composite	Influent (Raw Sewage)
TSS	Summer		mg/L	MAvg Conc	Weekdays	Composite	Influent (Raw Sewage)
TSS	Winter		mg/L	DMax Conc	Weekdays	Composite	Influent (Raw Sewage)
TSS	Winter		mg/L	MAvg Conc	Weekdays	Composite	Influent (Raw Sewage)
TSS % Removal	All Year	40	Percent	DMin % Removal	Weekdays	Calculated	%Removal
TSS % Removal	All Year	85	Percent	MAvg % Removal	Weekdays	Calculated	%Removal
Zinc Dissolved (as Zn)	All Year	0.129	mg/L	DMax Conc	Semi-annually	Composite	Effluent
Zinc Dissolved (as Zn)	All Year	0.115	mg/L	MAvg Conc	Semi-annually	Composite	Effluent
pH	All Year	9	SU	DMax Conc	Weekdays	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	Weekdays	Grab	Effluent

Table 6-6b.

Tables 6-6a-b. Permit Limits for Lafayette STP.

Compliance History:
The following numbers of exceedences were noted in PCS:

51 Overflows
185 Bypasses
11 Total Suspended Solids
21 Ammonia
16 Fecal coliform
7 Total Nitrogen
7 Escerichia coli
14 Settleanble Solids
6 Suspended Solids % Removal
1 Copper
1 Dissolved Oxygen
1 Carbonaceous Oxygen Demand
1 Total Phosphorous

Enforcement:
Director's Order 06-138D was issued for effluent violations and for excessive overflows in the collection system.

Comments:
Since October 2004, Lafayette STP has been a major discharger with treatment capacity of 1.5 MGD. Effluent flow measurement is affected by turbulence. Ferric Chloride was used for chemical removal of phosphorus. The dosing was relatively high. Further investigation of the bench sheets and phosphorus analysis revealed incorrect units of measurement resulting in overdose. Lafayette now uses biological removal of phosphorus most of the time. In February 2005, a Performance Audit Inspection (PAI) was conducted to provide comprehensive guidance to resolve many deficiencies in the laboratory and in the QA/QC program. A formal Operation and Maintenance program along with a process control program have been established. In March 2006, compliance sampling inspection followed up the PAI. Split results were comparable. Ammonia comparability study is under way. Total nitrogen testing has been explained and procedures changed to capture all components of the test. The effluent quality and the laboratory performance have improved significantly. Sludge is dewatered using rotary press and hauled to Smith County Landfill.

4/10/06: Compliance Sampling Inspection: Total Nitrogen was defined as a sum of total Kjeldahl nitrogen (TKN) and nitrite plus nitrate. The laboratory has not included the TKN in the Total Nitrogen results.

11/3/06: Compliance Evaluation Inspection: *notes below*

Facility Review

The wastewater treatment plant was designed with a capacity of 1.5 MGD. The plant is inspected daily for operational or maintenance problems. Sludge is processed through a rotary press. The effluent from the rotary press has been piped to the influent Parshall flume. This resulted in metering and sampling the return sludge effluent along with the plant influent. The facility is in process of routing the press effluent flow to the digesters. The effluent was of low turbidity and did not cause an objectionable contrast with the receiving waters. Treatment basins from the old plan have been retrofitted for storm surge storage. New surge pump has been installed in July 2006.

Collection System

The City of Lafayette initiated a capacity evaluation of the sewer system. Several sewer rehabilitation and pump station upgrade projects are underway. The 2005 CDBG Sewer Rehabilitation Project involving diagnostics and point repairs is near completion. Several pump stations were observed during the inspection.

- Page Durham - under contract for major renovation and upgrade.
- Carter's - new wet well and new pump installed along with Force Main renovation.
- Cardinal Drive – Force Main has been upgraded to reduce friction head on the station reducing overflows at this location.
- North Central – coarse solids from the County Justice Center will be processed through a comminutor prior to discharge reducing the pump wear and tear as well as potential for malfunction.

TN0064939 Westside School STP

Discharger rating: Minor
City: Westmoreland
County: Macon
EFO Name: Cookeville
Issuance Date: 4/1/04
Expiration Date: 2/27/09
Receiving Stream(s): Mile 0.15 of a ditch to mile 6.9 of the West Fork of Long Creek
HUC-12: 051100020408
Effluent Summary: Treated domestic wastewater from Outfall 001
Treatment system: Septic tank, recirculating sand filter followed by ultraviolet disinfection

Segment	TN05110002024_0300
Name	West Fork Long Creek
Size	10.1
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Recreation (Supporting), Irrigation (Supporting), Fish and Aquatic Life (Supporting), Livestock Watering and Wildlife (Supporting)
Causes	N/A
Sources	N/A

Table 6-7. Stream Segment Information for Westside School STP.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Ammonia as N (Total)	Summer	2.4	mg/L	DMax Conc	Monthly	Grab	Effluent
Ammonia as N (Total)	Summer	1.2	mg/L	MAvg Conc	Monthly	Grab	Effluent
Ammonia as N (Total)	Winter	3.6	mg/L	DMax Conc	Monthly	Grab	Effluent
Ammonia as N (Total)	Winter	1.8	mg/L	MAvg Conc	Monthly	Grab	Effluent
CBOD5	All Year	40	mg/L	DMax Conc	Monthly	Grab	Effluent
CBOD5	All Year	25	mg/L	MAvg Conc	Monthly	Grab	Effluent
D.O.	All Year	1	mg/L	DMin Conc	Weekdays	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Geo Mean	Monthly	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	Monthly	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Geo Mean	Monthly	Grab	Effluent
Settleable Solids	All Year	1	mL/L	DMax Conc	2/Week	Grab	Effluent
TRC	All Year	0.02	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	Monthly	Grab	Effluent
TSS	All Year	30	mg/L	MAvg Conc	Monthly	Grab	Effluent
pH	All Year	8.5	SU	DMax Conc	2/Week	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	2/Week	Grab	Effluent

Table 6-8. Permit Limits for Westside School STP.

Comments:
The school has a re-circulating sand filter with ultraviolet light. The effluent discharge is very small. The disinfection unit does not always appear very dependable. City sewer is not going to be available for several years.

TN0058670 Highland Academy

Discharger rating: Minor
City: Portland
County: Sumner
EFO Name: Nashville
Issuance Date: 10/1/04
Expiration Date: 8/31/09
Receiving Stream(s): Unnamed tributary at mile 2.7 to West Fork Drakes Creek at mile 48.1
HUC-12: 051100020101
Effluent Summary: Treated domestic wastewater from Outfall 001
Treatment system: Extended aeration

Segment	TN05110002008_0500
Name	Unnamed Trib to West Fork Drakes Creek
Size	7.7
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Recreation (Not Assessed), Irrigation (Supporting), Fish and Aquatic Life (Supporting), Livestock Watering and Wildlife (Supporting)
Causes	N/A
Sources	N/A

Table 6-9. Stream Segment Information for Highland Academy.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Ammonia as N (Total)	All Year	1.5	mg/L	DMax Conc	2/Month	Grab	Effluent
Ammonia as N (Total)	All Year	1	mg/L	MAvg Conc	2/Month	Grab	Effluent
CBOD5	All Year	30	mg/L	DMax Conc	2/Month	Grab	Effluent
CBOD5	All Year	20	mg/L	MAvg Conc	2/Month	Grab	Effluent
D.O.	All Year	6	mg/L	DMin Conc	Weekdays	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Geo Mean	2/Month	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	2/Month	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Geo Mean	2/Month	Grab	Effluent
Flow	All Year		MGD	DMax Load	Weekdays	Instantaneous	Effluent
Flow	All Year		MGD	MAvg Load	Weekdays	Instantaneous	Effluent
Settleable Solids	All Year	1	mL/L	DMax Conc	2/Week	Grab	Effluent
TRC	All Year	0.02	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	40	mg/L	DMax Conc	2/Month	Grab	Effluent
TSS	All Year	30	mg/L	MAvg Conc	2/Month	Grab	Effluent
pH	All Year	9	SU	DMax Conc	2/Week	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	2/Week	Grab	Effluent

Table 6-10. Permit Limits for Highland Academy.

Comments:
None

TN0029254 Highland Manor Nursing Home

Discharger rating: Minor
City: Portland
County: Sumner
EFO Name: Nashville
Issuance Date: 11/1/04
Expiration Date: 9/30/09
Receiving Stream(s): Unnamed tributary at mile 3.2 to West Fork Drakes Creek at mile 50.0
HUC-12: 051100020101
Effluent Summary: Treated domestic wastewater from Outfall 001
Treatment system: Extended aeration

Segment	TN05110002008_0500
Name	Unnamed Trib to West Fork Drakes Creek
Size	7.7
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Recreation (Not Assessed), Irrigation (Supporting), Fish and Aquatic Life (Supporting), Livestock Watering and Wildlife (Supporting)
Causes	N/A
Sources	N/A

Table 6-11. Stream Segment Information for Highland Academy.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Ammonia as N (Total)	Summer	1.65	mg/L	DMax Conc	2/Month	Grab	Effluent
Ammonia as N (Total)	Summer	1.1	mg/L	MAvg Conc	2/Month	Grab	Effluent
Ammonia as N (Total)	Winter	2.7	mg/L	DMax Conc	2/Month	Grab	Effluent
Ammonia as N (Total)	Winter	1.8	mg/L	MAvg Conc	2/Month	Grab	Effluent
CBOD5	All Year	37.5	mg/L	DMax Conc	2/Month	Grab	Effluent
CBOD5	All Year	25	mg/L	MAvg Conc	2/Month	Grab	Effluent
D.O.	All Year	5	mg/L	DMin Conc	Weekdays	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Ari Mean	2/Month	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Ari Mean	2/Month	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	MAvg Geo Mean	2/Month	Grab	Effluent
Flow	All Year		MGD	DMax Load	Weekdays	Instantaneous	Effluent
Flow	All Year		MGD	MAvg Load	Weekdays	Instantaneous	Effluent
Settleable Solids	All Year	1	mg/L	DMax Conc	2/Week	Grab	Effluent
TRC	All Year	0.02	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	40	mg/L	DMax Conc	2/Month	Grab	Effluent
TSS	All Year	30	mg/L	MAvg Conc	2/Month	Grab	Effluent
pH	All Year	9	SU	DMax Conc	2/Week	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	2/Week	Grab	Effluent

Table 6-12. Permit Limits for Highland Academy.

Enforcement:

9/14/07 Notice of Violation sent for failure to maintain the treatment plant and the consequent discharge of partially treated wastewater.

Comments (TN0029254 Highland Manor Nursing Home)*:*
8/27/07 Compliance Evaluation Inspection: Not in compliance.
Comments:

1. The treatment plant is a conventional built-in-place extended aeration type plant including a comminutor, aeration basin, clarifier, sand filters, and chlorine contact tank. Disinfection is by chlorine tablets, and dechlorination is by sodium sulfite tablets. In 1996, an existing underground storage tank was converted for use as an influent surge tank. A perimeter security fence encloses the plant and an onsite utility building, which houses the sand filters, pumps, and piping. The operator said that the collection system grease trap is pumped about every two weeks by Griffin Company, and the influent surge tank is pumped every month by Owen Company. The operator said that the surge tank collects a lot of rags and other debris.

2. The treatment plant has received some repairs since the previous inspection; the aeration basin piping and the grating over the basins have been replaced. However, other parts of the plant remain unchanged or have deteriorated further. Clumps of sludge were floating on the water surface of the clarifier; the operator explained that this was due to the air lift sludge pump being clogged, which he cleared during this inspection. The two steel tank effluent sand filters continue to be inoperable due to being clogged with rust for years. The aerated digester had not been used in years because mixed liquor from the aeration basin leaks into the digester filling it up. The effluent in the chlorine contact tank (CCT) was turbid and gray in color; settled sludge in the CCT was denitrifying and producing gas bubbles. Small trees were growing out of the concrete block partitions in the CCT; the operator said that when he removed some of the trees, that part of the partition collapsed. The operator said that he pumps sludge from the CCT to a separate small holding basin where he has a septic tank hauler empty the basin about once per month. Periodically he has sludge pumped out of the clarifier.

3. The outfall was difficult to access because of the dense vegetation; a pathway should be maintained to facilitate regular inspection by the operator. The collapsed portion of the outfall pipe described in the previous inspection report had been repaired. The outfall sign has fallen; it should be cleaned and put up again. The receiving stream pooled below the outfall pipe was black with settled sludge, although the effluent being discharged at this time appeared clear despite its gray appearance in the CCT. The streambed downstream of the pool appeared clear. The settled sludge in the pool should be removed to prevent it being washed downstream.

4. Review of the MOR/DMRs received since the last CEI have reported generally good compliance with the effluent limits. However, it was evident from the receiving stream appearance that the plant has not been consistent or reliable in meeting its permit effluent limits; the operator should consider ways to make his sampling more representative of the effluent typically being discharged. It is also noted that the operator has not been performing the analysis for *E. coli* as specified in the current permit; he has continued to perform the analysis for Fecal coliform as was required in the previous permit but is not required by the current permit. The operator should be furnished with a copy of the current permit for his use.

TN0055026 Westmoreland STP

Discharger rating: Minor
City: Westmoreland
County: Sumner
EFO Name: Nashville
Issuance Date: 4/1/06
Expiration Date: 2/28/09
Receiving Stream(s): Little Trammel Creek at mile 9.9
HUC-12: 051100020802
Effluent Summary: Treated municipal wastewater from Outfall 001
Treatment system: Extended aeration plant with an oxidation ditch followed by sedimentation in clarifiers and then chlorination

Segment	TN05110002010_0500
Name	Little Trammel Creek
Size	11
Unit	Miles
First Year on 303(d) List	2004
Designated Uses	Recreation (Non-Supporting), Irrigation (Supporting), Fish and Aquatic Life (Non-Supporting), Livestock Watering and Wildlife (Supporting)
Causes	Nitrates, Phosphate
Sources	Municipal Point Source Discharges

Table 6-13. Stream Segment Information for Westmoreland STP.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Ammonia as N (Total)	Summer	1.5	mg/L	DMax Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	2.8	lb/day	WAvg Load	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	1.1	mg/L	WAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	1.8	lb/day	MAvg Load	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	0.7	mg/L	MAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	2.1	mg/L	DMax Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	1.6	mg/L	WAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	4	lb/day	WAvg Load	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	1.1	mg/L	MAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	2.7	lb/day	MAvg Load	3/Week	Composite	Effluent
Bypass of Treatment (occurrences)	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Wet Weather
CBOD % Removal	All Year	40	Percent	DMin % Removal	3/Week	Calculated	% Removal
CBOD % Removal	All Year	85	Percent	MAvg % Removal	3/Week	Calculated	% Removal
CBOD5	Summer	13.3	mg/L	DMax Conc	3/Week	Composite	Effluent
CBOD5	Summer	6.8	mg/L	MAvg Conc	3/Week	Composite	Effluent
CBOD5	Summer	25	lb/day	WAvg Load	3/Week	Composite	Effluent
CBOD5	Summer		mg/L	DMax Conc	3/Week	Composite	Influent (Raw Sewage)
CBOD5	Summer		mg/L	MAvg Conc	3/Week	Composite	Influent (Raw Sewage)
CBOD5	Summer	10	mg/L	WAvg Conc	3/Week	Composite	Effluent
CBOD5	Summer	17	lb/day	MAvg Load	3/Week	Composite	Effluent
CBOD5	Winter	17.8	mg/L	DMax Conc	3/Week	Composite	Effluent
CBOD5	Winter	42	lb/day	MAvg Load	3/Week	Composite	Effluent
CBOD5	Winter		mg/L	DMax Conc	3/Week	Composite	Influent (Raw Sewage)
CBOD5	Winter		mg/L	MAvg Conc	3/Week	Composite	Influent (Raw Sewage)
CBOD5	Winter	23.2	mg/L	WAvg Conc	3/Week	Composite	Effluent
CBOD5	Winter	58	lb/day	WAvg Load	3/Week	Composite	Effluent
CBOD5	Winter	16.8	mg/L	MAvg Conc	3/Week	Composite	Effluent
D.O.	All Year	6	mg/L	DMin Conc	Weekdays	Grab	Effluent
E. coli	All Year	941	#/100mL	DMax Conc	3/Week	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Geo Mean	3/Week	Grab	Effluent
IC25 7day Ceriodaphnia Dubia	All Year	100	Percent	DMin Conc	Quarterly	Composite	Effluent
IC25 7day Fathead Minnows	All Year	100	Percent	DMin Conc	Quarterly	Composite	Effluent
Nitrogen Total (as N)	Summer		mg/L	MAvg Conc	2/Month	Composite	Effluent
Nitrogen Total (as N)	Summer		mg/L	DMax Conc	2/Month	Composite	Effluent
Overflow Use Occurences	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Wet Weather
Overflow Use Occurences	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Non Wet Weather
Phosphorus Total	Summer		mg/L	MAvg Conc	2/Month	Composite	Effluent
Phosphorus Total	Summer		mg/L	DMax Conc	2/Month	Composite	Effluent
Settleable Solids	All Year	1	mL/L	DMax Conc	Weekdays	Grab	Effluent

Table 6-14a.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
TRC	All Year	0.02	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	3/Week	Composite	Effluent
TSS	All Year	40	mg/L	WAvg Conc	3/Week	Composite	Effluent
TSS	All Year	50	lb/day	MAvg Load	3/Week	Composite	Effluent
TSS	All Year		mg/L	DMax Conc	3/Week	Composite	Influent (Raw Sewage)
TSS	All Year		mg/L	MAvg Conc	3/Week	Composite	Influent (Raw Sewage)
TSS	All Year	30	mg/L	MAvg Conc	3/Week	Composite	Effluent
TSS	All Year	68	lb/day	WAvg Load	3/Week	Composite	Effluent
TSS % Removal	All Year	40	Percent	DMin % Removal	3/Week	Calculated	% Removal
TSS % Removal	All Year	85	Percent	MAvg % Removal	3/Week	Calculated	% Removal
pH	All Year	8.5	SU	DMax Conc	Weekdays	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	Weekdays	Grab	Effluent

Table 6-14b.

Tables 6-14a-b. Permit Limits for Westmoreland STP.

Compliance History:
The following numbers of exceedences were noted in PCS:
4 Ammonia
1 Fecal Coliform
1 pH
1 Total Chlorine
1 Carbonaceous Biological Oxygen Demand

Comments:
3/6/07 Compliance Evaluation Inspection: Problems with recordkeeping, some Operations & Maintenance needed, new generator not installed yet - will be there in 2 weeks, effluent flow meter inaccurate & cannot be calibrated (needs replacement); 2 pump stations within collection system are privately owned, haven't been taken over by the city, & don't have State Operating Permit coverage, 1 is inadequate and has to be pumped out by city once a week.