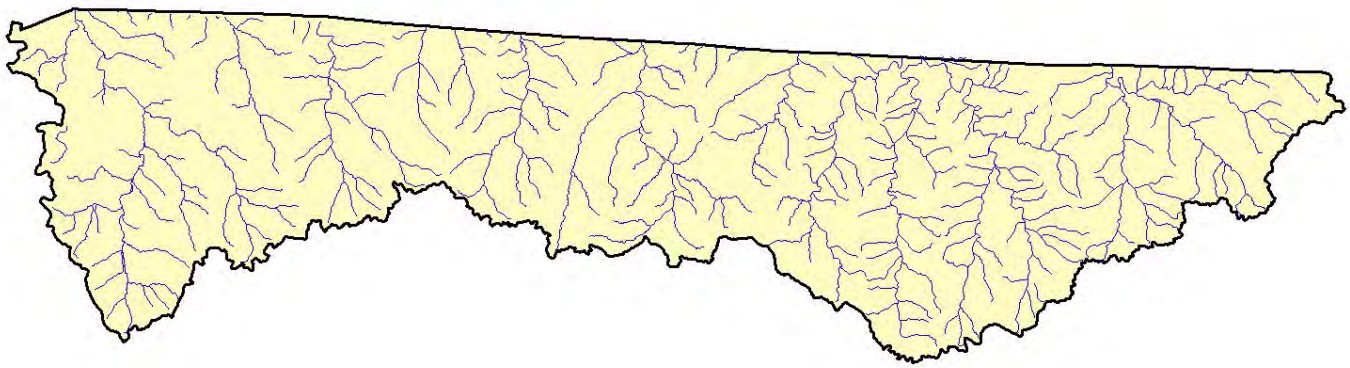
BARREN RIVER WATERSHED (05110002) OF THE OHIO RIVER BASIN

WATERSHED WATER QUALITY MANAGEMENT PLAN



TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER POLLUTION CONTROL
WATERSHED MANAGEMENT SECTION

Presented to the people of the Barren River Watershed by the Division of Water Pollution Control October 16, 2007.

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BARREN RIVER WATERSHED
WATER QUALITY MANAGEMENT PLAN

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GLOSSARY

1Q20. The lowest average 1 consecutive days flow with average recurrence frequency of once every 20 years.

30Q2. The lowest average 3 consecutive days flow with average recurrence frequency of once every 2 years.

7Q10. The lowest average 7 consecutive days flow with average recurrence frequency of once every 10 years.

303(d). The section of the federal Clean Water Act that requires a listing by states, territories, and authorized tribes of impaired waters, which do not meet the water quality standards that states, territories, and authorized tribes have set for them, even after point sources of pollution have installed the minimum required levels of pollution control technology.

305(b). The section of the federal Clean Water Act that requires EPA to assemble and submit a report to Congress on the condition of all water bodies across the Country as determined by a biennial collection of data and other information by States and Tribes.

AFO. Animal Feeding Operation.

Ambient Sites. Those sites established for long term instream monitoring of water quality.

ARAP. Aquatic Resource Alteration Permit.

Assessment. The result of an analysis of how well streams meet the water quality criteria assigned to them.

Bankfull Discharge. The momentary maximum peak flow before a stream overflows its banks onto a floodplain.

Basin. An area that drains several smaller watersheds to a common point. Most watersheds in Tennessee are part of the Cumberland, Mississippi, or Tennessee Basin (The Conasauga River and Barren River Watersheds are the exceptions).

Benthic. Bottom dwelling.

Biorecon. A qualitative multihabitat assessment of benthic macroinvertebrates that allows rapid screening of a large number of sites. A Biorecon is one tool used to recognize stream impairment as judged by species richness measures, emphasizing the presence or absence of indicator organisms without regard to relative abundance.

BMP. An engineered structure or management activity, or combination of these, that eliminates or reduces an adverse environmental effect of a pollutant.

BOD. Biochemical Oxygen Demand. A measure of the amount of oxygen consumed in the biological processes that break down organic and inorganic matter.

CAFO. Concentrated Animal Feeding Operation.

Designated Uses. The part of Water Quality Standards that describes the uses of surface waters assigned by the Water Quality Control Board. All streams in Tennessee are designated for Recreation, Fish and Aquatic Life, Irrigation, and Livestock Watering and Wildlife. Additional designated uses for some, but not all, waters are Drinking Water Supply, Industrial Water Supply, and Navigation.

DMR. Discharge Monitoring Report. A report that must be submitted periodically to the Division of Water Pollution Control by NPDES permitees.

DO. Dissolved oxygen.

EPA. Environmental Protection Agency. The EPA Region 4 web site is http://www.epa.gov/region4/

Field Parameter. Determinations of water quality measurements and values made in the field using a kit or probe. Common field parameters include pH, DO, temperature, conductivity, and flow.

Fluvial Geomorphology. The physical characteristics of moving water and adjoining landforms, and the processes by which each affects the other.

HUC-8. The 8-digit Hydrologic Unit Code corresponding to one of 54 watersheds in Tennessee.

HUC-10. The 10-digit NRCS Hydrologic Unit Code. HUC-10 corresponds to a smaller land area than HUC-8.

HUC-12. The 12-digit NRCS Hydrologic Unit Code. HUC-12 corresponds to a smaller land area than HUC-10.

MRLC. Multi-Resolution Land Classification.

MS4. Municipal Separate Storm Sewer System.

Nonpoint Source (NPS). Sources of water pollution without a single point of origin. Nonpoint sources of pollution are generally associated with surface runoff, which may carry sediment, chemicals, nutrients, pathogens, and toxic materials into receiving waterbodies. Section 319 of the Clean Water Act of 1987 requires all states to assess the impact of nonpoint source pollution on the waters of the state and to develop a program to abate this impact.

NPDES. National Pollutant Discharge Elimination System. Section 402 of the Clean Water Act of 1987 requires dischargers to waters of the U.S. to obtain NPDES permits.

NRCS. Natural Resources Conservation Service. NRCS is part of the federal Department of Agriculture. The NRCS home page is http://www.nrcs.usda.gov

Point Source. Any discernable, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural storm water discharges and return flows from irrigated agriculture (Clean Water Act Section 502(14)).

Q Design. The average daily flow that a treatment plant or other facility is designed to accommodate.

Reference Stream (Reference Site). A stream (site) judged to be least impacted. Data from reference streams are used for comparisons with similar streams.

SBR. Sequential Batch Reactor.

Stakeholder. Any person or organization affected by the water quality or by any watershed management activity within a watershed.

STATSGO. State Soil Geographic Database. STATSGO is compiled and maintained by the Natural Resources Conservation Service.

STORET. The EPA repository for water quality data that is used by state environmental agencies, EPA and other federal agencies, universities, and private citizens. STORET (Storage and Retrieval of National Water Quality Data System) data can be accessed at http://www.epa.gov/storet/

TDA. Tennessee Department of Agriculture. The TDA web address is http://www.state.tn.us/agriculture

TDEC. Tennessee Department of Environment and Conservation. The TDEC web address is http://www.tdec.net

TMDL. Total Maximum Daily Load. A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of the amount to the pollutant's sources. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources. The calculation includes a margin of safety to ensure that the waterbody can be used for the purposes the State has designated. The calculation must also account for seasonal variation in water quality. A TMDL is required for each pollutant in an impaired stream as described in Section 303 of the Federal Clean Water Act of 1987. Updates and information on Tennessee's TMDLs can be found at http://www.tdec.net/wpc/tmdl/

TMSP. Tennessee Multi-Sector Permit.

USGS. United States Geological Survey. USGS is part of the federal Department of the Interior. The USGS home page is http://www.usgs.gov/.

WAS. Waste Activated Sludge.

Water Quality Standards. A triad of designated uses, water quality criteria, and antidegradation statement. Water Quality Standards are established by Tennessee and approved by EPA.

Watershed. A geographic area which drains to a common outlet, such as a point on a larger stream, lake, underlying aquifer, estuary, wetland, or ocean.

WET. Whole Effluent Toxicity.

WWTP. Waste Water Treatment Plant

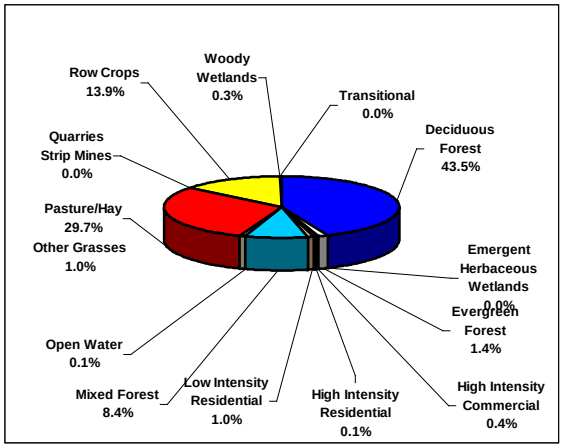
Summary – Barren River Watershed (05110002)

In 1996, the Tennessee Department of Environment and Conservation Division of Water Pollution Control adopted a watershed approach to water quality. This approach is based on the idea that many water quality problems, like the accumulation of point and nonpoint pollutants, are best addressed at the watershed level. Focusing on the whole watershed helps reach the best balance among efforts to control point sources of pollution and polluted runoff as well as protect drinking water sources and sensitive natural resources such as wetlands. Tennessee has chosen to use the USGS 8-digit Hydrologic Unit Code (HUC-8) as the organizing unit.

The Watershed Approach recognizes awareness that restoring and maintaining our waters requires crossing traditional barriers (point *vs.* nonpoint sources of pollution) when designing solutions. These solutions increasingly rely on participation by both public and private sectors, where citizens, elected officials, and technical personnel all have opportunities to participate. The Watershed Approach provides the framework for a watershed-based and community-based approach to address water quality problems.

Chapter 1 of the Barren River Watershed Water Quality Management Plan discusses the Watershed Approach and emphasizes that the Watershed Approach is not a regulatory program or an EPA mandate; rather it is a decision-making process that reflects a common strategy for information collection and analysis as well as a common understanding of the roles, priorities, and responsibilities of all stakeholders within a watershed. Traditional activities like permitting, planning and monitoring are also coordinated in the Watershed Approach.

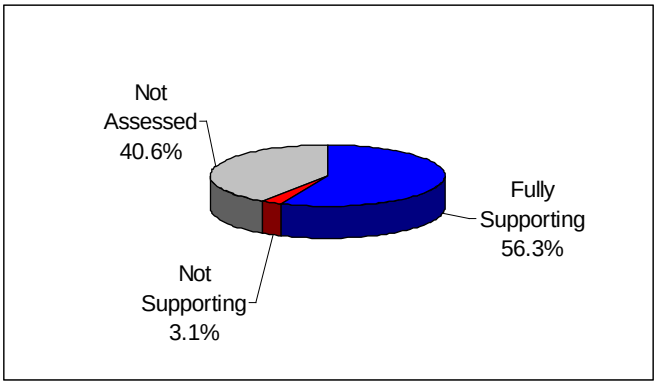
A detailed description of the watershed can be found in Chapter 2. The Barren River Watershed is approximately 1,661 square miles (432 mi^2 in Tennessee) and includes parts of three Tennessee counties. A part of the Ohio River drainage basin, the watershed has 563.2 stream miles and 45 lake acres in Tennessee.



Land Use Distribution in the Tennessee Portion of the Barren River Watershed.

Twelve rare plant and animal species have been documented in the watershed, including seven rare fish species and one rare snail species.

A review of water quality sampling and assessment is presented in Chapter 3. Using the Watershed Approach to Water Quality, 201 sampling events occurred in the Barren River Watershed in 2000-2005. These were conducted at ambient, ecoregion or watershed monitoring sites. Monitoring results support the conclusion that 94.7% of stream miles and 100% of lake acres assessed fully support one or more designated uses.



Water Quality Assessment of Streams and Rivers in the Tennessee Portion of the Barren River Watershed. Assessment data are based on the 2004 Water Quality Assessment of 563.2 stream miles in the watershed.

Also in Chapter 3, a series of maps illustrate overall use support in the watershed, as well as use support for the individual uses of Fish and Aquatic Life Support, Recreation, Irrigation, and Livestock Watering and Wildlife. Another series of maps illustrate streams that are listed for impairment by specific causes (organic enrichment).

Point and Nonpoint Sources are addressed in Chapter 4. Chapter 4 is organized by HUC-12 subwatersheds. Maps illustrating the locations of STORET monitoring sites and stream gauging stations are also presented in each subwatershed.

HUC-10	HUC-12
0511000201	051100020101 (Upper West Fork)
	051100020102 (Lower West Fork
0511000204	051100020403 (Treeline Creek)
	051100020404 (Barren River)
	051100020405 (Puncheon Creek)
	051100020406 (Pinchgut Creek)
	051100020407 (Long Hungry Creek)
	051100020408 (Long Creek)
0511000205	051100020501 (Salt Lick Creek)
	051100020502 (Long Fork)
0511000208	051100020801 (Trammel Creek)
	051100020802 (Little Trammel Creek)
0511000209	051100020901 (Middle Fork)
	051100020902 (Sulfur Fork)

The Tennessee Portion of the Barren River Watershed is Composed of fourteen USGS-Delineated Subwatersheds (12-Digit Subwatersheds).

Point source contributions to the Tennessee portion of the Barren River Watershed consist of eight individual NPDES-permitted facilities, three of which discharge into streams that have been listed on the 2004 303(d) list. Other point source permits in the watershed (as of October 16, 2007) are Tennessee Multi-Sector Permits (12), Concentrated Animal Feeding Operation Permits (10), Aquatic Resource Alteration Permits (8), Ready Mix Concrete Plant Permits (3), and Water Treatment Plant Permits (1). Agricultural operations include cattle, chicken, hog, and sheep farming. Maps illustrating the locations of permit sites and tables summarizing livestock practices are presented in each subwatershed.

Chapter 5 is entitled *Water Quality Partnerships in the Barren River Watershed* and highlights partnerships between agencies and between agencies and landowners that are essential to success. Programs of federal agencies (Natural Resources Conservation Service, U.S. Fish and Wildlife Service, and U.S. Geological), and state agencies (TDEC/State Revolving Fund, TDEC Division of Water Supply, Tennessee Department of Agriculture, and Kentucky Division of Water) are summarized. Local initiatives of organizations active in the watershed (Central Basin RC&D Council, The Nature Conservancy, and Hull-York Lakeland RC&D Council) are also described.

Point and Nonpoint source approaches to water quality problems in the Barren River Watershed are addressed in Chapter 6. Chapter 6 also includes comments received during public meetings, links to EPA-approved TMDLs in the watershed, and an assessment of needs for the watershed.

The full Barren River Watershed Water Quality Management Plan can be found at: http://www.state.tn.us/environment/wpc/watershed/wsmplans/

CHAPTER 1

WATERSHED APPROACH TO WATER QUALITY

1.1 BACKGROUND. The Division of Water Pollution Control is responsible for administration of the Tennessee Water Quality Control Act of 1977 (TCA 69–3–101). Information about the Division of Water Pollution Control, updates and announcements, may be found at http://www.state.tn.us/environment/wpc/index.html, and a summary of the organization of the Division of Water Pollution Control may be found in Appendix I.

> The mission of the Division of Water Pollution Control is to abate existing pollution of the waters of Tennessee, to reclaim polluted waters, to prevent the future pollution of the waters, and to plan for the future use of the waters so that the water resources of Tennessee might be used and enjoyed to the fullest extent consistent with the maintenance of unpolluted waters.

The Division monitors, analyzes, and reports on the quality of Tennessee's water. In order to perform these tasks more effectively, the Division adopted a Watershed Approach to Water Quality in 1996.

This Chapter summarizes TDEC's Watershed Approach to Water Quality.

1.2 WATERSHED APPROACH TO WATER QUALITY. The Watershed Approach to Water Quality is a coordinating framework designed to protect and restore aquatic systems and protect human health more effectively (EPA841-R-95-003). The Approach is based on the concept that many water quality problems, like the accumulation of pollutants or nonpoint source pollution, are best addressed at the watershed level. In addition, a watershed focus helps identify the most cost-effective pollution control strategies to meet clean water goals. Tennessee's Watershed Approach, updates and public participation opportunities, may be found on the web at http://www.state.tn.us/environment/wpc/wshed1.htm.

Watersheds are appropriate as organizational units because they are readily identifiable landscape units with readily identifiable boundaries that integrate terrestrial, aquatic, and geologic processes. Focusing on the whole watershed helps reach the best balance among efforts to control point source pollution and polluted runoff as well as protect drinking water sources and sensitive natural resources such as wetlands (EPA-840-R-98-001).

Four main features are typical of the Watershed Approach: 1) Identifying and prioritizing water quality problems in the watershed, 2) Developing increased public involvement, 3) Coordinating activities with other agencies, and 4) Measuring success through increased and more efficient monitoring and other data gathering.

Typically, the Watershed Approach meets the following description (EPA841-R-95-003):

- Features watersheds or basins as the basic management units
- Targets priority subwatersheds for management action
- Addresses all significant point and nonpoint sources of pollution
- Addresses all significant pollutants
- Sets clear and achievable goals
- Involves the local citizenry in all stages of the program
- Uses the resources and expertise of multiple agencies
- Is not limited by any single agency's responsibilities
- Considers public health issues

An additional characteristic of the Watershed Approach is that it complements other environmental activities. This allows for close cooperation with other state agencies and local governments as well as with federal agencies such as the Tennessee Valley Authority and the U.S. Army Corps of Engineers, U.S. Department of Agriculture (*e.g.*, Natural Resources Conservation Service, United States Forest Service), U.S. Department of the Interior (*e.g.* United States Geological Survey, U.S. Fish and Wildlife Service, National Park Service). When all permitted dischargers are considered together, agencies are better able to focus on those controls necessary to produce measurable improvements in water quality. This also results in a more efficient process: It encourages agencies to focus staff and financial resources on prioritized geographic locations and makes it easier to coordinate between agencies and individuals with an interest in solving water quality problems (EPA841-R-003).

The Watershed Approach is not a regulatory program or a new EPA mandate; rather it is a decision making process that reflects a common strategy for information collection and analysis as well as a common understanding of the roles, priorities, and responsibilities of all stakeholders within a watershed. The Watershed Approach utilizes features already in state and federal law, including:

- Water Quality Standards
- National Pollutant Discharge Elimination System (NPDES)
- Total Maximum Daily Loads (TMDLs)
- Clean Lakes Program
- Nonpoint Source Program
- Groundwater Protection

Traditional activities like permitting, planning, and monitoring are also coordinated in the Watershed Approach. A significant change from the past, however, is that the Watershed Approach encourages integration of traditional regulatory (point source pollution) and nonregulatory (nonpoint sources of pollution) programs. There are additional changes from the past as well:

THE PAST	WATERSHED APPROACH
Focus on fixed-station ambient monitoring	Focus on comprehensive watershed monitoring
Focus on pollutant discharge sites	Focus on watershed-wide effects
Focus on WPC programs	Focus on coordination and cooperation
Focus on point sources of pollution	Focus on all sources of pollution
Focus on dischargers as the problem	Focus on dischargers as an integral part of the solution
Focus on short-term problems	Focus on long-term solutions

Table 1-1. Contrast Between the Watershed Approach and the Past.

This approach places greater emphasis on all aspects of water quality, including chemical water quality (conventional pollutants, toxic pollutants), physical water quality (temperature, flow), habitat quality (channel morphology, composition and health of benthic communities), and biodiversity (species abundance, species richness).

1.2.A. Components of the Watershed Approach. Tennessee is composed of fifty-five watersheds corresponding to the 8-digit USGS Hydrologic Unit Codes (HUC-8). These watersheds, which serve as geographic management units, are combined in five groups according to year of implementation.

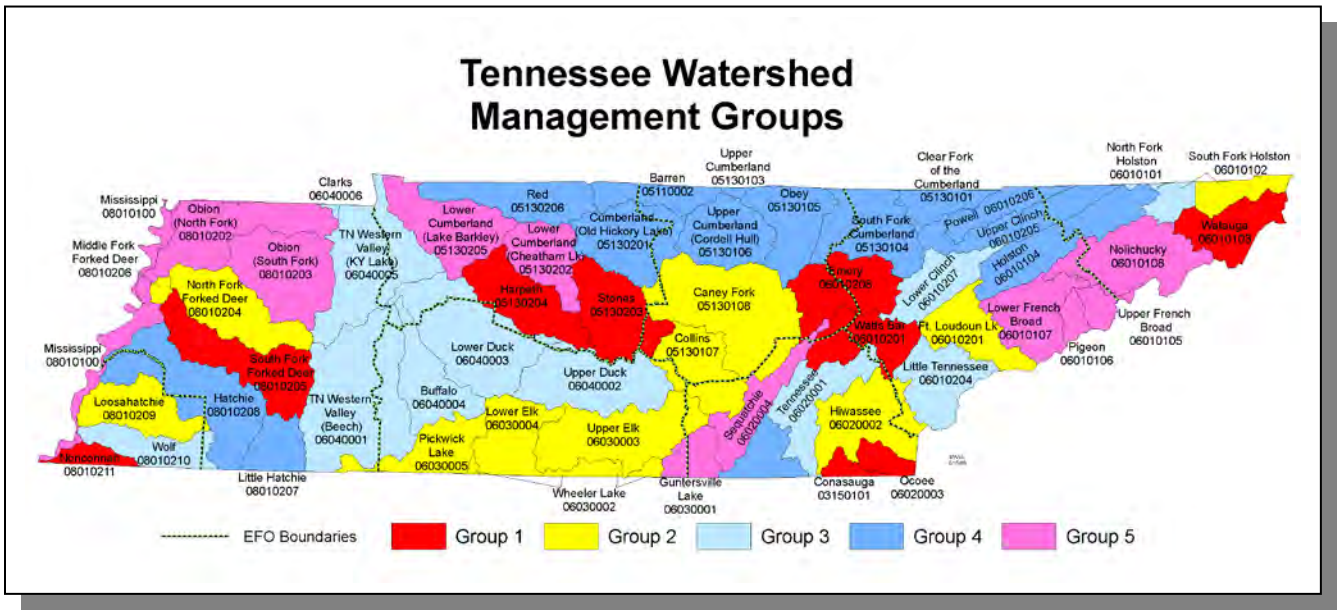


Figure 1-1. Watershed Groups in Tennessee's Watershed Approach to Water Quality.

Each year, TDEC conducts monitoring in one-fifth of Tennessee's watersheds; assessment, priority setting and follow-up monitoring are conducted in another one fifth of watersheds; modeling and TMDL studies in another one fifth; developing management plans in another one fifth; and implementing management plans in another one fifth of watersheds.

GROUP	WEST TENNESSEE	MIDDLE TENNESSEE	EAST TENNESSEE
1	Nonconnah South Fork Forked Deer	Harpeth Stones	Conasauga Emory Ocoee Watauga Watts Bar
2	Loosahatchie Middle Fork Forked Deer North Fork Forked Deer	Caney Fork Collins Lower Elk Pickwick Lake Upper Elk Wheeler Lake	Fort Loudoun Hiwassee South Fork Holston (Upper) Wheeler Lake
3	Tennessee Western Valley (Beech River) Tennessee Western Valley (KY Lake) Wolf River	Buffalo Lower Duck Upper Duck	Little Tennessee Lower Clinch North Fork Holston South Fork Holston (Lower) Tennessee (Upper)
4	Lower Hatchie Upper Hatchie	Barren Obey Red Upper Cumberland (Cordell Hull Lake) Upper Cumberland (Old Hickory Lake) Upper Cumberland (Cumberland Lake)	Holston Powell South Fork Cumberland Tennessee (Lower) Upper Clinch Upper Cumberland (Clear Fork)
5	Mississippi North Fork Obion South Fork Obion	Guntersville Lake Lower Cumberland (Cheatham Lake) Lower Cumberland (Lake Barkley)	Lower French Broad Nolichucky Pigeon Upper French Broad

Table 1-2. Watershed Groups in Tennessee's Watershed Approach.

In succeeding years of the cycle, efforts rotate among the watershed groups. The activities in the five year cycle provide a reference for all stakeholders.

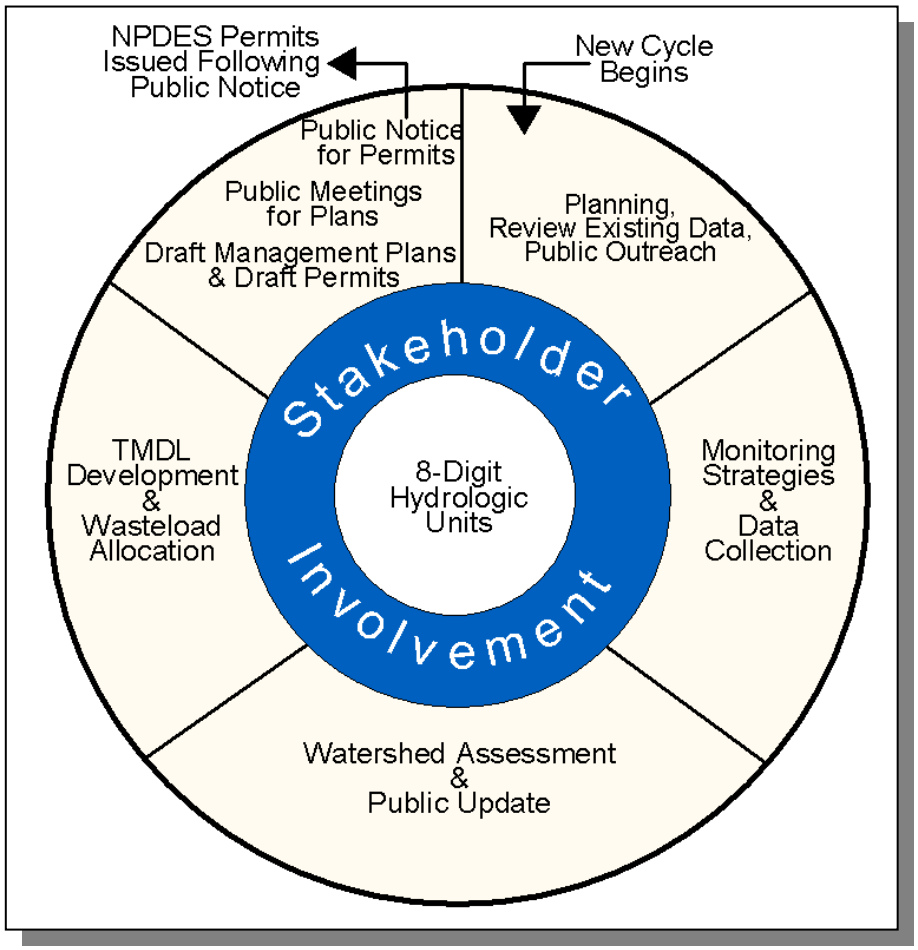


Figure 1-2. The Watershed Approach Cycle.

The six key activities that take place during the cycle are:

1. Planning and Existing Data Review. Existing data and reports from appropriate agencies and organizations are compiled and used to describe the current conditions and status of rivers and streams. Reviewing all existing data and comparing agencies' work plans guide the development of an effective monitoring strategy.

2. Monitoring. Field data is collected for streams in the watershed. These data supplement existing data and are used for the water quality assessment.

3. Assessment. Monitoring data are used to determine the status of the stream's designated use supports.

4. Wasteload Allocation/TMDL Development. Monitoring data are used to determine nonpoint source contributions and pollutant loads for permitted dischargers releasing wastewater to the watershed. Limits are set to assure that water quality is protected.

5. Permits. Issuance and expiration of all discharge permits are synchronized based on watersheds. Currently, 1700 permits have been issued in Tennessee under the federally delegated National Pollutant Discharge Elimination System (NPDES).

6. Watershed Management Plans. These plans include information for each watershed including general watershed description, water quality goals, major water quality concerns and issues, and management strategies.

Public participation opportunities occur throughout the entire five year cycle. Participation in Years 1, 3 and 5 is emphasized, although additional meetings are held at stakeholder's request. People tend to participate more readily and actively in protecting the quality of waters in areas where they live and work, and have some roles and responsibilities:

- Data sharing
- Identification of water quality stressors
- Participation in public meetings
- Commenting on management plans
- Shared commitment for plan implementation

1.2.B. Benefits of the Watershed Approach. The Watershed Approach fosters a better understanding of the physical, chemical and biological effects on a watershed, thereby allowing agencies and citizens to focus on those solutions most likely to be effective. The Approach recognizes the need for a comprehensive, ecosystem-based approach that depends on local governments and local citizens for success (EPA841-R-95-004). On a larger scale, many lessons integrating public participation with aquatic ecosystem-based programs have been learned in the successful Chesapeake Bay, Great Lakes, Clean Lakes, and National Estuary Programs.

Benefits of the Watershed Approach include (EPA841-R-95-004):

- Focus on water quality goals and ecological integrity rather than on program activities such as number of permits issued.

- Improve basis for management decisions through consideration of both point and nonpoint source stressors. A watershed strategy improves the scientific basis for decision making and focuses management efforts on basins and watersheds where they are most needed. Both point and nonpoint control strategies are more effective under a watershed approach because the Approach promotes timely and focused development of TMDLs.

- Enhance program efficiency, as the focus becomes watershed. A watershed focus can improve the efficiency of water management programs by facilitating consolidation of programs within each watershed. For example, handling all point source dischargers in a watershed at the same time reduces administrative costs due to the potential to combine hearings and notices as well as allowing staff to focus on more limited areas in a sequential fashion.

- Improve coordination between federal, state and local agencies including data sharing and pooling of resources. As the focus shifts to watersheds, agencies are better able to participate in data sharing and coordinated assessment and control strategies.

- Increase public involvement. The Watershed Approach provides opportunities for stakeholders to increase their awareness of water-related issues and inform staff about their knowledge of the watershed. Participation is via three public meetings over the five-year watershed management cycle as well as meetings at stakeholder's request. Additional opportunities are provided through the Department of Environment and Conservation homepage and direct contact with local Environmental Assistance Centers.

- Greater consistency and responsiveness. Developing goals and management plans for a basin or watershed with stakeholder involvement results in increased responsiveness to the public and consistency in determining management actions. In return, stakeholders can expect improved consistency and continuity in decisions when management actions follow a watershed plan.

Additional benefits of working at the watershed level are described in the Clean Water Action Plan (EPA-840-R-98-001), and can be viewed at http://www.cleanwater.gov/action/toc.html.

The Watershed Approach represents awareness that restoring and maintaining our waters requires crossing traditional barriers (point *vs.* nonpoint sources of pollution) when designing solutions. These solutions increasingly rely on participation by both public and private sectors, where citizens, elected officials and technical personnel all have opportunity to participate. This integrated approach mirrors the complicated relationships in which people live, work and recreate in the watershed, and suggests a comprehensive, watershed-based and community-based approach is needed to address these (EPA841-R-97-005).

CHAPTER 2

DESCRIPTION OF THE BARREN RIVER WATERSHED

2.1. BACKGROUND. The Barren River and Watershed are named for the Barrens, the meadowlands that are predominant in the watershed. The Barren River Watershed appears to be in the Cumberland River Basin, but it is not. Water in the watershed flows to the Green River, then to the Ohio River.

This Chapter describes the location and characteristics of the Barren River Watershed.

2.2. DESCRIPTION OF THE WATERSHED.

2.2.A. General Location. The Barren River Watershed is located in Middle Tennessee and includes parts of Clay, Macon, and Sumner Counties.

Figure 2-1. General Location of the Barren River Watershed.

COUNTY	% OF WATERSHED IN EACH COUNTY
Macon	50.2
Sumner	37.4
Clay	12.4

Table 2-1. The Barren River Watershed Includes Parts of Three Middle Tennessee Counties.

2.2.B. Population Density Centers. Nine highways serve the major communities in the Tennessee portion of the Barren River Watershed.

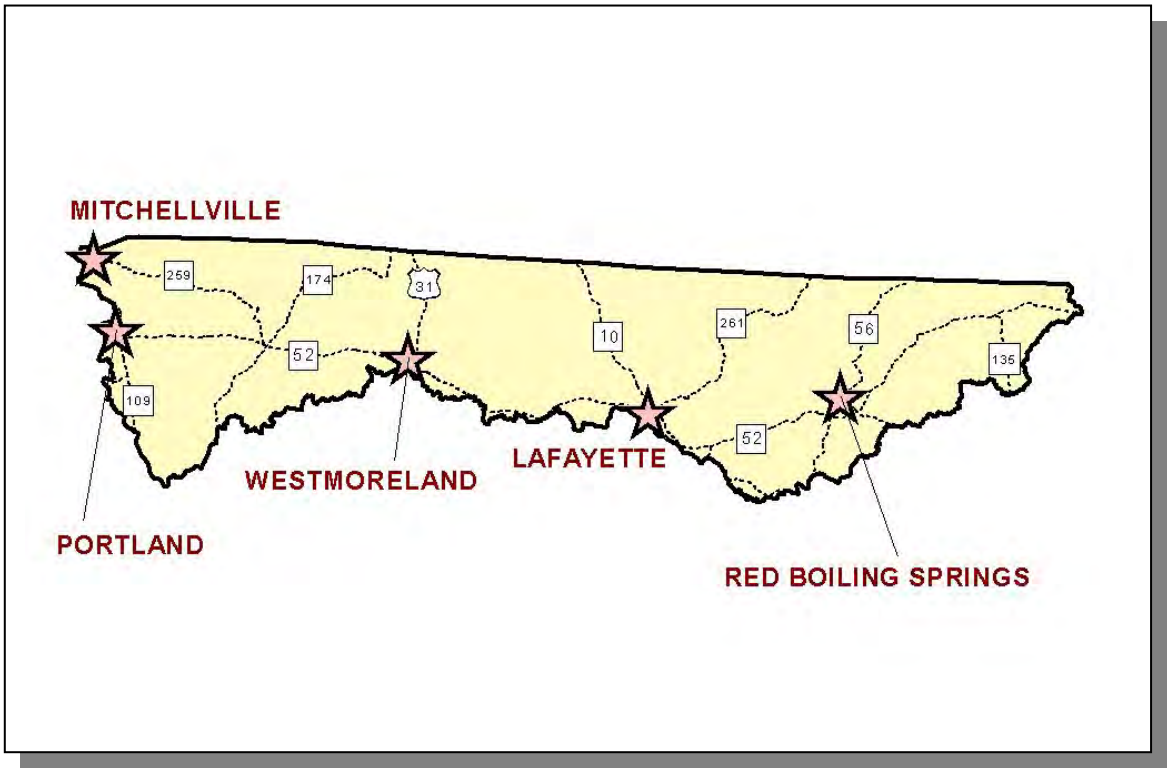


Figure 2-2. Communities and Roads in the Tennessee Portion of the Barren River Watershed.

MUNICIPALITY	POPULATION	COUNTY
Portland	8,462	Sumner
Westmoreland	2,093	Sumner
Red Boiling Springs	1,023	Macon
Mitchelville	207	Sumner
Lafayette*	136	Macon

Table 2-2. Municipalities in the Tennessee Portion of the Barren River Watershed. *Population based on 2000 census (Tennessee Blue Book) or http://www.hometownlocator.com. Asterisk (*) indicates county seat.*

2.3. GENERAL HYDROLOGIC DESCRIPTION.

2.3.A. Hydrology. The Barren River Watershed, designated 05110002 by the USGS, is approximately 1,661 square miles (432 square miles in Tennessee) and drains to the Green River.

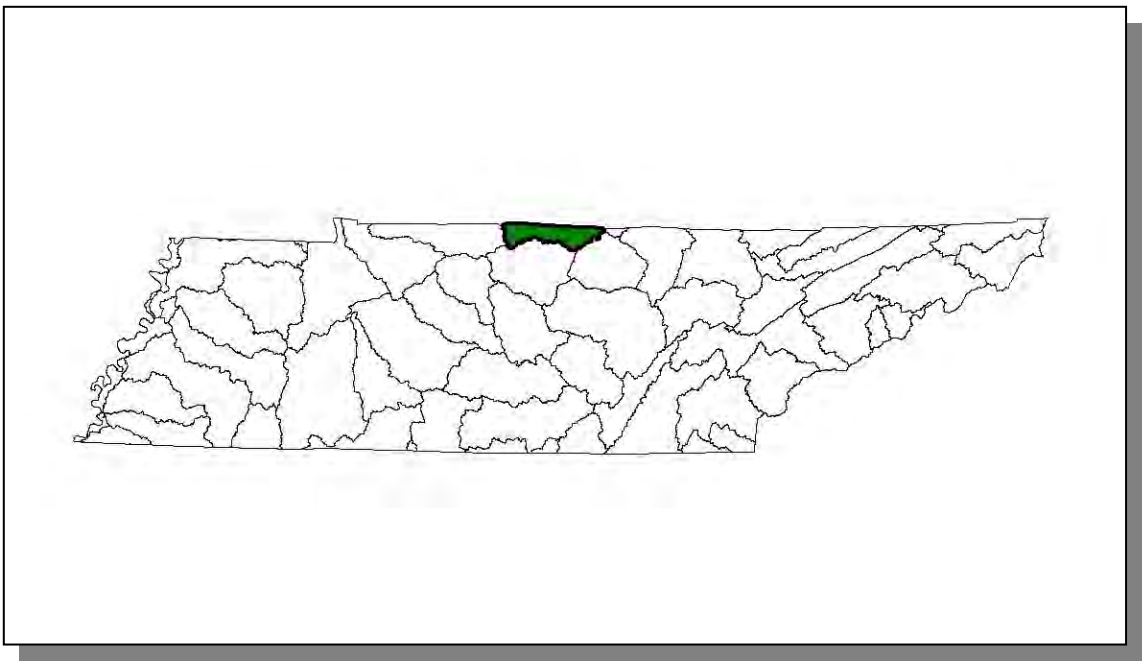


Figure 2-3. The Barren River Watershed is Part of the Green River Drainage in Kentucky; it is not Part of the Cumberland River Basin.

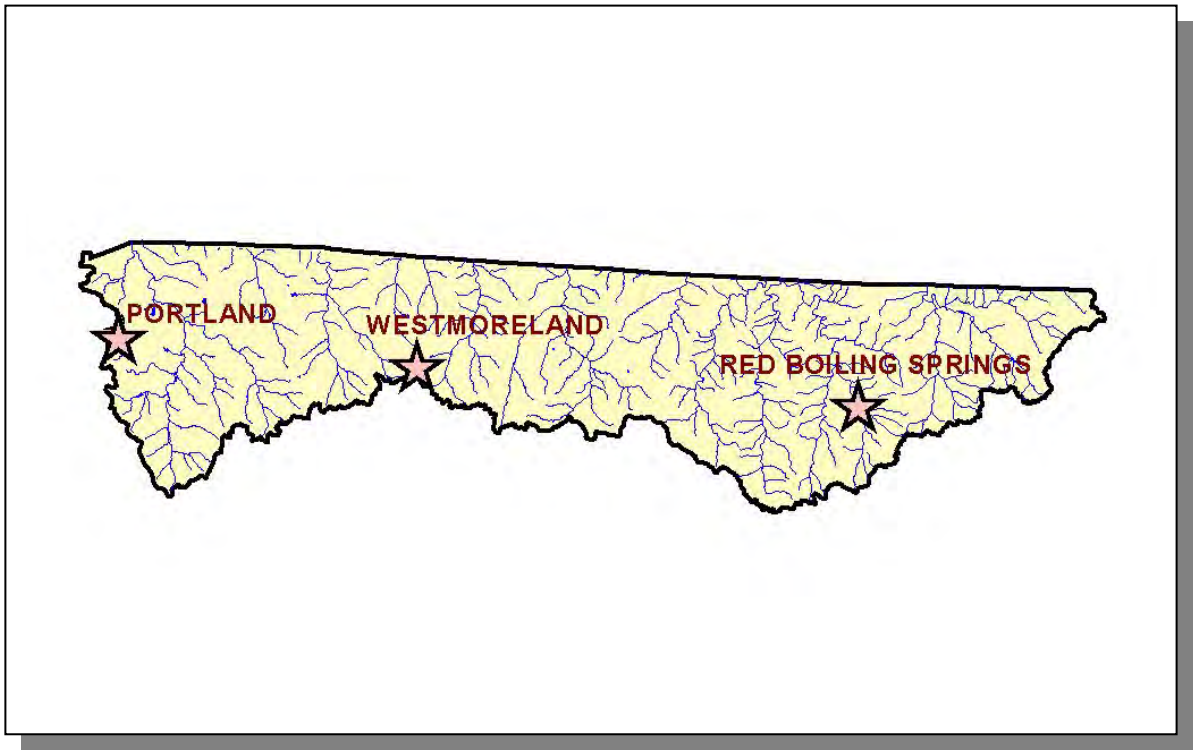


Figure 2-4. Hydrology in the Tennessee Portion of the Barren River Watershed. *There are 563.2 stream miles and 45 lake acres recorded in River Reach File 3 in the Tennessee portion of the Barren River Watershed. Location of Portland, Red Boiling Springs, and Westmoreland are shown for reference.*

2.3.B. Dams. There are 12 dams inventoried by TDEC Division of Water Supply in the Tennessee portion of the Barren River Watershed. These dams either retain 30 acre-feet of water or have structures at least 20 feet high.

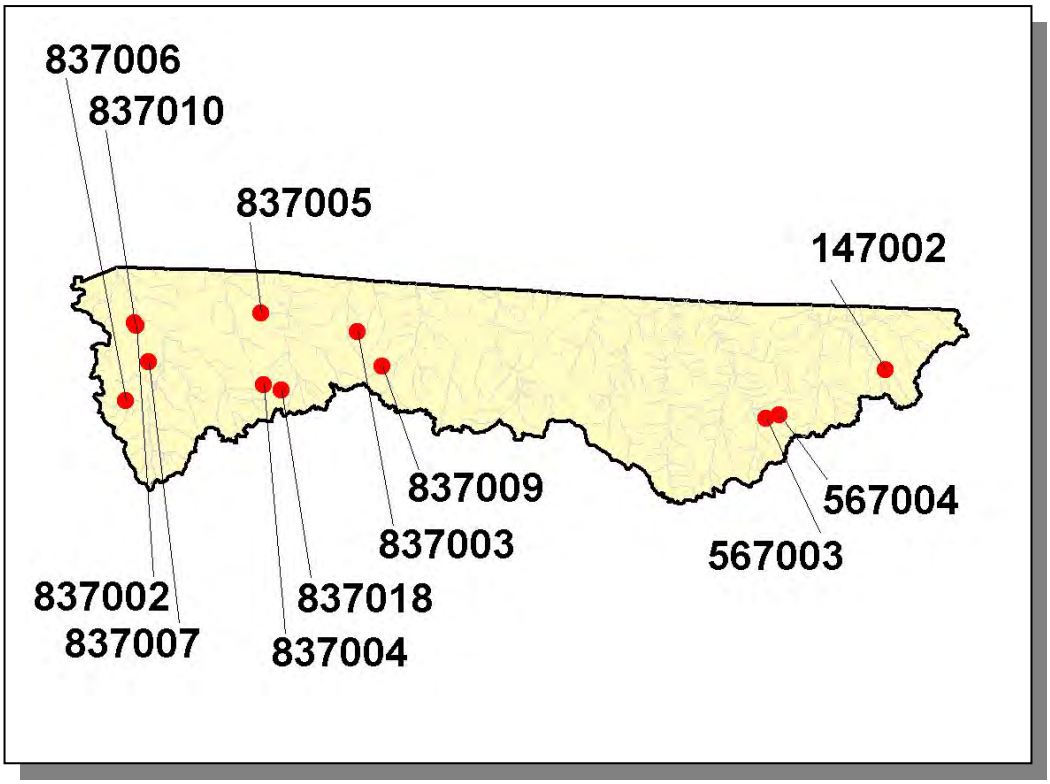


Figure 2-5. Location of Inventoried Dams in the Tennessee Portion of the Barren River Watershed. *More information, including identification of inventoried dams labeled, is provided in Appendix II and at http://gwidc.memphis.edu/website/dams/viewer.htm.*

2.4. LAND USE. Land Use/Land Cover information was provided by EPA Region 4 and was interpreted from 1992 Multi-Resolution Land Cover (MRLC) satellite imagery.

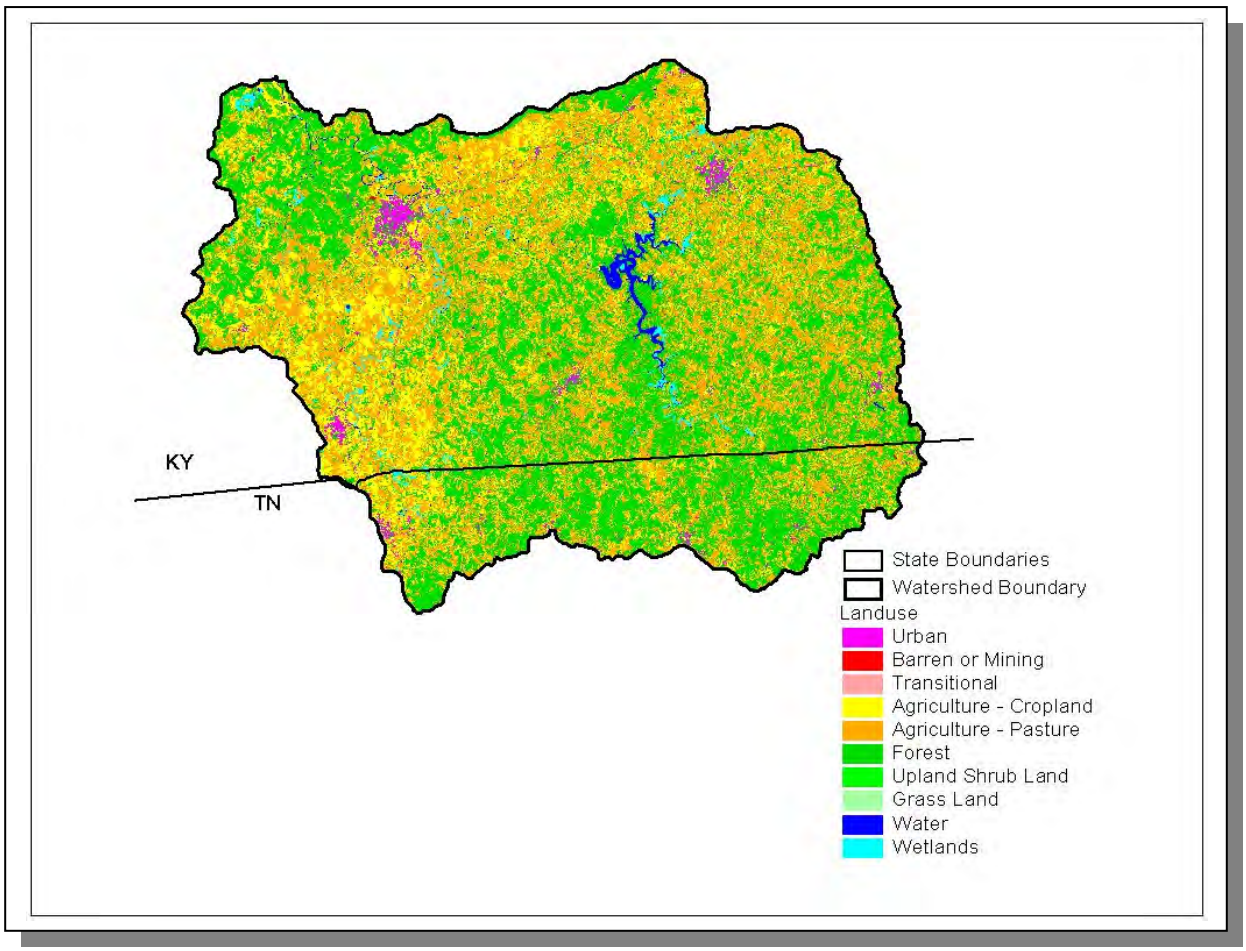


Figure 2-6. Illustration of Select Land Cover/Land Use Data from MRLC Satellite Imagery.

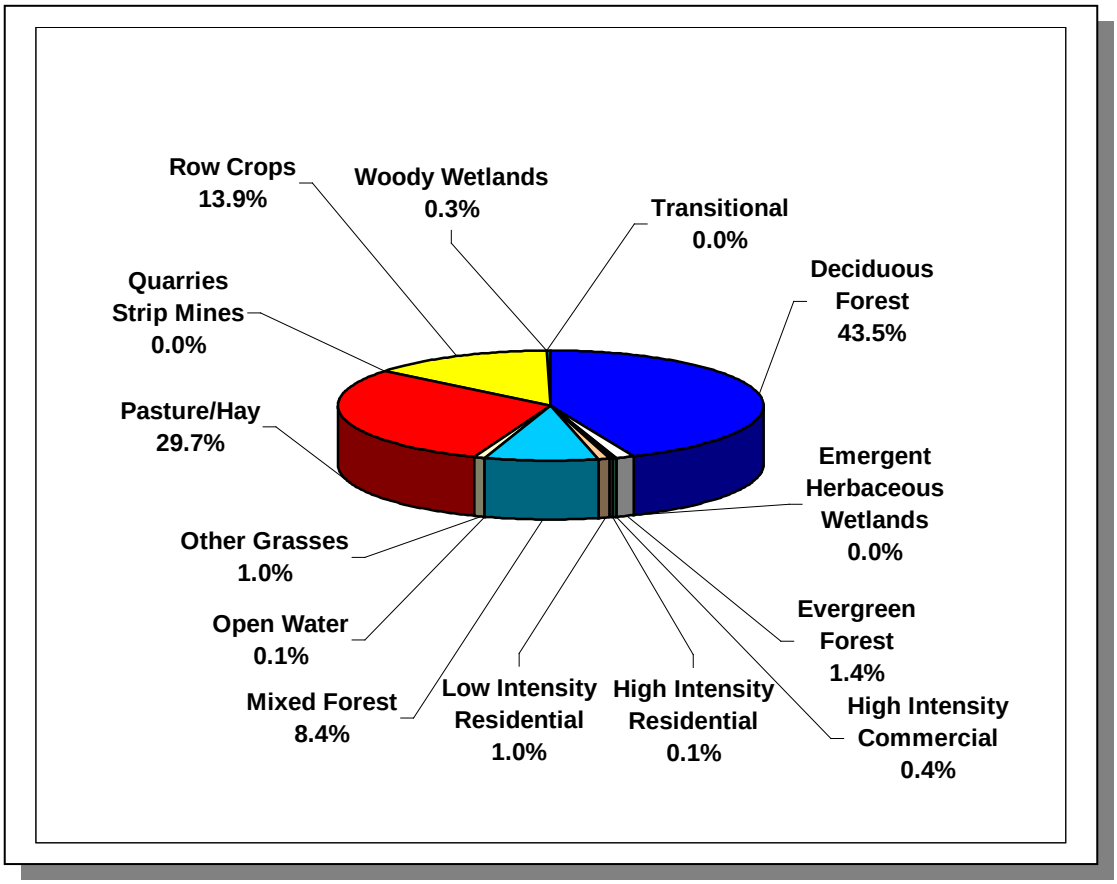


Figure 2-7. Land Use Distribution in the Tennessee Portion of the Barren River Watershed.
More information is provided in Appendix II.

Sinkholes, springs, disappearing streams and caves characterize karst topography. The term “karst” describes a distinctive landform that indicates dissolution of underlying soluble rocks by surface water or ground water. Although commonly associated with limestone and dolomite (carbonate rocks), other highly soluble rocks such as gypsum and rock salt can be sculpted into karst terrain. In karst areas, the ground water flows through solution-enlarged channels, bedding planes and microfractures within the rock. The characteristic landforms of karst regions are: closed depressions of various size and arrangement; disrupted surface drainage; and caves and underground drainage systems. The term “karst” is named after a famous region in the former country of Yugoslavia.

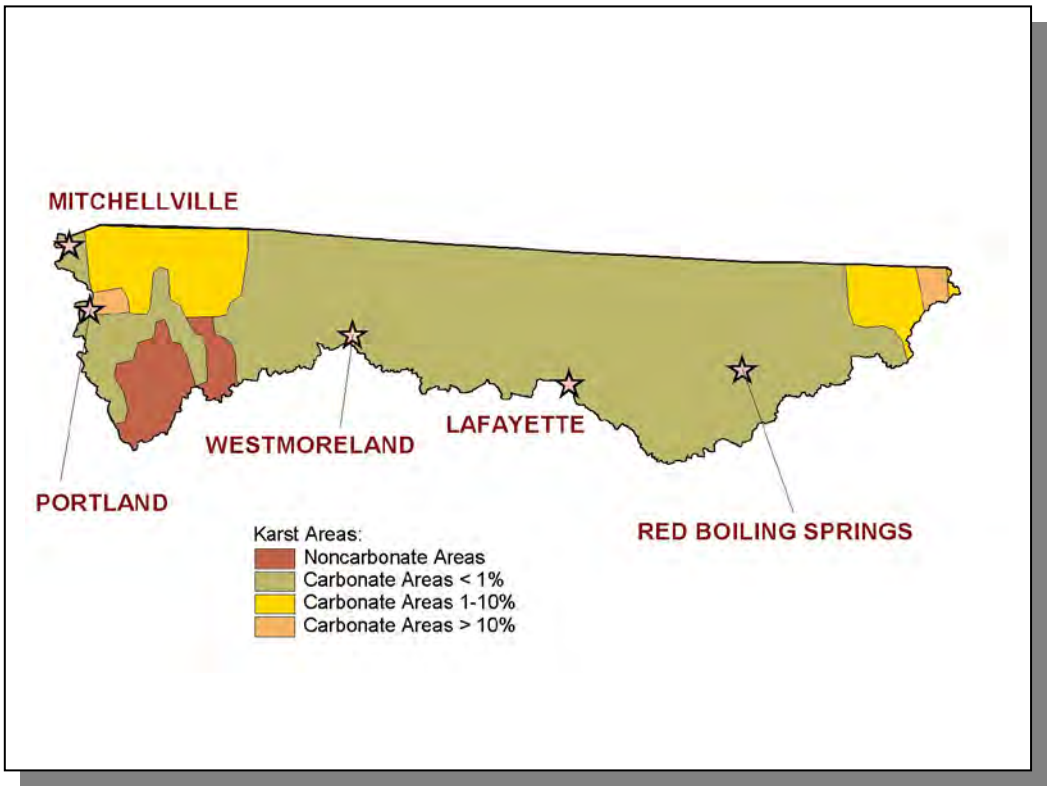


Figure 2-8. Illustration of Karst Areas in the Tennessee Portion of the Barren River Watershed. *Locations of communities in the watershed are shown for reference.*

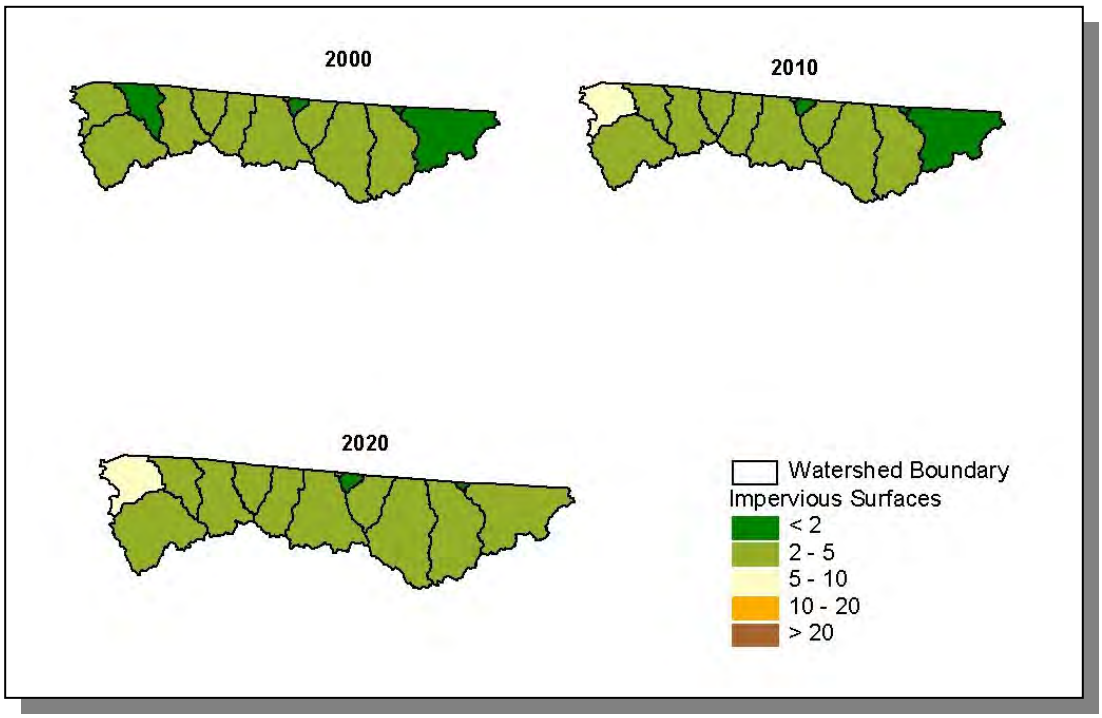


Figure 2-9. Illustration of Total Impervious Area in the Tennessee Portion of the Barren River Watershed. *All HUC-12 subwatersheds are shown. Current and projected total impervious cover (percent of total area) is provided by EPA Region 4. More information can be found at: http://www.epa.gov/ATHENS/research/impervious/*

2.5. ECOREGIONS AND REFERENCE STREAMS. Ecoregions are relatively homogeneous areas of similar geography, topography, climate and soils that support similar plant and animal life. Ecoregions serve as a spatial framework for the assessment, management, and monitoring of ecosystems and ecosystem components. Ecoregion studies can aid the selection of regional stream reference sites, identifying high quality waters, and developing ecoregion-specific chemical and biological water quality criteria.

There are eight Level III Ecoregions and twenty-five Level IV subecoregions in Tennessee. The Tennessee portion of the Barren River Watershed lies within 1 Level III ecoregion (Interior Plateau) and contains 3 Level IV subecoregions:

- The **Western Pennyroyal Karst (71e)** is a flatter area of irregular plains, with fewer perennial streams, compared to the open hills of the Western Highland Rim (71f). Small sinkholes and depressions are common. The productive soils of this notable agricultural area are formed mostly from a thin loess mantle over residuum of Mississippian-age limestones. Most of the region is cultivated or in pasture; tobacco and livestock are the principal agricultural products, with some corn, soybeans, and small grains. The natural vegetation consisted of oak-hickory forest with mosaics of bluestem prairie. The barrens of Kentucky that extended south into Stewart, Montgomery, and Robertson counties, were once some of the largest natural grasslands in Tennessee.

- The **Eastern Highland Rim (71g)** has level terrain, with landforms characterized as tablelands of moderate relief and irregular plains. Mississippian-age limestone, chert, shale, and dolomite predominate, and karst terrain sinkholes and depressions are especially noticeable between Sparta and McMinnville. Numerous springs and spring-associated fish fauna also typify the region. Natural vegetation for the region is transitional between the oak-hickory type to the west and the mixed mesophytic forests of the Appalachian ecoregions (68, 69) to the east. Bottomland hardwood forest has been inundated by several large impoundments. Barrens and former prairie areas are now mostly oak thickets or pasture and cropland.

- The **Outer Nashville Basin (71h)** is a more heterogeneous region than the Inner Nashville Basin, with more rolling and hilly topography and slightly higher elevations. The region encompasses most all of the outer areas of the generally non-cherty Ordovician limestone bedrock. The higher hills and knobs are capped by the more cherty Mississippian-age formations, and some Devonian-age Chattanooga shale, remnants of the Highland Rim. The region's limestone rocks and soils are high in phosphorus, and commercial phosphate is mined. Deciduous forests with pasture and cropland are the dominant land covers. Streams are low to moderate gradient, with productive nutrient-rich waters, resulting in algae, rooted vegetation, and occasionally high densities of fish. The Nashville Basin as a whole has a distinctive fish fauna, notable for fish that avoid the region, as well as those that are present.

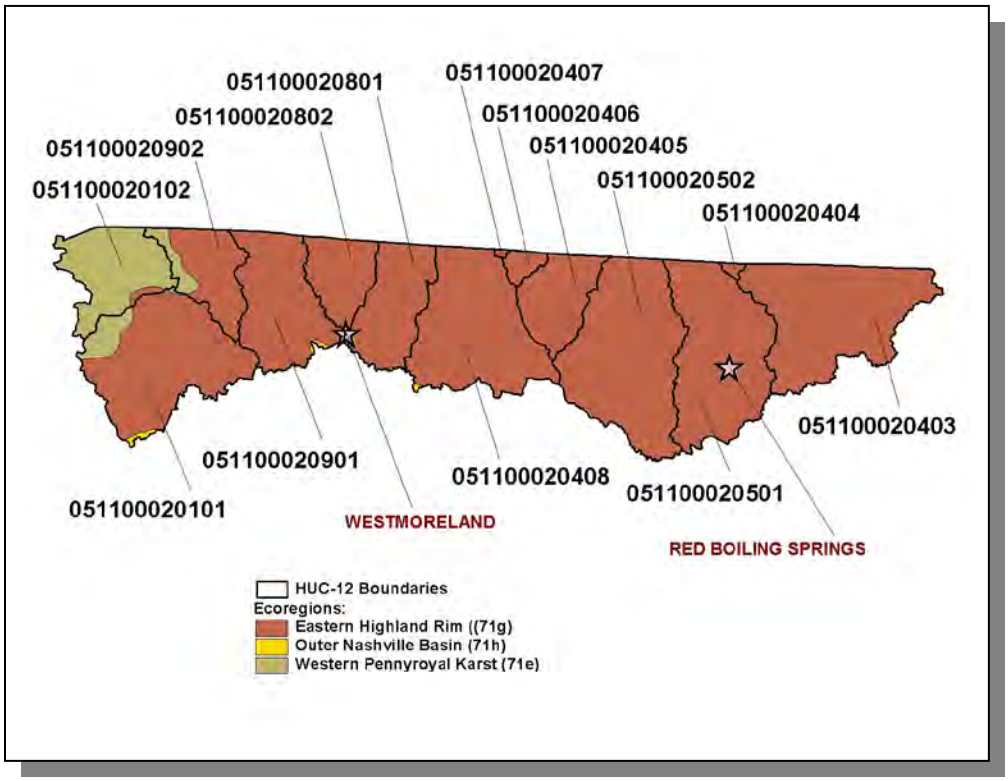


Figure 2-10. Level IV Ecoregions in the Tennessee Portion of the Barren River Watershed. *HUC-12 subwatershed boundaries and locations of Red Boiling Springs and Westmoreland are shown for reference.*

Each Level IV Ecoregion has at least one reference stream associated with it. A reference stream represents a least impacted condition and may not be representative of a pristine condition.

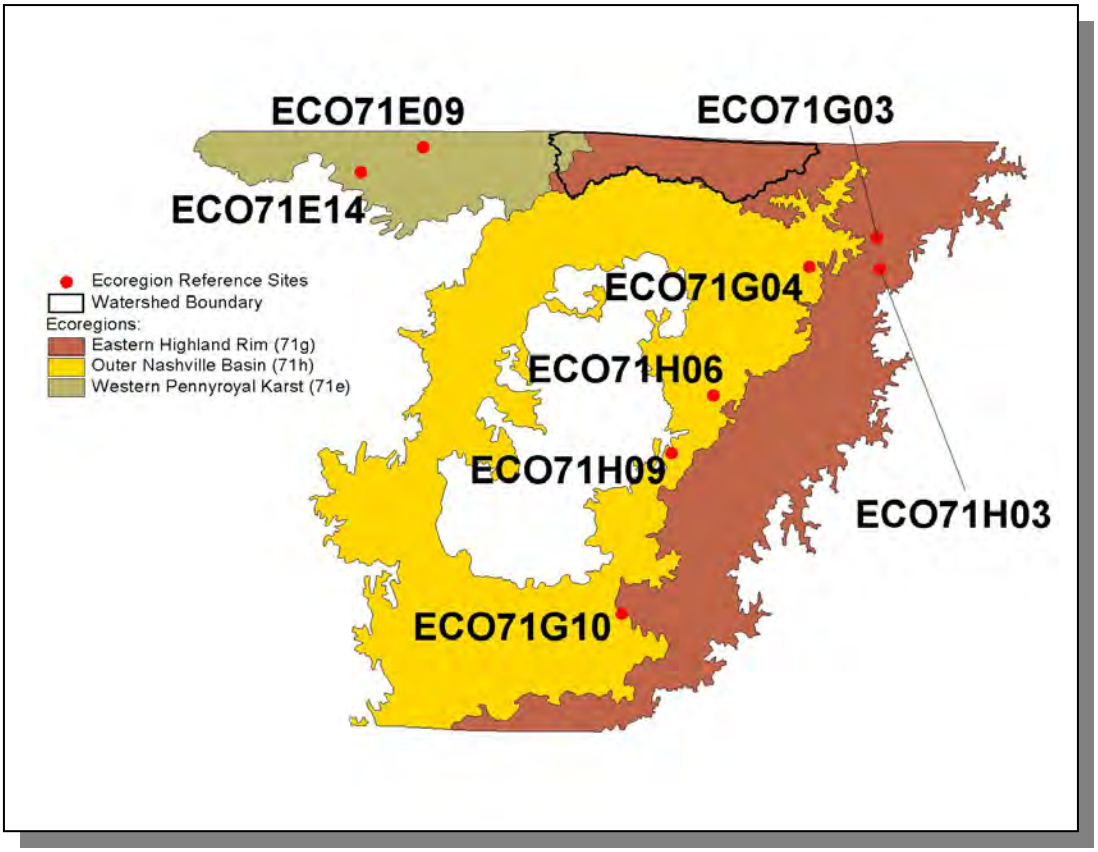


Figure 2-11. Ecoregion Monitoring Sites in Level IV Ecoregions 71e, 71g, and 71h. *The Tennessee portion of the Barren River Watershed is shown for reference. More information, including which ecoregion reference sites were inactive or dropped prior to 01/01/2006, is provided in Appendix II.*

2.6. NATURAL RESOURCES.

2.6.A. Rare Plants and Animals. The Heritage Program in the TDEC Division of Natural Heritage maintains a database of rare species that is shared by partners at The Nature Conservancy, Tennessee Wildlife Resources Agency, the US Fish and Wildlife Service, and the Tennessee Valley Authority. The information is used to: 1) track the occurrence of rare species in order to accomplish the goals of site conservation planning and protection of biological diversity, 2) identify the need for, and status of, recovery plans, and 3) conduct environmental reviews in compliance with the federal Endangered Species Act.

GROUPING	NUMBER OF RARE SPECIES
Insects	1
Snails	1
Birds	3
Fish	7
Total	**12**

Table 2-3. There are 12 Known Rare Plant and Animal Species in the Tennessee Portion of the Barren River Watershed.

In the Tennessee portion of the Barren River Watershed, there are seven known rare fish species and one known rare snail species.

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS
Etheostoma barbouri	Teardrop darter		D
Etheostoma barrenense	Splendid darter		D
Etheostoma bellum	Orangefin darter		D
Moxostoma atripinne	Blackfin sucker		D
Notropis rubellus rubellus	Rosyface shiner		D
Percina macrocephala	Longhead darter		T
Percina strictogaster	Blackfin darter		D
Carychium stygium	Cave thorn		

Table 2-4. Rare Aquatic Species in the Tennessee Portion of the Barren River Watershed. *State Status: T, Threatened; D, Deemed in Need of Management by the Tennessee Wildlife Resources Agency. More information may be found* at http://www.state.tn.us/environment/na/.

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2.6.B. Wetlands. The Division of Natural Areas maintains a database of wetland records in Tennessee. These records are a compilation of field data from wetland sites inventoried by various state and federal agencies. Maintaining this database is part of Tennessee's Wetland Strategy, which is described at:

http://www.state.tn.us/environment/na/wetlands/

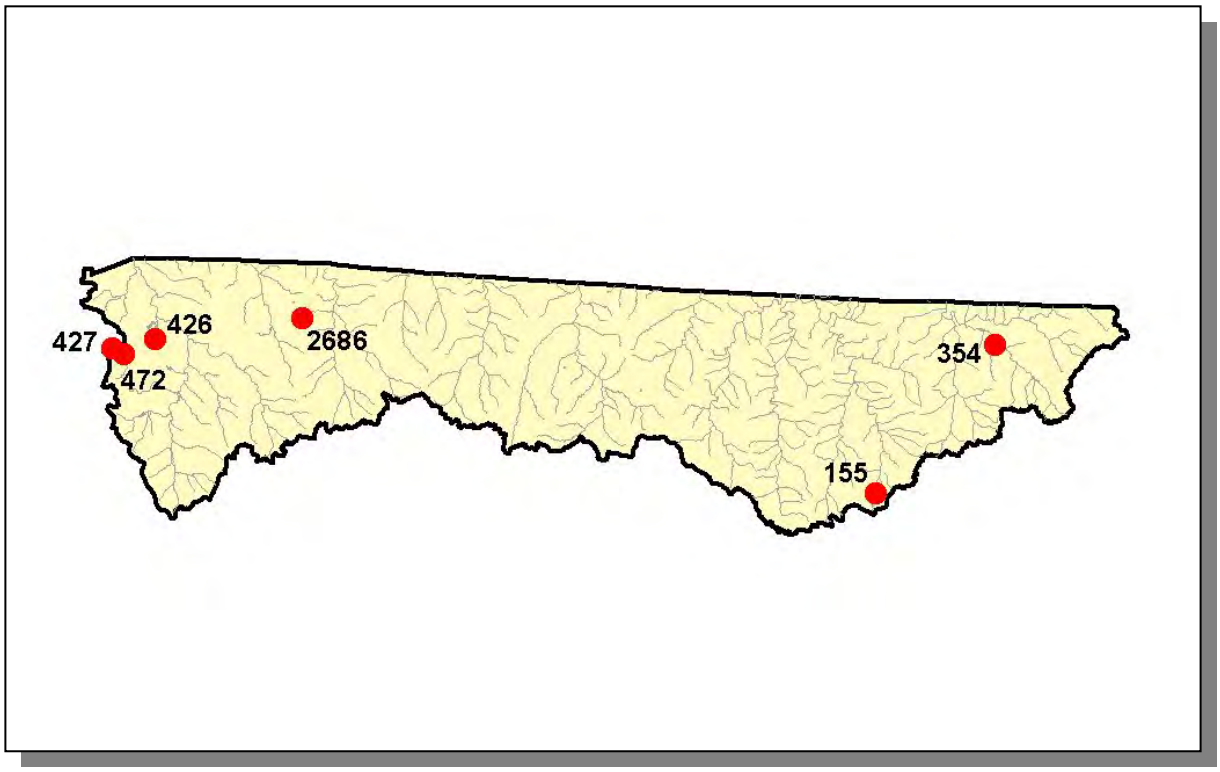

Figure 2-12. Location of Wetland Sites in TDEC Division of Natural Heritage Database in the Tennessee Portion of the Barren River Watershed. This map represents an incomplete inventory and should not be considered a dependable indicator of the presence of wetlands. *There may be additional wetland sites in the watershed. More information, including identification of wetland sites labeled, is provided in Appendix II.*

2.7. TENNESSEE RIVERS ASSESSMENT PROJECT. The Tennessee Rivers Assessment is part of a national program operating under the guidance of the National Park Service's Rivers and Trails Conservation Assistance Program. The Assessment is an inventory of river resources, and should not be confused with "Assessment" as defined by the Environmental Protection Agency. A more complete description can be found in the Tennessee Rivers Assessment Summary Report, which is available from the Department of Environment and Conservation and on the web at:

http://www.state.tn.us/environment/wpc/publications/riv/

STREAM	NSQ	RB	RF	STREAM	NSQ	RB	RF
Bean Branch Creek	3			Long Fork Creek	1	2	
Big Trammel Creek	3			Long Hungry Creek	1	2	
Caney Fork Creek	3			Middle Fork Drakes Creek	3		1,2
Dutch Creek	3			Puncheon Creek	2		
Garrett Creek	3			Salt Lick Creek	1	2	2
Line Creek	3			Sulfur Fork Creek	3		
Little Trace Creek	3			Trace Creek	3		
Little Trammel Creek	3			West Fork Drakes Creek	2,3		1
Long Creek	3			White Oak Creek	3	2	2

Table 2-5. Tennessee Rivers Assessment Project Stream Scoring in the Barren River Watershed.

Categories: NSQ, Natural and Scenic Qualities
RB, Recreational Boating
RF, Recreational Fishing

Scores: 1. Statewide or greater Significance; Excellent Fishery
2. Regional Significance; Good Fishery
3. Local Significance; Fair Fishery
4. Not a significant Resource; Not Assessed

CHAPTER 3

WATER QUALITY ASSESSMENT OF THE BARREN RIVER WATERSHED.

3.1. BACKGROUND. Section 305(b) of The Clean Water Act requires states to report the status of water quality every two years. Historically, Tennessee's methodologies, protocols, frequencies and locations of monitoring varied depending upon whether sites were ambient, ecoregion, or intensive survey. Alternatively, in areas where no direct sampling data existed, water quality may have been assessed by evaluation or by the knowledge and experience of the area by professional staff.

In 1996, Tennessee began the watershed approach to water quality protection. In the Watershed Approach, resources—both human and fiscal—are better used by assessing water quality more intensively on a watershed-by-watershed basis. In this approach, water quality is assessed in year three of the watershed cycle, following one to two years of data collection. More information about the Watershed Approach may be found in Chapter 1 and at http://www.state.tn.us/environment/wpc/watershed/

The assessment information is used in the 305(b) Report (The Status of Water Quality in Tennessee) and the 303(d) list as required by the Clean Water Act.

The 305(b) Report documents the condition of the State's waters. Its function is to provide information used for water quality based decisions, evaluate progress, and measure success.

Tennessee uses the 305(b) Report to meet four goals (from 2006 305(b) Report):

1. Describe the water quality assessment process

2. Categorize waters in the State by placing them in the assessment categories suggested by federal guidance

3. Identify waterbodies that pose imminent human health risks due to elevated bacteria levels or contamination of fish

4. Provide detailed information on each watershed

EPA aggregates the state use support information into a national assessment of the nation's water quality. This aggregated use support information can be viewed at EPA's "Surf Your Watershed" site at http://cfpub.epa.gov/surf/locate/index.cfm.

The 303(d) list is a compilation of the waters of Tennessee that fail to support some or all of their classified uses. The 303(d) list does not include streams determined to be fully supporting designated uses nor streams the Division of Water Pollution Control cannot assess due to lack of water quality information. Also absent are streams where a control strategy is already in the process of being implemented.

Once a stream is placed on the 303(d) list, it is considered a priority for water quality improvement efforts. These efforts not only include traditional regulatory approaches such as permit issuance, but also include efforts to control pollution sources that have historically been exempted from regulations, such as certain agricultural and forestry activities. If a stream is on the 303(d) list, the Division of Water Pollution Control cannot use its regulatory authority to allow additional sources of the same pollutant(s) for which it is listed.

States are required to develop Total Maximum Daily Loads (TMDLs) for 303(d)-listed waterbodies. The TMDL process establishes the maximum amount of a pollutant that a waterbody can assimilate without exceeding water quality standards and allocates this load among all contributing pollutant sources. The purpose of the TMDL is to establish water quality objectives required to reduce pollution from both point and nonpoint sources and to restore and maintain the quality of water resources.

The current 303(d) List is available on the TDEC homepage at:
http://tennessee.gov/environment/wpc/publications/303d2006.pdf

and information about Tennessee's TMDL program may be found at:
http://www.state.tn.us/environment/wpc/tmdl/.

This chapter provides a summary of water quality in the Tennessee portion of the Barren River Watershed, summarizes data collection and assessment results, and describes impaired waters.

3.2. DATA COLLECTION. The figures and table below represent data collected in the last 5-year cycle (July 1, 2000 through June 30, 2005). Water quality data are from one of four site types: (1) Ambient sites, (2) Ecoregion sites, (3) Watershed Screening sites, or (4) Tier Evaluation sites.

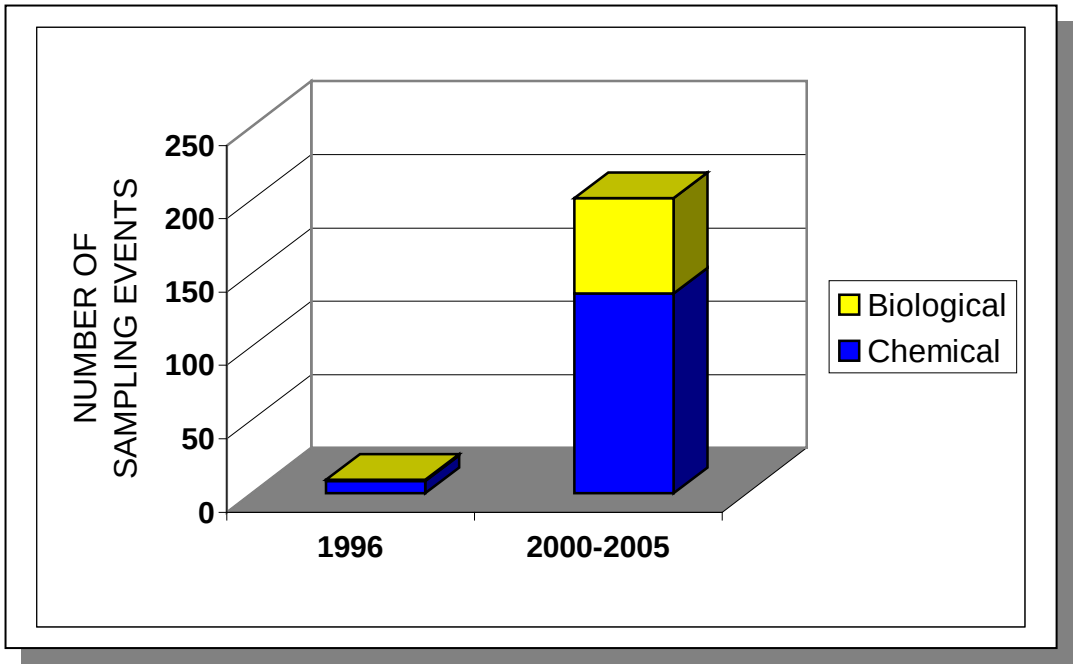

Figure 3-1. Number of Sampling Events Using the Traditional Approach (1996) and Watershed Approach (July 1, 2000 through June 30, 2005) in the Tennessee Portion of the Barren River Watershed.

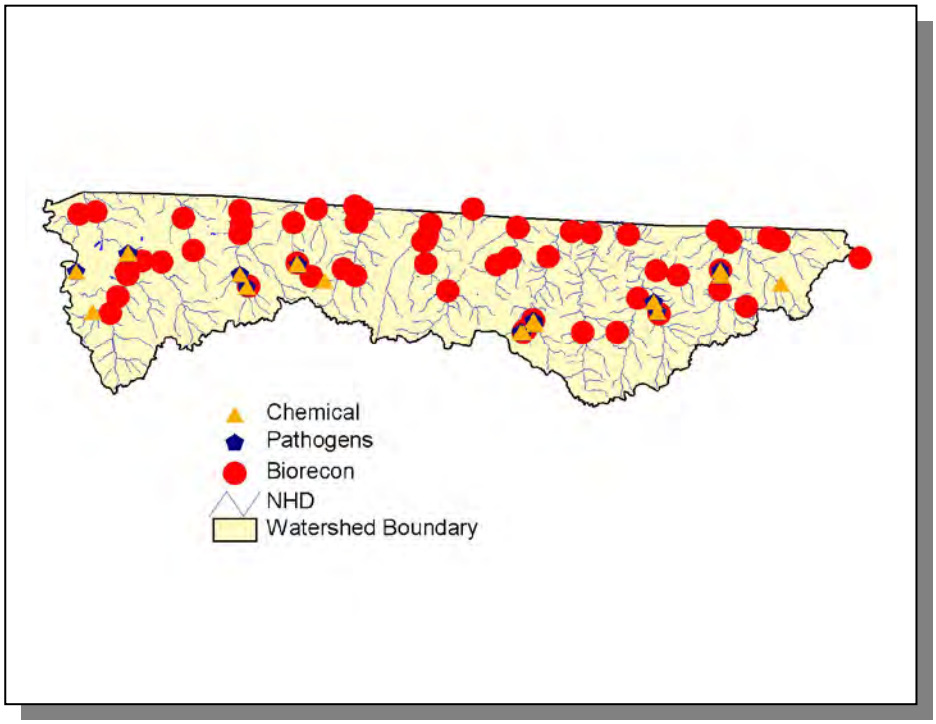

Figure 3-2. Location of Monitoring Sites in the Tennessee Portion of the Barren River Watershed (July 1, 2000 through June 30, 2005). *Pathogens include E. coli and fecal coliform; NHD, National Hydrography Dataset of Streams.*

	1996	**2000-2005**
Biological	1	65
Chemical	8	136
Total	**9**	**201**

Table 3-1. Number of Sampling Events in the Tennessee Portion of the Barren River Watershed in the last 5-Year Cycle (July 1, 2000 through June 30, 2005).

3.2.A. Ambient Monitoring Sites. These fixed-station chemical monitoring sites are sampled quarterly or monthly by the Environmental Field Office-Nashville and Environmental Field Office-Cookeville staff (this is in addition to samples collected by water and wastewater treatment plant operators). Samples are analyzed by the Tennessee Department of Health, Division of Environmental Laboratory Services. Ambient monitoring data are used to assess water quality in major bodies of water where there are NPDES facilities and to identify trends in water quality. Water quality parameters traditionally measured at ambient sites in the Tennessee portion of the Barren River Watershed are provided in Appendix IV.

Data from ambient monitoring stations are entered into the STORET (Storage and Retrieval) system administered by EPA.

3.2.B. Ecoregion Sites. Ecoregions are relatively homogeneous areas of similar geography, topography, climate and soils that support similar plants and animals. The delineation phase of the Tennessee Ecoregion Project was completed in 1997 when the ecoregions and subecoregions were mapped and summarized (EPA/600/R-97/022). There are eight Level III Ecoregions and twenty-five Level IV subecoregions in Tennessee (see Chapter 2 for more details). The Tennessee portion of the Barren River Watershed lies within 1 Level III ecoregion (Interior Low Plateau) and contains 3 subecoregions (Level IV):

- Western Pennyroyal Karst (71e)
- Eastern Highland Rim (71g)
- Outer Nashville Basin (71h)

Ecoregion reference sites are chemically monitored using methodology outlined in the Division's Chemical Standard Operating Procedure (Standard Operating Procedure for Modified Clean Technique Sampling Protocol). Macroinvertebrate samples are collected in spring and fall. These biological sample collections follow methodology outlined in the Tennessee Biological Standard Operating Procedures Manual. Volume 1: Macroinvertebrates and EPA's Revision to Rapid Bioassessment Protocols for use in Streams and Rivers.

Ecoregion stations are scheduled to be monitored during the watershed sampling time period.

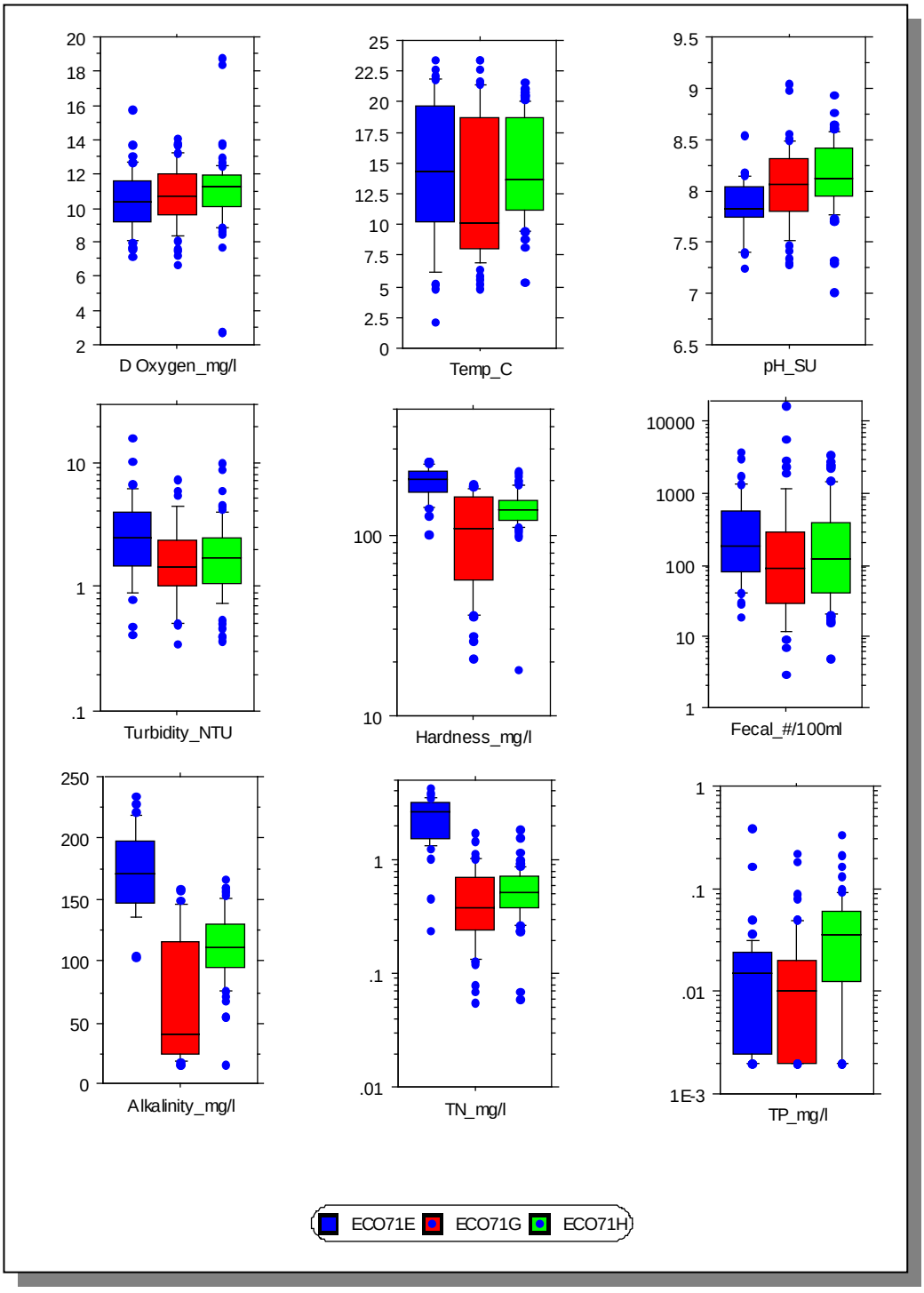

Figure 3-3. Select Chemical Data Collected in the Tennessee Portion of Barren River Watershed Ecoregion Sites. *Boxes and bars illustrate 10th, 25th, median, 75th, and 90th*

percentiles. Extreme values are also shown as dots. Fecal, fecal coliform bacteria; TN, Total Nitrogen; TP, Total Phosphorus.

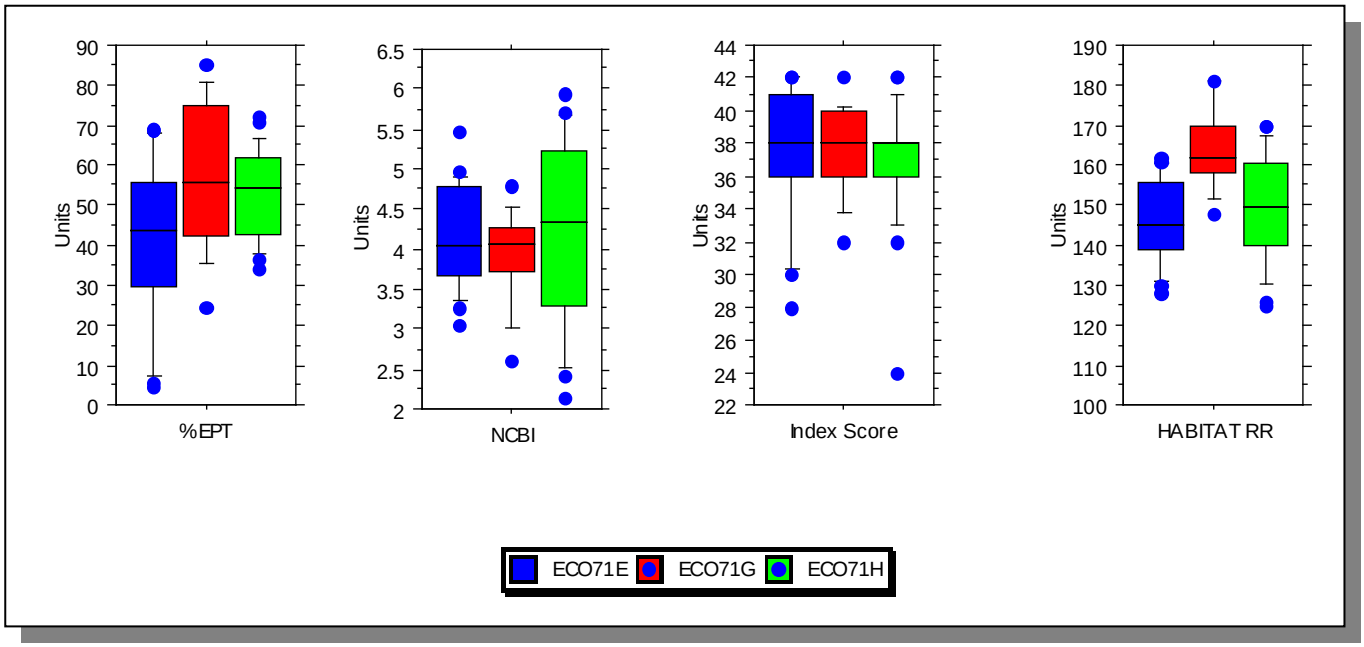

Figure 3-4. Benthic Macroinvertebrate and Habitat Scores for the Tennessee Portion of Barren River Watershed Ecoregion Sites. *Boxes and bars illustrate 10th, 25th, median, 75th, and 90th percentiles. Extreme values are also shown as dots. NCBI, North Carolina Biotic Index. Index Score and Habitat Riffle/Run scoring system are described in TDEC's Quality System Standard Operating Procedure for Macroinvertebrate Stream Surveys (2006).*

3.2.C. Watershed Screening Sites. Activities that take place at watershed sites are benthic macroinvertebrate stream surveys, physical habitat determinations and/or chemical monitoring. Following review of existing data, watershed sites are selected in Year 1 of the watershed approach when preliminary monitoring strategies are developed. Additional sites may be added in Year 2 when additional monitoring strategies are implemented.

A Biological Reconnaissance (BioRecon) is used as a screening tool to describe the condition of water quality, in general, by determining the absence or presence of clean water indicator organisms, such as EPT (Ephemeroptera [mayfly], Plecoptera [stonefly], Trichoptera [caddisfly]). Factors and resources used for selecting BioRecon sites are:

- The current 303(d) list,
- HUC-10 maps (every HUC-10 is scheduled for a BioRecon)
- Land Use/Land Cover maps
- Topographic maps
- Locations of NPDES facilities
- Sites of recent ARAP activities.

An intensive multiple or single habitat assessment involves the regular monitoring of a station over a fixed period of time. Intensive surveys (Rapid Bioassessment Protocols) are performed when BioRecon results warrant it.

3.2.D. Special Surveys. These investigations are performed when needed and include:

- ARAP in-stream investigation
- Time-of-travel dye study
- Sediment oxygen demand study
- Lake eutrophication study

3.3. STATUS OF WATER QUALITY. Use support determinations, which can be classified as monitored or evaluated, are based on:

- Data less than 5 years old (monitored)
- Data more than 5 years old (evaluated)
- Knowledge and experience of the area by technical staff (evaluated)
- Complaint investigation (monitored, if samples are collected)
- Other readily available Agencies' data (monitored)
- Readily available Volunteer Monitoring data (monitored, if certain quality assurance standards are met)

All readily available data are considered, including data from TDEC Environmental Field Offices, Tennessee Department of Health (Aquatic Biology Section of Laboratory Services), Tennessee Wildlife Resources Agency, National Park Service, Tennessee Valley Authority, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Geological Survey, U.S. Forest Service, universities and colleges, the regulated community, and the private sector.

The assessment is based on the degree of support of designated uses as measured by compliance with Tennessee's water quality standards.

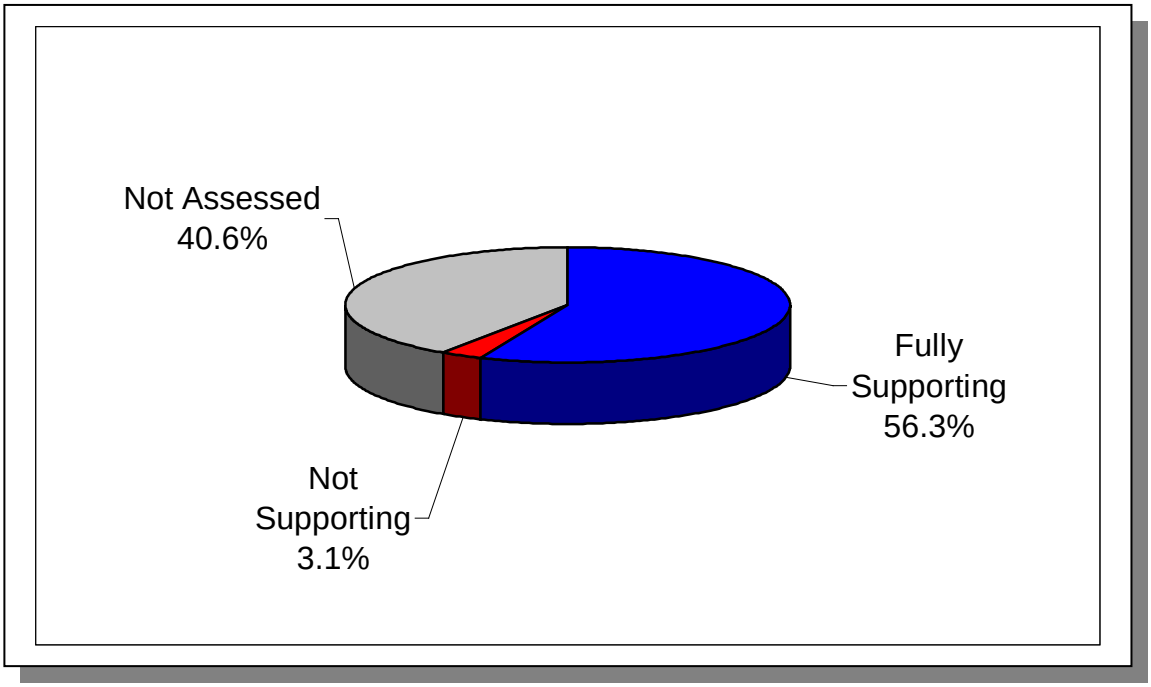

Figure 3-5. Water Quality Assessment of Streams in the Tennessee Portion of the Barren River Watershed. *Assessment data are based on the 2004 Water Quality Assessment of 563.2 stream miles in the watershed. More information is provided in Appendix III.*

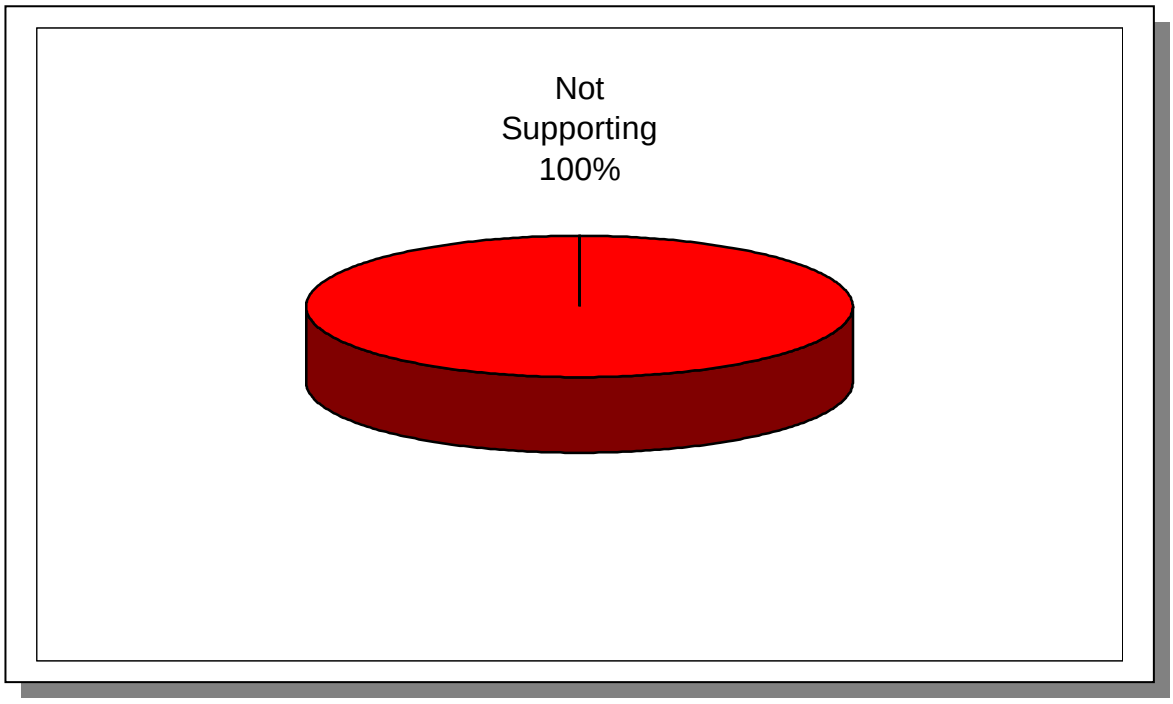

Figure 3-6. Water Quality Assessment of Lakes in the Tennessee Portion of the Barren River Watershed. *Assessment data are based on the 2004 Water Quality Assessment of 45 lake acres in the watershed. More information is provided in Appendix III.*

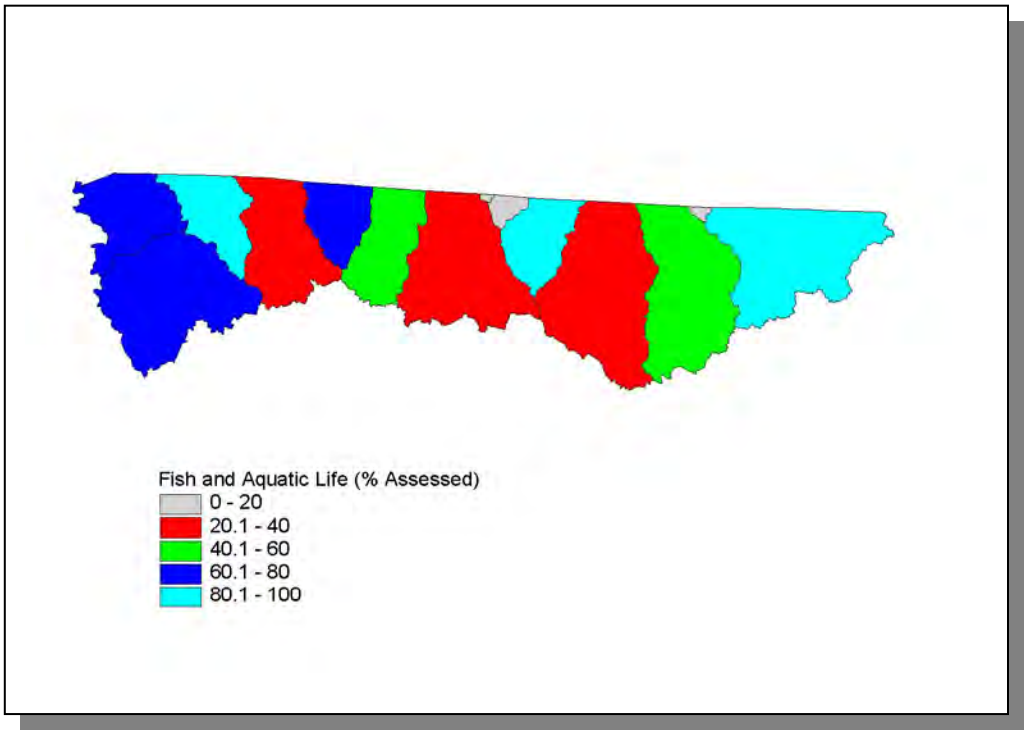

Figure 3-7. Percentage of Stream Miles Assessed for Support of Fish and Aquatic Life Designated Use in HUC-12 Subwatersheds.

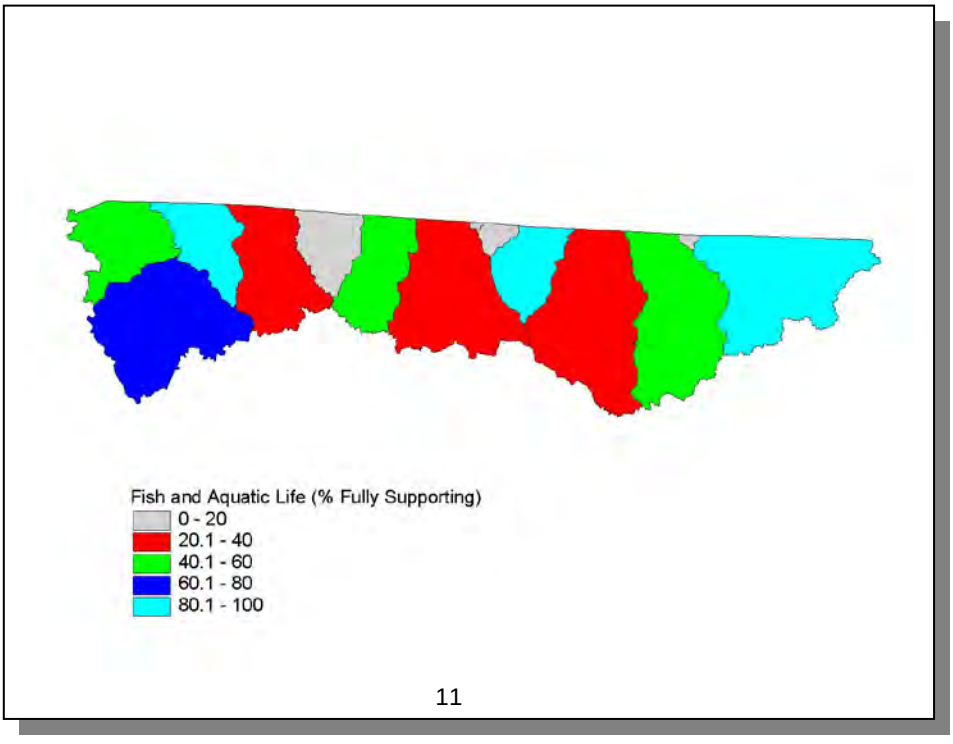

Figure 3-8. Percentage of Stream Miles Fully Supporting for Fish and Aquatic Life Designated Use in HUC-12 Subwatersheds.

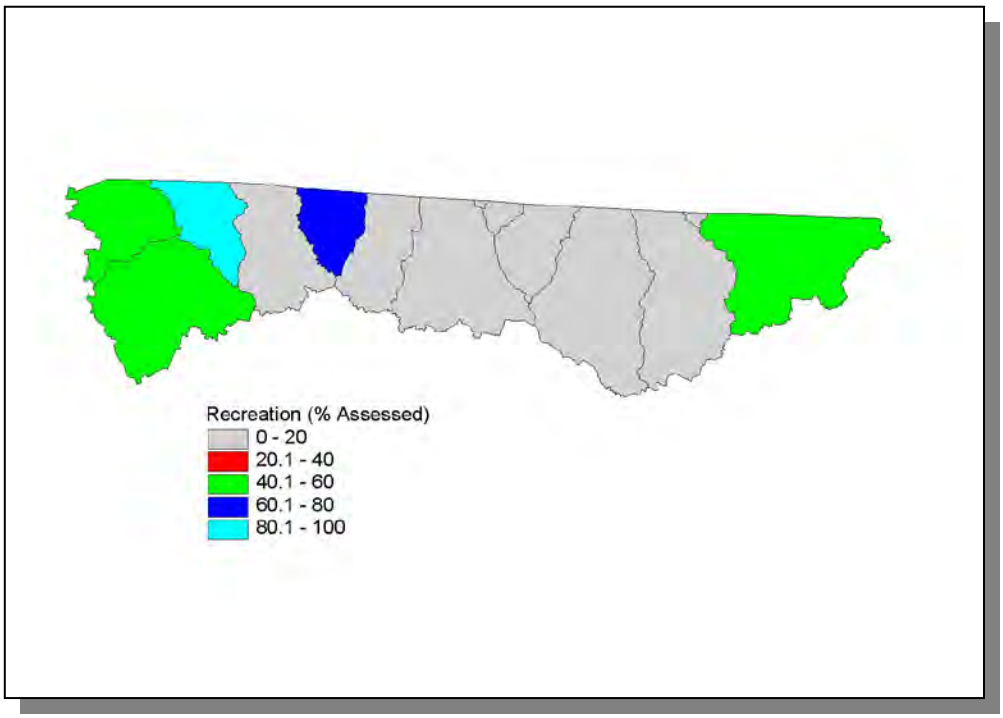

Figure 3-9. Percentage of Stream Miles Assessed for Support of Recreation Designated Use in HUC-12 Subwatersheds.

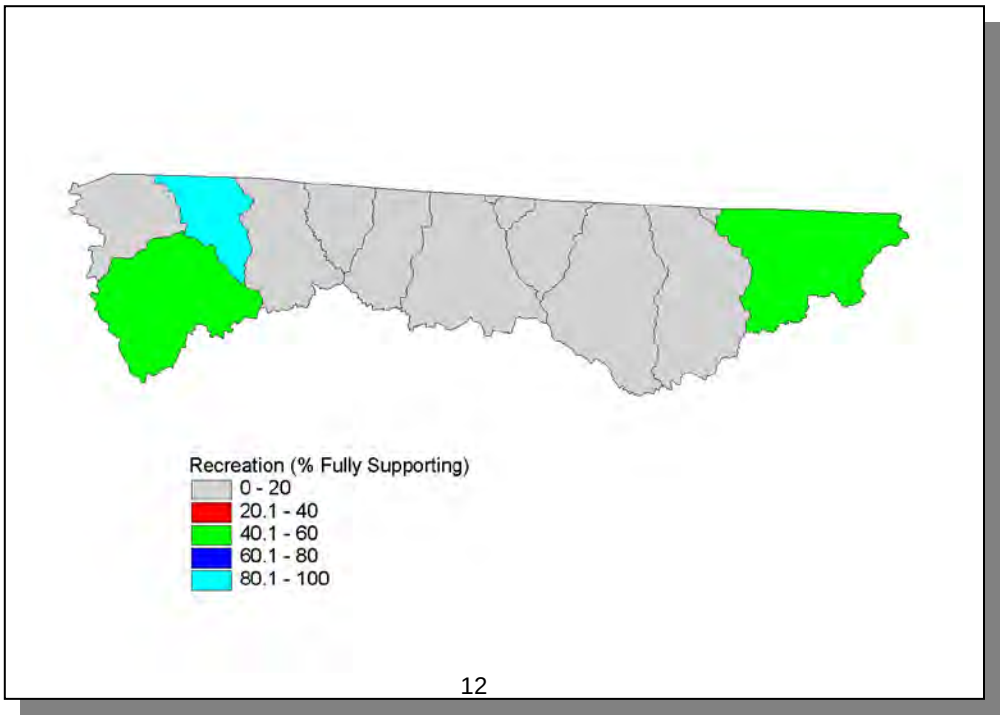

Figure 3-10. Percentage of Stream Miles Fully Supporting for Recreation Designated Use in HUC-12 Subwatersheds.

3.3.A. Assessment Summary.

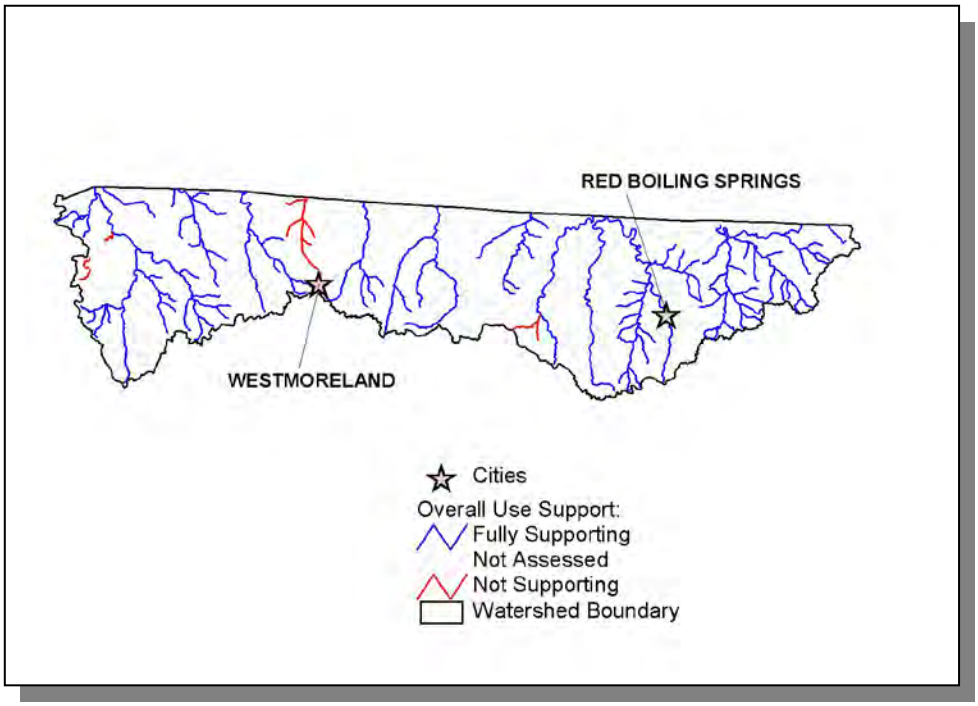

Figure 3-11. Overall Use Support Attainment in the Tennessee Portion of the Barren River Watershed. *Assessment data are based on the 2004 Water Quality Assessment. Water Quality Standards are described at http://www.state.tn.us/sos/rules/1200/1200-04/1200-04.htm. Locations of Red Boiling Springs and Westmoreland are shown for reference. More information is provided in Appendix III.*

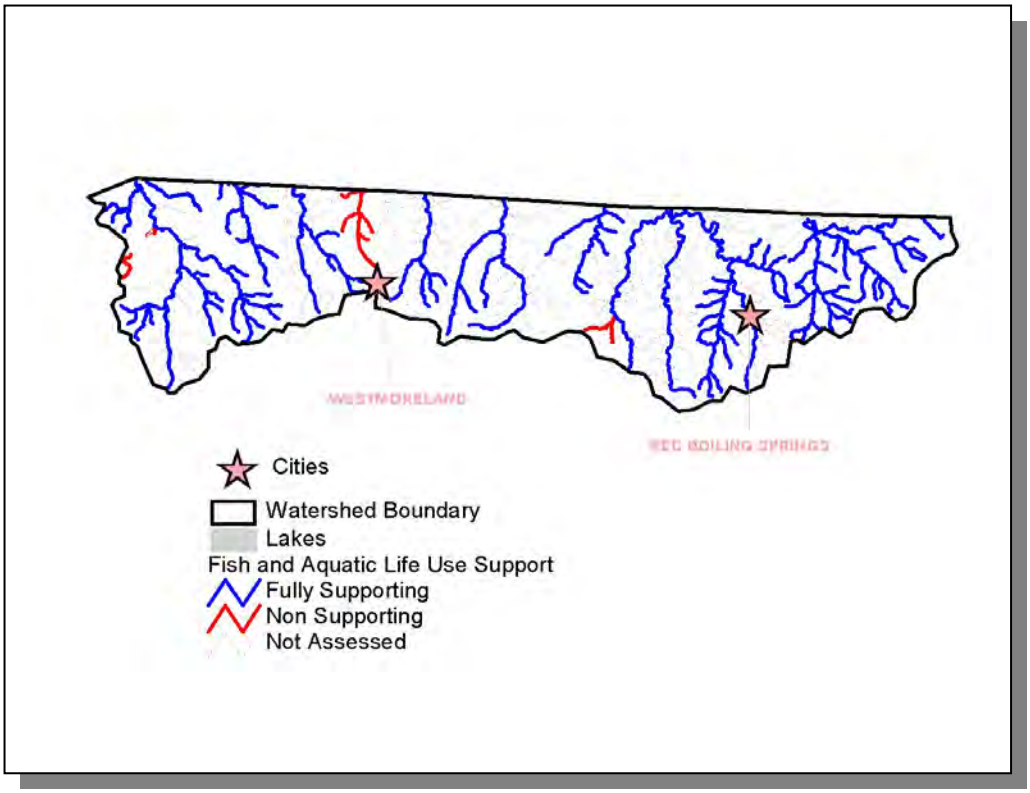

Figure 3-12. Fish and Aquatic Life Use Support Attainment in the Tennessee Portion of the Barren River Watershed. *Assessment data are based on the 2004 Water Quality Assessment. Water Quality Standards are described at http://www.state.tn.us/sos/rules/1200/1200-04/1200-04.htm. Locations of Red Boiling Springs and Westmoreland are shown for reference. More information is provided in Appendix III.*

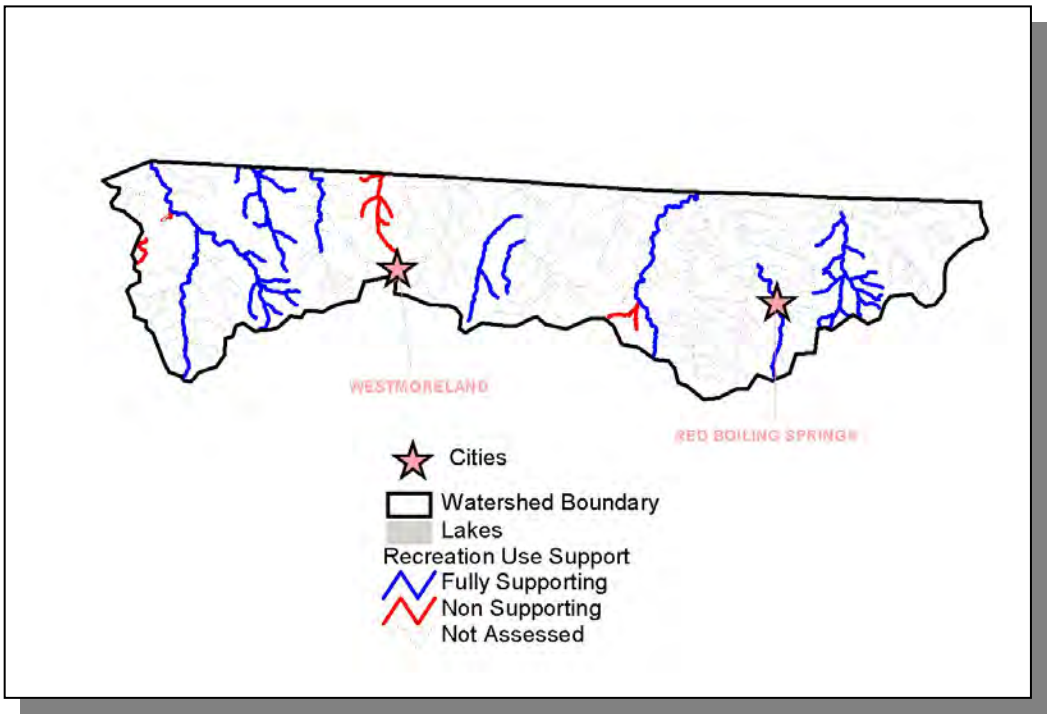

Figure 3-13. Recreation Use Support Attainment in the Tennessee Portion of the Barren River Watershed. *Assessment data are based on the 2004 Water Quality Assessment. Water Quality Standards are described at http://www.state.tn.us/sos/rules/1200/1200-04/1200-04.htm. Locations of Red Boiling Springs and Westmoreland are shown for reference. More information is provided in Appendix III.*

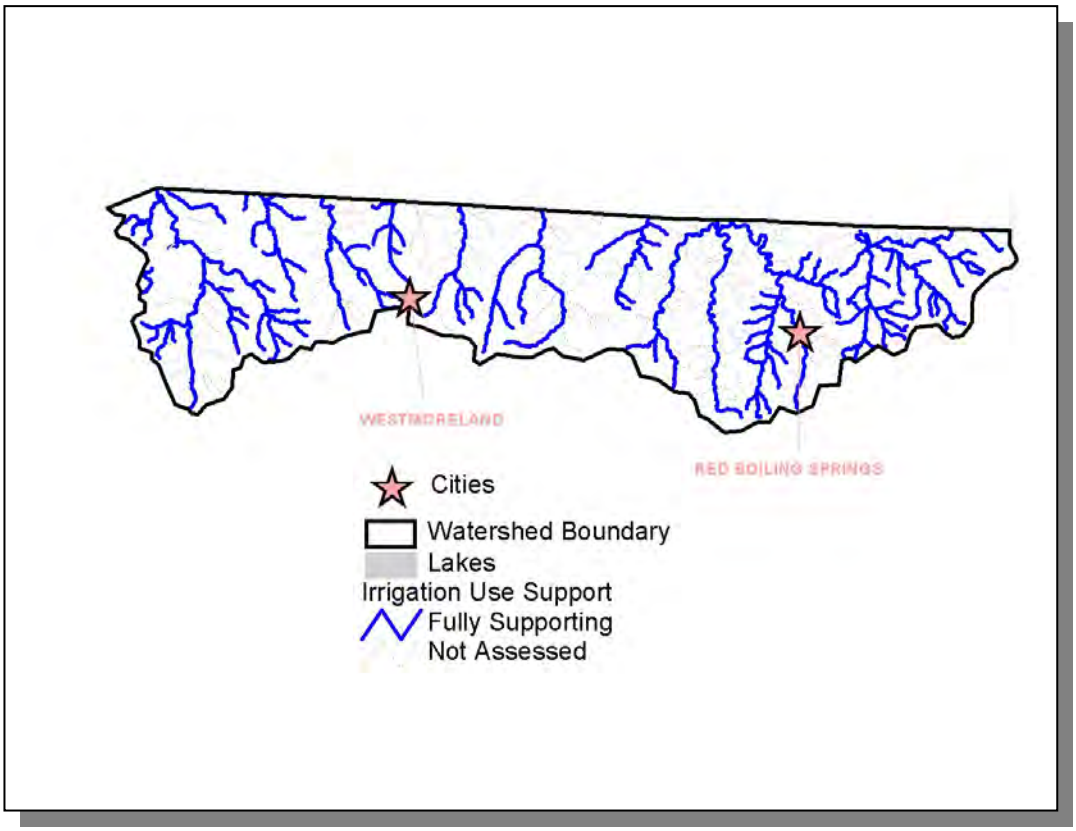

Figure 3-14. Irrigation Use Support Attainment in the Tennesse Portion of the Barren River Watershed. *Assessment data are based on the 2004 Water Quality Assessment. Water Quality Standards are described at http://www.state.tn.us/sos/rules/1200/1200-04/1200-04.htm. Locations of Red Boiling Springs and Westmoreland are shown for reference. More information is provided in Appendix III.*

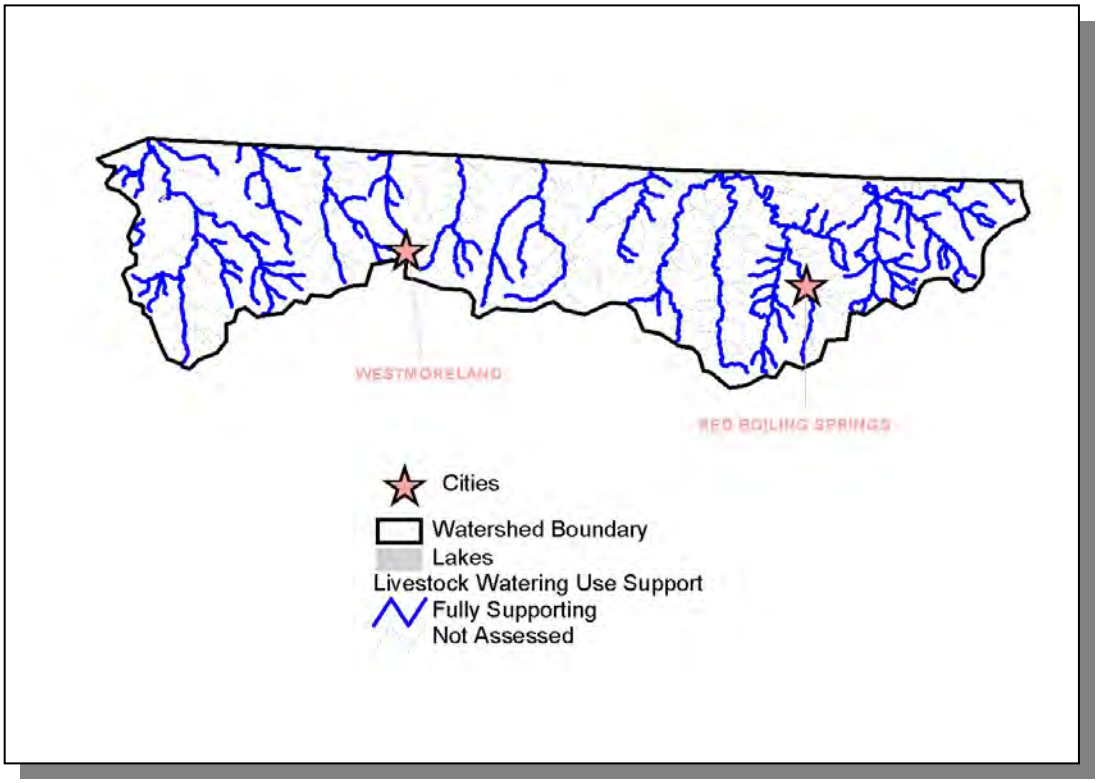

Figure 3-15. Livestock Watering and Wildlife Use Support Attainment in the Tennessee Portion of the Barren River Watershed. *Assessment data are based on the 2002 Water Quality Assessment. Water Quality Standards are described at http://www.state.tn.us/sos/rules/1200/1200-04/1200-04.htm. Locations of Red Boiling Springs and Westmoreland are shown for reference. More information is provided in Appendix III.*

3.3.B. Use Impairment Summary.

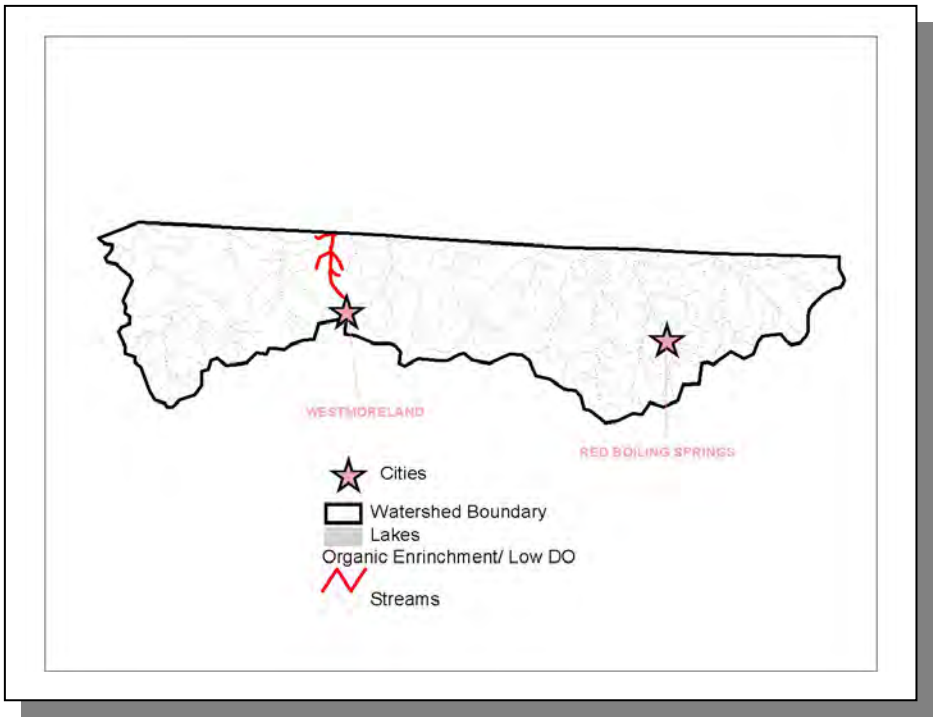

Figure 3-16. Impaired Streams Due to Organic Enrichment in the Tennessee Portion of the Barren River Watershed. *Assessment data are based on the 2004 Water Quality Assessment. Locations of Portland and Red Boiling Springs are shown for reference. More information is provided in Appendix III.*

The listing of impaired waters that do not support designated uses (the 303(d) list) is traditionally submitted to EPA every two years. A copy of the most recent 303(d) list may be downloaded from:
http://tennessee.gov/environment/wpc/publications/303d2006.pdf

Since the year 2002, the 303(d) list has been compiled by using EPA's ADB (Assessment Database) software developed by RTI (Research Triangle Institute). The ADB allows for a more detailed segmentation of waterbodies. While this results in a more accurate description of the status of water quality, it makes it difficult when comparing water quality assessments with and without using this tool. A more

meaningful comparison will be between assessments completed in Year 3 of each succeeding five-year cycle.

The ADB was used to create maps that illustrate water quality. These maps may be viewed on TDEC's homepage at http://gis2.memphis.edu/wpc.

CHAPTER 4

POINT AND NONPOINT SOURCE CHARACTERIZATION OF THE BARREN RIVER WATERSHED

4.1. BACKGROUND. This chapter is organized by HUC-12 subwatershed, and the description of each subwatershed is divided into four parts:

i. General description of the subwatershed
ii. Description of point source contributions
ii.a. Description of facilities discharging to water bodies listed on the 2004 303(d) list
iii. Description of nonpoint source contributions

The Tennessee portion of the Barren River Watershed (HUC 05110002) has been delineated into five HUC 10 (10-digit) subwatersheds, each of which is composed of one or more HUC-12 subwatersheds.

Information for this chapter was obtained from databases maintained by the Division of Water Pollution Control or provided in the WCS (Watershed Characterization System) data set. The WCS used was version 2.0 (developed by Tetra Tech, Inc for EPA Region 4) released in 2003.

WCS integrates with ArcView® v3.x and Spatial Analyst® v1.1 to analyze user-delineated (sub)watersheds based on hydrologically connected water bodies. Reports are generated by integrating WCS with Microsoft® Word. Land Use/Land Cover information from 1992 MRLC (Multi-Resolution Land Cover) data are calculated based on the proportion of county-based land use/land cover in user-delineated (sub)watersheds. Nonpoint source data in WCS are based on agricultural census data collected 1992–1998; nonpoint source data were reviewed by Tennessee NRCS staff.

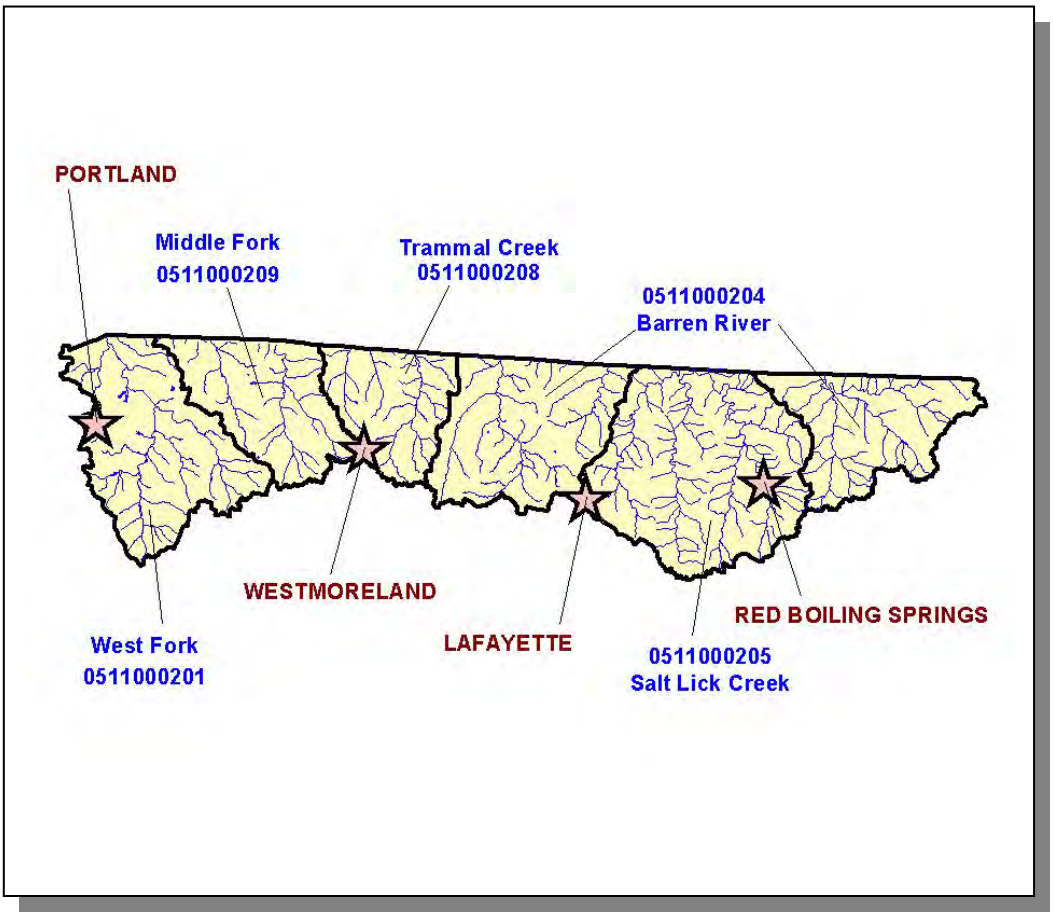

Figure 4-1. The Tennessee Portion of the Barren River Watershed is Composed of Five USGS-Delineated Subwatersheds (10-Digit Subwatersheds). *Locations of Lafayette, Portland, Red Boiling Springs, and Westmoreland are shown for reference.*

4.2. CHARACTERIZATION OF HUC-12 SUBWATERSHEDS. The Watershed Characterization System (WCS) software and data sets provided by EPA Region IV were used to characterize each subwatershed in the Tennessee portion of the Barren River Watershed.

HUC-10	HUC-12
0511000201	051100020101 (Upper West Fork)
	051100020102 (Lower West Fork
0511000204	051100020403 (Treeline Creek)
	051100020404 (Barren River)
	051100020405 (Puncheon Creek)
	051100020406 (Pinchgut Creek)
	051100020407 (Long Hungry Creek)
	051100020408 (Long Creek)
0511000205	051100020501 (Salt Lick Creek)
	051100020502 (Long Fork)
0511000208	051100020801 (Trammel Creek)
	051100020802 (Little Trammel Creek)
0511000209	051100020901 (Middle Fork)
	051100020902 (Sulfur Fork)

Table 4-1. HUC-12 Drainage Areas are Nested Within HUC-10 Drainages. *NRCS worked with USGS to delineate the HUC-10 and HUC-12 drainage boundaries.*

4.2.A. 0511000201.

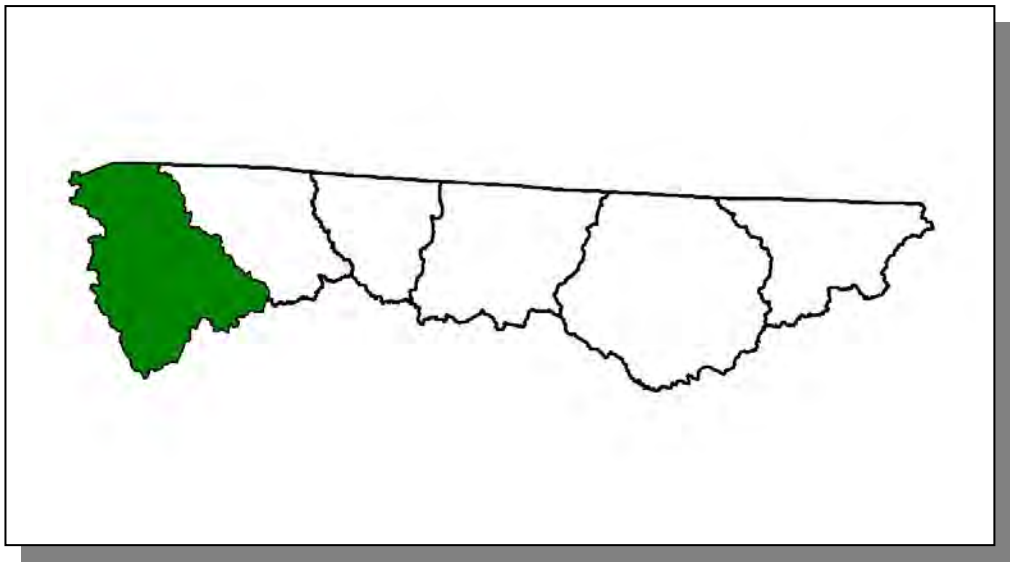

Figure 4-2. Location of Subwatershed 0511000201. *All Barren River HUC-10 subwatershed boundaries in the Tennessee portion of the watershed are shown for reference.*

4.2.A.i. 051100020101 (Upper West Fork).

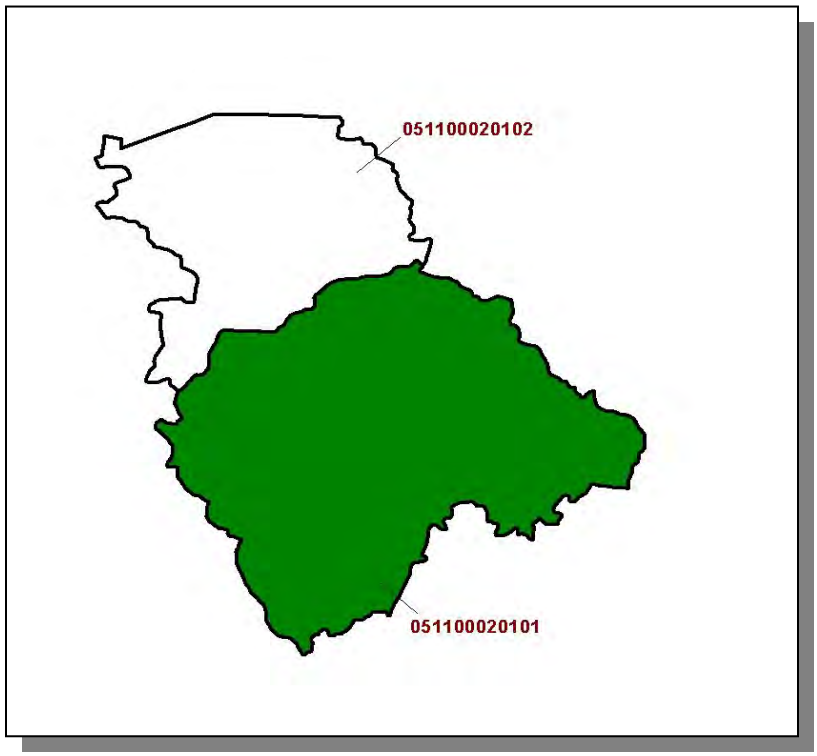

Figure 4-3. Location of Subwatershed 051100020101. *HUC-12 subwatershed boundaries are shown for reference.*

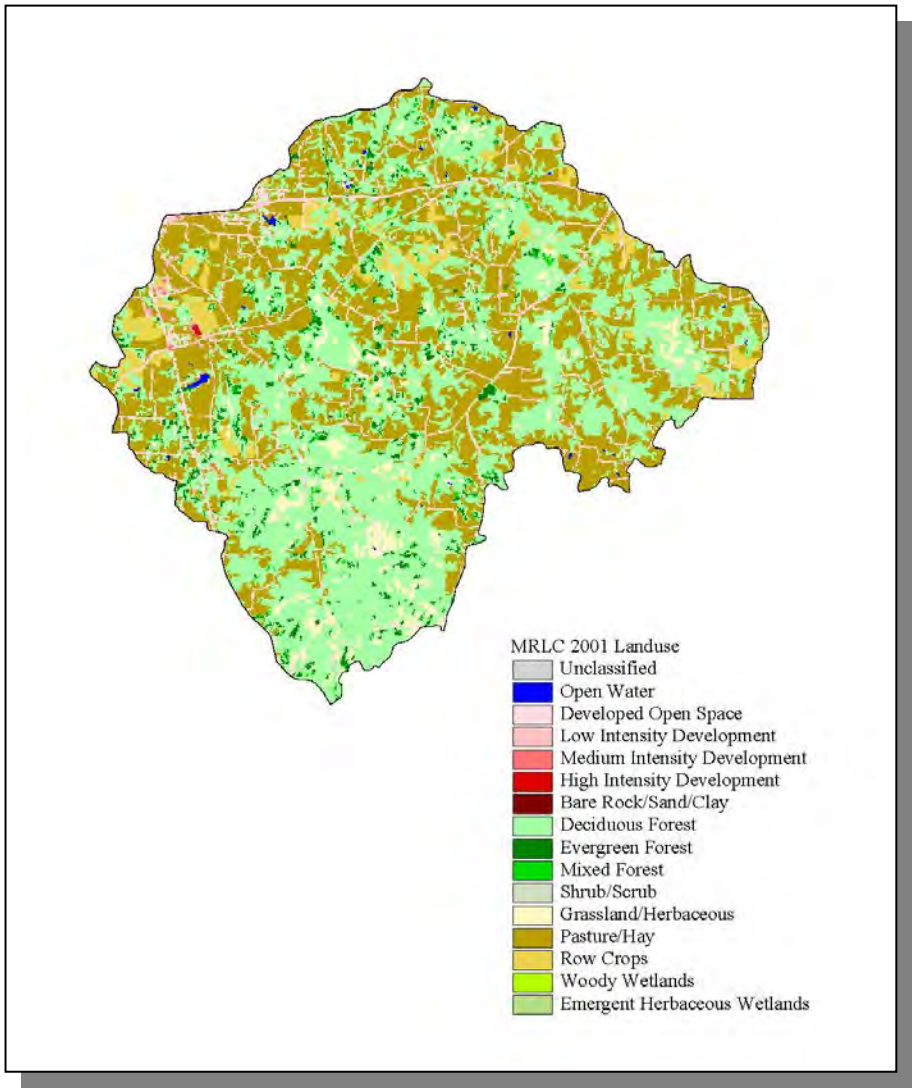

Figure 4-4. Illustration of Land Use Distribution in Subwatershed 051100020101. *More information is provided in Appendix IV.*

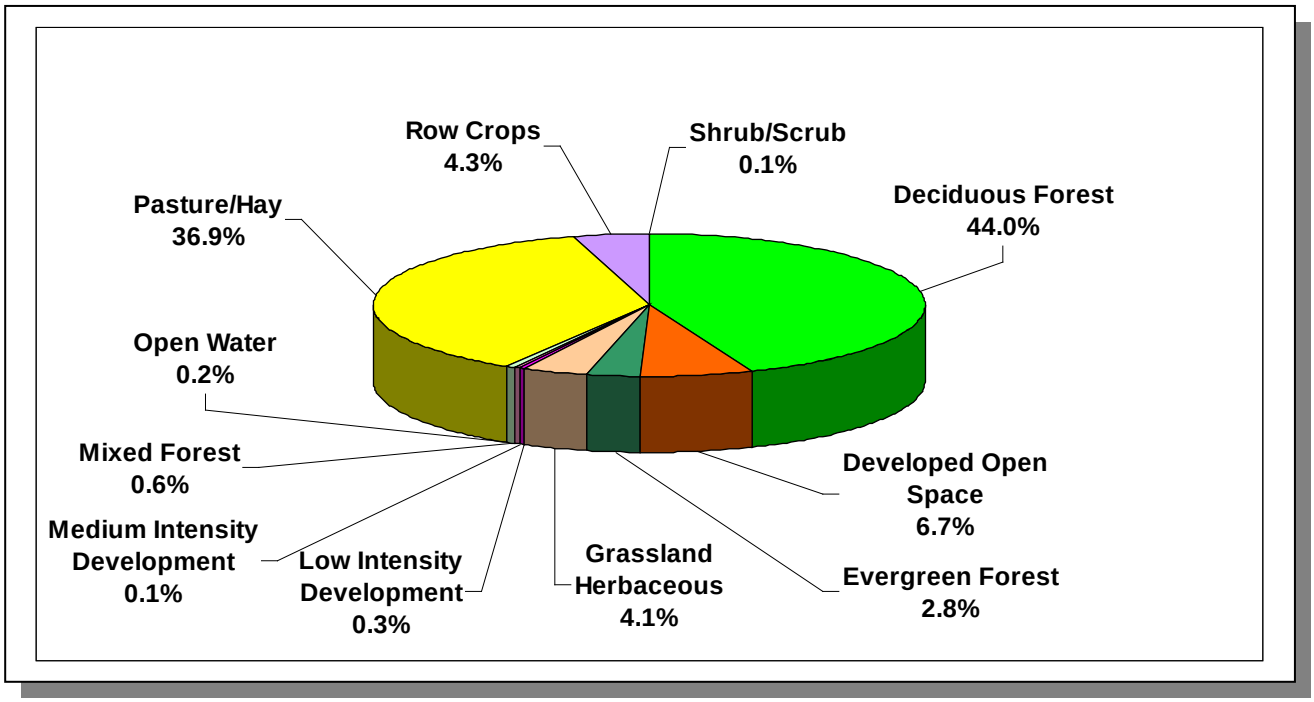

Figure 4-5. Land Use Distribution in Subwatershed 051100020101. *More information is provided in Appendix IV.*

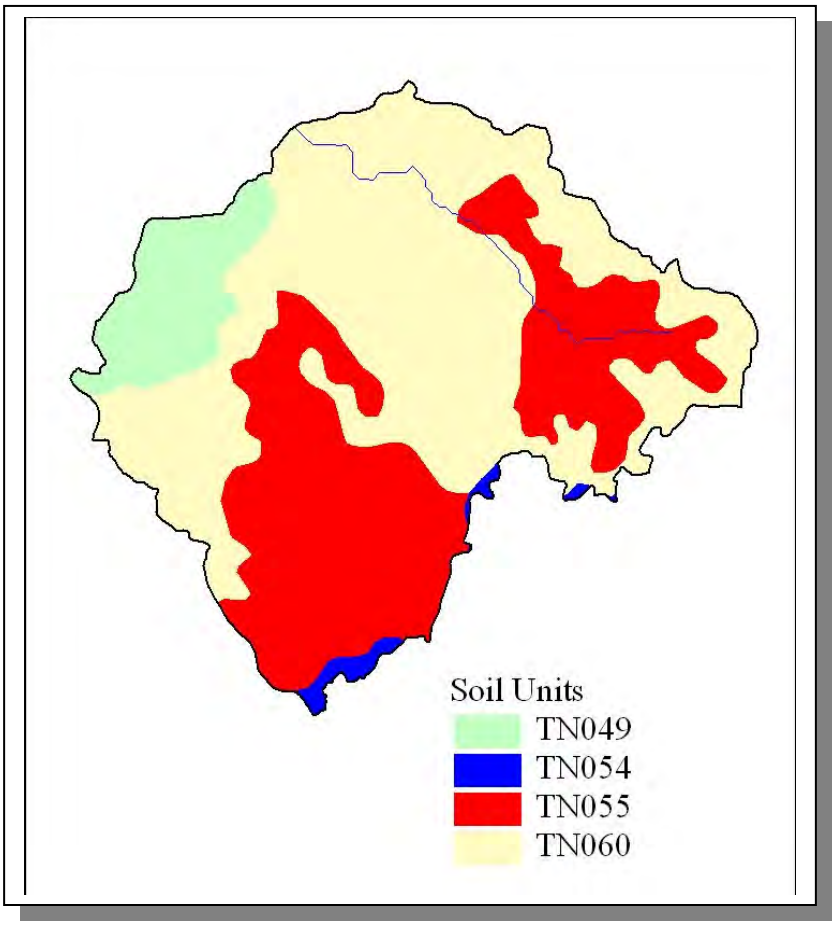

Figure 4-6. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 051100020101.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN049	0.00	B	1.30	5.94	Silty Loam	0.34
TN054	0.00	C	3.04	4.84	Loam	0.32
TN055	3.00	C	2.45	5.24	Loam	0.34
TN060	5.00	B	1.30	5.32	Silty Loam	0.39

Table 4-2. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 051100020101. *The definition of "Hydrologic Group" is provided in Appendix IV.*

	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Sumner	103,281	121,936	130,449	9.55	9,865	11,646	12,460	26.3

Table 4-3. Population Estimates in Subwatershed 051100020101.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Portland	Sumner	5,165	2,101	1,382	705	14

Table 4-4. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 051100020101.

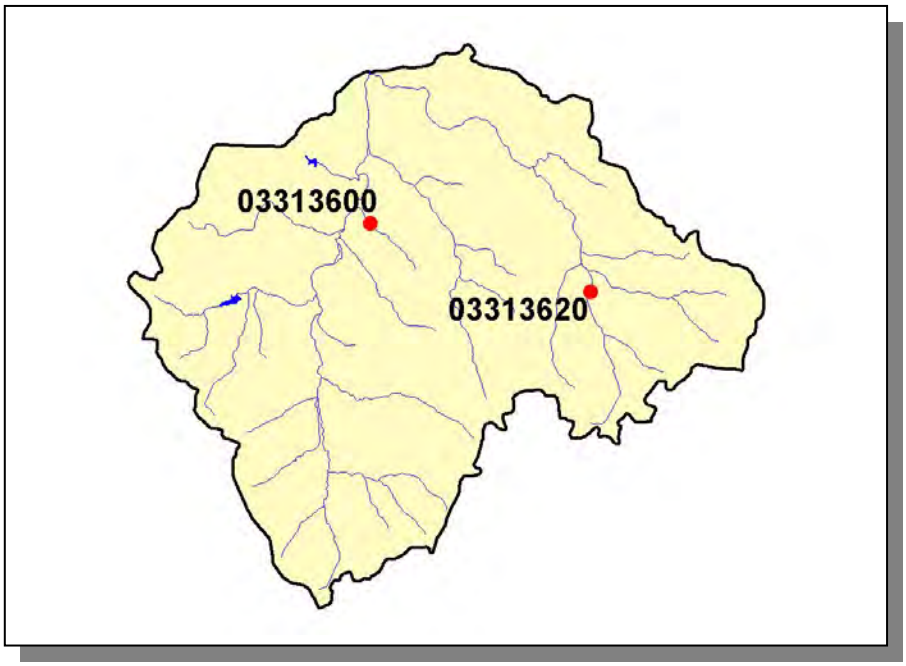

Figure 4-7. Location of Historical Streamflow Data Collection Sites in Subwatershed 051100020101. *More information is provided in Appendix IV.*

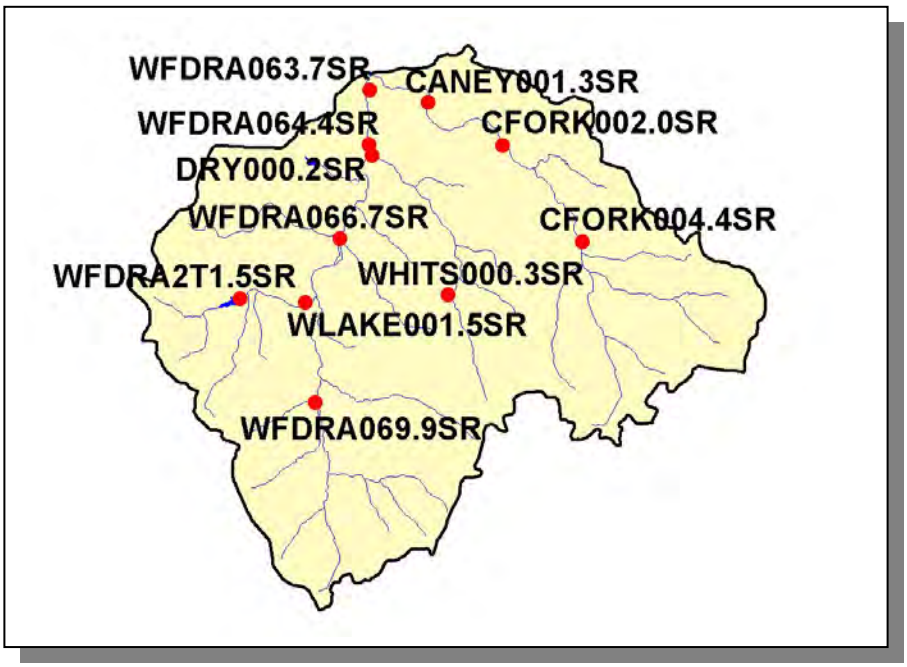

Figure 4-8. Location of Monitoring Sites in EPA's STORET Database in Subwatershed 051100020101. *More information, including site names and locations, and station numbers for sites located in the watershed outside of Tennessee, is provided in Appendix IV.*

4.2.A.i.a. Point Source Contributions.

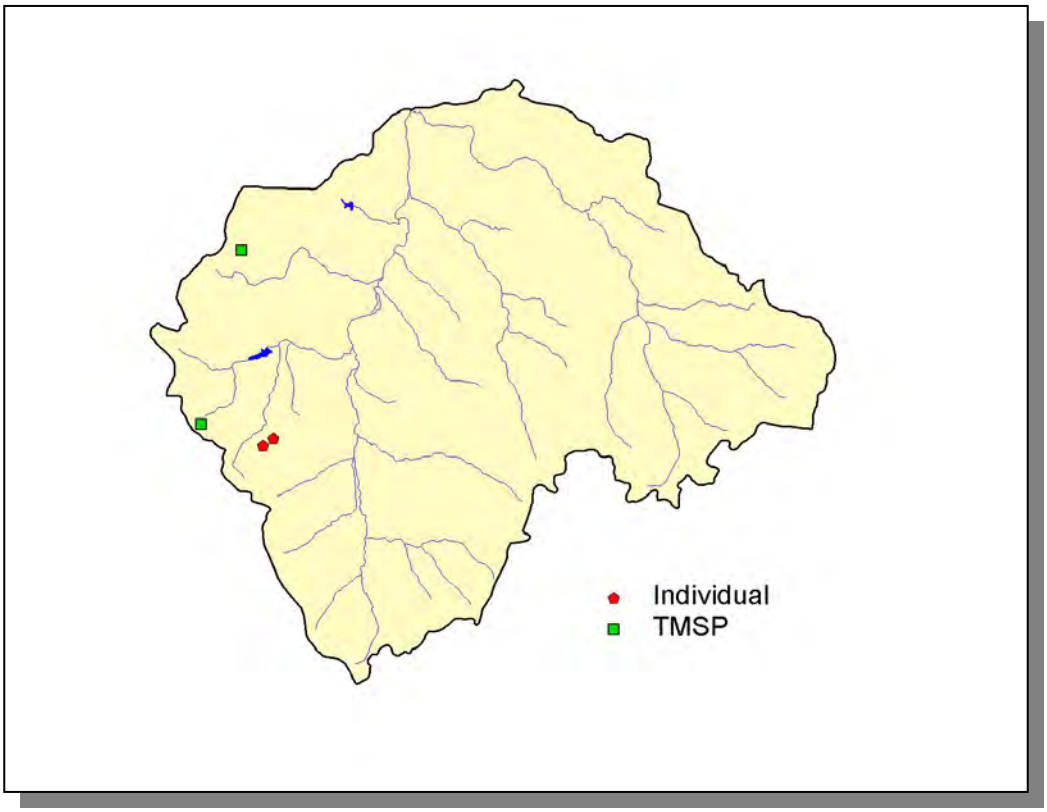

Figure 4-9. Location of Active NPDES Sites in Subwatershed 051100020101. *More information, including the names of facilities, is provided in Appendix IV.*

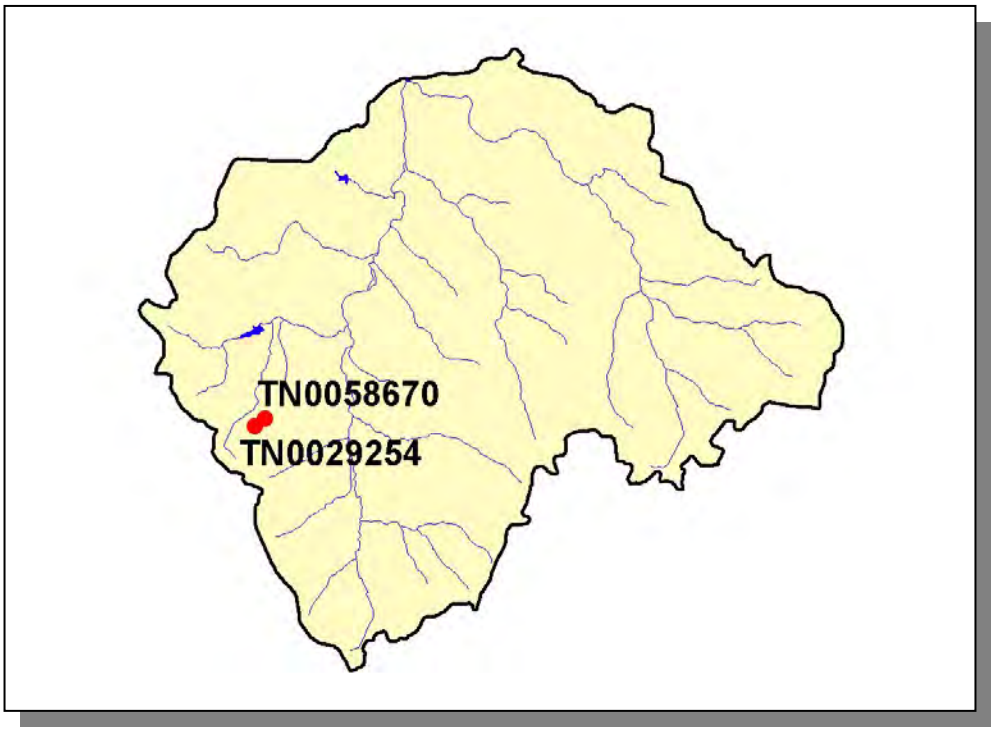

Figure 4-10. Location of Active NPDES Sites in Subwatershed 051100020101. *More information, including the names of facilities, is provided in Appendix IV.*

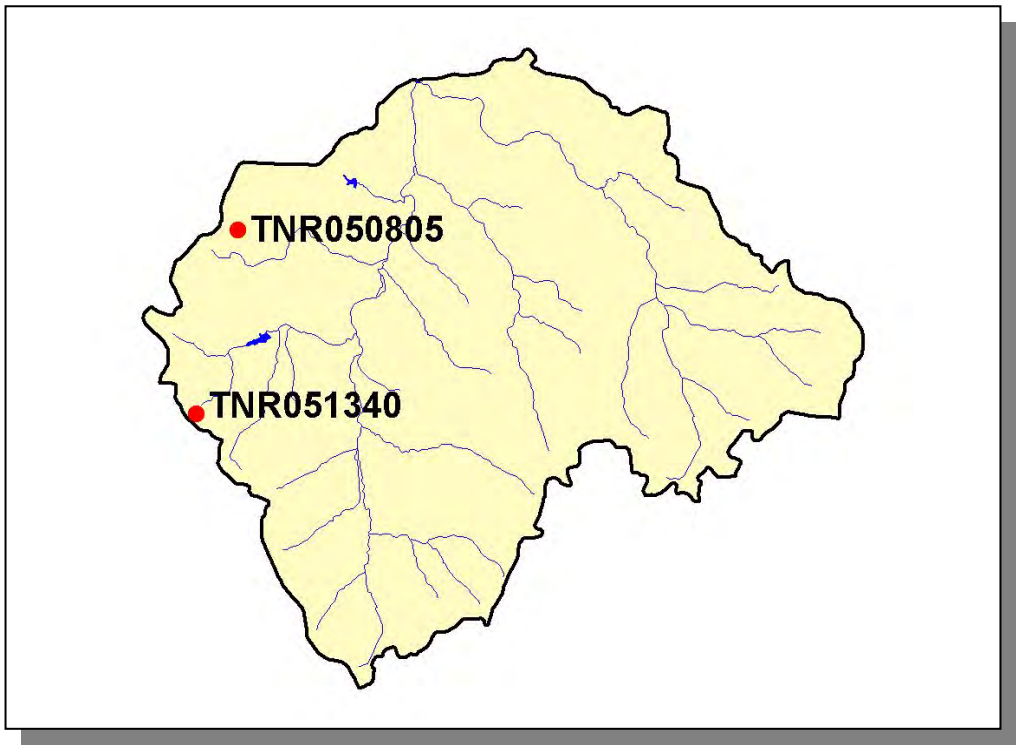

Figure 4-11. Location of TMSP Sites in Subwatershed 051100020101. *More information, including the names of facilities, is provided in Appendix IV.*

4.2.A.i.b. Nonpoint Source Contributions.

LIVESTOCK COUNTS					
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
3,641	7,368	247	8	408	31

Table 4-5. Summary of Livestock Count Estimates in Subwatershed 051100020101. *According to the 1997 Census of Agriculture (http://www.nass.usda.gov/census/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

LIVESTOCK COUNTS						
County	Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
Sumner	22,296	45,116	1,515	50	2,500	189

Table 4-6. Summary of Livestock Count Estimates in Sumner County. *According to the 1997 Census of Agriculture (http://www.nass.usda.gov/census/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

	INVENTORY		REMOVAL RATE	
County	Forest Land (thousand acres)	Timber Land (thousand acres)	Growing Stock (million cubic feet)	Sawtimber (million board feet)
Sumner	88.2	88.2	2	6.3

Table 4-7. Forest Acreage and Annual Removal Rates (1987-1994) in Subwatershed 051100020101.

CROPS	TONS/ACRE/YEAR
Grass (Pastureland)	0.46
Grass (Hayland)	0.23
Legumes (Hayland)	0.12
Grass, Forbs, Legumes (Mixed Pasture)	0.54
Corn (Row Crops)	12.32
Soybeans (Row Crops)	11.27
Other Cropland not Planted	19.23
Conservation Reserve Program Lands	0.26
Non-Agricultural Land Use	0.00
Farmsteads and Ranch Headquarters	0.34

Table 4-8. Annual Estimated Total Soil Loss in Subwatershed 051100020101.

4.2.A.ii. 051100020102 (Lower West Fork).

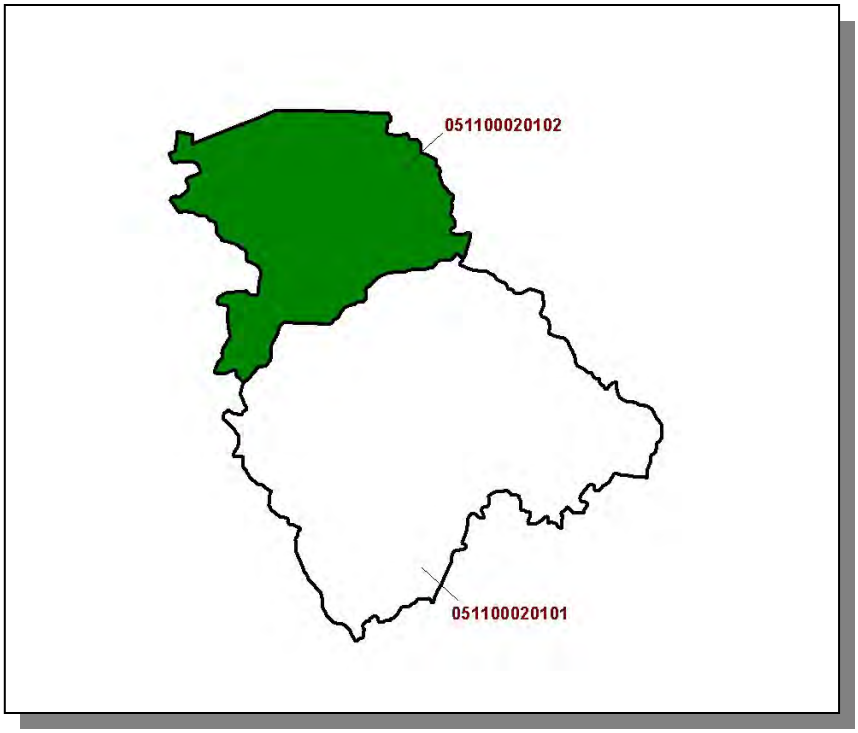

Figure 4-12. Location of Subwatershed 051100020102. *HUC-12 subwatershed boundaries are shown for reference.*

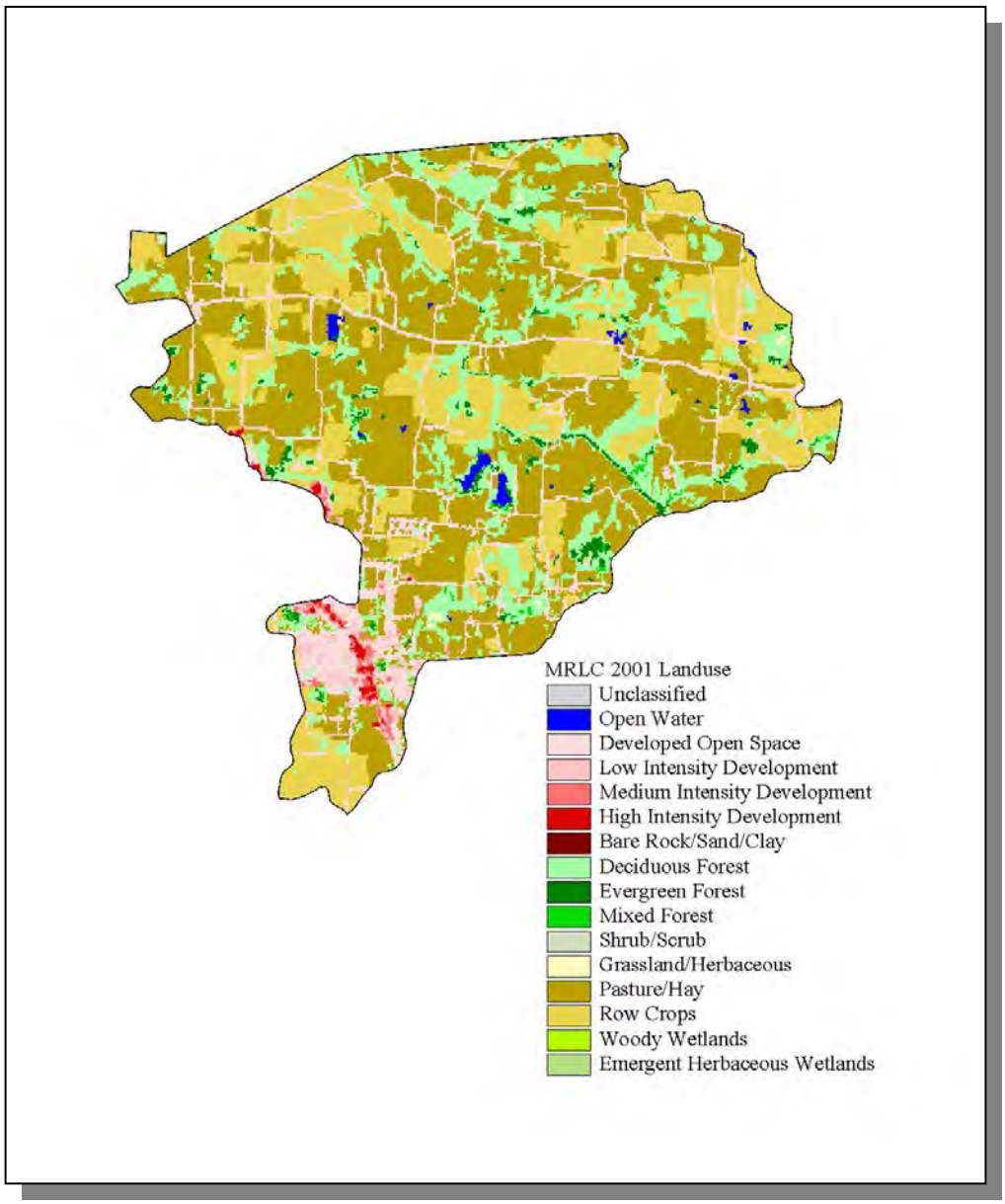

Figure 4-13. Illustration of Land Use Distribution in Subwatershed 051100020102. *More information is provided in Appendix IV.*

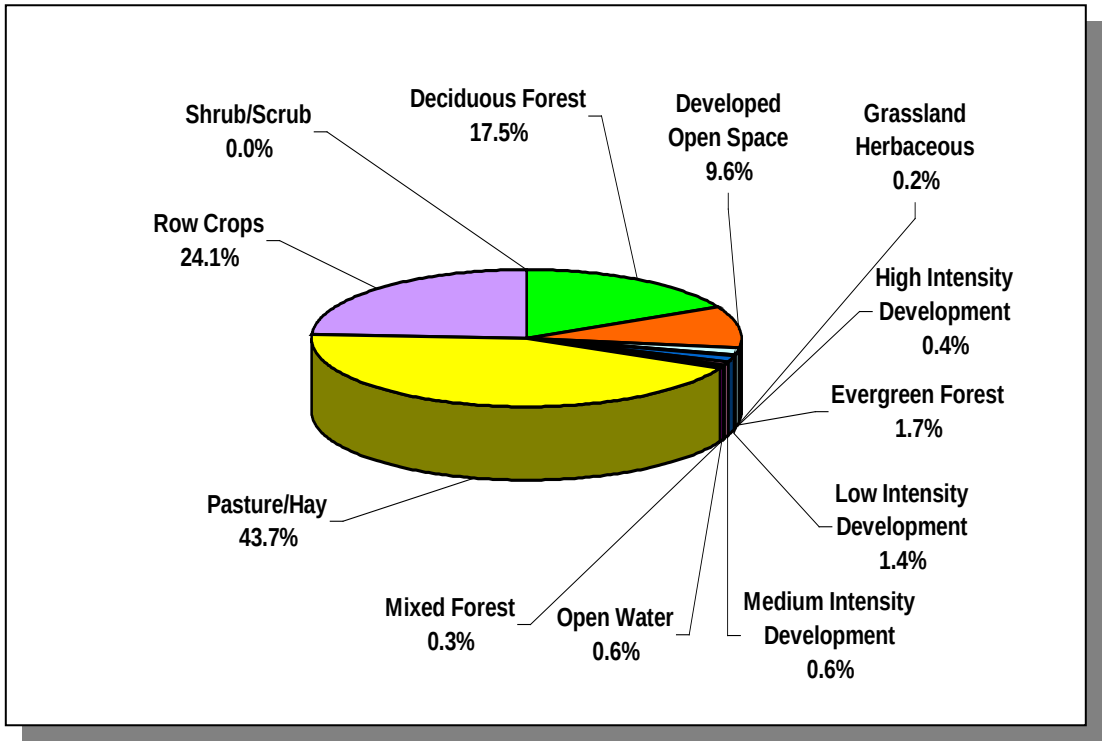

Figure 4-14. Land Use Distribution in Subwatershed 051100020102. *More information is provided in Appendix IV.*

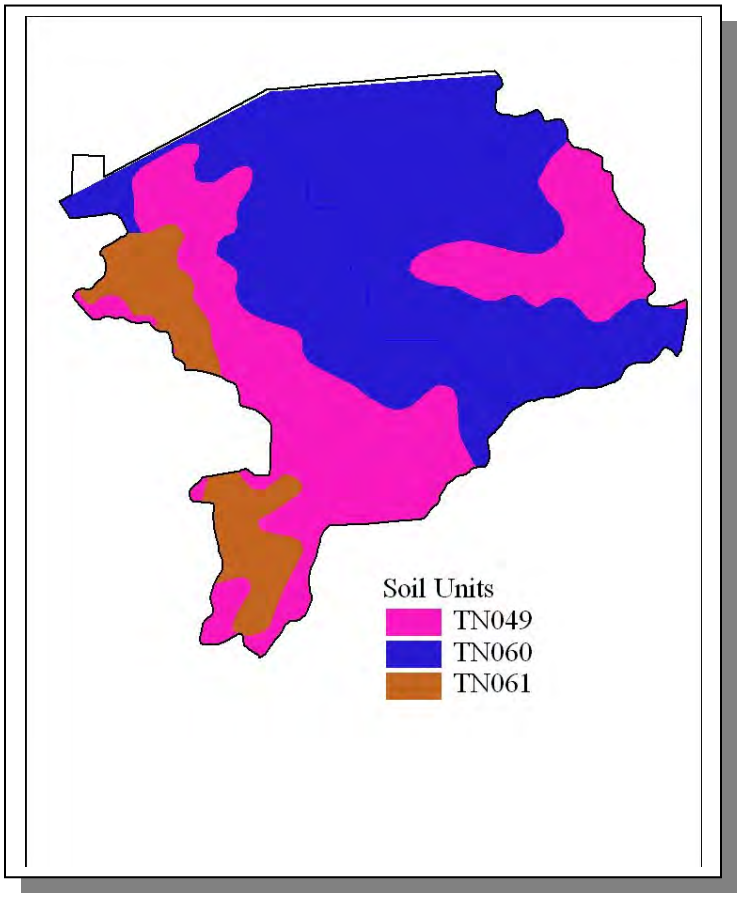

Figure 4-15. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 051100020102.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN049	0.00	B	1.30	5.94	Silty Loam	0.34
TN060	0.00	B	1.30	5.32	Silty Loam	0.39
TN061	50.00	C	1.30	5.09	Silty Loam	0.42

Table 4-9. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 051100020102. *The definition of "Hydrologic Group" is provided in Appendix IV.*

.

	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Robertson	41,494	51,533	54,433	0.25	103	128	135	31.1
Sumner	103,281	121,936	130,449	4.94	5,107	6,029	6,450	26.3
Total	**144,775**	**173,469**	**184,882**		**5,210**	**6,157**	**6,585**	**26.4**

Table 4-10. Population Estimates in Subwatershed 051100020102.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Mitchellville	Sumner	198	96	2	94	0
Portland	Sumner	5,165	2,101	1,382	705	14
Totals		**5,363**	**2,197**	**1,384**	**799**	**14**

Table 4-11. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 051100020102.

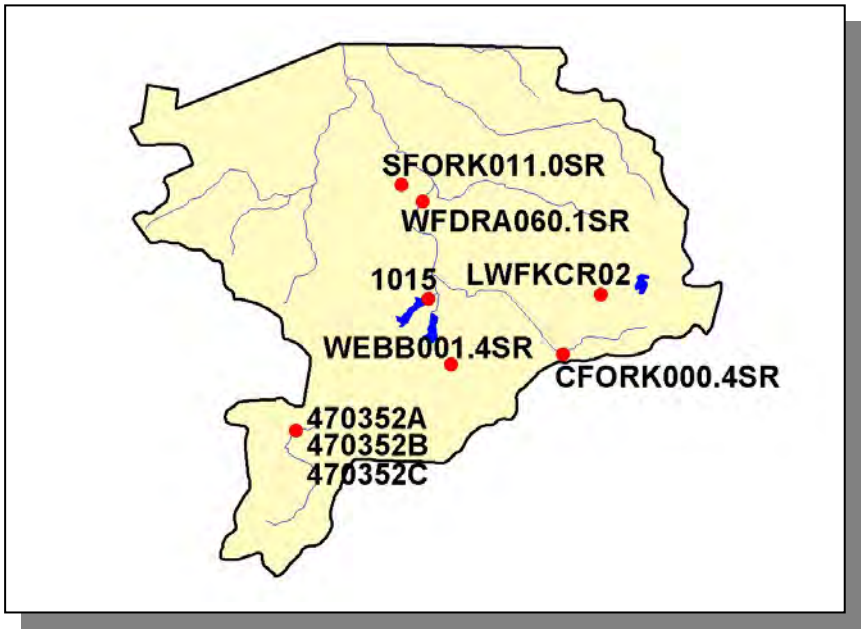

Figure 4-16. Location of Monitoring Sites in EPA's STORET Database in Subwatershed 051100020102. *More information, including site names and locations, and station numbers for sites located in the watershed outside of Tennessee, is provided in Appendix IV.*

4.2.A.ii.a. Point Source Contributions.

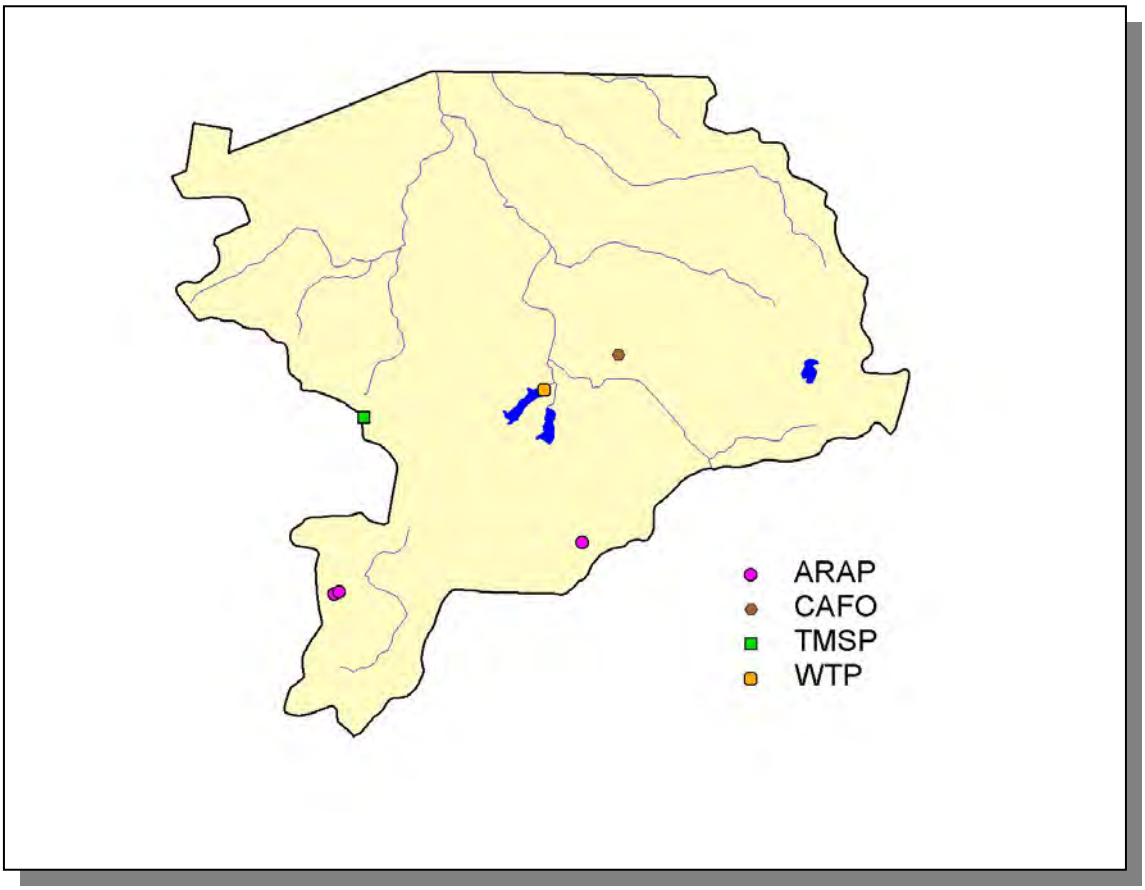

Figure 4-17. Location of Permits Issued in Subwatershed 051100020102. *More information, including the names of facilities, is provided in Appendix IV.*

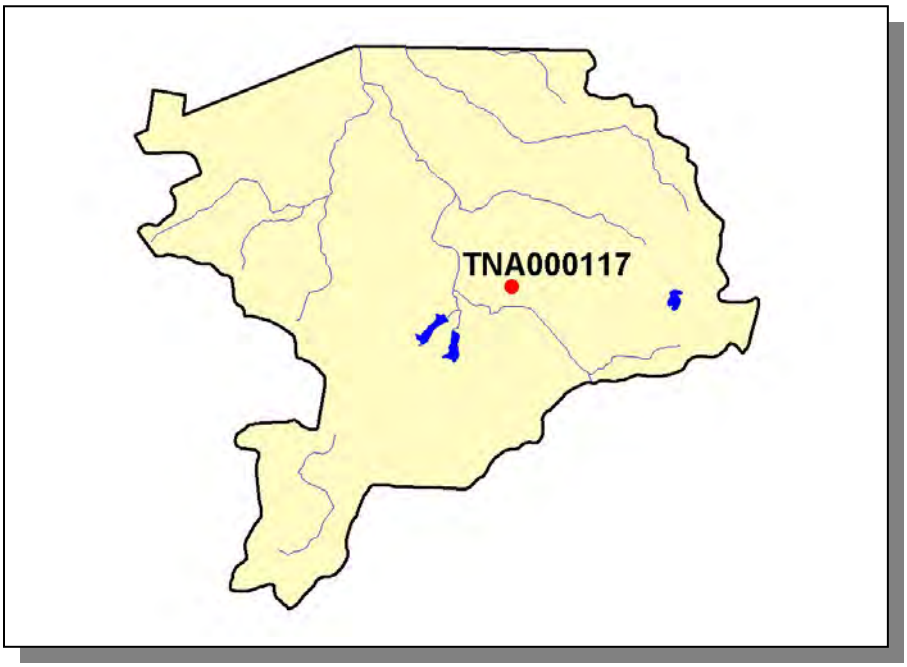

Figure 4-18. Location of Concentrated Animal Feeding Operations (CAFO) in Subwatershed 051100020102. *More information, including the names of facilities, is provided in Appendix IV*

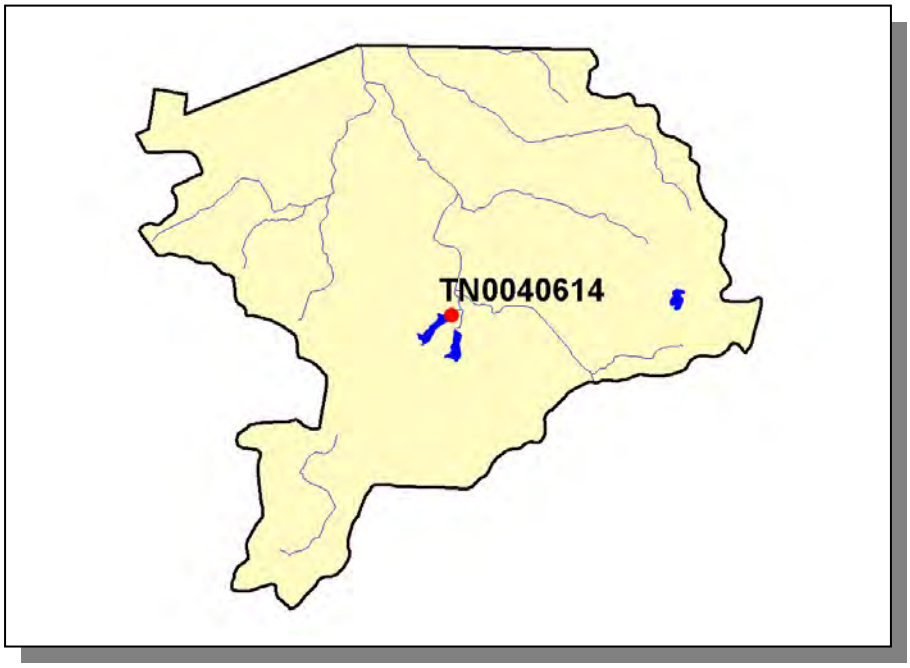

Figure 4-19. Location of Water Treatment Plants in Subwatershed 051100020102. *More information, including the names of facilities, is provided in Appendix IV.*

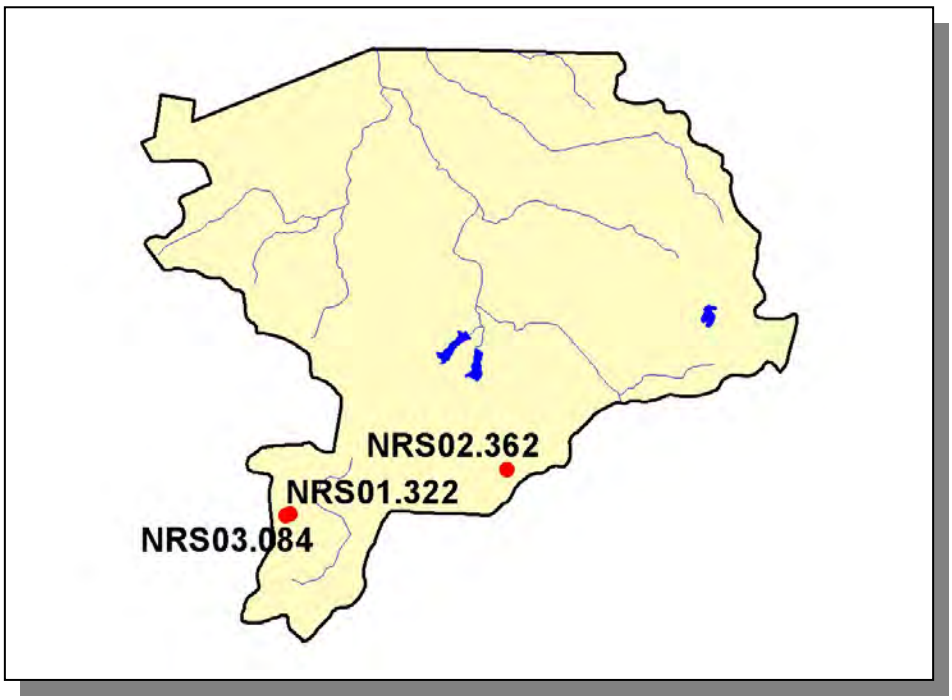

Figure 4-20. Location of Aquatic Resource Alteration Permit (ARAP) Sites (Individual Permits) in Subwatershed 051100020102. *More information is provided in Appendix IV.*

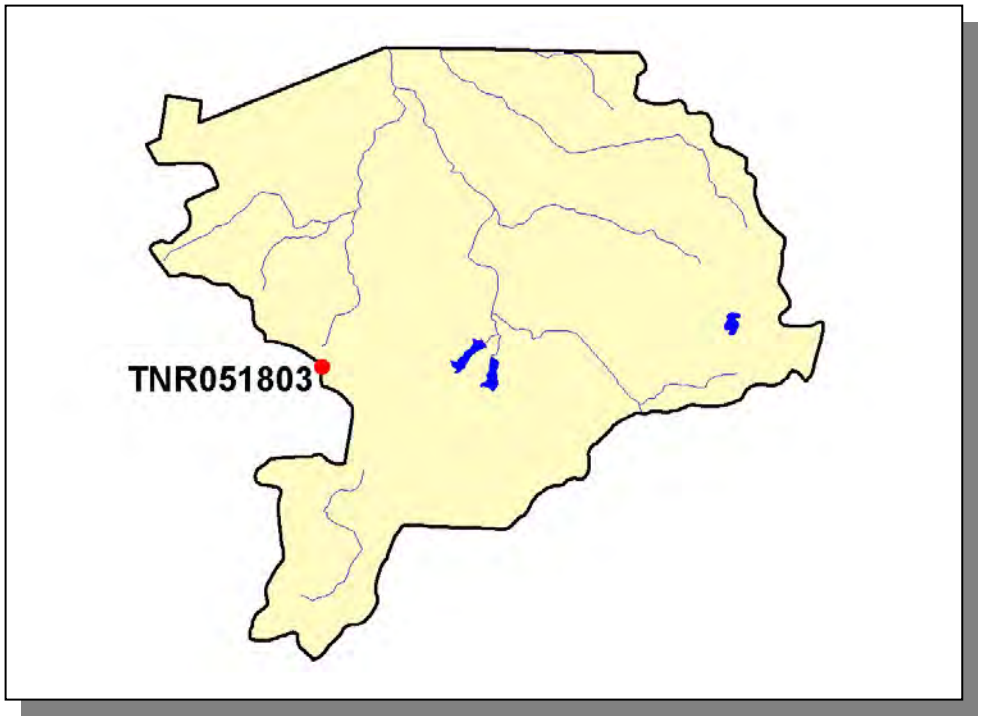

Figure 4-21. Location of TMSP Sites in Subwatershed 051100020102. *More information, including the names of facilities, is provided in Appendix IV.*

4.2.A.ii.a. Dischargers to Water Bodies Listed on the 2004 303(d) List

There is one NPDES facility discharging to water bodies listed on the 2004 303(d) list in Subwatershed 051100020102:

- TN0040614 (Portland WTP) discharges to Donaho Branch

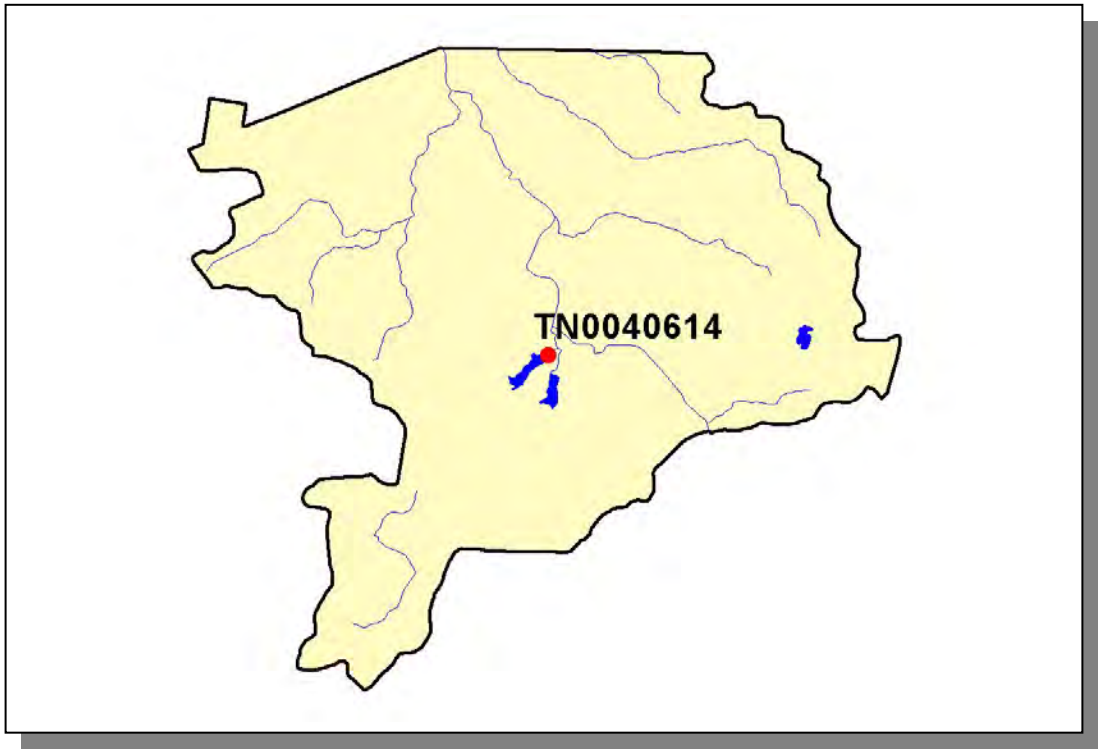

Figure 4-22. Location of NPDES Dischargers to Water Bodies Listed on the 2004 303(d) List in Subwatershed 051100020102. *More information, including the names of facilities, is provided in Appendix IV.*

Permit #	3Q2	3Q10	3Q20	7Q10
TN0040614	0.07	0.03	0.02	0.04

Table 4-12. Receiving Stream Low Flow Information for NPDES Dischargers to Waterbodies Listed on the 2004 303(d) List in Subwatershed 051100020102. *Data are in cubic feet per second (CFS). Data were obtained from the USGS web application StreamStats at http://water.usgs.gov/osw/streamstats/.*

PERMIT #	Al
TN0040614	X

Table 4-13. Monitoring Requirements for NPDES Dischargers to Waterbodies Listed on the 2004 303(d) List in Subwatershed 051100020102.

PERMIT #	TRC	TSS	SETTLEABLE SOLIDS	pH
TN0040614	X	X	X	X

Table 4-14. Inorganic Parameters Monitored for Daily Maximum Limits for NPDES Dischargers to Waterbodies Listed on the 2004 303(d) List in Subwatershed 051100020102. *TRC, Total Residual Chlorine; TSS, Total Suspended Solids.*

4.2.A.ii.b. Nonpoint Source Contributions.

LIVESTOCK					
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
1,998	4,043	136	<5	224	17

Table 4-15. Summary of Livestock Count Estimates in Subwatershed 051100020102. *According to the 1997 Census of Agriculture (http://www.nass.usda.gov/census/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

LIVESTOCK COUNTS						
County	Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
Robertson	22,502	47,887	3,478	31	6,982	279
Sumner	22,296	45,116	1,515	50	2,500	189

Table 4-16. Summary of Livestock Count Estimates in Robertson and Sumner Counties. *According to the 1997 Census of Agriculture (http://www.nass.usda.gov/census/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

	INVENTORY		REMOVAL RATE	
County	Forest Land (thousand acres)	Timber Land (thousand acres)	Growing Stock (million cubic feet)	Sawtimber (million board feet)
Robertson	53.0	53.0	2.2	9.7
Sumner	88.2	88.2	2.0	6.3

Table 4-17. Forest Acreage and Annual Removal Rates (1987-1994) in Subwatershed 051100020102.

CROPS	TONS/ACRE/YEAR
Grass (Pastureland)	0.46
Grass (Hayland)	0.31
Legumes (Hayland)	0.12
Legumes, Grass (Hayland)	0.23
Grass, Forbs, Legumes (Mixed Pasture)	0.54
Corn (Row Crops)	12.32
Soybeans (Row Crops)	11.27
Tobacco (Row Crops)	11.87
Wheat (Close-Grown Cropland)	1.68
Other Cropland not Planted	19.23
Conservation Reserve Program Lands	0.26
Other Land in Farms	0.27
Farmsteads and Ranch Headquarters	0.34

Table 4-18. Annual Estimated Total Soil Loss in Subwatershed 051100020102.

4.2.B. 0511000204.

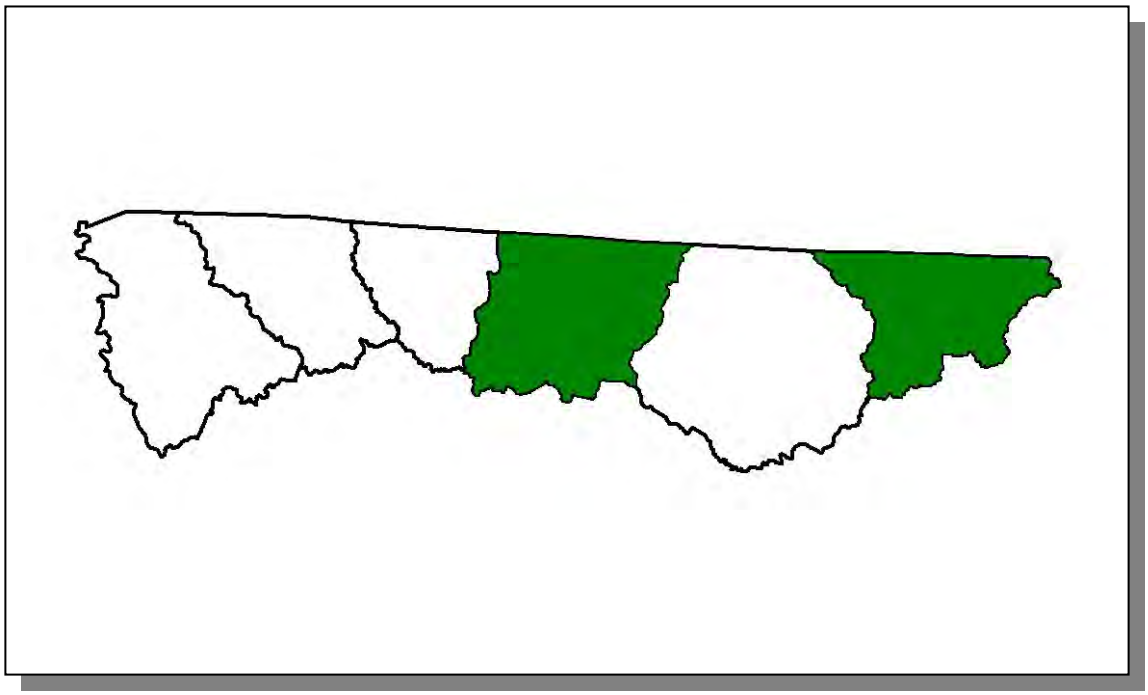

Figure 4-23. Location of Subwatershed 0511000204. *All Barren River HUC-10 subwatershed boundaries in the Tennessee portion of the watershed are shown for reference.*

4.2.B.i. 051100020403 (Treeline Creek).

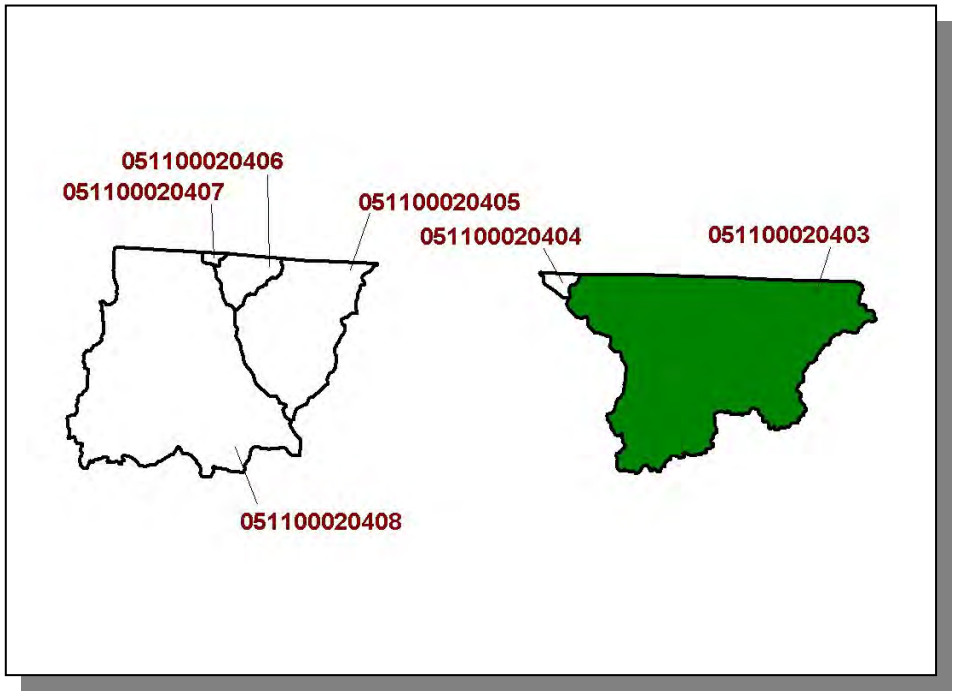

Figure 4-24. Location of Subwatershed 051100020403. *HUC-12 subwatershed boundaries are shown for reference.*

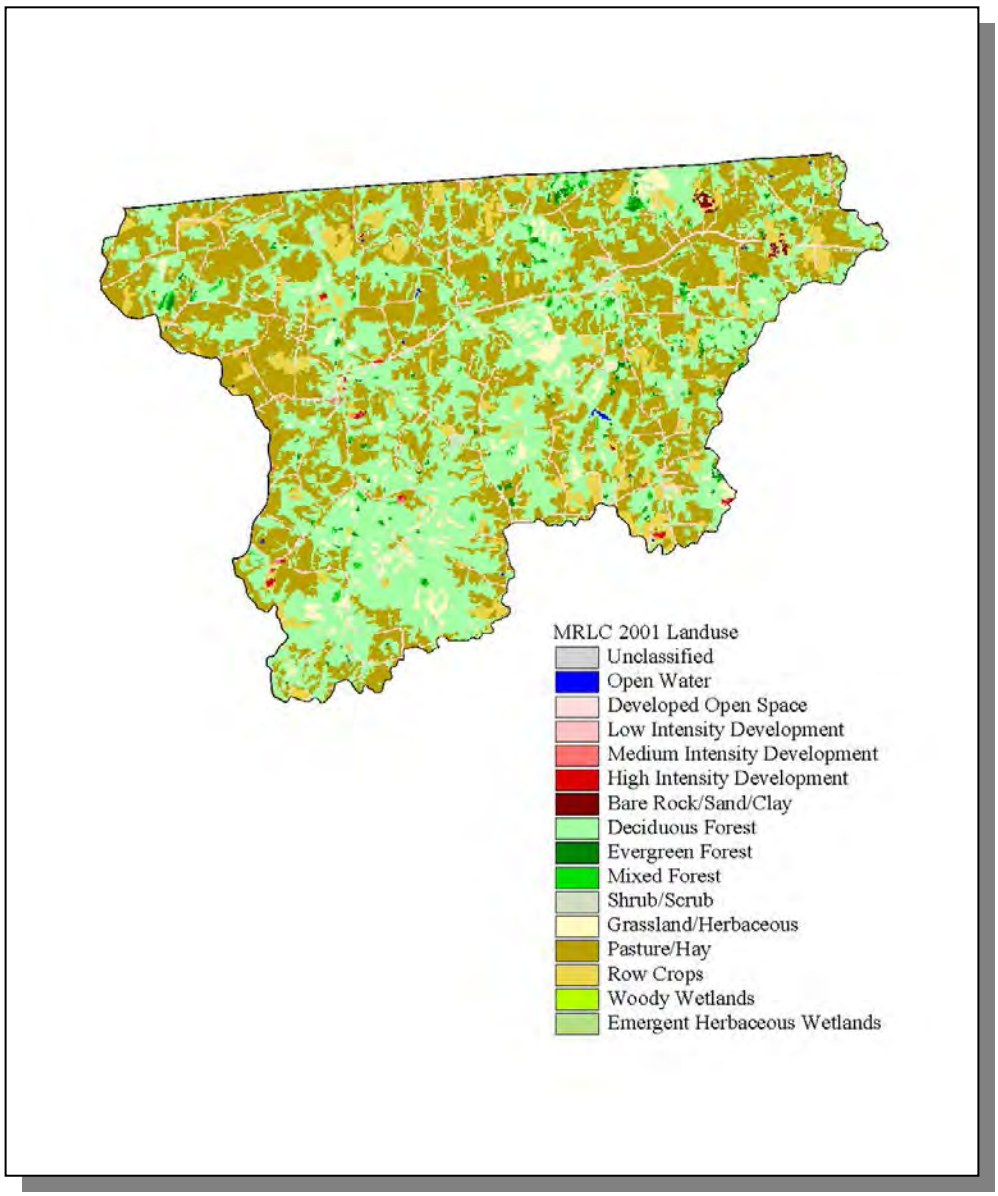

Figure 4-25. Illustration of Land Use Distribution in Subwatershed 051100020403.

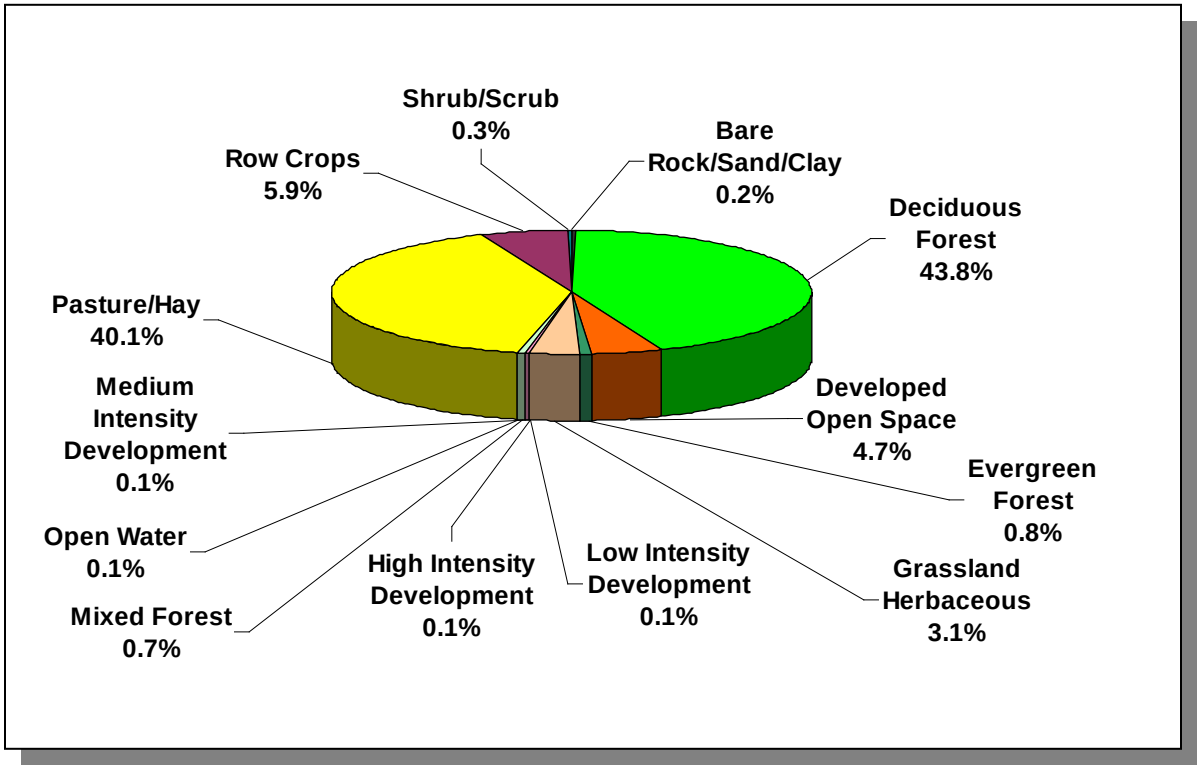

Figure 4-26. Land Use Distribution in Subwatershed 051100020403. *More information is provided in Appendix IV.*

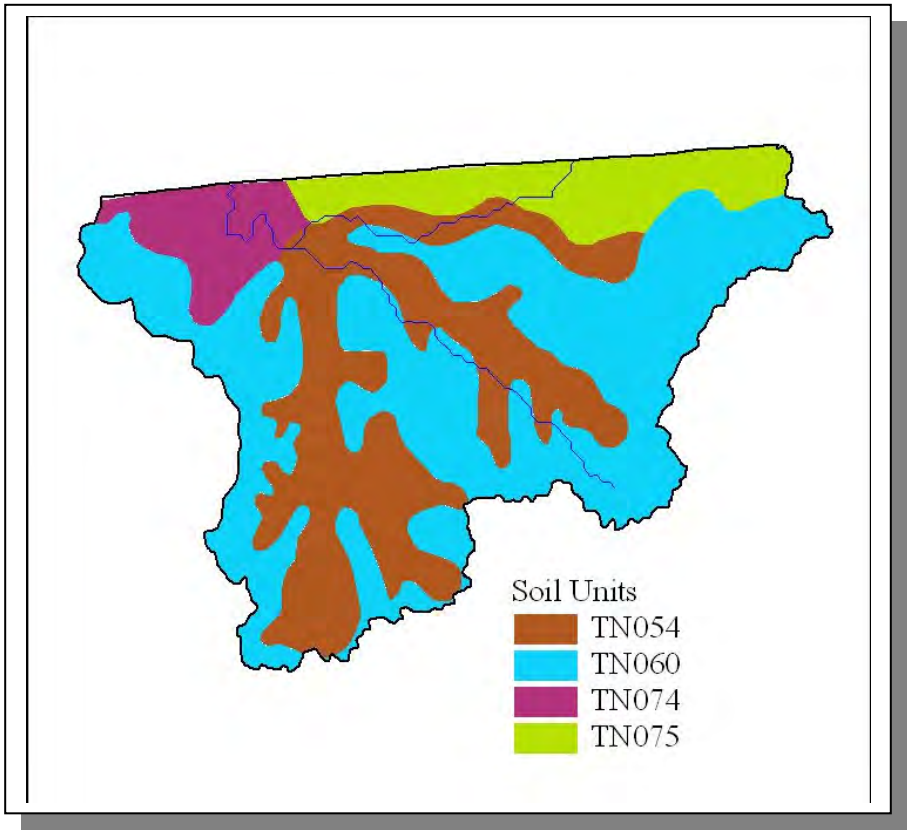

Figure 4-27. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 051100020403.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN054	0.00	C	3.04	4.84	Loam	0.32
TN060	5.00	B	1.30	5.32	Silty Loam	0.39
TN074	7.00	B	1.55	4.94	Loam	0.33
TN075	0.00	B	1.33	5.24	Loam	0.31

Table 4-19. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 051100020403. *The definition of "Hydrologic Group" is provided in Appendix IV.*

.

	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Clay	7,238	7,311	7,976	19.4	1,404	1,418	1,547	10.2
Macon	15,906	17,854	20,386	2.89	459	515	588	28.1
Totals	**23,144**	**25,165**	**28,362**		**1,863**	**1,933**	**2,135**	**14.6**

Table 4-20. Population Estimates in Subwatershed 051100020403.

Figure 4-28. Location of Monitoring Sites in EPA's STORET Database in Subwatershed 051100020403. *More information, including site names and locations, and station numbers for sites located in the watershed outside of Tennessee, is provided in Appendix IV.*

4.2.B.i.a. Point Source Contributions.

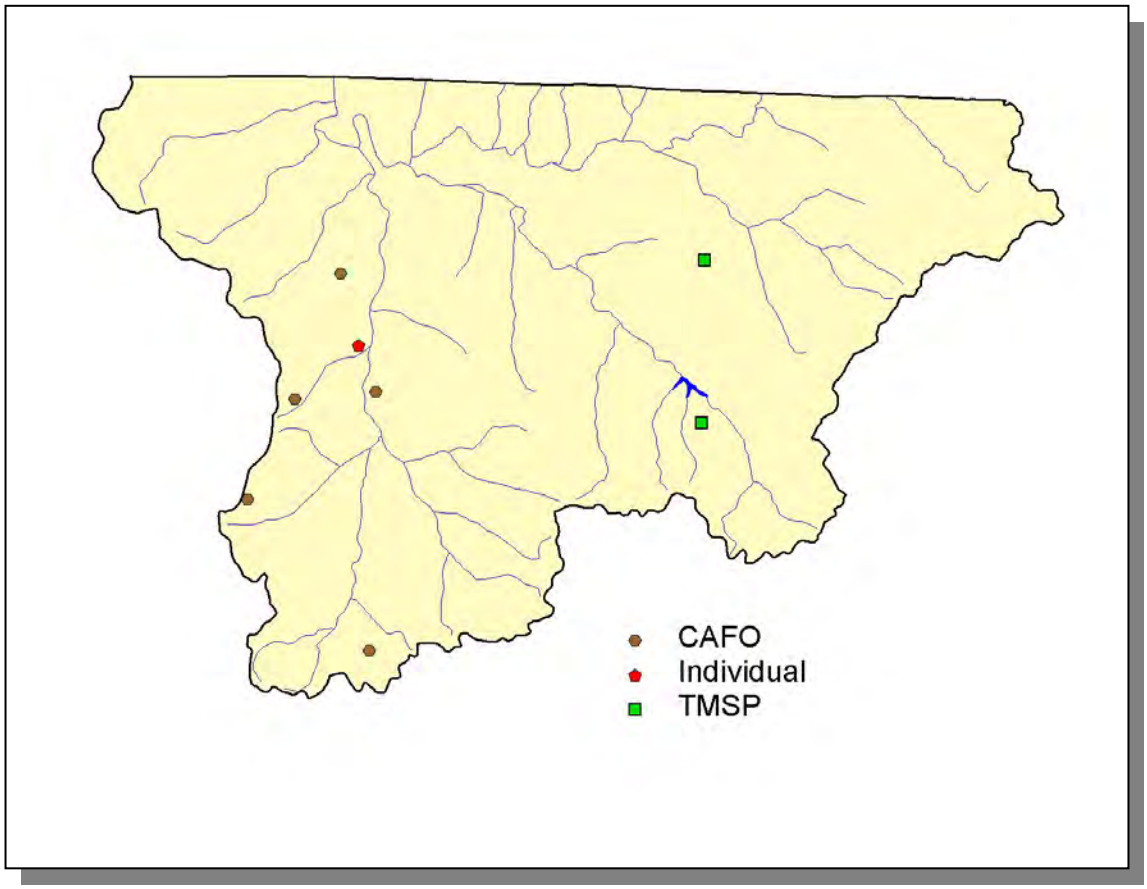

Figure 4-29. Location of Permits Issued in Subwatershed 05110020403. *More information, including the names of facilities, is provided in Appendix IV.*

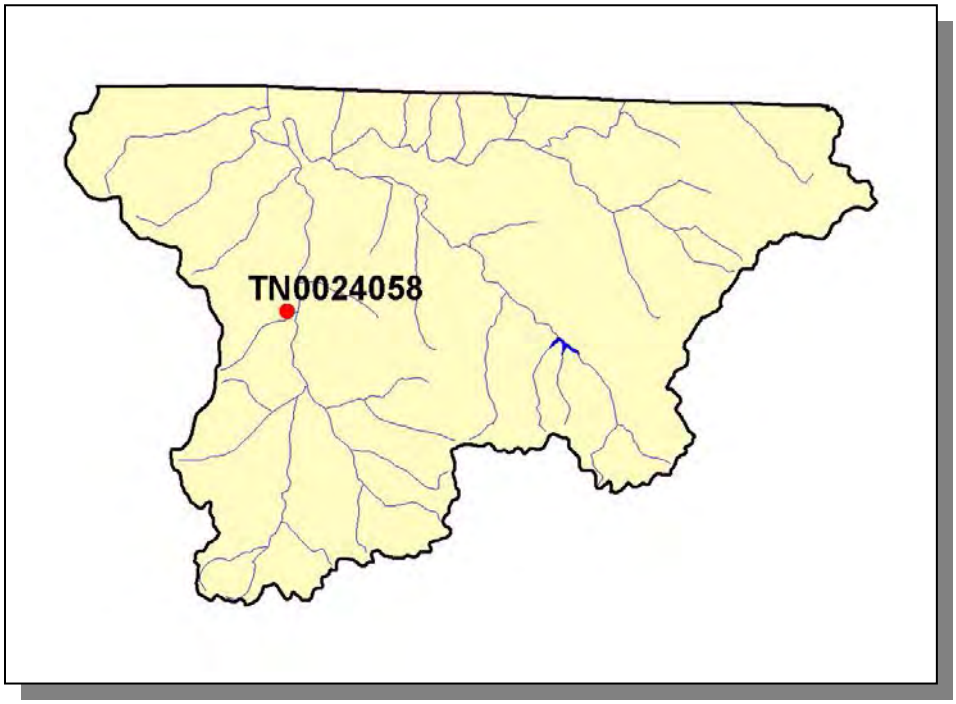

Figure 4-30. Location of Active NPDES Sites in Subwatershed 051100020403. *More information, including the names of facilities, is provided in Appendix IV.*

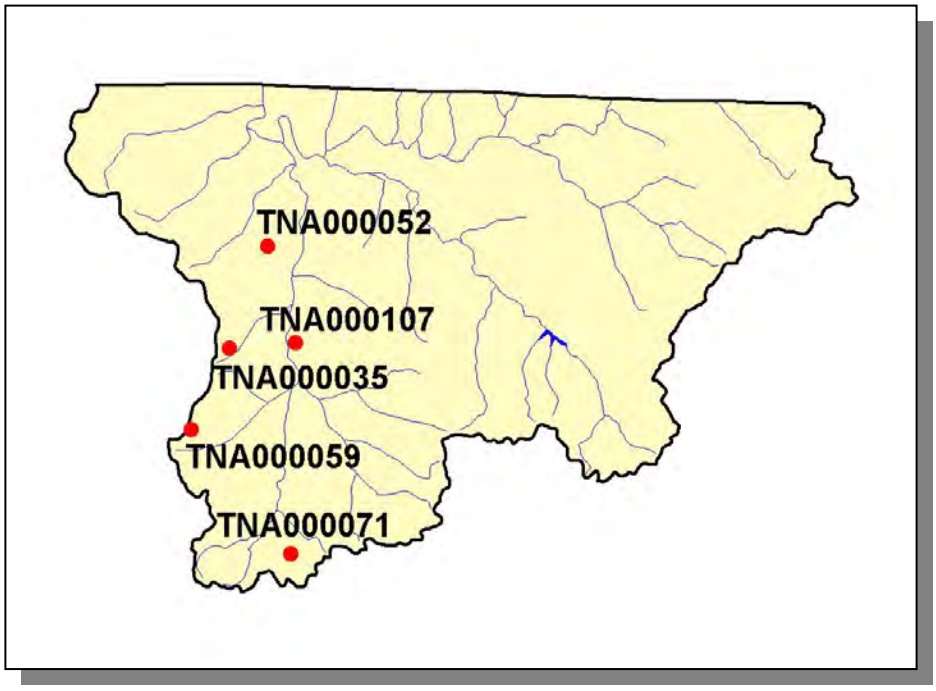

Figure 4-31. Location of Concentrated Animal Feeding Operations (CAFO) in Subwatershed 051100020403. *More information, including the names of facilities, is provided in Appendix IV.*

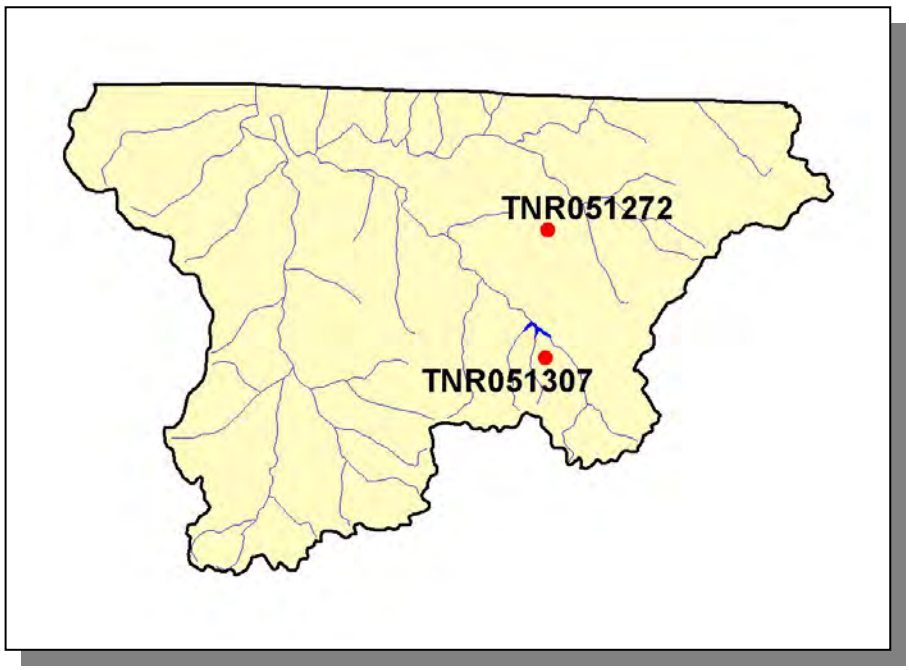

Figure 4-32. Location of TMSP Sites in Subwatershed 051100020403. *More information, including the names of facilities, is provided in Appendix IV.*

4.2.B.i.b. Nonpoint Source Contributions.

LIVESTOCK COUNTS					
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
686	10,525	15	13	220	20

Table 4-21. Summary of Livestock Count Estimates in Subwatershed 051100020403. *According to the 1997 Census of Agriculture (http://www.nass.usda.gov/census/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

LIVESTOCK COUNTS						
County	Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
Clay	0	14,574	0	18	174	23
Macon	15,039	26,098	318	675	2,377	111

Table 4-22. Summary of Livestock Count Estimates in Clay and Macon Counties. *According to the 1997 Census of Agriculture (http://www.nass.usda.gov/census/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

CROPS	TONS/ACRE/YEAR
Legumes (Pastureland)	0.07
Grass (Pastureland)	1.04
Grass (Hayland)	0.37
Legume (Hayland)	0.13
Legumes, Grass (Hayland)	0.47
Grass, Forbs, Legumes (Mixed Pasture)	1.33
Corn (Row Crops)	3.99
Tobacco (Row Crops)	26.08
Wheat (Close-Grown Cropland)	3.43
Other Vegetable and Truck Crop	5.48
Conservation Reserve Program Lands	0.28
Farmsteads and Ranch Headquarters	1.36

Table 4-23. Annual Estimated Total Soil Loss in Subwatershed 051100020403.

4.2.B.ii. 051100020404 (Barren River).

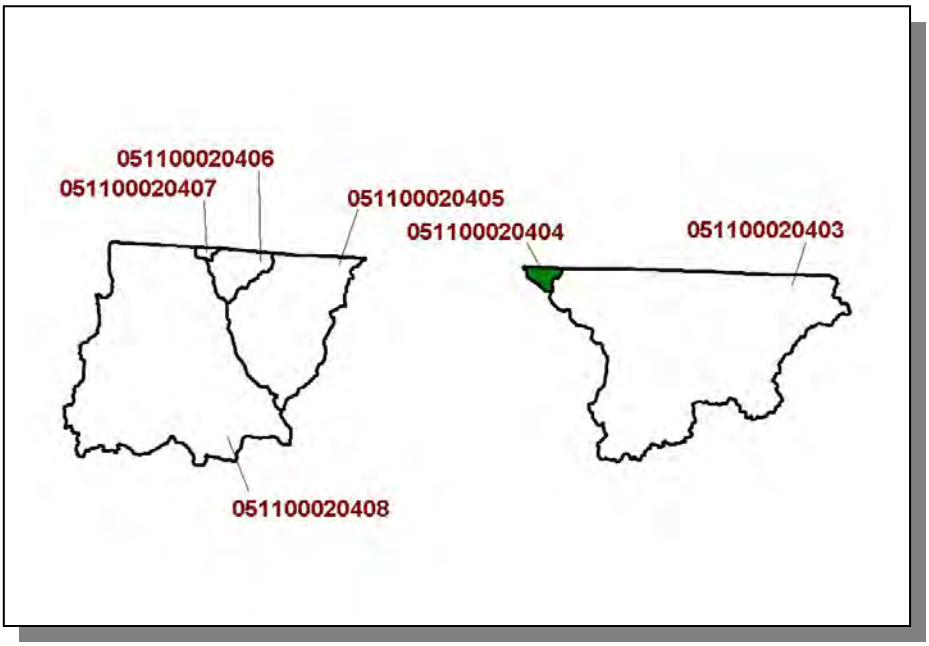

Figure 4-33. Location of Subwatershed 051100020404. *HUC-12 subwatershed boundaries are shown for reference.*

	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Macon	15,906	17,854	20,386	0.58	92	103	118	28.3

Table 4-24. Population Estimates in Subwatershed 051100020404.

4.2.B.ii.a. Point Source Contributions.

There are no point source contributions in this subwatershed.

4.2.B.ii.b. Nonpoint Source Contributions.

There are known nonpoint source contributions in this subwatershed.

4.2.B.iii. 051100020405 (Puncheon Creek).

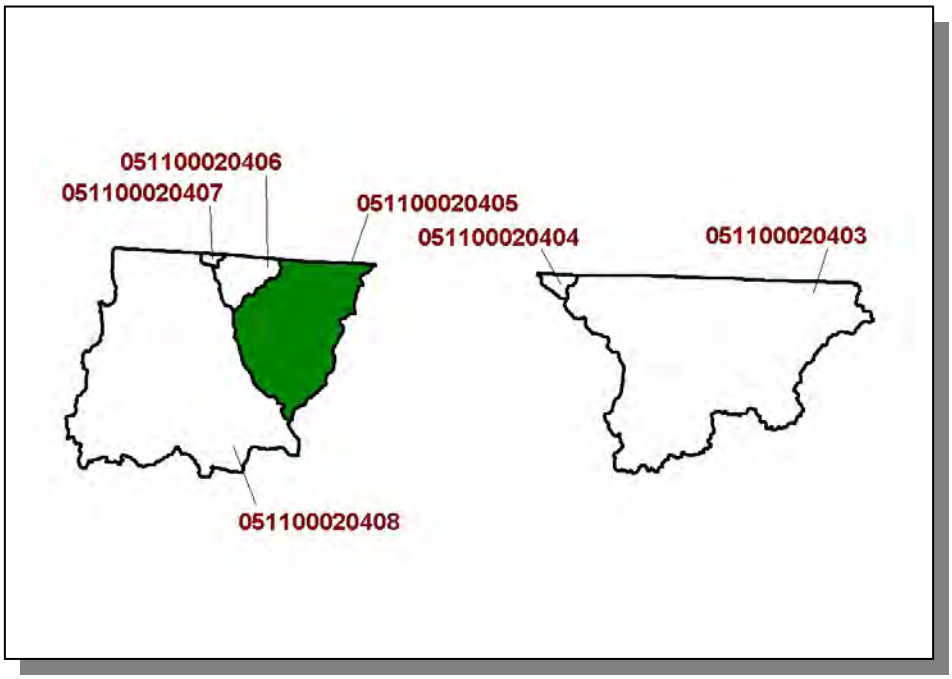

Figure 4-34. Location of Subwatershed 051100020405. *HUC-12 subwatershed boundaries are shown for reference.*

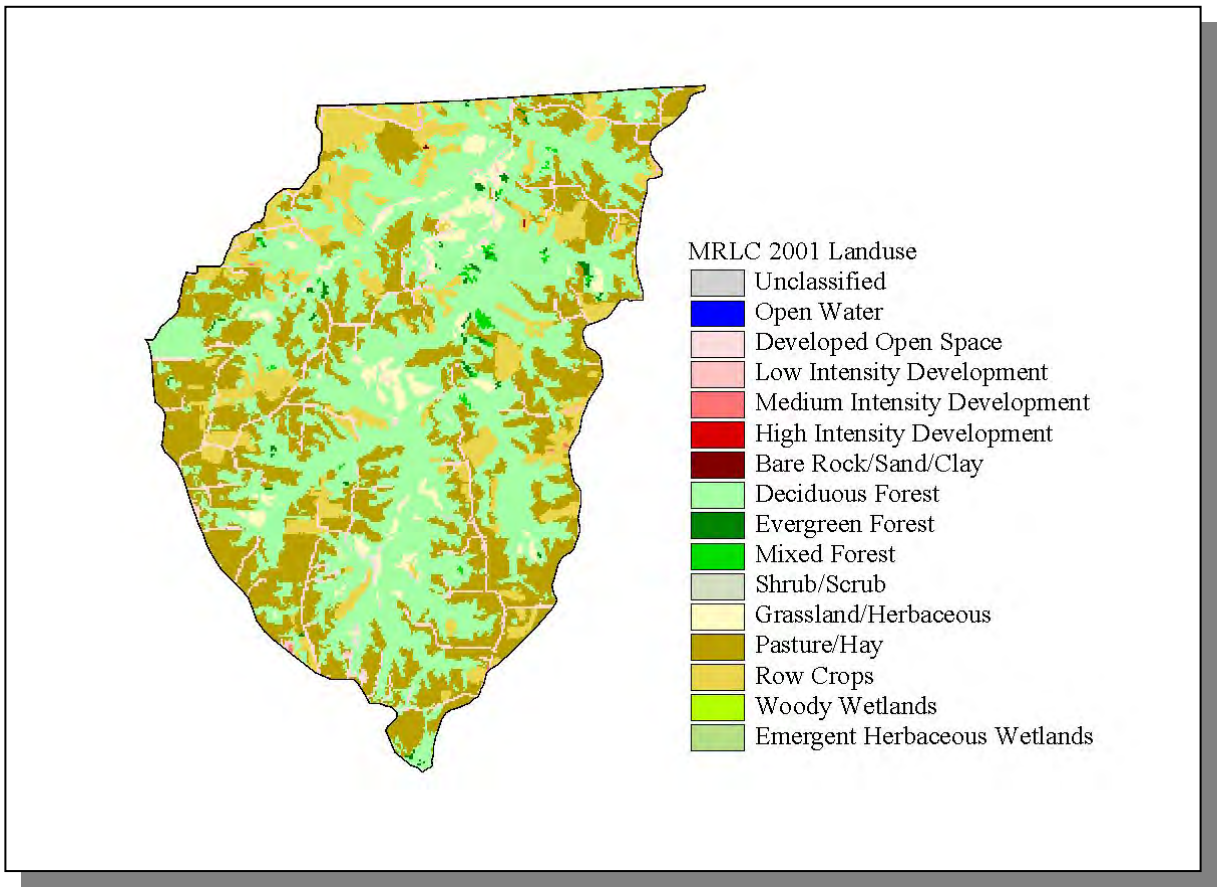

Figure 4-35. Land Use Distribution in Subwatershed 051100020405.

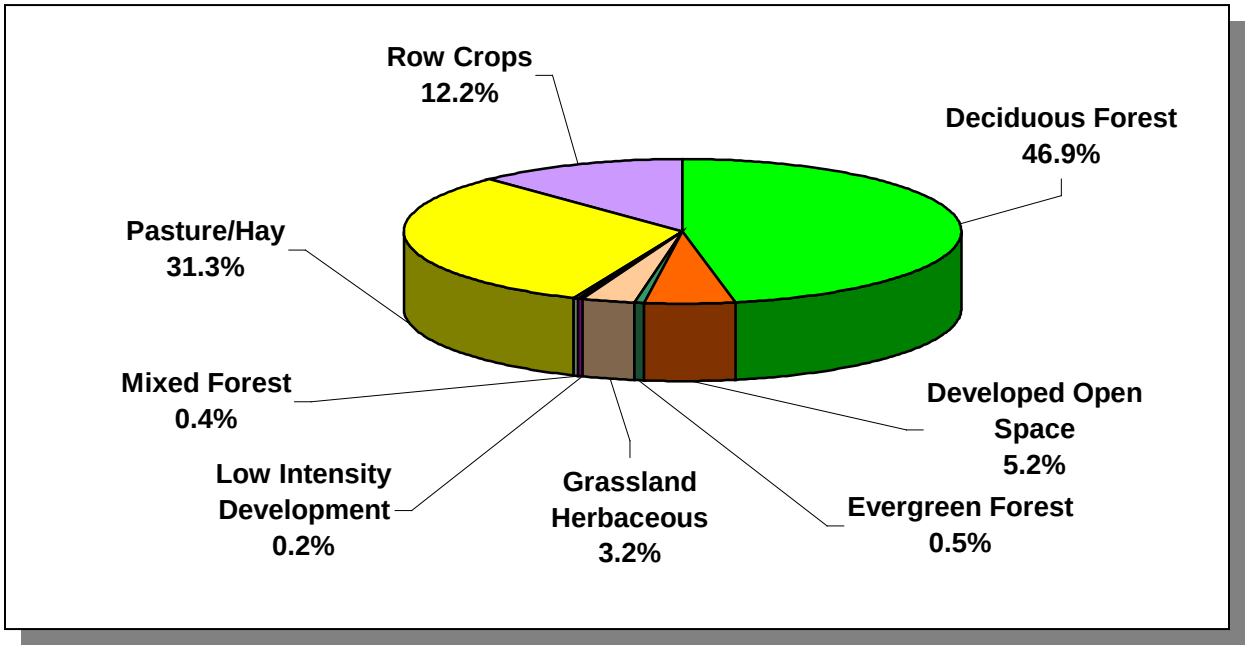

Figure 4-36. Land Use Distribution in Subwatershed 051100020405.

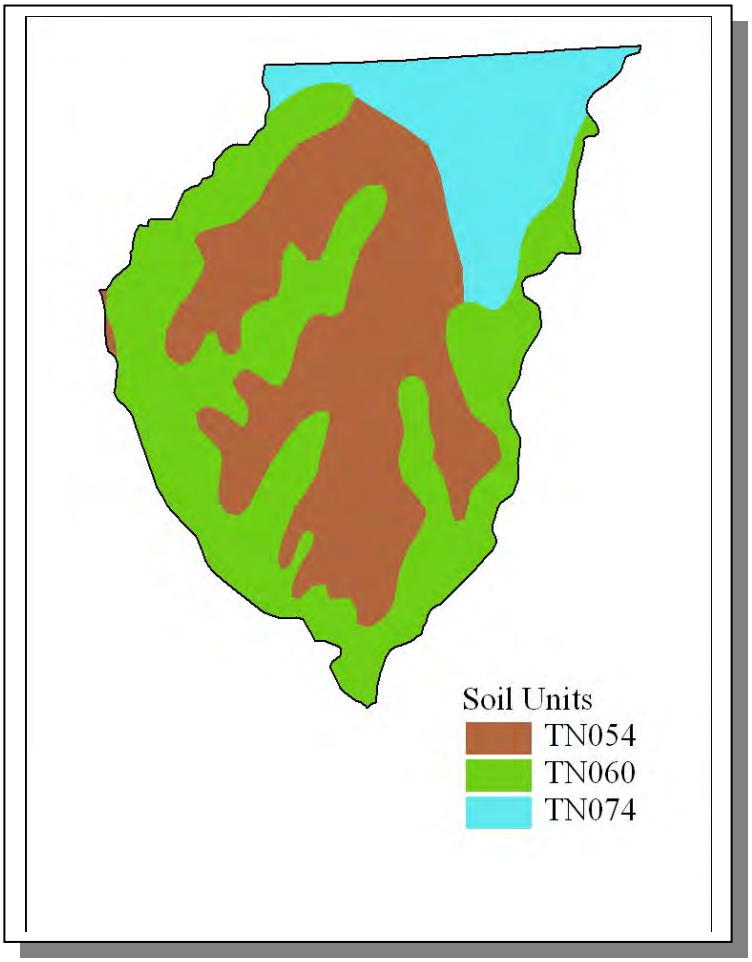

Figure 4-37. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 051100020405.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN054	0.00	C	3.04	1.38	Loam	0.32
TN060	5.00	B	1.30	1.37	Silty Loam	0.39
TN074	7.00	B	1.44	1.36	Loam	0.33

Table 4-25. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 051100020405. *The definition of "Hydrologic Group" is provided in Appendix IV.*

.

	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Macon	15,906	17,854	20,386	6.08	967	1,085	1,239	28.1

Table 4-26. Population Estimates in Subwatershed 051100020405.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Lafayette	Macon	3,641	1,695	1,323	348	24

Table 4-27. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 051100020405.

Figure 4-38. Location of Monitoring Sites in EPA's STORET Database in Subwatershed 051100020405. *More information, including site names and locations, and station numbers for sites located in the watershed outside of Tennessee, is provided in Appendix IV.*

4.2.B.iii.a. Point Source Contributions.

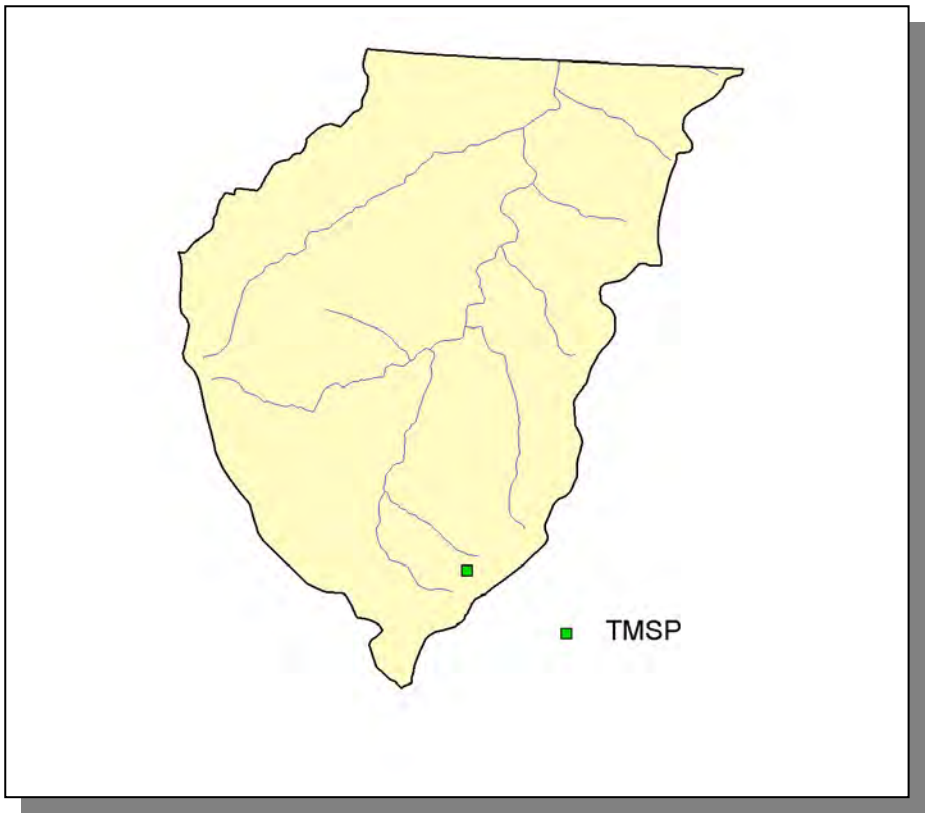

Figure 4-39. Location of Permits Issued in Subwatershed 051100020405. *More information, including the names of facilities, is provided in Appendix IV.*

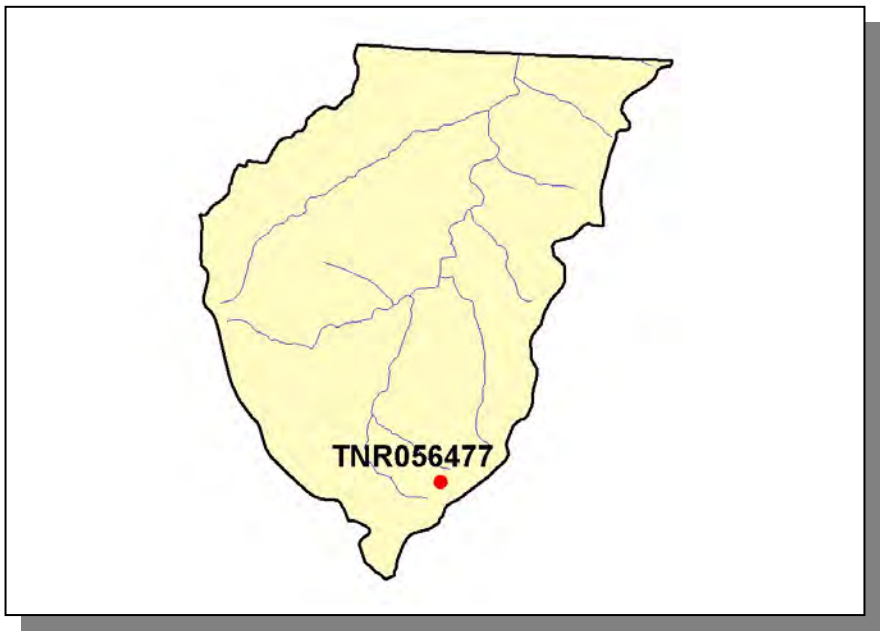

Figure 4-40. Location of TMSP Sites in Subwatershed 051100020405. *More information, including the names of facilities, is provided in Appendix IV.*

4.2.B.iii.b. Nonpoint Source Contributions.

LIVESTOCK COUNTS					
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
1,185	2,056	25	3	187	9

Table 4-28. Summary of Livestock Count Estimates in Subwatershed 051100020405. *According to the 1997 Census of Agriculture (http://www.nass.usda.gov/census/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

LIVESTOCK COUNTS						
County	Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
Macon	15,039	26,098	318	675	2,377	111

Table 4-29. Summary of Livestock Count Estimates in Macon County. *According to the 1997 Census of Agriculture (http://www.nass.usda.gov/census/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

CROPS	TONS/ACRE/YEAR
Legumes (Pastureland)	0.07
Grass (Pastureland)	0.43
Grass (Hayland)	0.21
Legumes (Hayland)	0.13
Legumes, Grass (Hayland)	0.14
Grass, Forbs, Legumes (Mixed Pasture)	1.03
Corn (Row Crops)	3.99
Tobacco (Row Crops)	11.12
Wheat (Close-Grown Cropland)	3.43
Other Vegetable and Truck Crop	5.48
Conservation Reserve Program Lands	0.28
Farmsteads and Ranch Headquarters	0.16

Table 4-30. Annual Estimated Total Soil Loss in Subwatershed 051100020405.

4.2.B.iv. 051100020406 (Pinchgut Creek).

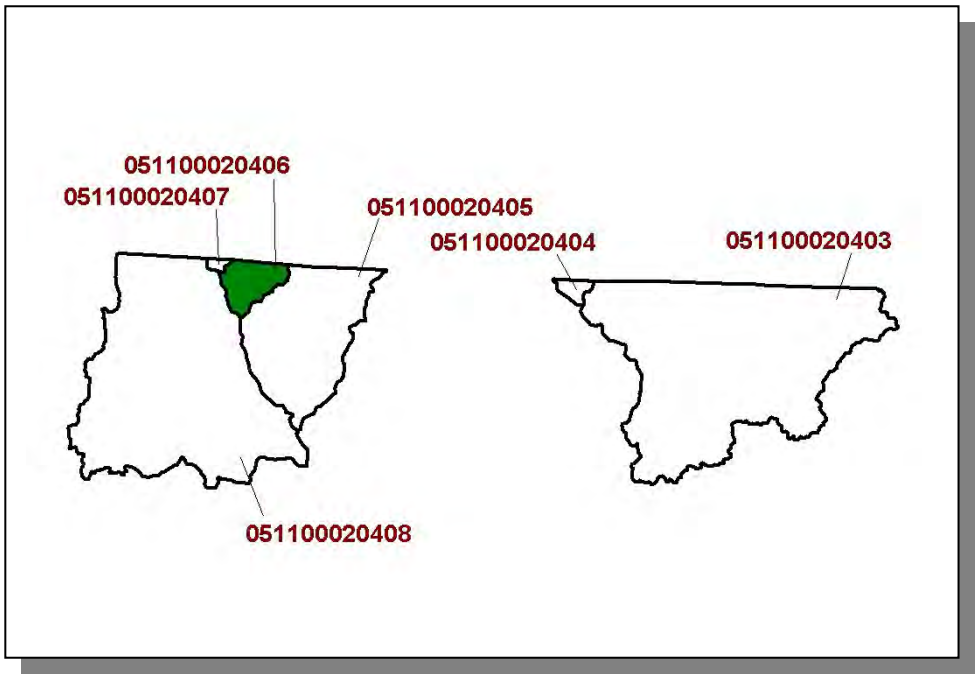

Figure 4-41. Location of Subwatershed 051100020406. *HUC-12 subwatershed boundaries are shown for reference.*

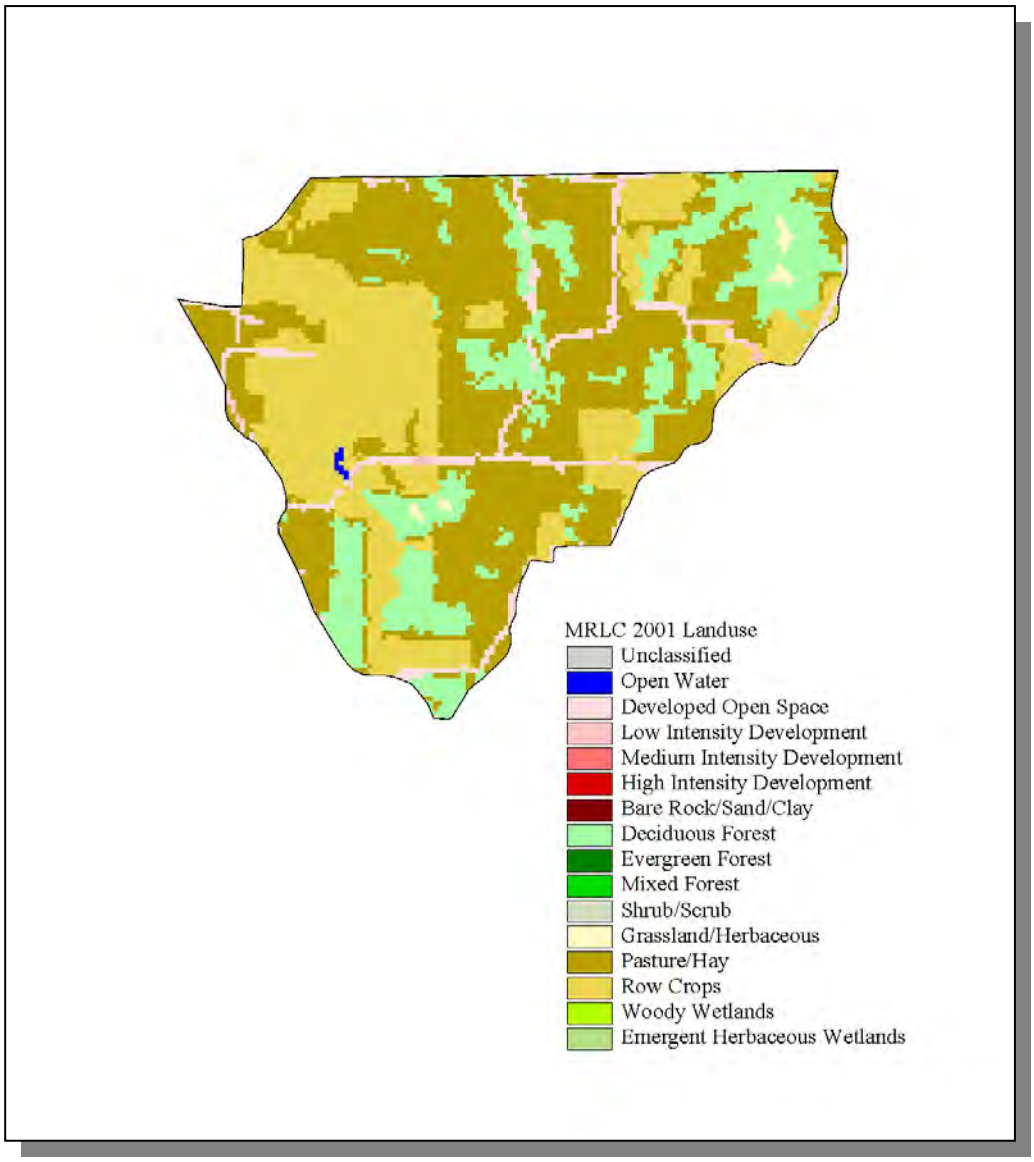

Figure 4-42. Illustration of Land Use Distribution in Subwatershed 051100020406.

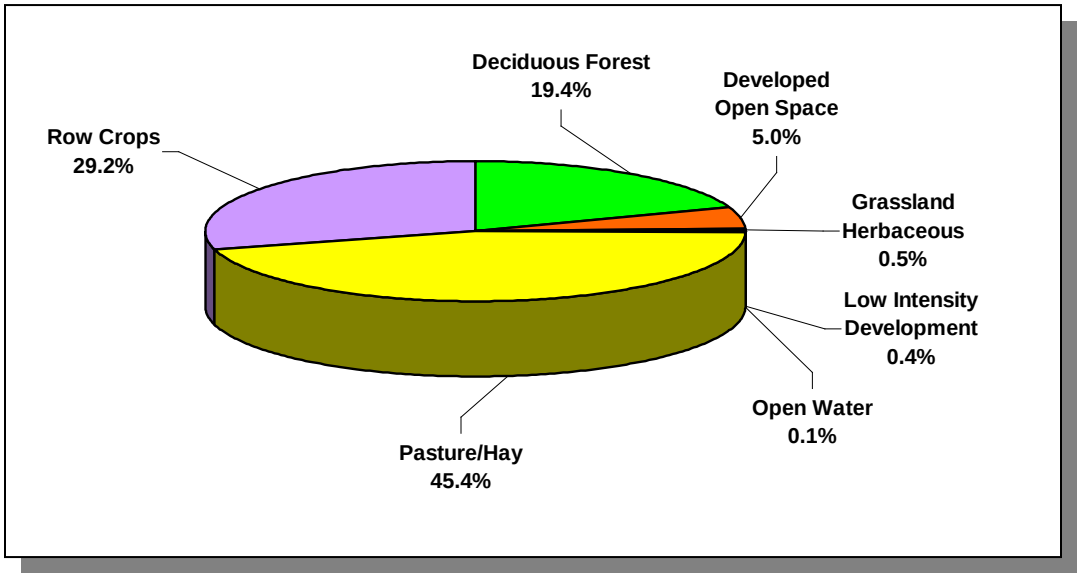

Figure 4-43. Land Use Distribution in Subwatershed 051100020406. *More information is provided in Appendix IV.*

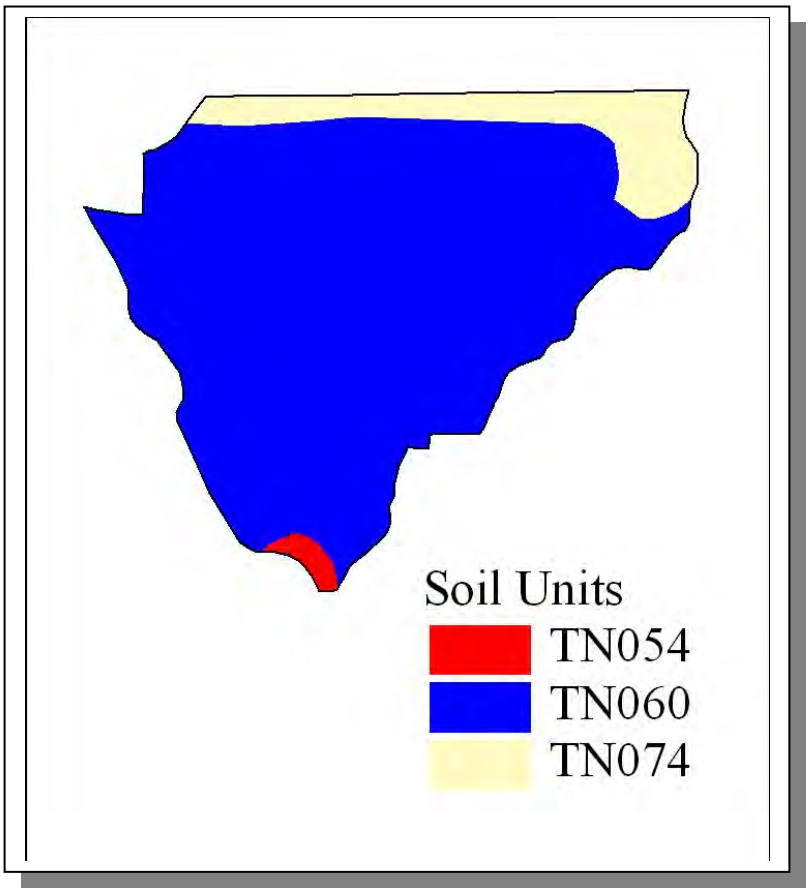

Figure 4-44. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 051100020406.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN054	0.00	C	3.04	4.84	Loam	0.32
TN060	5.00	B	1.30	5.32	Silty Loam	0.39
TN074	7.00	B	1.44	4.94	Loam	0.33

Table 4-31. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 051100020406. *The definition of "Hydrologic Group" is provided in Appendix IV.*

.

	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Macon	15,906	17,854	20,386	1.41	235	264	302	28.5

Table 4-32. Population Estimates in Subwatershed 051100020406.

4.2.B.iv.a. Point Source Contributions.

There are no point source contributions in this subwatershed.

4.2.B.iv.b. Nonpoint Source Contributions.

LIVESTOCK COUNTS					
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
345	599	7	<5	55	3

Table 4-33. Summary of Livestock Count Estimates in Subwatershed 051100020406. *According to the 1997 Census of Agriculture (http://www.nass.usda.gov/census/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

LIVESTOCK COUNTS						
County	Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
Macon	15,039	26,098	318	675	2,377	111

Table 4-34. Summary of Livestock Count Estimates in Macon County. *According to the 1997 Census of Agriculture (http://www.nass.usda.gov/census/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

CROPS	TONS/ACRE/YEAR
Legumes (Pastureland)	0.07
Grass (Pastureland)	0.43
Grass (Hayland)	0.21
Legumes (Hayland)	0.13
Legumes, Grass (Hayland)	0.14
Grass, Forbs, Legumes (Mixed Pasture)	1.03
Corn (Row Crops)	3.99
Tobacco (Row Crops)	11.12
Wheat (Close-Grown Cropland)	3.43
Other Vegetable and Truck Crop	5.48
Conservation Reserve Program Lands	0.28
Farmsteads and Ranch Headquarters	0.16

Table 4-35. Annual Estimated Total Soil Loss in Subwatershed 051100020406.

4.2.B.v. 051100020407 (Long Hungry Creek).

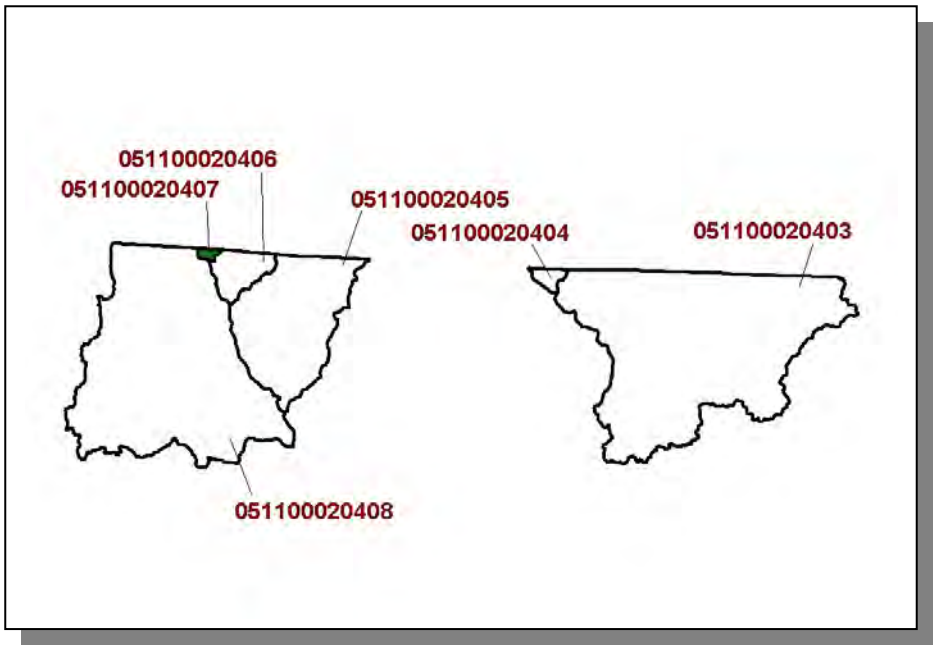

Figure 4-45. Location of Subwatershed 051100020407. *HUC-12 subwatershed boundaries are shown for reference.*

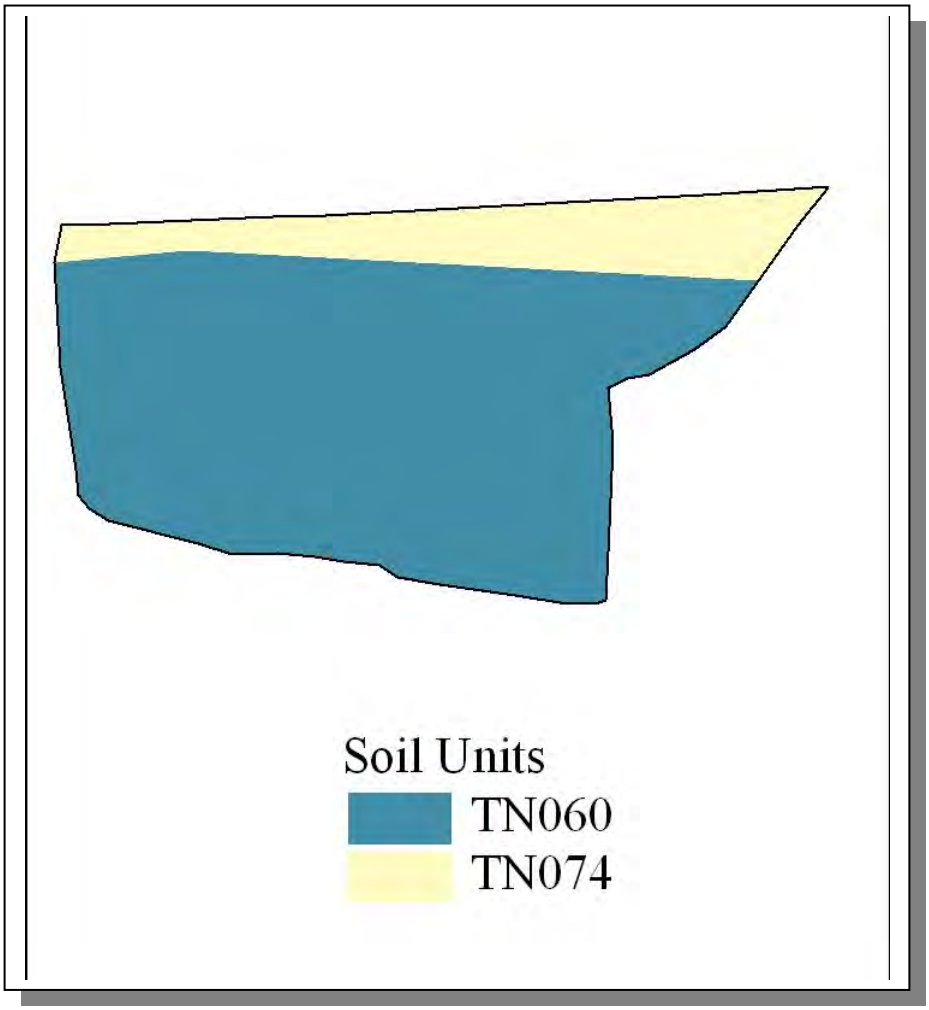

Figure 4-46. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 051100020407.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN060	5.00	B	1.30	5.32	Silty Loam	0.39
TN074	7.00	B	1.44	4.94	Loam	0.33

Table 4-36. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 051100020407. *The definition of "Hydrologic Group" is provided in Appendix IV.*

.

	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Macon	15,906	17,854	20,386	0.29	47	52	60	27.7

Table 4-37. Population Estimates in Subwatershed 051100020407.

4.2.B.v.a. Point Source Contributions.

There are no point source contributions in this subwatershed.

4.2.B.v.b. Nonpoint Source Contributions.

LIVESTOCK COUNTS			
Beef Cow	Cattle	Milk Cow	Hogs
42	73	<5	7

Table 4-38. Summary of Livestock Count Estimates in Subwatershed 051100020407. *According to the 1997 Census of Agriculture (http://www.nass.usda.gov/census/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

LIVESTOCK COUNTS						
County	Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
Macon	15,039	26,098	318	675	2,377	111

Table 4-39. Summary of Livestock Count Estimates in Macon County. *According to the 1997 Census of Agriculture (http://www.nass.usda.gov/census/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

CROPS	TONS/ACRE/YEAR
Legumes (Pastureland)	0.07
Grass (Pastureland)	0.43
Grass (Hayland)	0.21
Legumes (Hayland)	0.13
Legumes, Grass (Hayland)	0.14
Grass, Forbs, Legumes (Mixed Pasture)	1.03
Corn (Row Crops)	3.99
Tobacco (Row Crops)	11.12
Wheat (Close-Grown Cropland)	3.43
Other Vegetable and Truck Crops	5.48
Conservation Reserve Program Lands	0.28
Farmsteads and Ranch Headquarters	0.16

Table 4-40. Annual Estimated Total Soil Loss in Subwatershed 051100020407.

4.2.B.vi. 051100020408 (Long Creek).

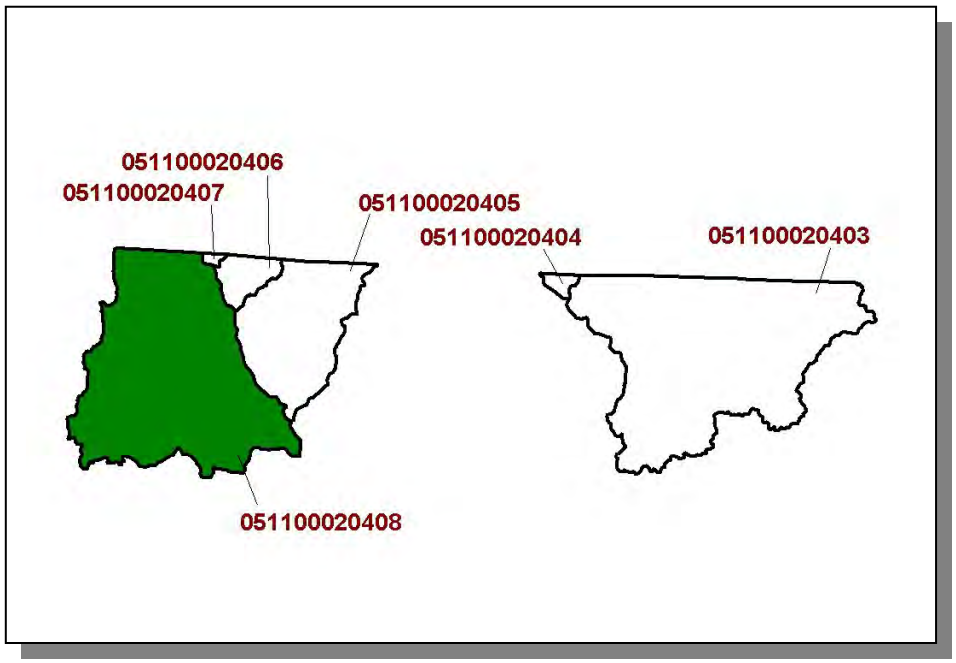

Figure 4-41. Location of Subwatershed 051100020408. *HUC-12 subwatershed boundaries are shown for reference.*

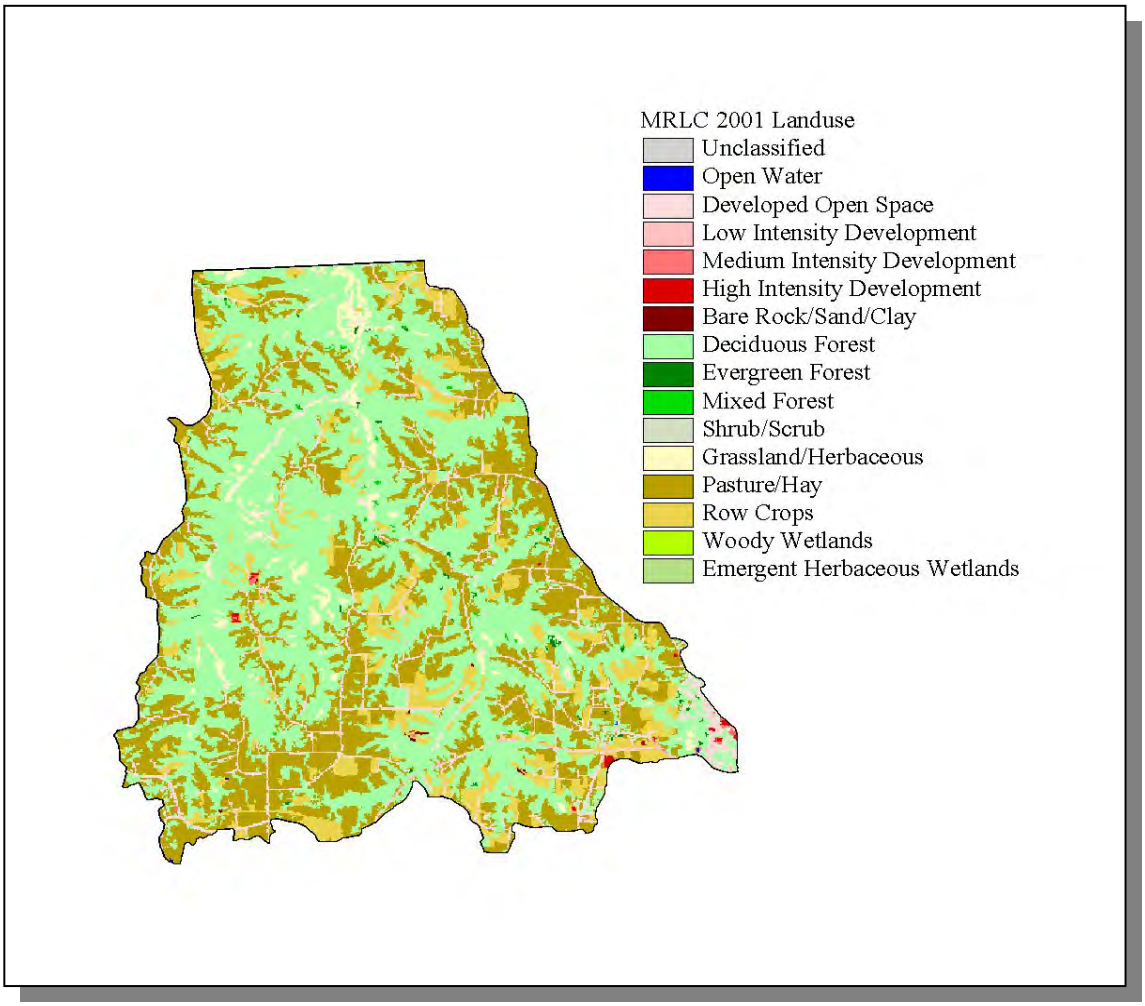

Figure 4-48. Illustration of Land Use Distribution in Subwatershed 051100020408.

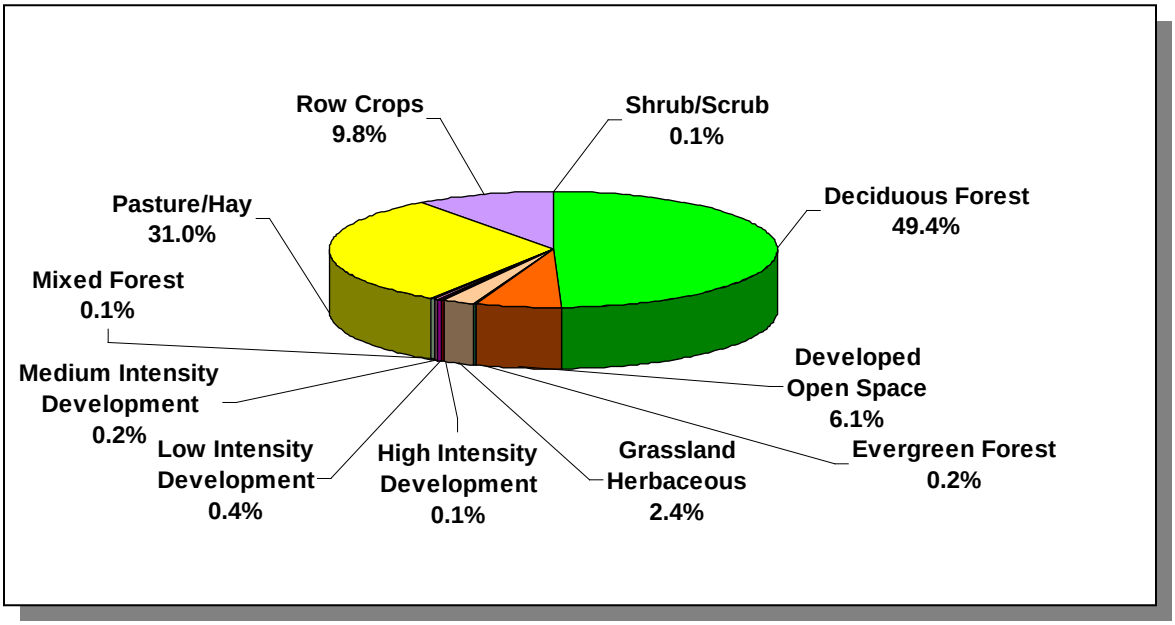

Figure 4-49. Land Use Distribution in Subwatershed 051100020408. *More information is provided in Appendix IV.*

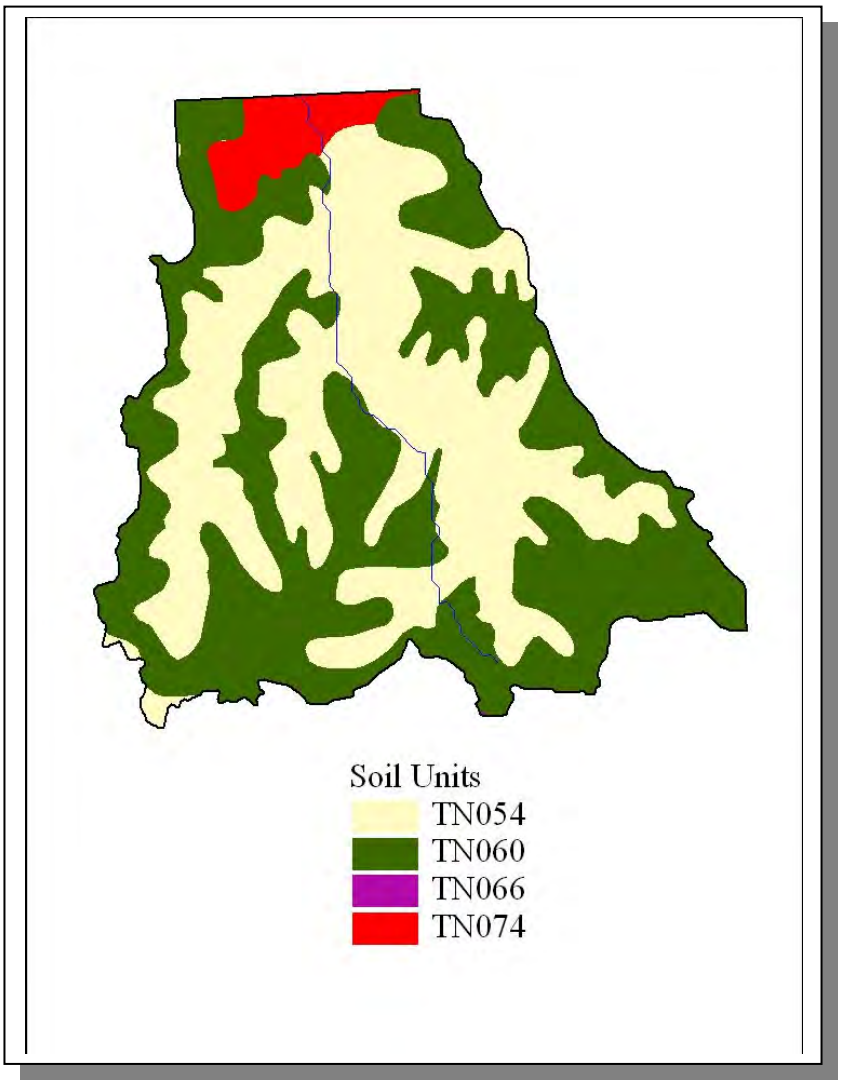

Figure 4-50 STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 051100020408.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN054	0.00	C	3.04	4.84	Loam	0.32
TN060	5.00	B	1.30	5.32	Silty Loam	0.39
TN066	0.00	B	2.62	4.75	Loam	0.28
TN074	7.00	B	1.44	4.94	Loam	0.33

Table 4-41. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 051100020408. *The definition of "Hydrologic Group" is provided in Appendix IV.*

.

	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Macon	15,906	17,854	20,386	15.96	2,539	2,850	3,254	28.2

Table 4-42. Population Estimates in Subwatershed 051100020408.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Lafayette	Macon	3,641	1,695	1,323	348	24

Table 4-43. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 051100020408.

Figure 4-51. Location of Monitoring Sites in EPA's STORET Database in Subwatershed 051100020408. *More information, including site names and locations, and station numbers for sites located in the watershed outside of Tennessee, is provided in Appendix IV.*

4.2.B.vi.a. Point Source Contributions.

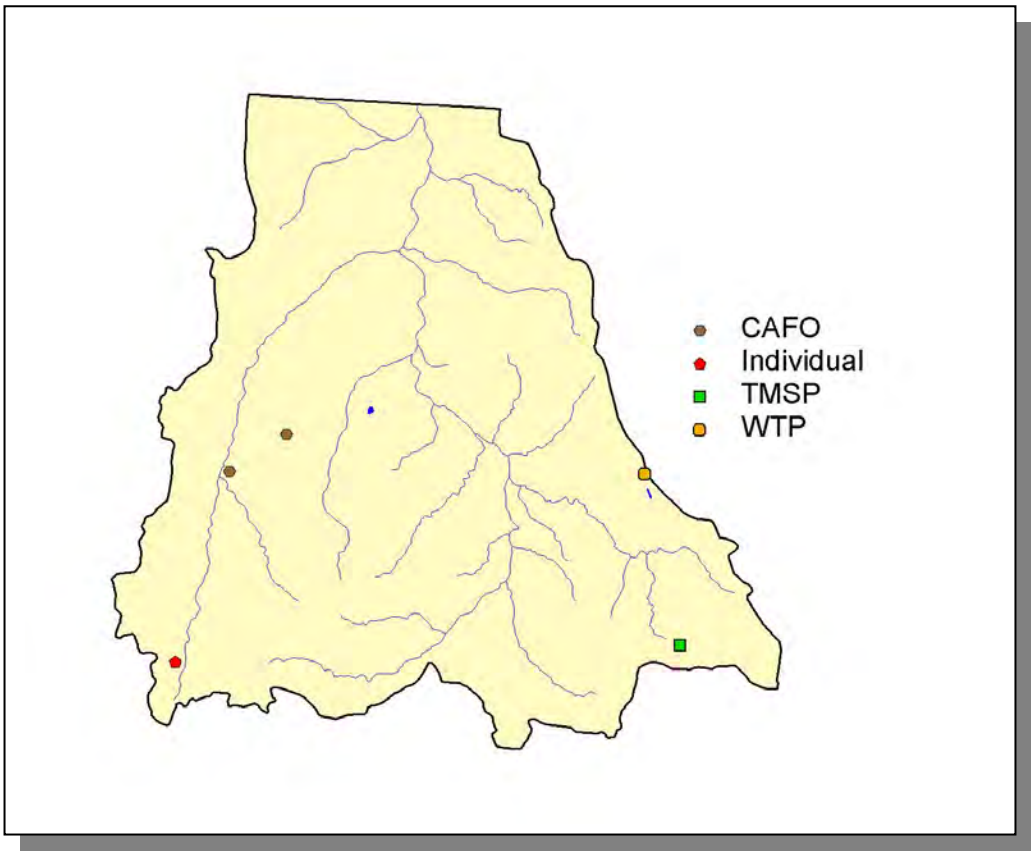

Figure 4-52. Location of Permits Issued in Subwatershed 051100020408. *More information, including the names of facilities, is provided in Appendix IV.*

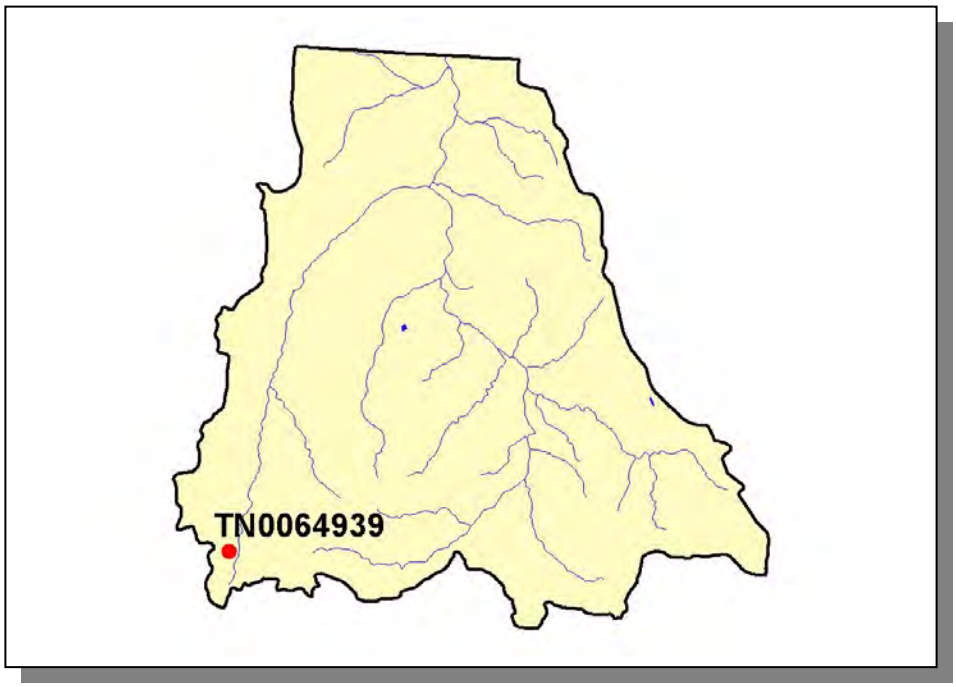

Figure 4-53. Location of Active NPDES Sites in Subwatershed 051100020408. *More information, including the names of facilities, is provided in Appendix IV.*

Figure 4-54. Location of Concentrated Animal Feeding Operations (CAFO) in Subwatershed 051100020408. *More information, including the names of facilities, is provided in Appendix IV*

Figure 4-55. Location of Water Treatment Plants in Subwatershed 051100020408. *More information, including the names of facilities, is provided in Appendix IV.*

Figure 4-56. Location of TMSP Sites in Subwatershed 051100020408. *More information, including the names of facilities, is provided in Appendix IV.*

4.2.B.vi.b. Nonpoint Source Contributions.

LIVESTOCK COUNTS					
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
2,608	4,526	55	6	412	19

Table 4-44. Summary of Livestock Count Estimates in Subwatershed 051100020408. *According to the 1997 Census of Agriculture (http://www.nass.usda.gov/census/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

LIVESTOCK COUNTS						
County	Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
Macon	1,5039	26,098	318	675	2,377	111

Table 4-45. Summary of Livestock Count Estimates in Macon County. *According to the 1997 Census of Agriculture (http://www.nass.usda.gov/census/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

CROPS	TONS/ACRE/YEAR
Legumes (Pastureland)	0.07
Grass (Pastureland)	0.43
Grass (Hayland)	0.21
Legumes (Hayland)	0.13
Legumes, Grass (Hayland)	0.14
Grass, Forbs, Legumes (Mixed Pasture)	1.03
Corn (Row Crops)	3.99
Tobacco (Row Crops)	11.12
Wheat (Close-Grown Cropland)	3.43
Other Vegetable and Truck Crops	5.48
Conservation Reserve Program Lands	0.28
Farmsteads and Ranch Headquarters	0.16

Table 4-46. Annual Estimated Total Soil Loss in Subwatershed 051100020408.

4.2.C. 0511000205.

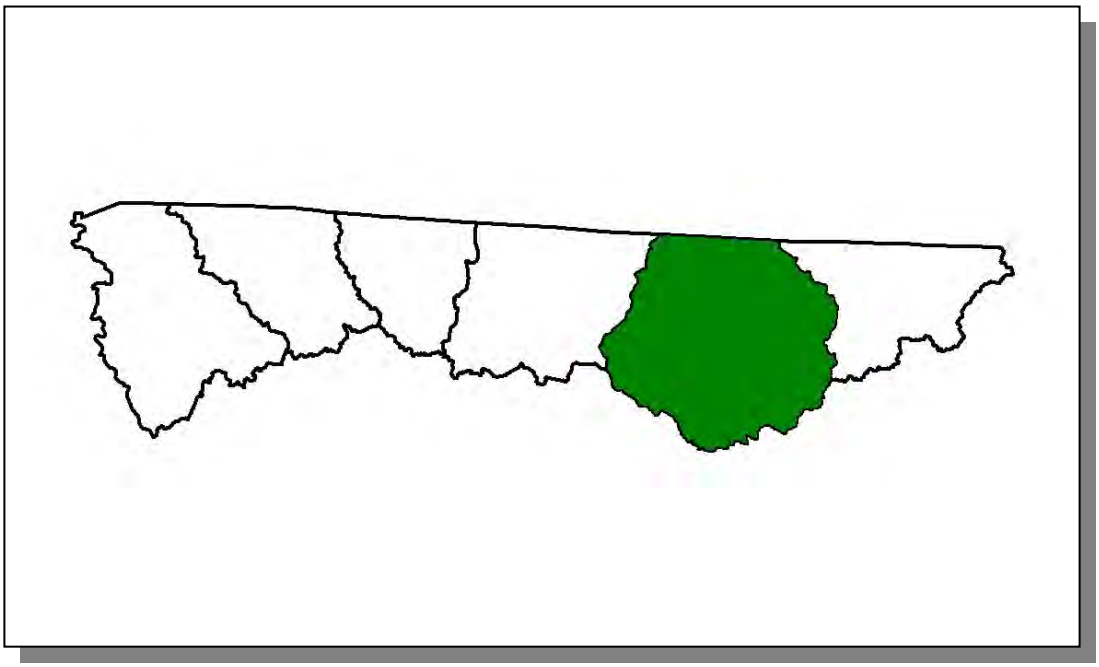

Figure 4-57. Location of Subwatershed 0511000205. *All Barren River HUC-10 subwatershed boundaries in the Tennessee portion of the watershed are shown for reference.*

4.2.C.i. 051100020501 (Salt Lick Creek).

Figure 4-58. Location of Subwatershed 051100020501. *HUC-12 subwatershed boundaries are shown for reference.*

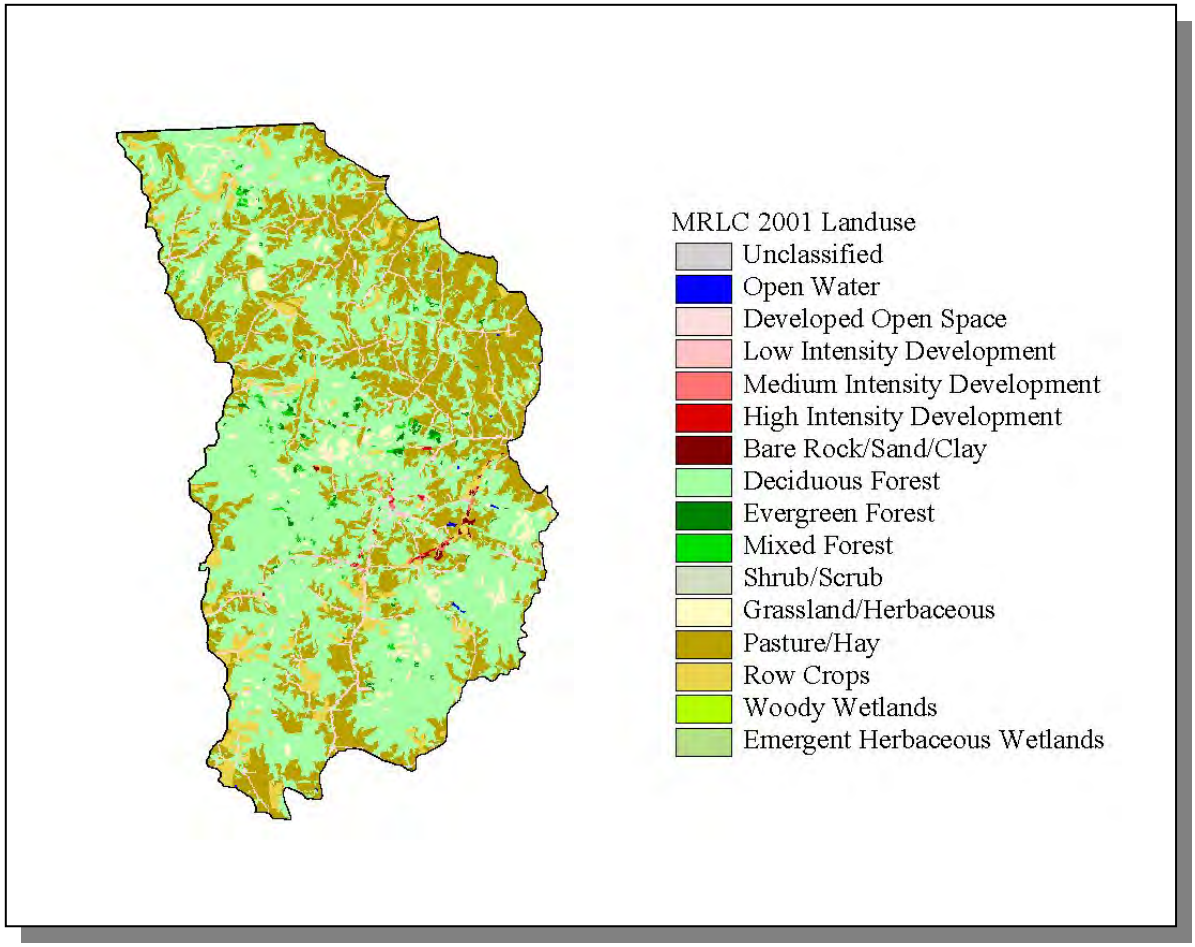

Figure 4-59. Illustration of Land Use Distribution in Subwatershed 051100020501.

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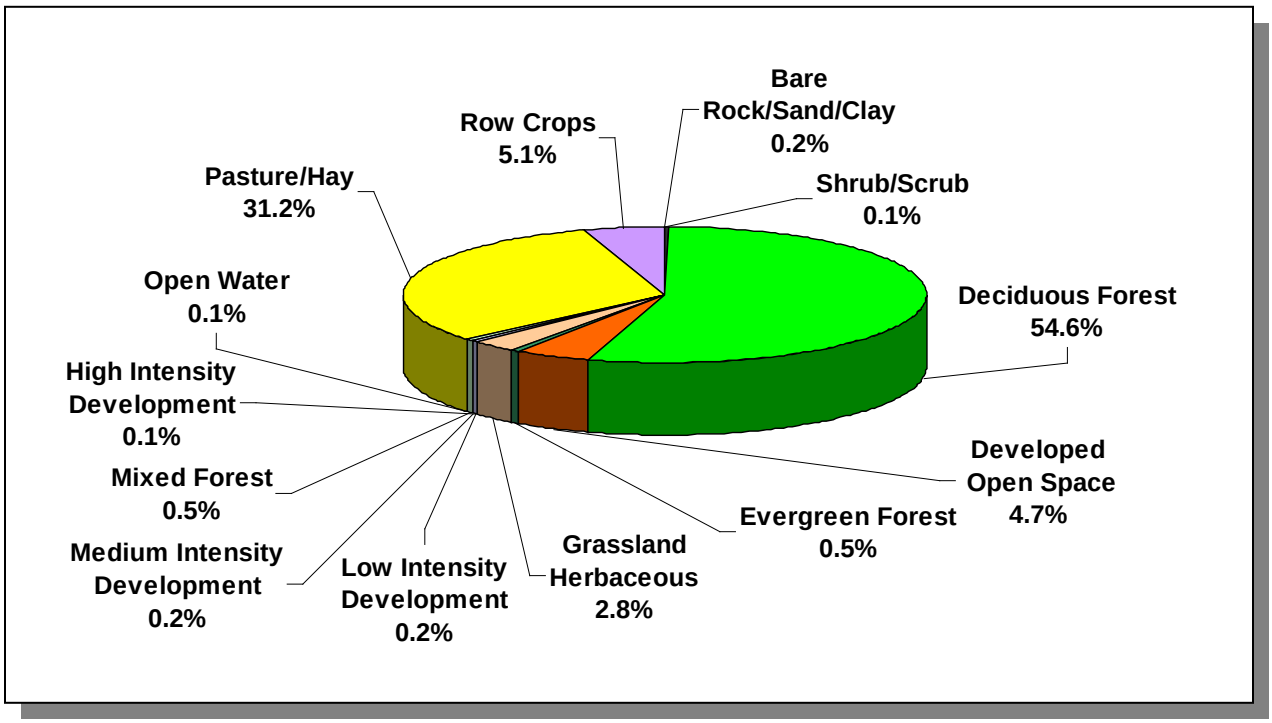

Figure 4-60. Land Use Distribution in Subwatershed 051100020501. *More information is provided in Appendix IV.*

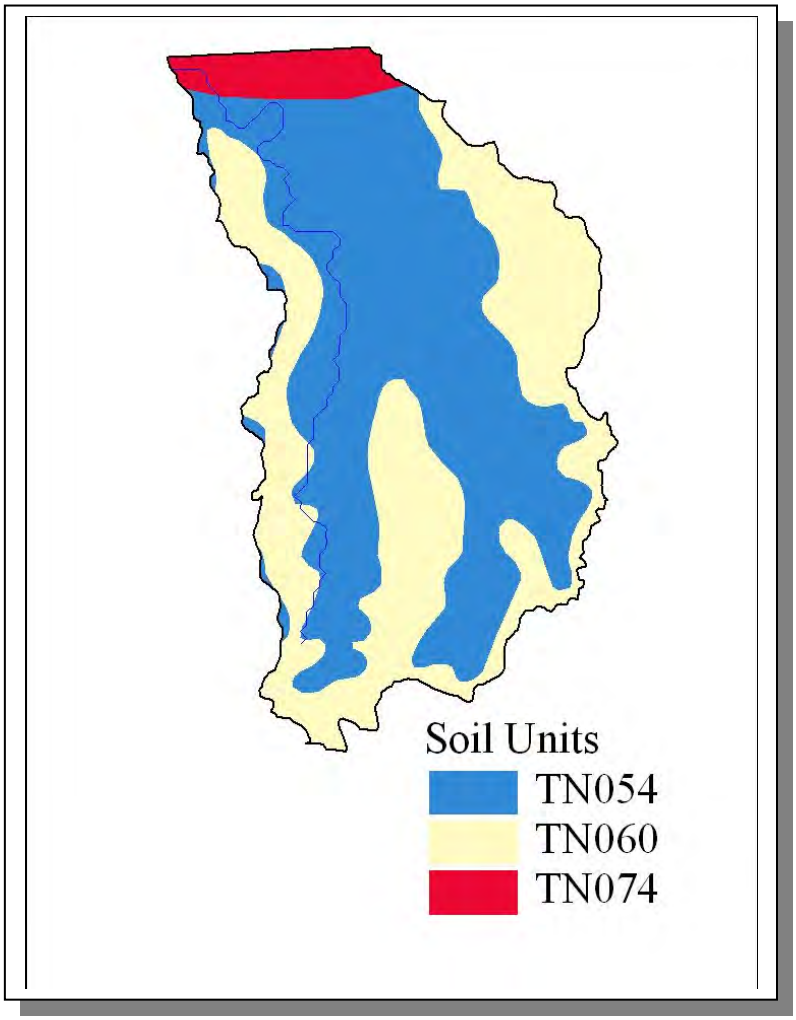

Figure 4-61. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 051100020501.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN054	0.00	C	3.04	4.84	Loam	0.32
TN060	5.00	B	1.30	5.32	Silty Loam	0.39
TN074	7.00	B	1.44	4.94	Loam	0.33

Table 4-47. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 051100020501. *The definition of "Hydrologic Group" is provided in Appendix IV.*

.

	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Macon	15,906	17,854	20,386	16.32	2,596	2,914	3,327	28.2

Table 4-48. Population Estimates in Subwatershed 051100020501.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Red Boiling Springs	Macon	905	420	37	376	7

Table 4-49. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 051100020501.

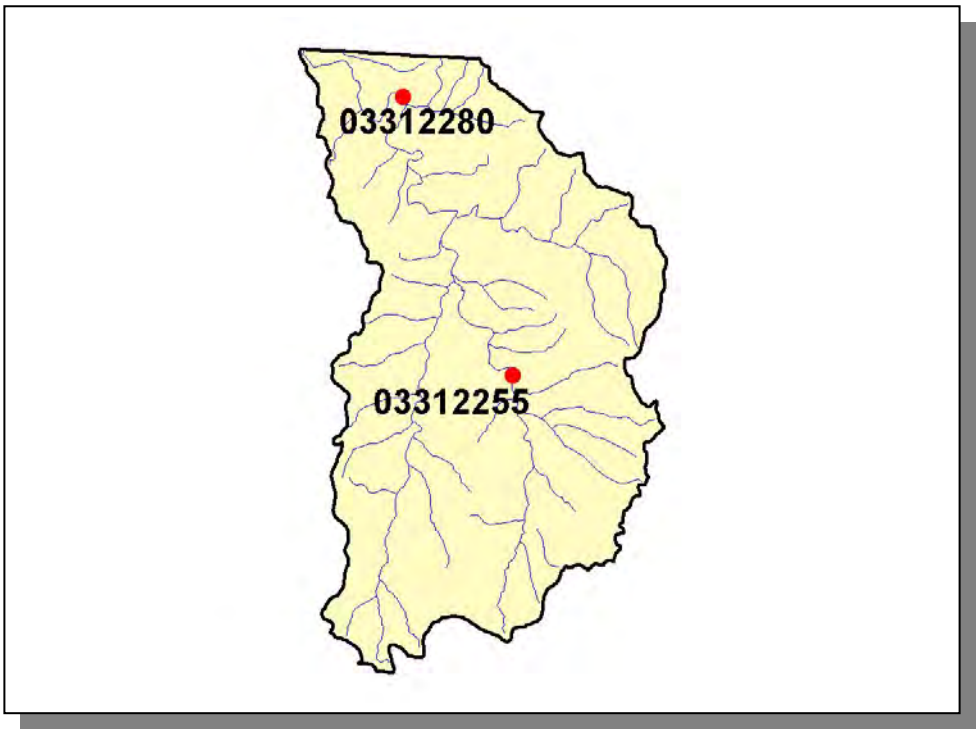

Figure 4-62. Location of Historical Streamflow Data Collection Sites in Subwatershed 051100020501. *More information is provided in Appendix IV.*

Figure 4-63. Location of Monitoring Sites in EPA's STORET Database in Subwatershed 051100020501. *More information, including site names and locations, and station numbers for sites located in the watershed outside of Tennessee, is provided in Appendix IV.*

4.2.C.i.a. Point Source Contributions.

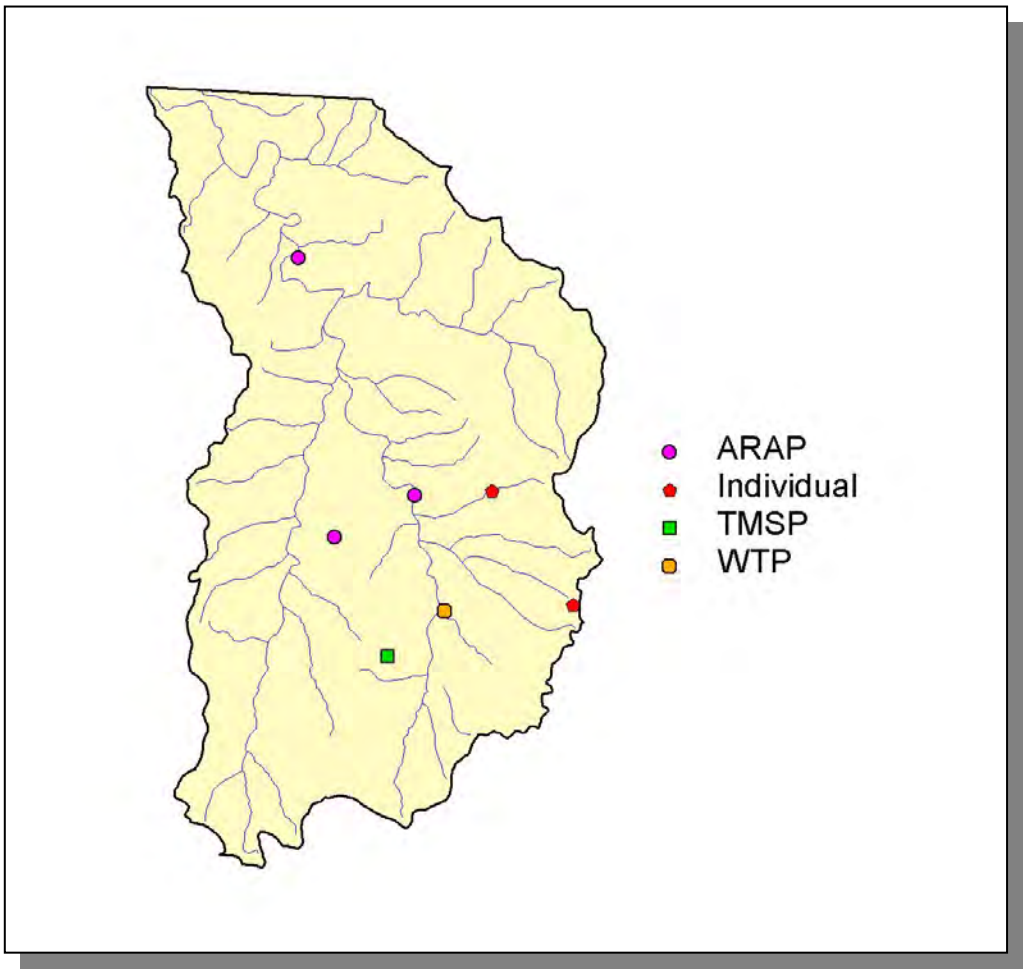

Figure 4-64. Location of Permits Issued in Subwatershed 051100020501. *More information, including the names of facilities, is provided in Appendix IV.*

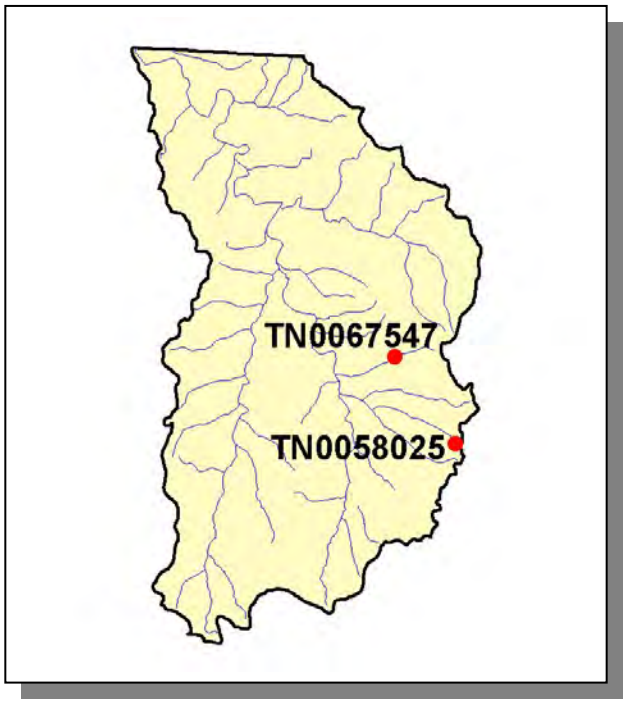

Figure 4-65. Location of Active NPDES Sites in Subwatershed 051100020501. *More information, including the names of facilities, is provided in Appendix IV.*

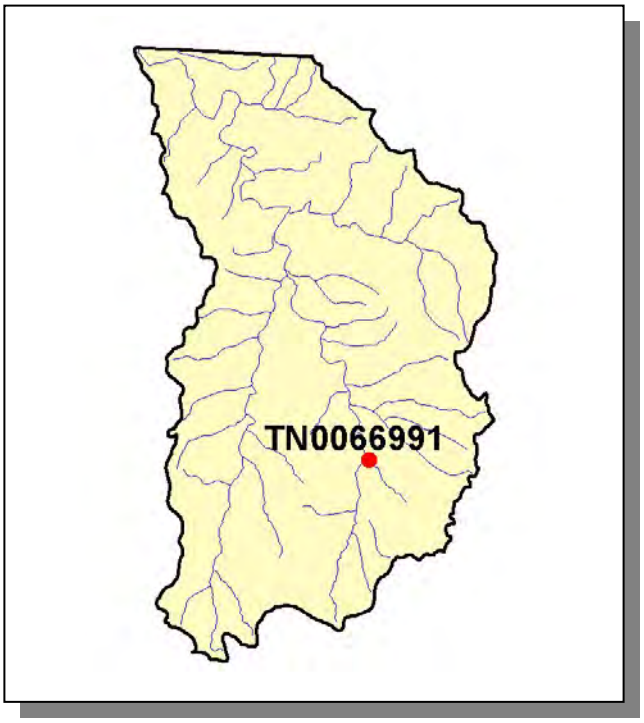

Figure 4-66. Location of Water Treatment Plants in Subwatershed 051100020501. *More information, including the names of facilities, is provided in Appendix IV.*

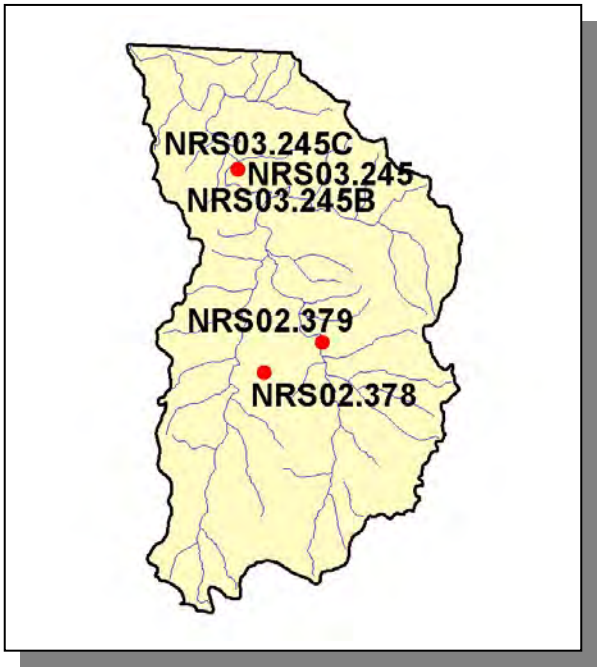

Figure 4-67. Location of Aquatic Resource Alteration Permit (ARAP) Sites (Individual Permits) in Subwatershed 051100020501. *More information is provided in Appendix IV.*

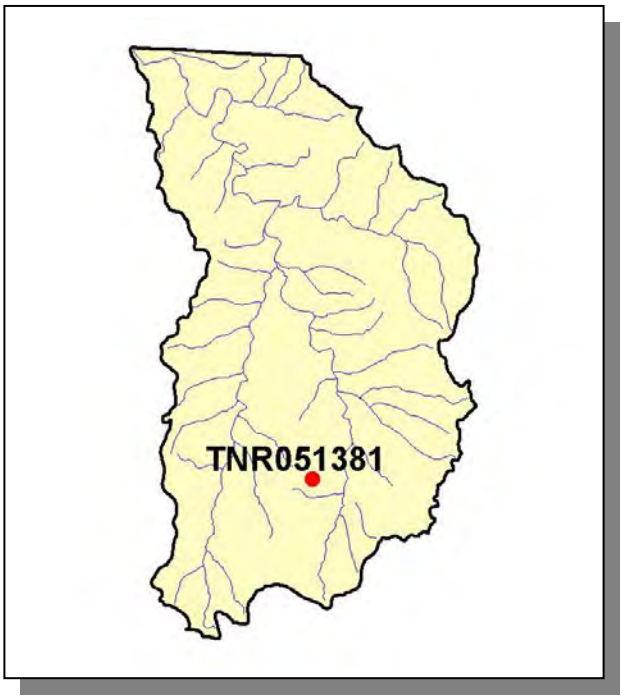

Figure 4-68. Location of TMSP Sites in Subwatershed 051100020501. *More information, including the names of facilities, is provided in Appendix IV.*

4.2.C.i.b. Nonpoint Source Contributions.

LIVESTOCK COUNTS					
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
2,688	4,669	57	6	425	20

Table 4-50. Summary of Livestock Count Estimates in Subwatershed 051100020501. *According to the 1997 Census of Agriculture (http://www.nass.usda.gov/census/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

LIVESTOCK COUNTS						
County	Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
Clay	0	14,574	0	18	174	23
Macon	15,039	26,098	318	675	2,377	111

Table 4-51. Summary of Livestock Count Estimates in Clay and Macon Counties. *According to the 1997 Census of Agriculture (http://www.nass.usda.gov/census/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

CROPS	TONS/ACRE/YEAR
Legumes (Pastureland)	0.07
Grass (Pastureland)	0.43
Grass (Hayland)	0.21
Legumes (Hayland)	0.13
Legumes, Grass (Hayland)	0.14
Grass, Forbs, Legumes (Mixed Pasture)	1.04
Corn (Row Crops)	3.99
Tobacco (Row Crops)	11.12
Wheat (Close-Grown Cropland)	3.43
Other Vegetable and Truck Crops	5.48
Conservation Reserve Program Lands	0.28
Farmsteads and Ranch Headquarters	0.16

Table 4-52. Annual Estimated Total Soil Loss in Subwatershed 051100020501.

4.2.C.ii. 051100020502 (Long Fork).

Figure 4-69. Location of Subwatershed 051100020502. *HUC-12 subwatershed boundaries are shown for reference.*

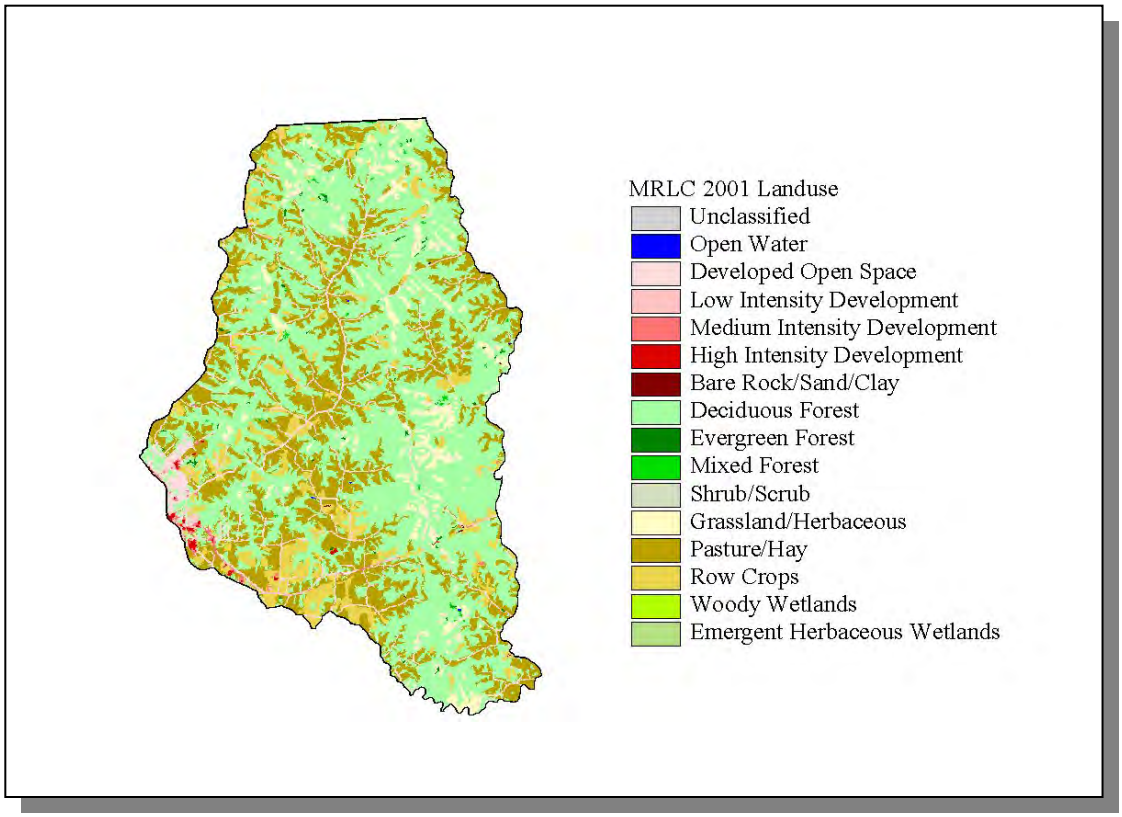

Figure 4-70. Illustration of Land Use Distribution in Subwatershed 051100020502.

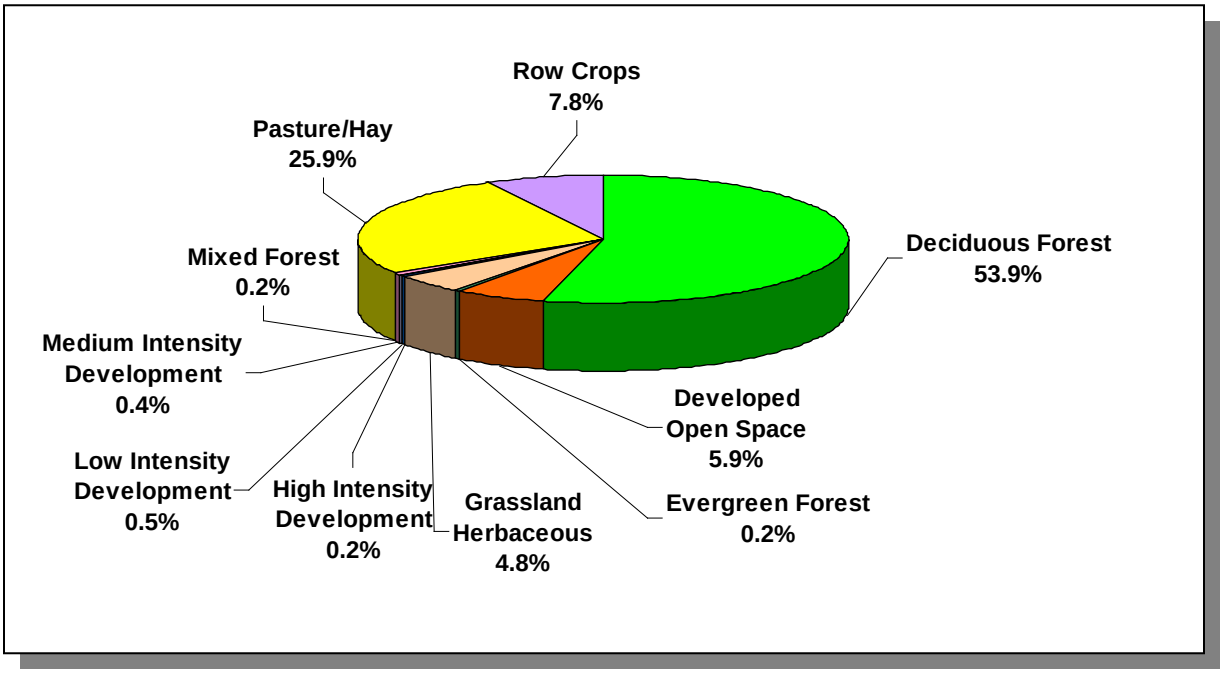

Figure 4-71. Land Use Distribution in Subwatershed 051100020502. *More information is provided in Appendix IV.*

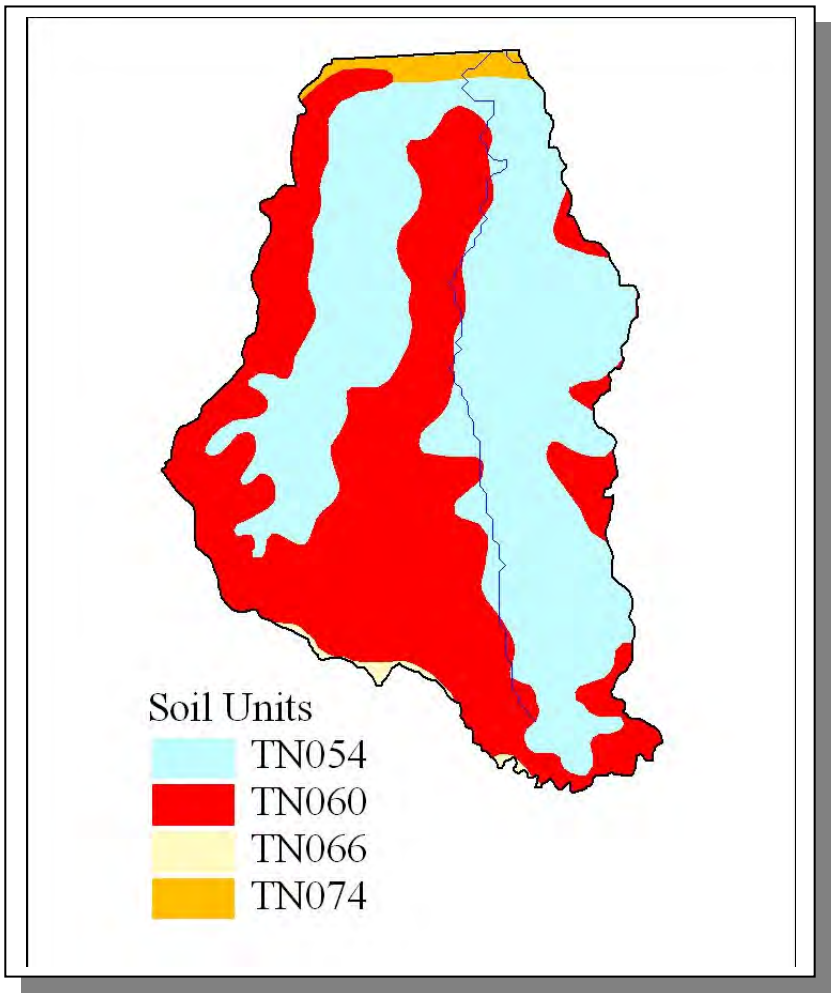

Figure 4-72. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 051100020502.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN054	0.00	C	3.04	4.84	Loam	0.32
TN060	5.00	B	1.30	5.32	Silty Loam	0.39
TN066	0.00	B	2.62	4.75	Loam	0.28
TN074	7.00	B	1.44	4.94	Loam	0.33

Table 4-53. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 051100020502. *The definition of "Hydrologic Group" is provided in Appendix IV.*

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	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Macon	15,906	17,854	20,386	19.02	3,025	3,396	3,877	28.2

Table 4-54. Population Estimates in Subwatershed 051100020502.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Lafayette	Macon	3,641	1,695	1,323	348	24

Table 4-55. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 051100020502.

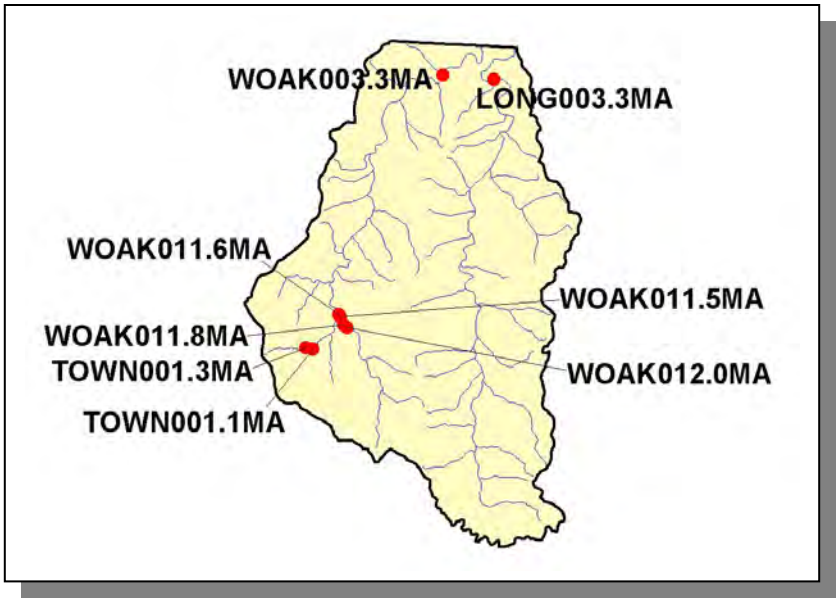

Figure 4-73. Location of Monitoring Sites in EPA's STORET Database in Subwatershed 051100020502. *More information, including site names and locations, and station numbers for sites located in the watershed outside of Tennessee, is provided in Appendix IV.*

4.2.C.ii.a. Point Source Contributions.

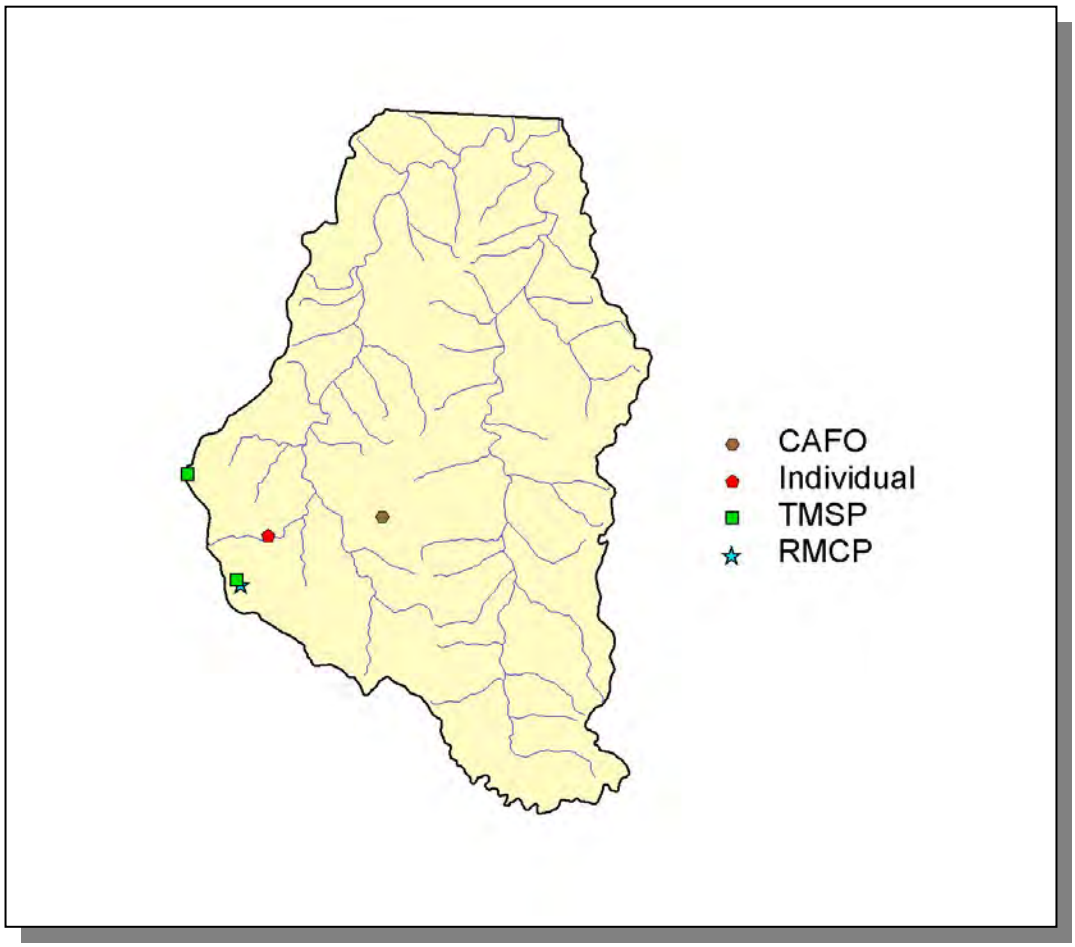

Figure 4-74. Location of Permits Issued in Subwatershed 051100020502. *More information, including the names of facilities, is provided in Appendix IV.*

Figure 4-75. Location of Active NPDES Sites in Subwatershed 051100020502. *More information, including the names of facilities, is provided in Appendix IV.*

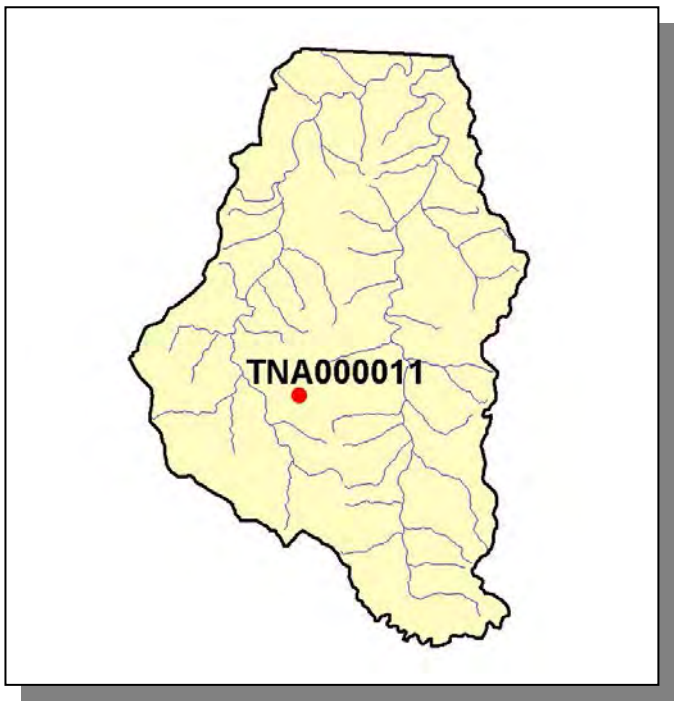

Figure 4-76. Location of Concentrated Animal Feeding Operations (CAFO) in Subwatershed 051100020502. *More information, including the names of facilities, is provided in Appendix IV*

Figure 4-77. Location of Ready Mix Concrete Plants (RMCP) in Subwatershed 051100020502. *More information is provided in Appendix IV.*

Figure 4-78. Location of TMSP Sites in Subwatershed 051100020502. *More information, including the names of facilities, is provided in Appendix IV.*

4.2.C.ii.a.i. Dischargers to Water Bodies Listed on the 2004 303(d) List

There is one NPDES facility discharging to water bodies listed on the 2004 303(d) list in Subwatershed 051100020502:

- TN0020877 (Lafayette STP) discharges to Town Creek @ RM 1.3

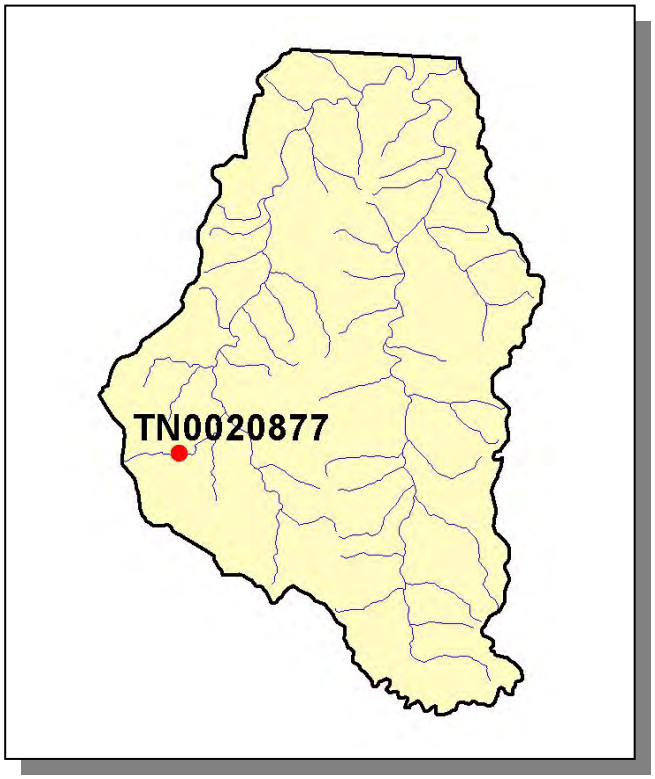

Figure 4-79. Location of NPDES Dischargers to Water Bodies Listed on the 2004 303(d) List in Subwatershed 051100020502. *More information, including the names of facilities, is provided in Appendix IV.*

Permit #	3Q2	3Q10	3Q20	7Q10
TN0020877	0.09	0.04	0.03	0.05

Table 4-56. Receiving Stream Low Flow Information for NPDES Dischargers to Waterbodies Listed on the 2004 303(d) List in Subwatershed 051100020502. *Data are in cubic feet per second (CFS). Data were obtained from the USGS web application StreamStats at http://water.usgs.gov/osw/streamstats/.*

PERMIT #	NH_3	P	Zn	Cu	Pb	Ni	Cd	Hg	Mo	As	Se
TN0020877	X	X	X	X	X	X	X	X	X	X	X

Table 4-57. Monitoring Requirements for NPDES Dischargers to Waterbodies Listed on the 2004 303(d) List in Subwatershed 051100020502.

PERMIT #	$CBOD_5$	E.coli	FECAL COLIFORM	NH_3	TSS	SETTLEABLE SOLIDS	DO	pH
TN0020877	X	X	X	X	X	X	X	X

Table 4-58. Parameters Monitored for Daily Maximum Limits for NPDES Dischargers to Waterbodies Listed on the 2004 303(d) List in Subwatershed 051100020502. *$CBOD_5$, Carbonaceous Biochemical Oxygen Demand (5-Day); TSS, Total Suspended Solids.*

4.2.C.ii.b. Nonpoint Source Contributions.

LIVESTOCK COUNTS					
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
3,241	5,624	69	8	512	24

Table 4-59. Summary of Livestock Count Estimates in Subwatershed 051100020502. *According to the 1997 Census of Agriculture (http://www.nass.usda.gov/census/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

LIVESTOCK COUNTS						
County	Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
Macon	15,039	26,098	318	675	2,377	111

Table 4-60. Summary of Livestock Count Estimates in Macon County. *According to the 1997 Census of Agriculture (http://www.nass.usda.gov/census/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

CROPS	TONS/ACRE/YEAR
Legumes (Pastureland)	0.07
Grass (Pastureland)	0.43
Grass (Hayland)	0.21
Legumes (Hayland)	0.13
Legumes, Grass (Hayland)	0.14
Grass, Forbs, Legumes (Mixed Pasture)	1.03
Corn (Row Crops)	3.99
Tobacco (Row Crops)	11.12
Wheat (Close-Grown Cropland)	3.43
Other Vegetable and Truck Crop	5.48
Conservation Reserve Program Lands	0.28
Farmsteads and Ranch Headquarters	0.16

Table 4-61. Annual Estimated Total Soil Loss in Subwatershed 051100020502.

4.2.D. 0511000208.

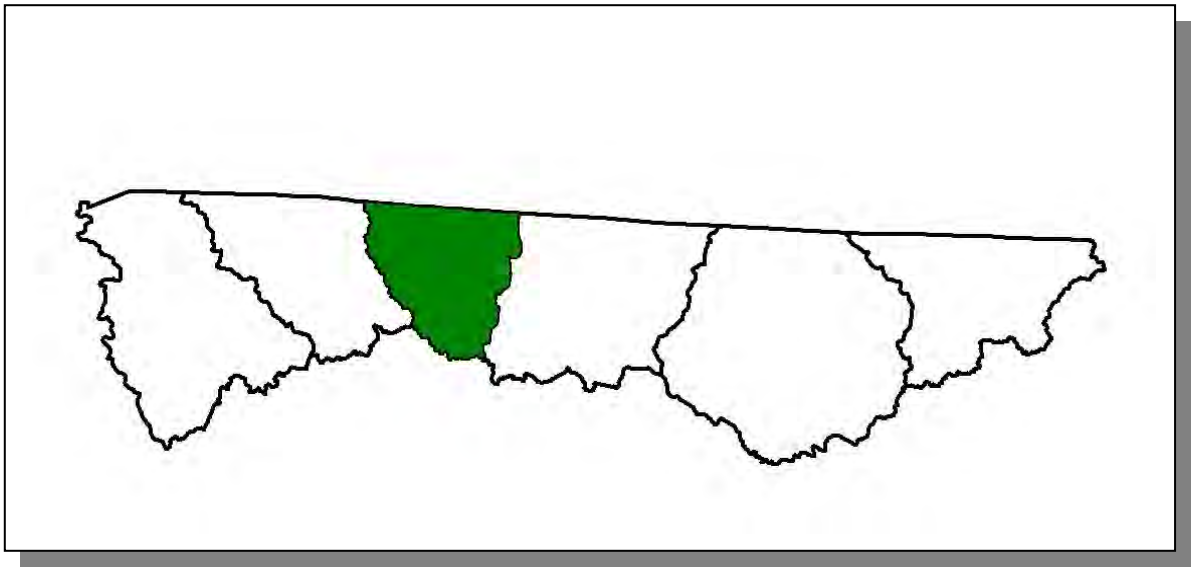

Figure 4-80. Location of Subwatershed 0511000208. *All Barren River HUC-10 subwatershed boundaries in the Tennessee portion of the watershed are shown for reference.*

4.2.D.i. 051100020801 (Trammel Creek).

Figure 4-81. Location of Subwatershed 051100020801. *HUC-12 subwatershed boundaries are shown for reference.*

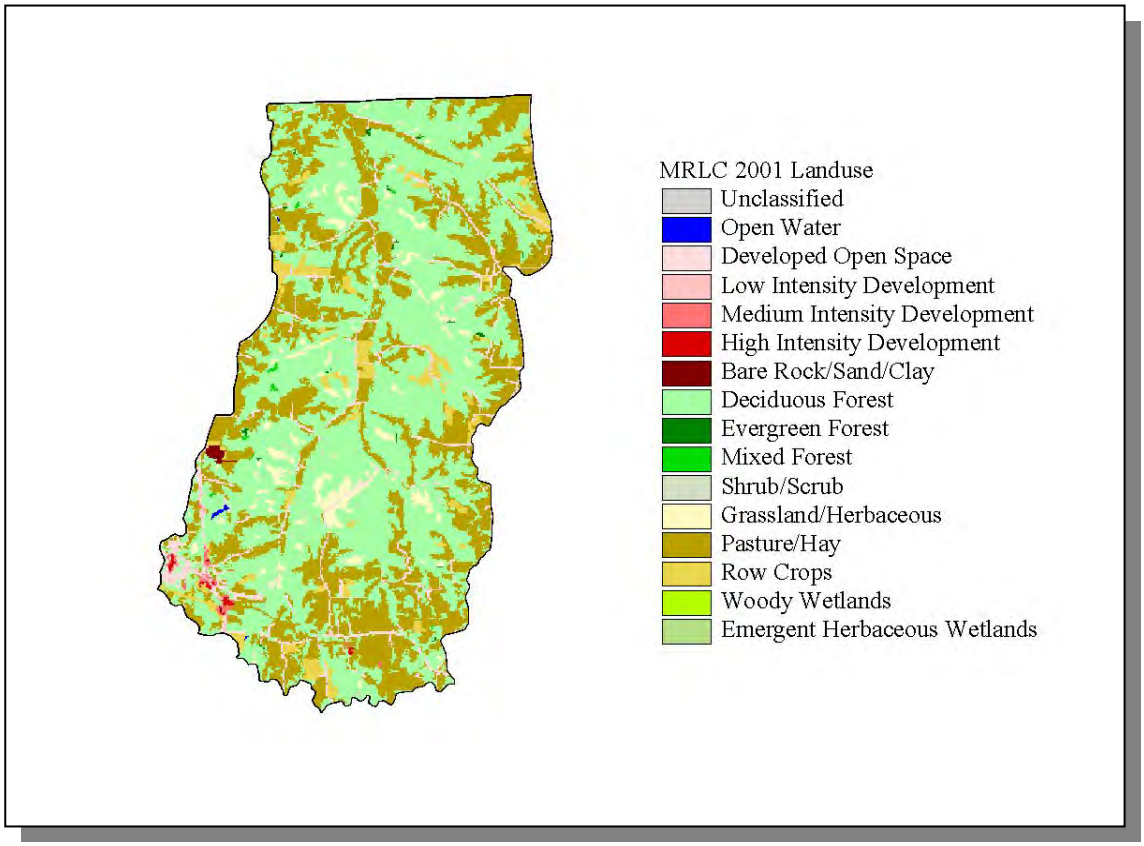

Figure 4-82. Illustration of Land Use Distribution in Subwatershed 051100020801.

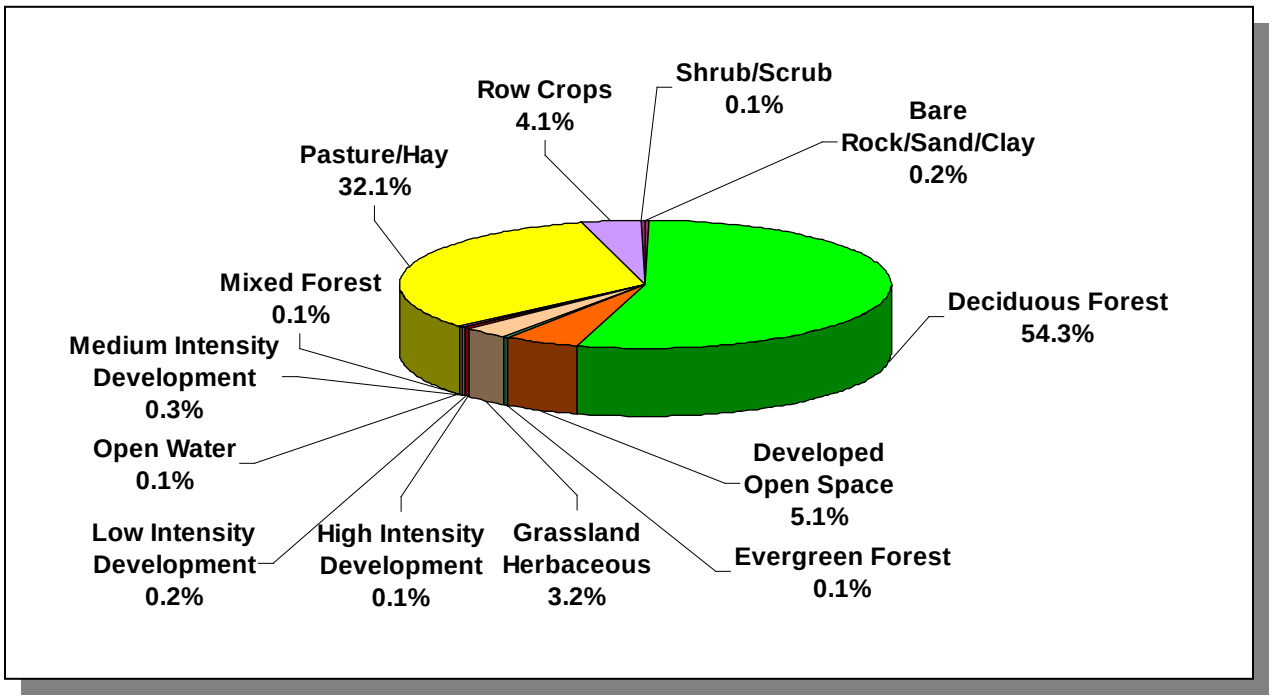

Figure 4-83. Land Use Distribution in Subwatershed 051100020801. *More information is provided in Appendix IV.*

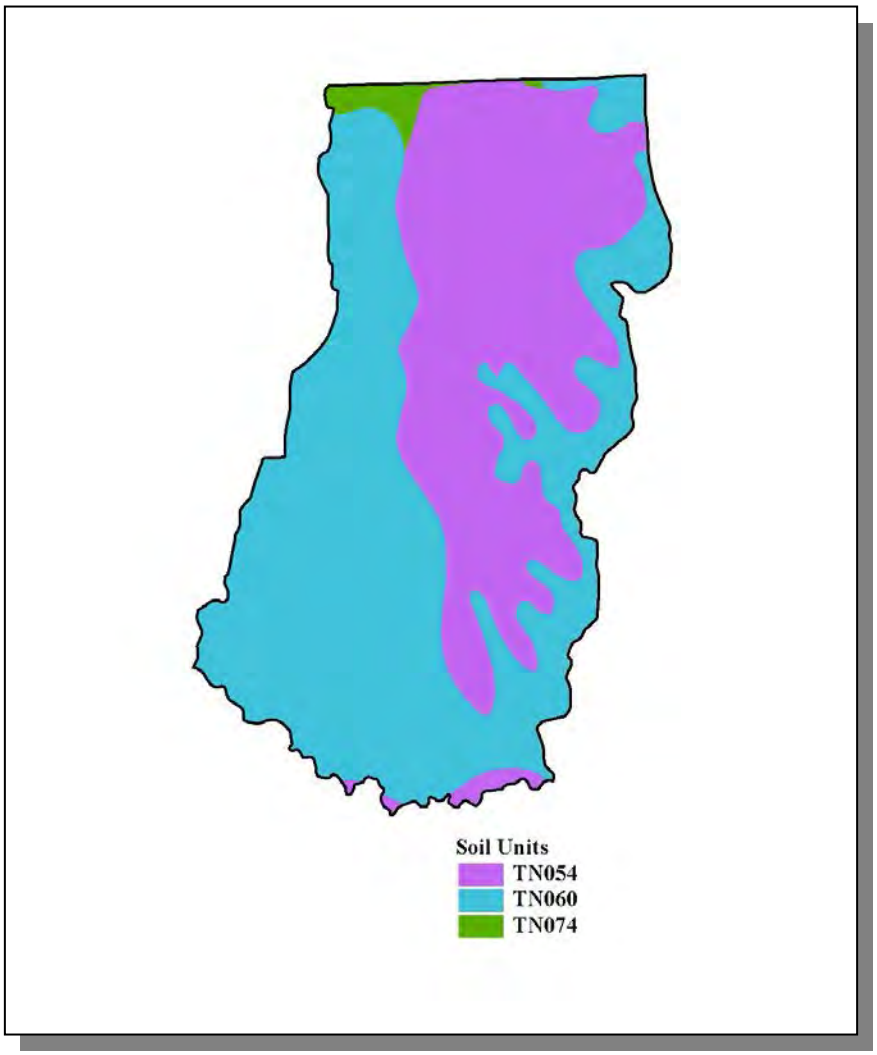

Figure 4-84. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 051100020801.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN054	0.00	C	3.04	4.84	Loam	0.32
TN060	20.00	B	1.30	5.32	Silty Loam	0.39
TN074	14.00	B	1.44	4.94	Loam	0.33

Table 4-62. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 051100020801. *The definition of "Hydrologic Group" is provided in Appendix IV.*

.

	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Macon	15,906	17,854	20,386	5.68	903	1,014	1,157	28.1
Sumner	103,281	121,936	130,449	1.54	1,586	1,872	2,003	26.3
Totals	**119,187**	**139,790**	**150,835**		**2,489**	**2,886**	**3,160**	**27.0**

Table 4-63. Population Estimates in Subwatershed 051100020801.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Westmoreland	Sumner	1,726	709	625	82	2

Table 4-64. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 051100020801.

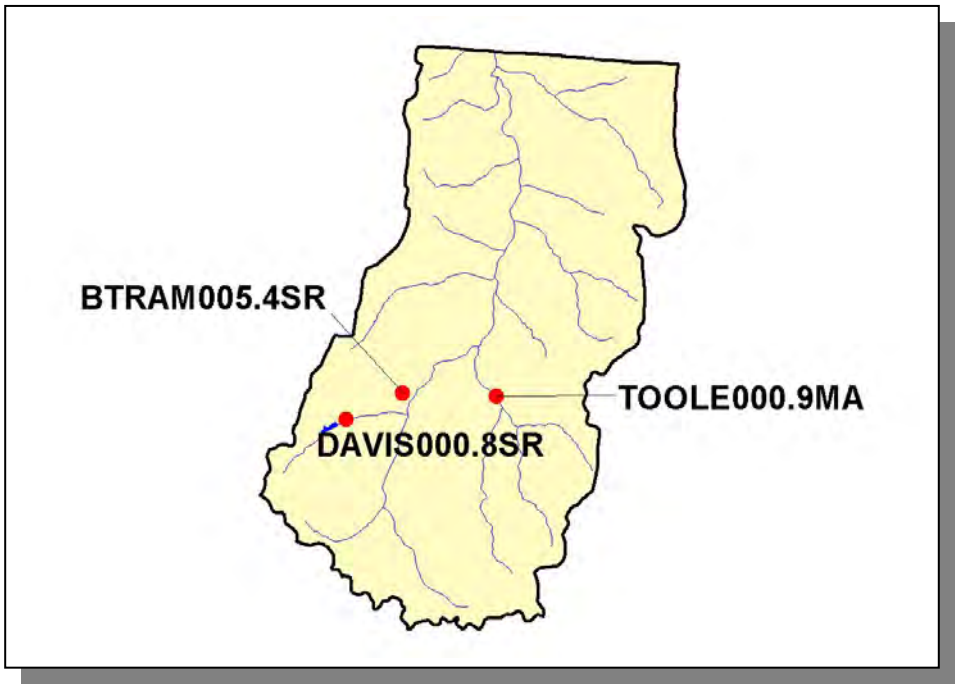

Figure 4-85. Location of Monitoring Sites in EPA's STORET Database in Subwatershed 051100020801. *More information, including site names and locations, and station numbers for sites located in the watershed outside of Tennessee, is provided in Appendix IV.*

4.2.D.i.a. Point Source Contributions.

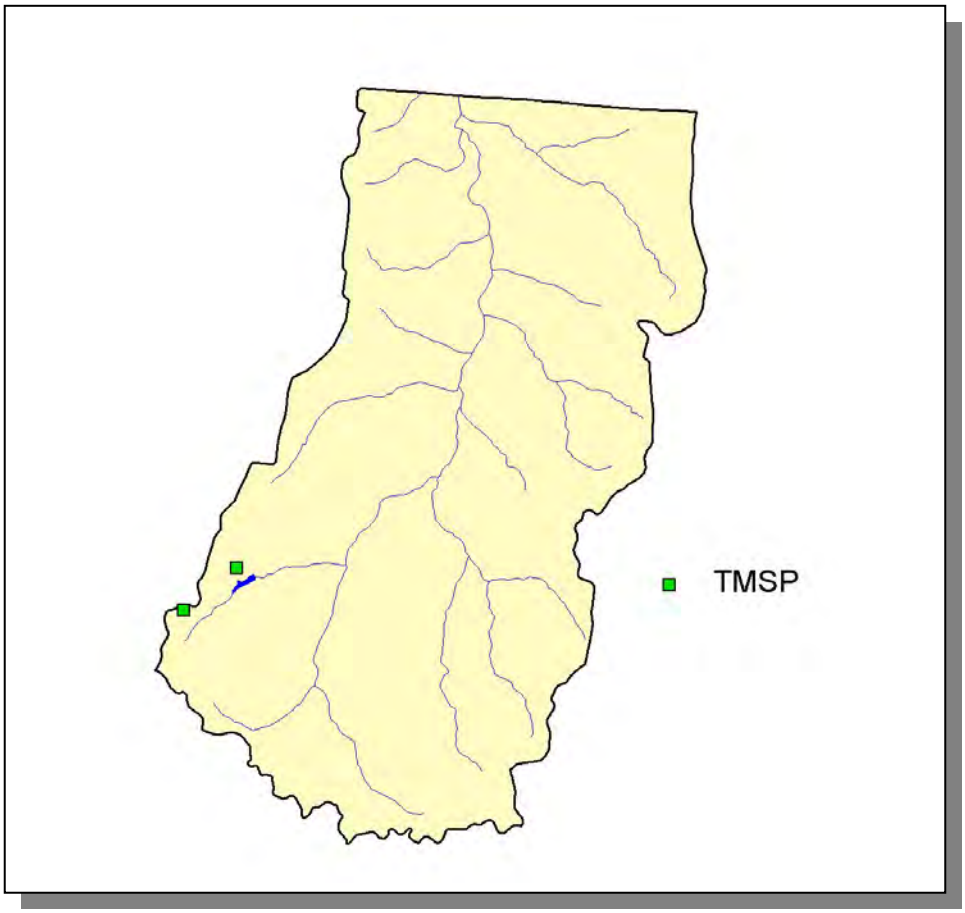

Figure 4-86. Location of Permits Issued in Subwatershed 051100020801. *More information, including the names of facilities, is provided in Appendix IV.*

Figure 4-87. Location of TMSP Sites in Subwatershed 051100020801. *More information, including the names of facilities, is provided in Appendix IV.*

4.2.D.i.b. Nonpoint Source Contributions.

LIVESTOCK COUNTS					
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
1,270	2,319	46	<5	182	10

Table 4-65. Summary of Livestock Count Estimates in Subwatershed 051100020801. *According to the 1997 Census of Agriculture (http://www.nass.usda.gov/census/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

LIVESTOCK COUNTS						
County	Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
Macon	15,039	26,098	318	675	2,377	111
Sumner	22,296	45,116	1,515	50	2,500	189

Table 4-66. Summary of Livestock Count Estimates in Macon and Sumner Counties. *According to the 1997 Census of Agriculture (http://www.nass.usda.gov/census/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

CROPS	TONS/ACRE/YEAR
Legumes (Pastureland)	0.07
Grass (Pastureland)	0.44
Grass (Hayland)	0.24
Legumes (Hayland)	0.13
Legumes, Grass (Hayland)	0.17
Grass, Forbs, Legumes (Mixed Pasture)	0.87
Corn (Row Crops)	6.70
Soybeans (Row Crops)	11.27
Tobacco (Row Crops)	11.12
Wheat (Close-Grown Cropland)	3.43
Other Vegetable and Truck Crop	5.48
Other Cropland not Planted	19.23
Conservation Reserve Program Lands	0.27
Farmsteads and Ranch Headquarters	0.22

Table 4-67. Annual Estimated Total Soil Loss in Subwatershed 051100020801.

4.2.D.ii. 051100020802 (Little Trammel Creek).

Figure 4-88. Location of Subwatershed 051100020802. *All Barren River HUC-12 subwatershed boundaries are shown for reference.*

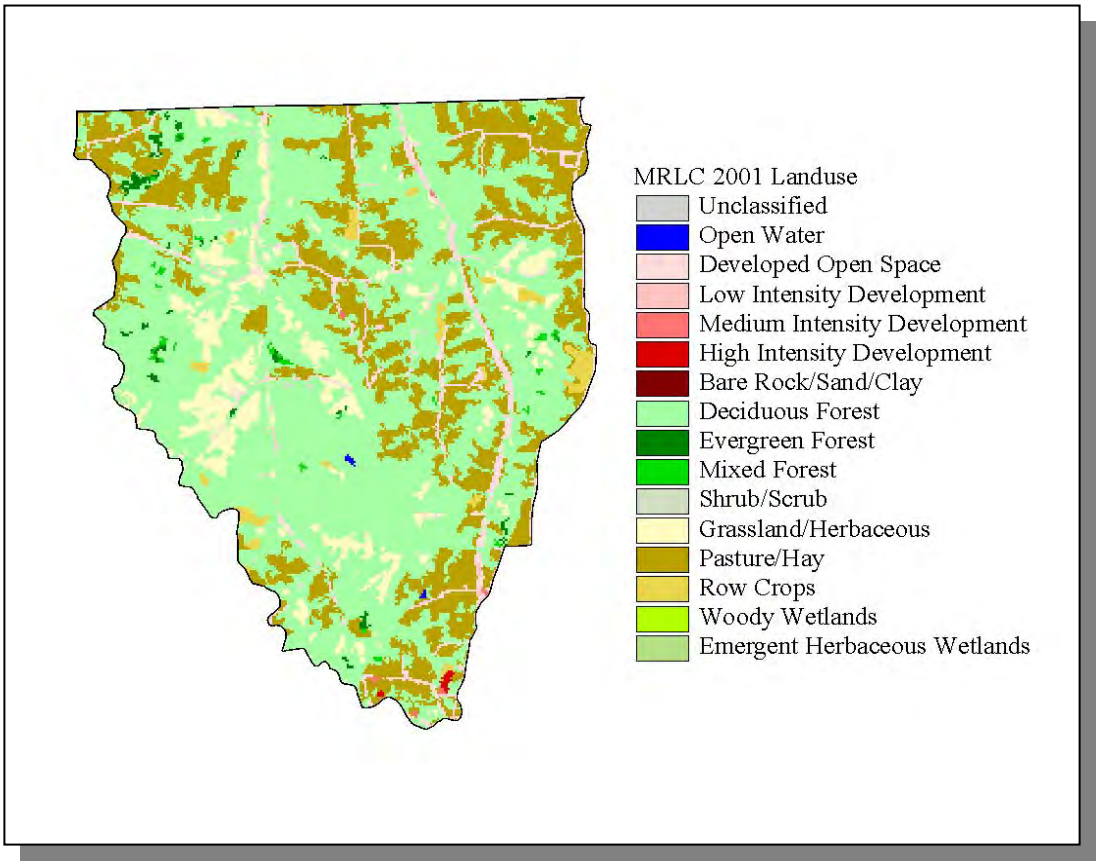

Figure 4-89. Illustration of Land Use Distribution in Subwatershed 051100020802.

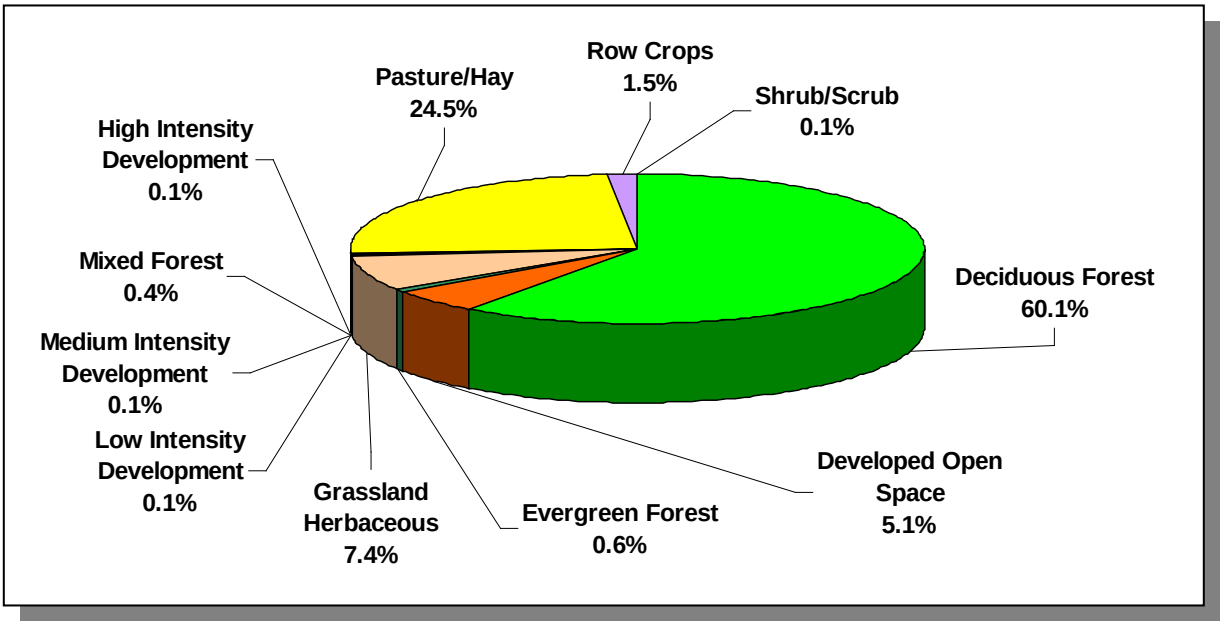

Figure 4-90. Land Use Distribution in Subwatershed 051100020802. *More information is provided in Appendix IV.*

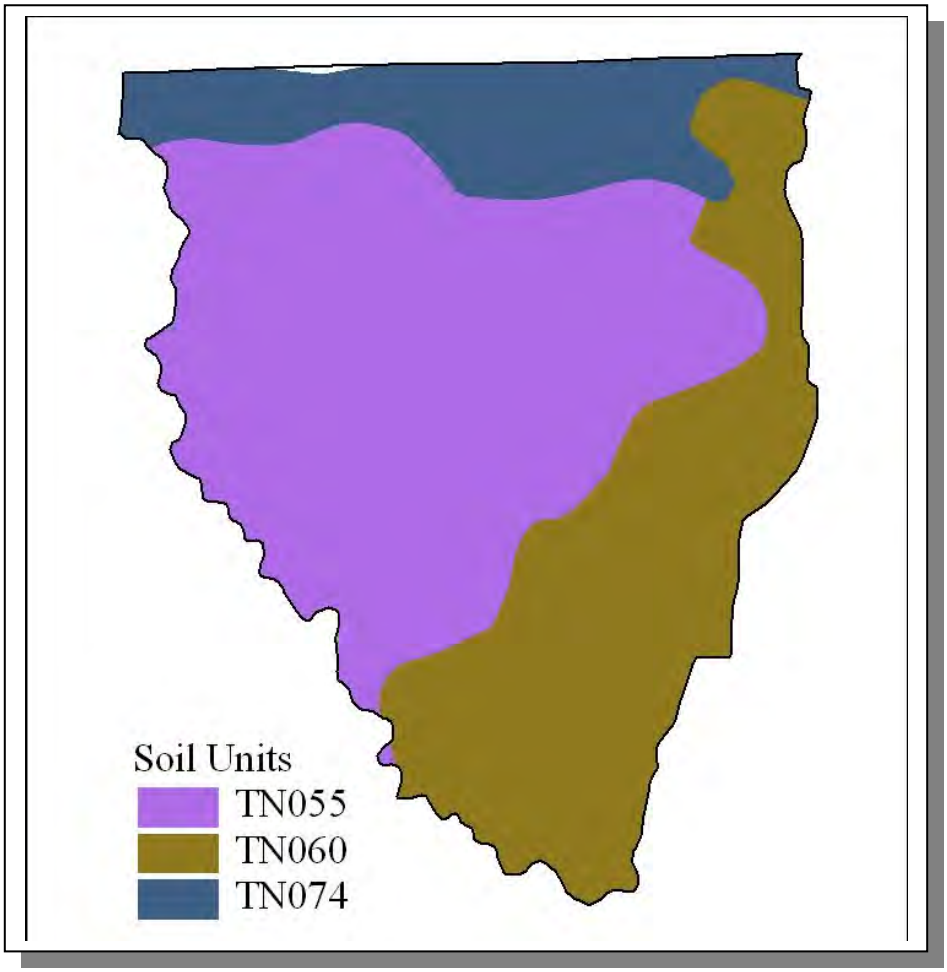

Figure 4-91. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 051100020802.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN055	3.00	C	0.17	5.24	Loam	0.34
TN060	5.00	B	0.19	5.32	Silty Loam	0.39
TN074	7.00	B	0.17	4.94	Loam	0.33

Table 4-68. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 051100020802. *The definition of "Hydrologic Group" is provided in Appendix IV.*

.

	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Sumner	103,281	121,936	130,449	3.21	3,316	3,915	4,188	26.3

Table 4-69. Population Estimates in Subwatershed 051100020802.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Westmoreland	Sumner	1,726	709	625	82	2

Table 4-70. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 051100020802.

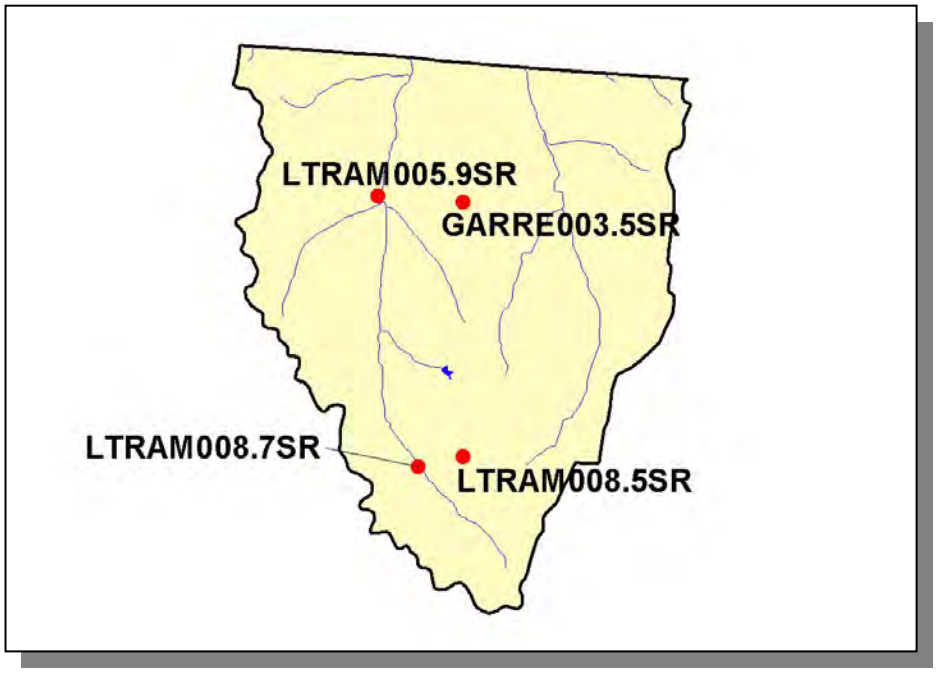

Figure 4-92. Location of Monitoring Sites in EPA's STORET Database in Subwatershed 051100020802. *More information, including site names and locations, and station numbers for sites located in the watershed outside of Tennessee, is provided in Appendix IV.*

4.2.D.ii.a. Point Source Contributions.

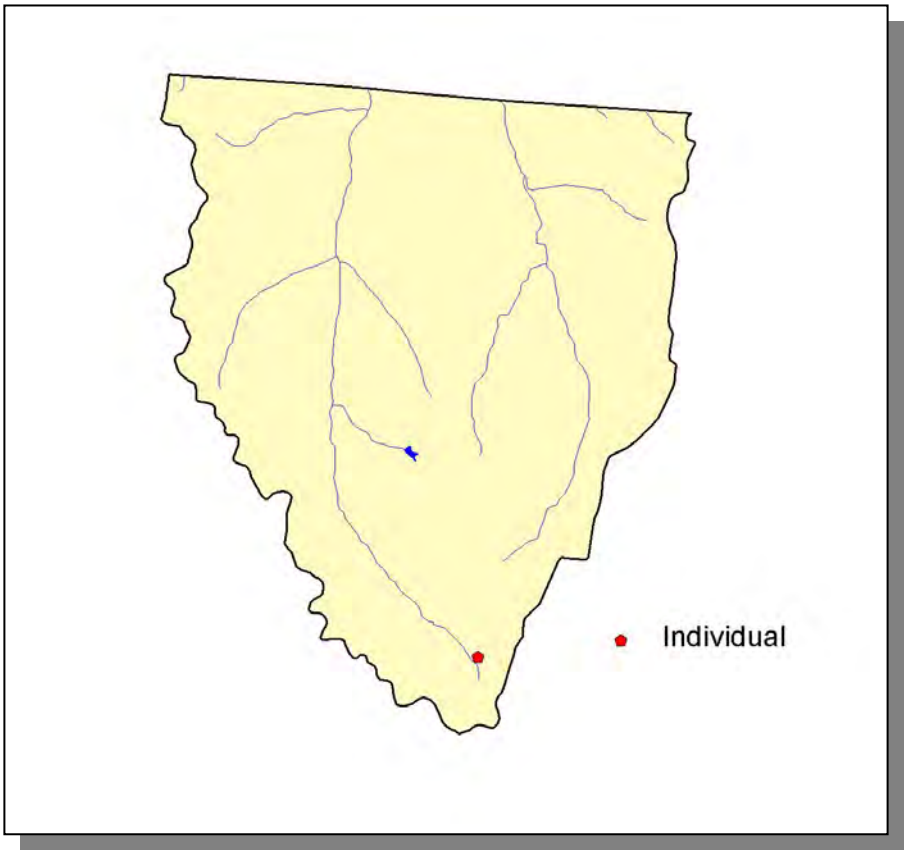

Figure 4-93. Location of Permits Issued in Subwatershed 051100020802. *More information, including the names of facilities, is provided in Appendix IV.*

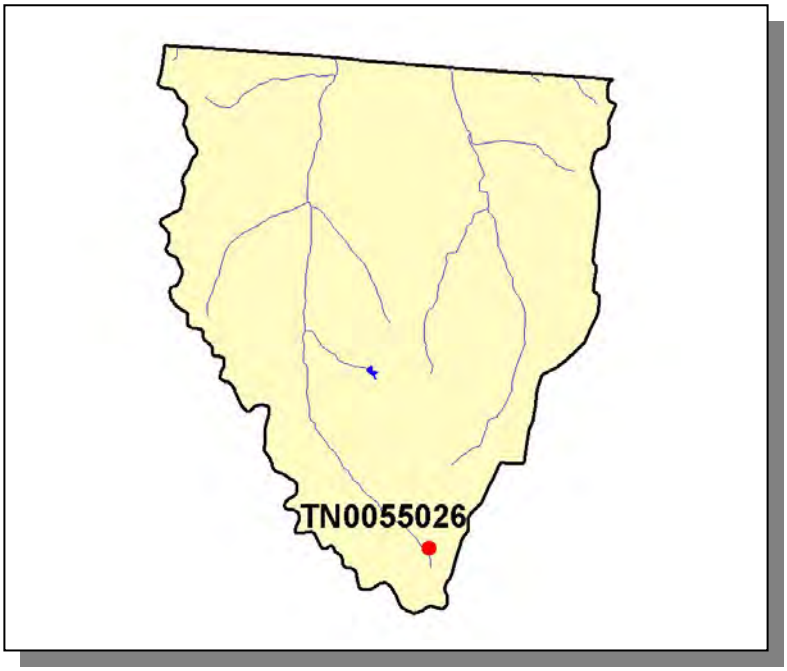

Figure 4-94. Location of Active NPDES Sites in Subwatershed 051100020802. *More information, including the names of facilities, is provided in Appendix IV.*

4.2.D.ii.b. Nonpoint Source Contributions.

LIVESTOCK COUNTS					
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
823	1,664	56	<5	92	7

Table 4-71. Summary of Livestock Count Estimates in Subwatershed 051100020802. *According to the 1997 Census of Agriculture (http://www.nass.usda.gov/census/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

LIVESTOCK COUNTS						
County	Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
Sumner	22,296	45,116	1,515	50	2,500	189

Table 4-72. Summary of Livestock Count Estimates in Sumner County. *According to the 1997 Census of Agriculture (http://www.nass.usda.gov/census/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

	INVENTORY		REMOVAL RATE	
County	Forest Land (thousand acres)	Timber Land (thousand acres)	Growing Stock (million cubic feet)	Sawtimber (million board feet)
Sumner	88.2	88.2	2	6.3

Table 4-73. Forest Acreage and Annual Removal Rates (1987-1994) in Sumner County.

CROPS	TONS/ACRE/YEAR
Grass (Pastureland)	0.46
Grass (Hayland)	0.31
Legumes (Hayland)	0.12
Legumes, Grass (Hayland)	0.23
Grass, Forbs, Legumes (Mixed Pasture)	0.54
Corn (Row Crops)	12.32
Soybeans (Row Crops)	11.27
Other Cropland not Planted	19.23
Conservation Reserve Program Lands	0.26
Farmsteads and Ranch Headquarters	0.34

Table 4-74. Annual Estimated Total Soil Loss in Subwatershed 051100020802.

4.2.D.ii.a.i. Dischargers to Water Bodies Listed on the 2004 303(d) List

There is one NPDES facility discharging to water bodies listed on the 2004 303(d) list in Subwatershed 051100020802:

- TN0055026 (Westmoreland STP) discharges to Little Trammel Creek @ RM 9.9

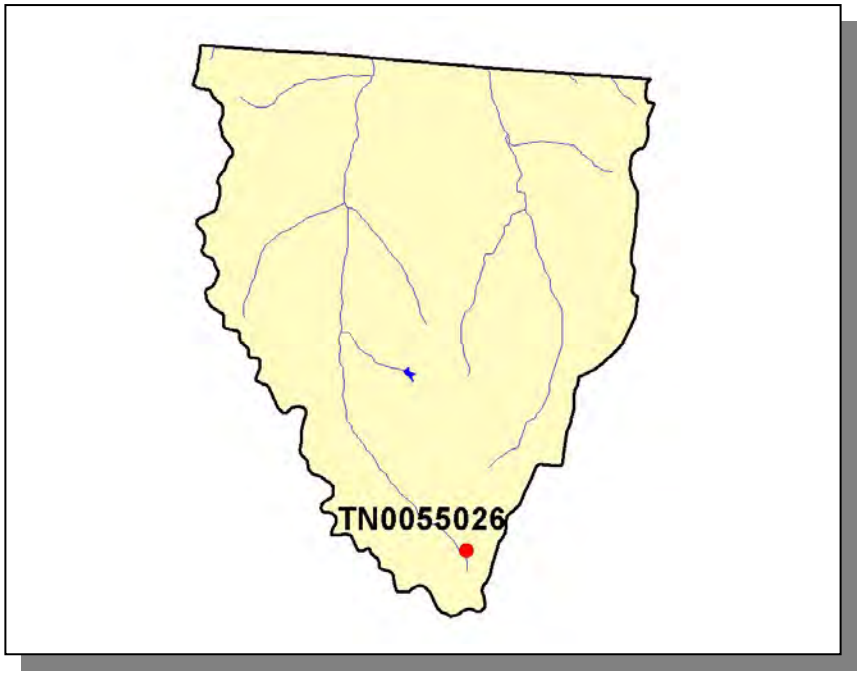

Figure 4-95. Location of NPDES Dischargers to Water Bodies Listed on the 2004 303(d) List in Subwatershed 051100020802. *More information, including the names of facilities, is provided in Appendix IV.*

Permit #	3Q2	3Q10	3Q20	7Q10
TN0055026	0.02	0.01	0.01	0.01

Table 4-75. Receiving Stream Low Flow Information for NPDES Dischargers to Waterbodies Listed on the 2004 303(d) List in Subwatershed 051100020802. *Data are in cubic feet per second (CFS). Data were obtained from the USGS web application StreamStats at http://water.usgs.gov/osw/streamstats/.*

PERMIT #	P	N	Cu	Pb	Ni	As	Cd	Se	Hg	Mo
TN0055026	X	X	X	X	X	X	X	X	X	X

Table 4-76. Monitoring Requirements for NPDES Dischargers to Waterbodies Listed on the 2004 303(d) List in Subwatershed 051100020802.

PERMIT #	WET	$CBOD_5$	FECAL COLIFORM	NH_3	TRC	TSS	SETTLEABLE SOLIDS	DO	pH
TN0055026	X	X	X	X	X	X	X	X	X

Table 4-77. Parameters Monitored for Daily Maximum Limits for NPDES Dischargers to Waterbodies Listed on the 2004 303(d) List in Subwatershed 051100020802. *WET, Whole Effluent Toxicity; $CBOD_5$, Carbonaceous Biochemical Oxygen Demand (5-Day); TRC, Total Residual Chlorine; TSS, Total Suspended Solids.*

4.2.E. 0511000209.

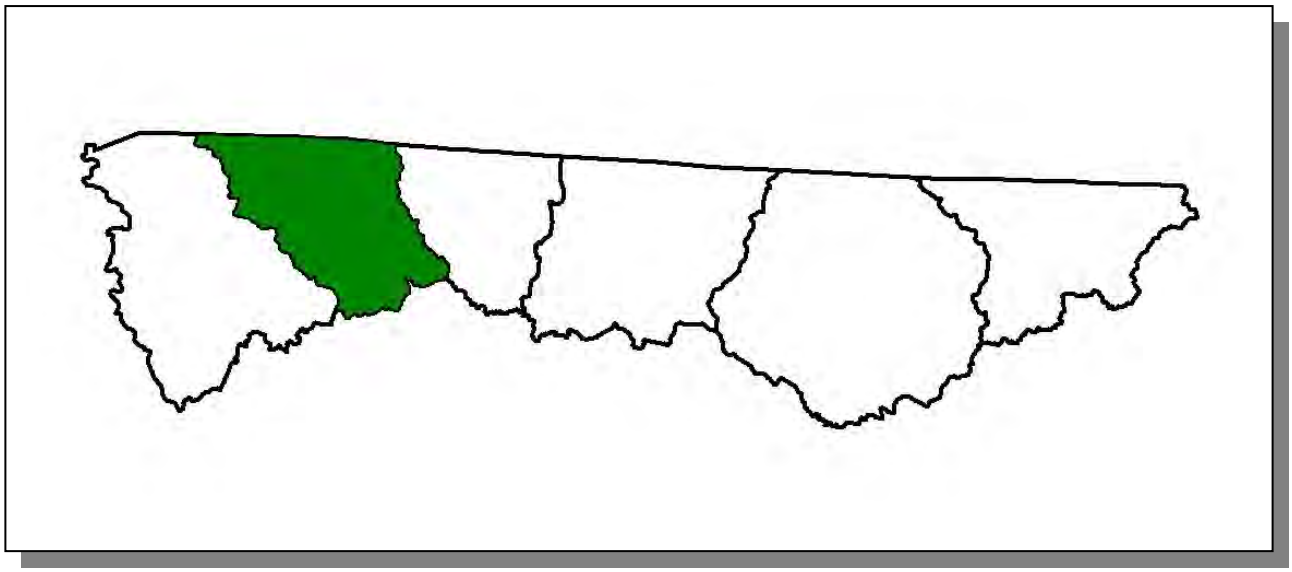

Figure 4-96. Location of Subwatershed 0511000209. *All Tennessee Western Valley (Beech River) HUC-10 subwatershed boundaries in the Tennessee portion of the watershed are shown for reference.*

4.2.E.i. 051100020901 (Middle Fork).

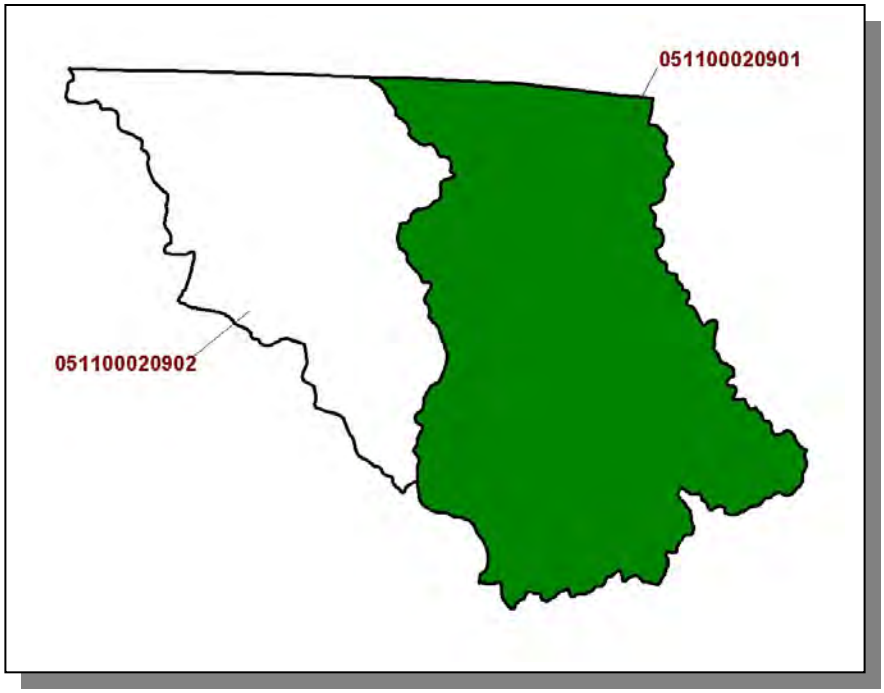

Figure 4-97. Location of Subwatershed 051100020901. *HUC-12 subwatershed boundaries are shown for reference.*

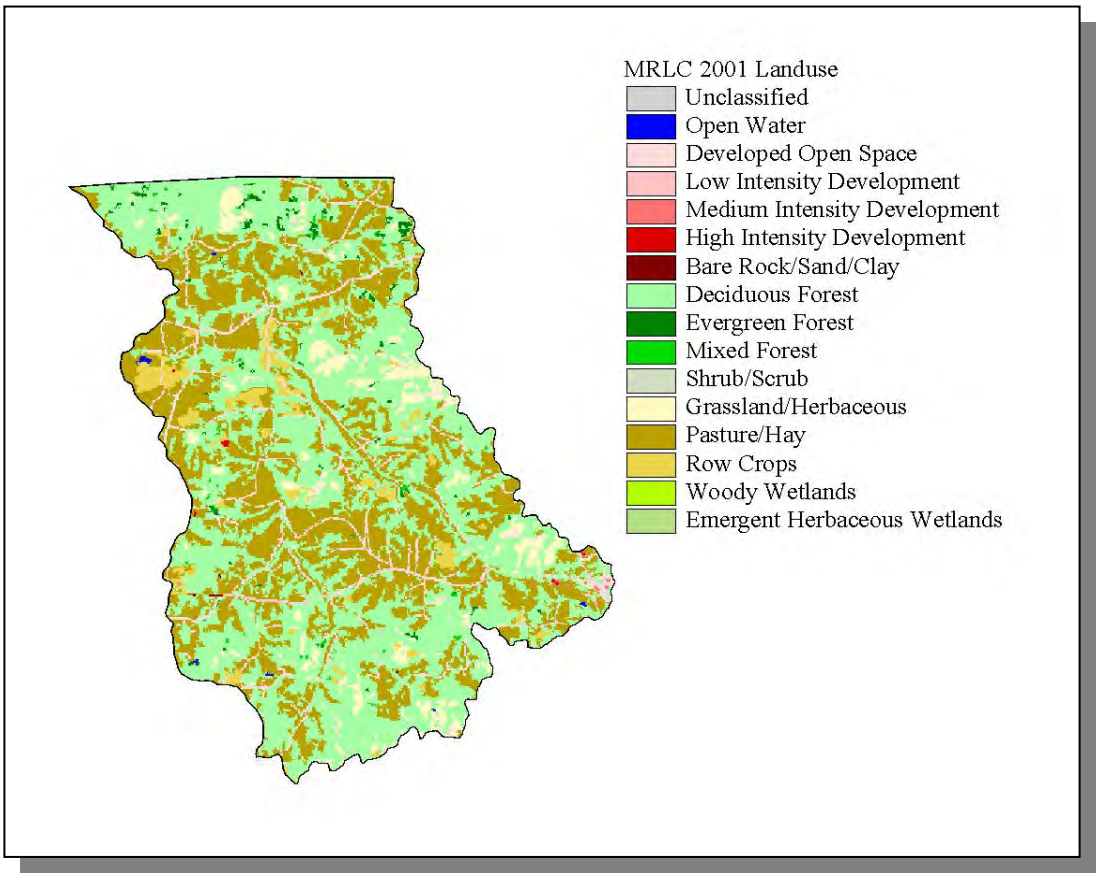

Figure 4-98. Illustration of Land Use Distribution in Subwatershed 051100020901.

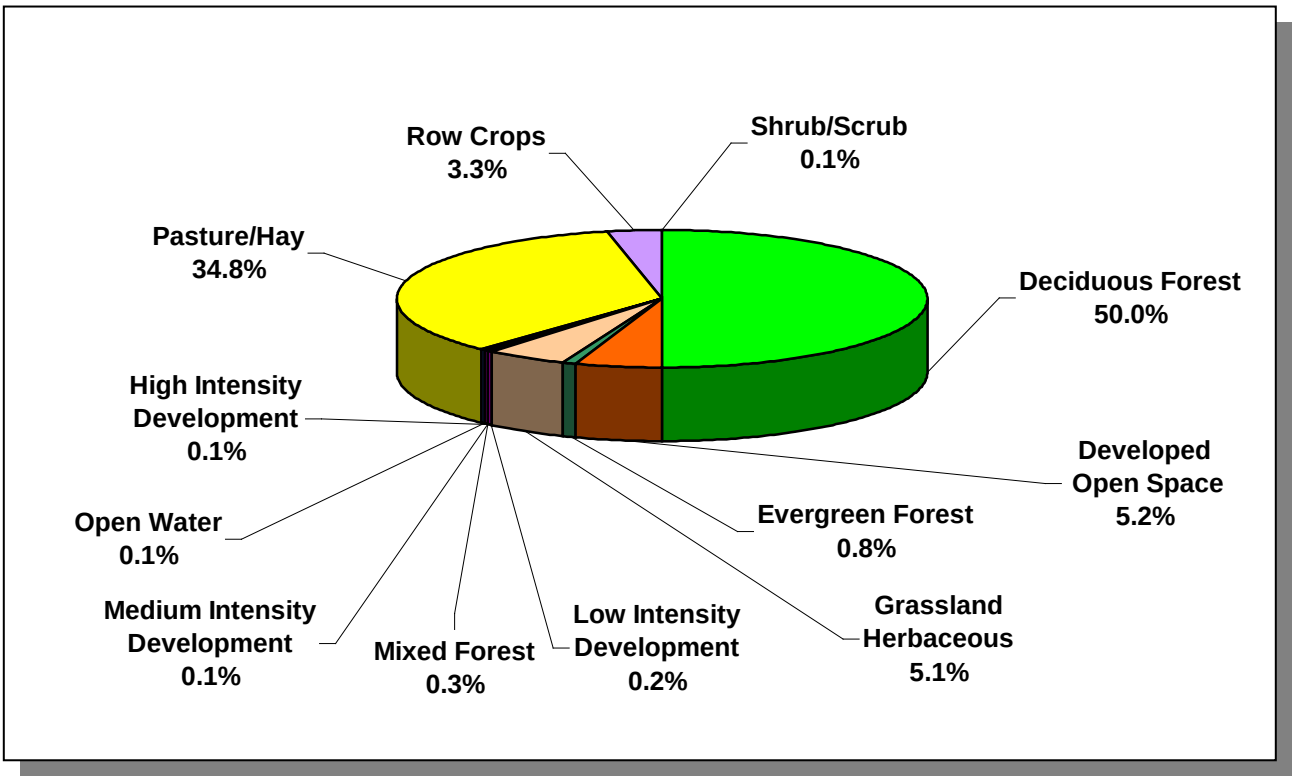

Figure 4-99. Land Use Distribution in Subwatershed 051100020901.

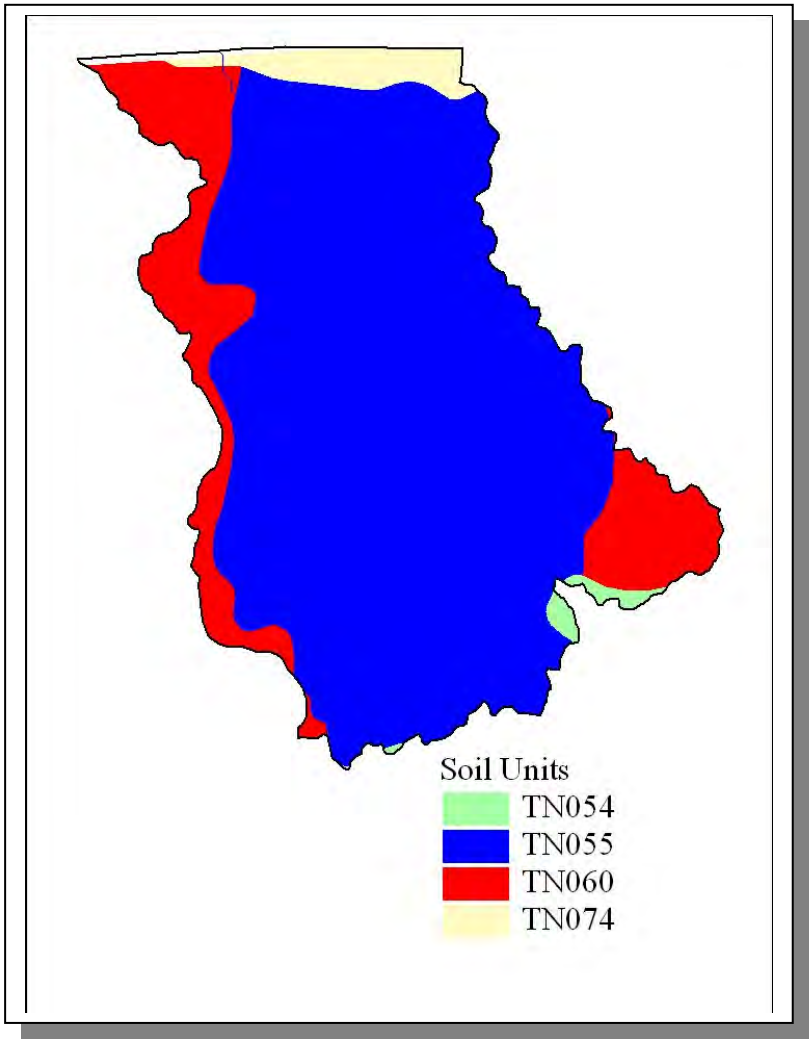

Figure 4-100. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 051100020901.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN054	0.00	C	3.04	4.84	Loam	0.32
TN055	3.00	C	2.45	5.24	Loam	0.34
TN060	5.00	B	1.30	5.32	Silty Loam	0.39
TN074	7.00	B	1.44	4.94	Loam	0.33

Table 4-78. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 051100020901. *The definition of "Hydrologic Group" is provided in Appendix IV.*

.

	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Sumner	103,281	121,936	130,449	6.19	6,392	7,546	8,073	26.3

Table 4-79. Population Estimates in Subwatershed 051100020901.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Westmoreland	Sumner	1,726	709	625	82	2

Table 4-80. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 051100020901.

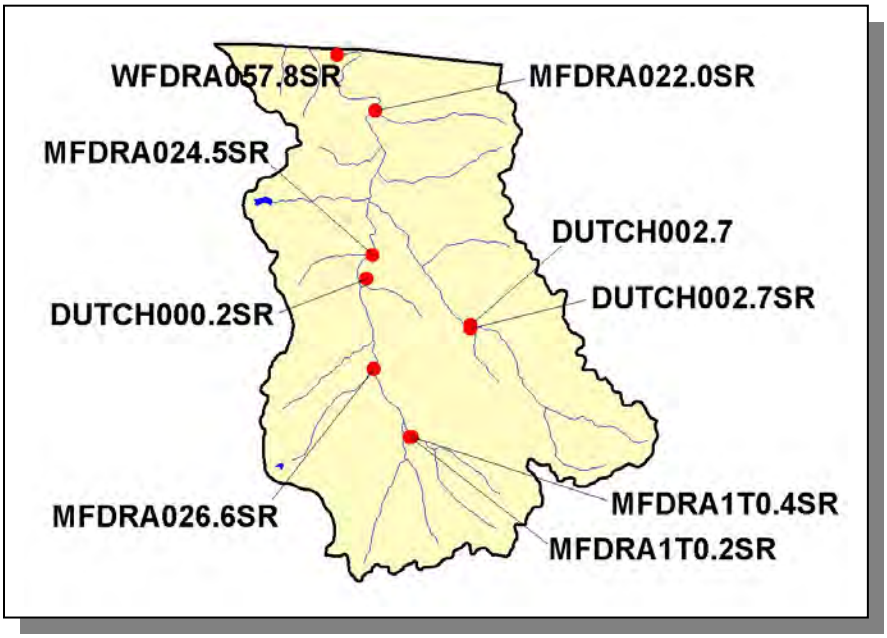

Figure 4-101. Location of Monitoring Sites in EPA's STORET Database in Subwatershed 051100020901. *More information, including site names and locations, and station numbers for sites located in the watershed outside of Tennessee, is provided in Appendix IV.*

4.2.E.i.a. Point Source Contributions.

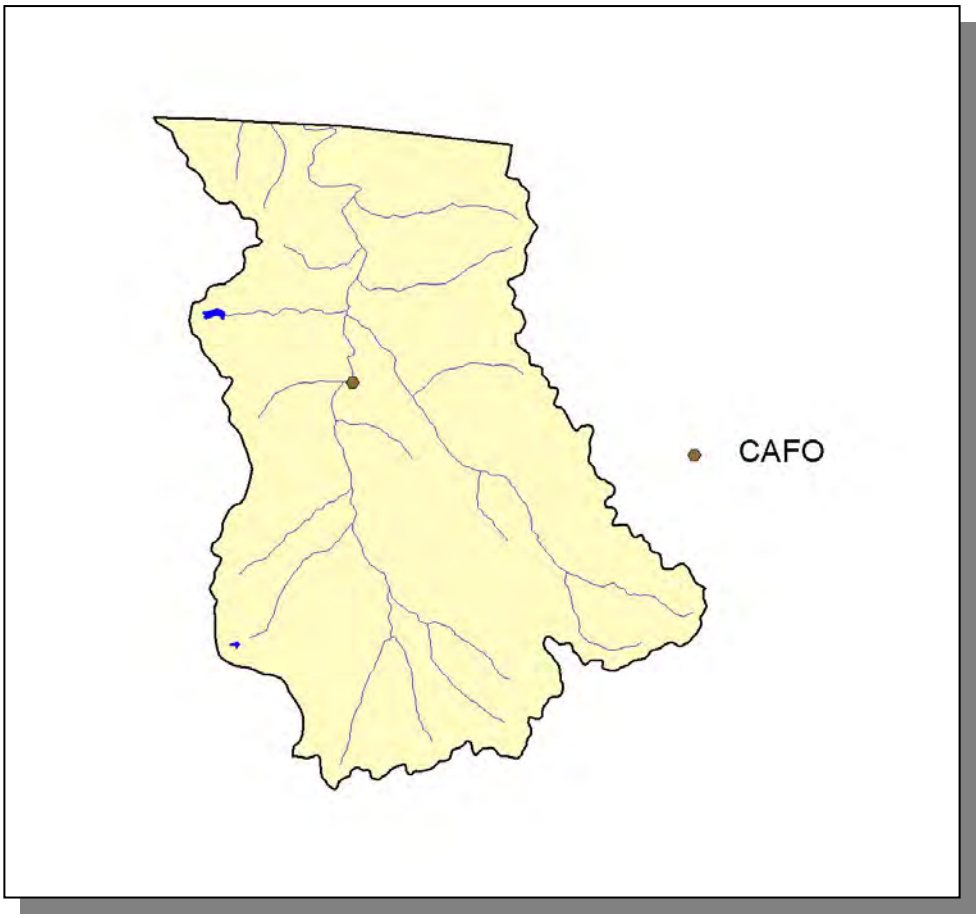

Figure 4-102. Location of Permits Issued in Subwatershed 051100020901. *More information, including the names of facilities, is provided in Appendix IV.*

Figure 4-103. Location of Concentrated Animal Feeding Operations (CAFO) in Subwatershed 051100020901. *More information, including the names of facilities, is provided in Appendix IV.*

4.2.E.i.b. Nonpoint Source Contributions.

LIVESTOCK COUNTS					
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
22,296	45,116	1,515	50	2,500	189

Table 4-81. Summary of Livestock Count Estimates in Subwatershed 051100020901. *According to the 1997 Census of Agriculture (http://www.nass.usda.gov/census/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

LIVESTOCK COUNTS						
County	Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
Sumner	22,296	45,116	1,515	50	2,500	189

Table 4-82. Summary of Livestock Count Estimates in Sumner County. *According to the 1997 Census of Agriculture (http://www.nass.usda.gov/census/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

	INVENTORY		REMOVAL RATE	
County	Forest Land (thousand acres)	Timber Land (thousand acres)	Growing Stock (million cubic feet)	Sawtimber (million board feet)
Sumner	88.2	88.2	2.0	6.3

Table 4-83. Forest Acreage and Annual Removal Rates (1987-1994) in Sumner County.

CROPS	TONS/ACRE/YEAR
Grass (Pastureland)	0.46
Grass (Hayland)	0.31
Legumes (Hayland)	0.12
Legumes, Grass (Hayland)	0.23
Grass, Forbs, Legumes (Mixed Pasture)	0.54
Corn (Row Crops)	12.32
Soybeans (Row Crops)	11.27
Other Cropland not Planted	19.23
Conservation Reserve Program Lands	0.26
Farmsteads and Ranch Headquarters	0.34

Table 4-84. Annual Estimated Total Soil Loss in Subwatershed 051100020901.

4.2.E.ii. 051100020902 (Sulfur Fork).

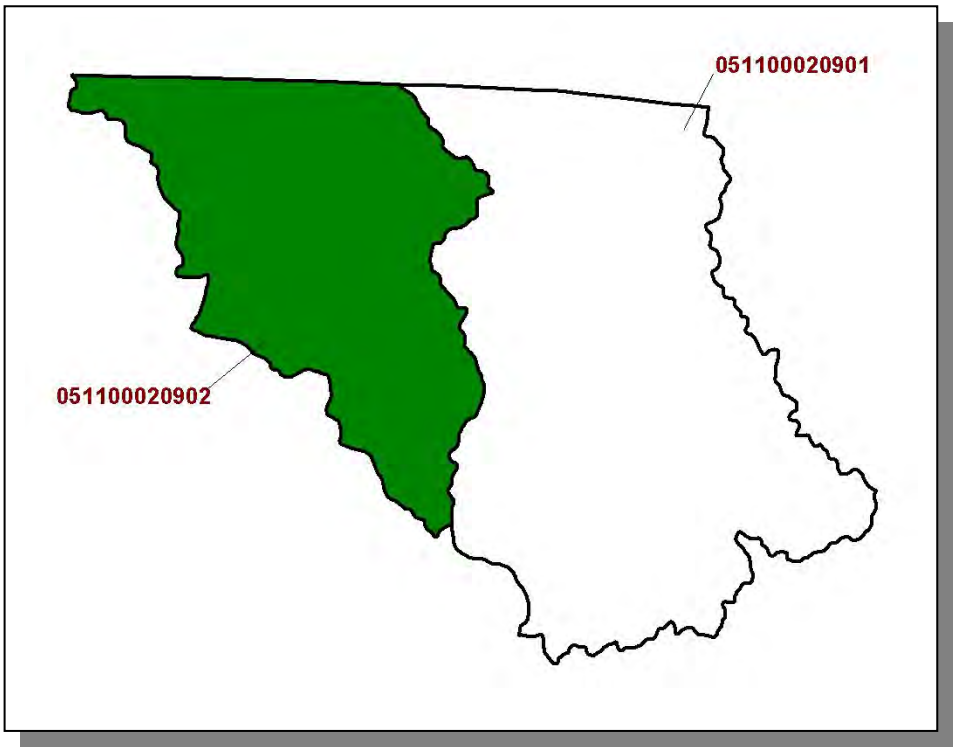

Figure 4-104. Location of Subwatershed 051100020902. *HUC-12 subwatershed boundaries are shown for reference.*

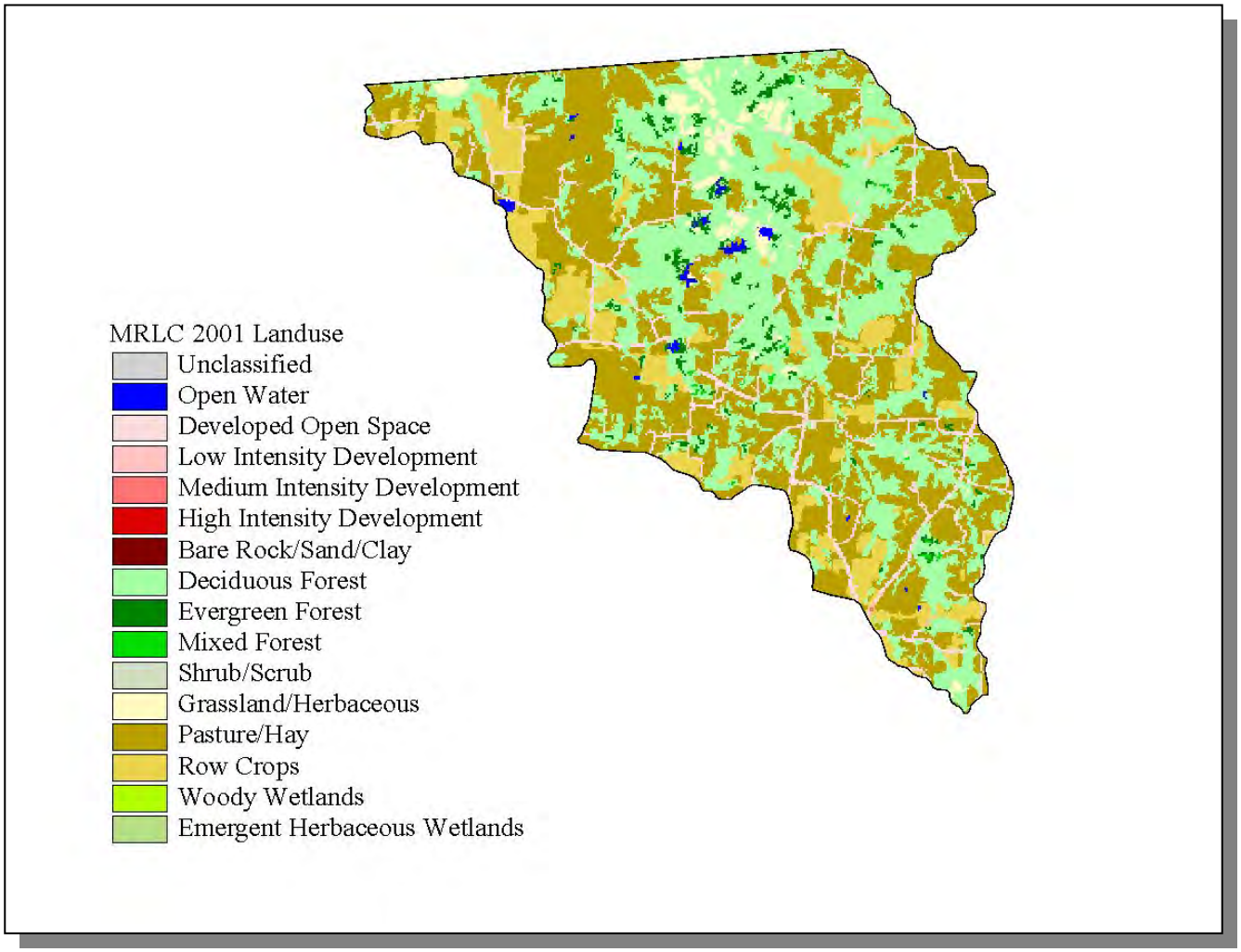

Figure 4-105. Illustration of Land Use Distribution in Subwatershed 051100020902.

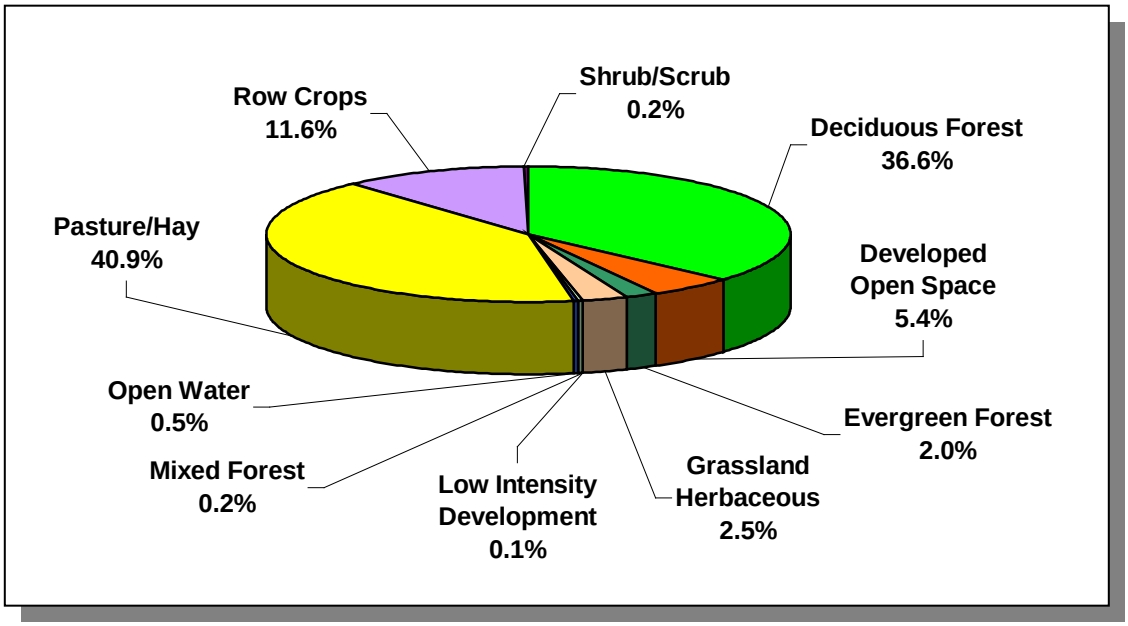

Figure 4-106. Land Use Distribution in Subwatershed 051100020902. *More information is provided in Appendix IV.*

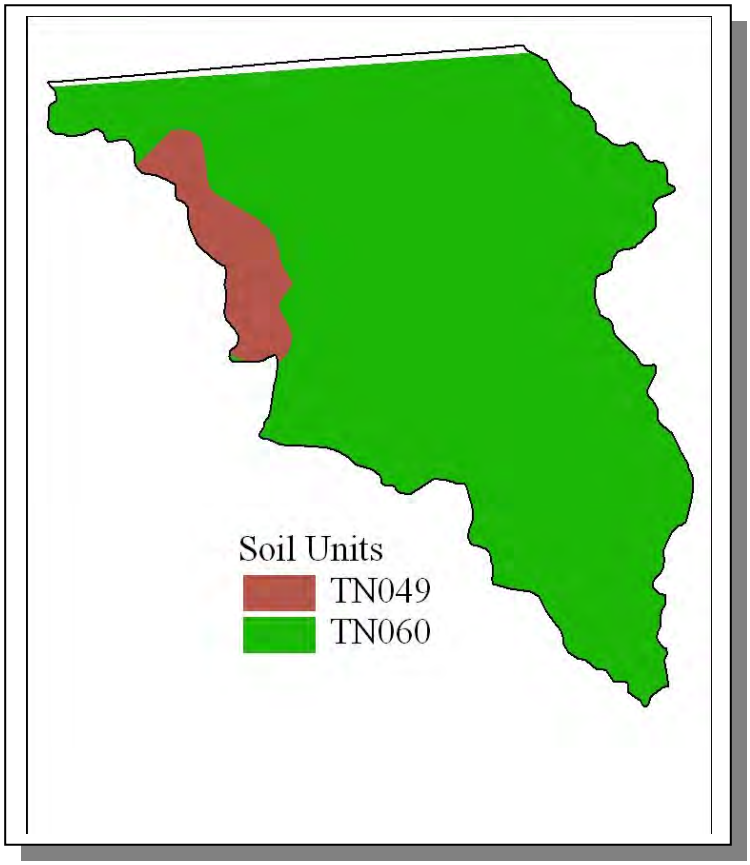

Figure 4-107. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 051100020902.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN049	0.00	B	1.30	5.94	Silty Loam	0.34
TN060	5.00	B	1.30	5.32	Silty Loam	0.39

Table 4-85. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 051100020902. *The definition of "Hydrologic Group" is provided in Appendix IV.*

.

	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Sumner	103,281	121,936	130,449	3.90	4,030	4,758	5,090	26.3

Table 4-86. Population Estimates in Subwatershed 051100020902.

Figure 4-108. Location of Monitoring Sites in EPA's STORET Database in Subwatershed 051100020902. *More information, including site names and locations, and station numbers for sites located in the watershed outside of Tennessee, is provided in Appendix IV.*

4.2.E.ii.a. Point Source Contributions.

There are no point source contributions in this subwatershed.

4.2.E.ii.b. Nonpoint Source Contributions.

LIVESTOCK COUNTS					
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
1,321	2,674	90	<5	148	11

Table 4-87. Summary of Livestock Count Estimates in Subwatershed 051100020902. *According to the 1997 Census of Agriculture (http://www.nass.usda.gov/census/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

LIVESTOCK COUNTS						
County	Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
Sumner	22,296	45,116	1,515	50	2,500	189

Table 4-88. Summary of Livestock Count Estimates in Sumner County. *According to the 1997 Census of Agriculture (http://www.nass.usda.gov/census/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

	INVENTORY		REMOVAL RATE	
County	Forest Land (thousand acres)	Timber Land (thousand acres)	Growing Stock (million cubic feet)	Sawtimber (million board feet)
Sumner	88.2	88.2	2.0	6.3

Table 4-89. Forest Acreage and Annual Removal Rates (1987-1994) in Sumner County.

CROPS	TONS/ACRE/YEAR
Grass (Pastureland)	0.46
Legumes (Hayland)	0.12
Grass (Hayland)	0.31
Legumes, Grass (Hayland)	0.23
Grass, Forbs, Legumes (Mixed Pasture)	0.54
Corn (Row Crops)	12.32
Soybeans (Row Crops)	11.27
Other Cropland not Planted	19.23
Conservation Reserve Program Lands	0.26
Non-Agricultural Land Use	0.00
Farmsteads and Ranch Headquarters	0.34

Table 4-90. Annual Estimated Total Soil Loss in Subwatershed 051100020902.

CHAPTER 5

WATER QUALITY PARTNERSHIPS IN THE BARREN RIVER WATERSHED

5.1. BACKGROUND. The Watershed Approach relies on participation at the federal, state, local and nongovernmental levels to be successful. Two types of partnerships are critical to ensure success:

- Partnerships between agencies
- Partnerships between agencies and landowners

This chapter describes both types of partnerships in the Barren River Watershed. The information presented is provided by the agencies and organizations described.

5.2. FEDERAL PARTNERSHIPS.

5.2.A. Natural Resources Conservation Service. The Natural Resources Conservation Service (NRCS), an agency of the U.S. Department of Agriculture, provides technical assistance, information, and advice to citizens in their efforts to conserve soil, water, plant, animal, and air resources on private lands.

Performance Results System (PRS) is a Web-based database application providing USDA Natural Resources Conservation Service, conservation partners, and the public fast and easy access to accomplishments and progress toward strategies and performance. The PRS may be viewed at http://prms.nrcs.usda.gov/prs. From the opening menu, select "Reports" in the top tool bar. You will select the time period that you are interested in and the conservation treatment of interest on the page that comes up. Depending on the time period of interest, you will have various report options to choose from, such as location, reporting period and program involved in the reporting. You may be required to "refresh" the page in order to get the current report to come up.

The data can be used to determine broad distribution trends in service provided to customers by NRCS conservation partnerships. These data do not show sufficient detail to enable evaluation of site-specific conditions (e.g., privately-owned farms and ranches) and are intended to reflect general trends.

Conservation Practice	Feet	Acres	Number
Conservation Buffers	27,067	103	
Erosion Control		111,581	
Nutrient Management		22,003	
Pest Management		19,918	60
Grazing / Forages		6,775	
Tree and Shrub Practices		3,423	
Tillage and Cropping		12,408	
Waste Management Systems			14
Wildlife Habitat Management		3,698	
Water Supply	20,058		24

Table 5-1. Landowner Conservation Practices in Partnership with NRCS in the Tennessee Portion of the Barren River Watershed. *Data are from PRMS for October 1, 2001 through September 30, 2005 reporting period. More information is provided in Appendix V.*

5.2.B. United States Geological Survey – Tennessee Water Science Center Programs. The United States Geological Survey (USGS) provides relevant and objective scientific information and data for public use in evaluation of the quantity, quality, and use of the Nation's water resources. National USGS water resource assessments include the National Streamflow Information Program (http://water.usgs.gov/nsip/), National Atmospheric Deposition Network (http://bqs.usgs.gov/acidrain), the National Stream Quality Accounting Network (http://water.usgs.gov/nasqan/), and the National Water-Quality Assessment Program (http://water.usgs.gov/nawqa). For a national overview of USGS water resources programs, please visit http://water.usgs.gov. Specific information on the Upper and Lower Tennessee River NAWQA study units can be found at http://tn.water.usgs.gov/lten/tenn.html .

In addition to National assessments, the USGS also conducts hydrologic investigations and data collection in cooperation with numerous Federal, State, and local agencies to address issues of National, regional, and local concern. Hydrologic investigations conducted by the USGS Tennessee Water Science Center address scientific questions pertaining to five general thematic topics:

1. Water Use and Availability,
2. Landforms and Ecology,
3. Watersheds and Land Use,
4. Occurrence, Fate, and Transport of Contaminants, and
5. Floods and Droughts.

In support of these investigations, the USGS Tennessee Water Science Center records streamflow continuously at more than 100 gaging stations, makes instantaneous measurements of streamflow at numerous other locations as needed or requested, monitors ground-water levels Statewide, and analyzes the physical, chemical, and biologic characteristics of surface and ground waters. In addition, the Water Science Center compiles annual water-use records for the State of Tennessee and collects a variety of data in support of National USGS baseline and other networks. More information pertaining to USGS activities in Tennessee can be accessed at http://tn.water.usgs.gov .

USGS Water Resources Information on the Internet. Real-time and historical streamflow, water-level, and water-quality data at sites operated by the USGS Tennessee Water Science Center can be accessed on-line at http://waterdata.usgs.gov/tn/nwis/nwis . Data can be retrieved by county, hydrologic unit code, or major river basin using drop-down menus on the web page. For specific information or questions about USGS streamflow data, contact Donna Flohr at (615) 837-4730 or dfflohr@usgs.gov . Recent USGS Tennessee Water Science Center publications can be accessed by visiting http://tn.water.usgs.gov/pubpg.html . A searchable bibliographic database is also provided for locating other USGS reports and products addressing specific scientific topics.

5.2.C. U.S. Fish and Wildlife Service. The mission of the U.S. Fish and Wildlife Service is working with others to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people. Sustaining our nation's fish and wildlife resources is a task that can be accomplished only through the combined efforts of governments, businesses, and private citizens. The U.S. Fish and Wildlife Service (Service) works with State and Federal agencies and Tribal governments, helps corporate and private landowners conserve habitat, and cooperates with other nations to halt illegal wildlife trade. The Service also administers a Federal Aid program that distributes funds annually to States for fish and wildlife restoration, boating access, hunter education, and related projects across America. The funds come from Federal excise taxes on fishing, hunting, and boating equipment.

Endangered Species Program

Through the Endangered Species Program, the Service consults with other federal agencies concerning their program activities and their effects on endangered and threatened species. Other Service activities under the Endangered Species Program include the listing of rare species under the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended: 16 U.S.C. 1531 et seq.) and the recovery of listed species. Once listed, a species is afforded the full range of protections available under the ESA, including prohibitions on killing, harming or otherwise taking a species. In some instances, species listing can be avoided by the development of Candidate Conservation Agreements, which may remove threats facing the candidate species, and funding efforts such as the Private Stewardship Grant Program. The federally endangered gray bat (*Myotis grisescens*) occurs in the Barren River Watershed. For a complete listing of endangered and threatened species in Tennessee, please visit the Service's website at http://*cookeville.fws.gov*.

Recovery is the process by which the decline of an endangered or threatened species is stopped and reversed, and threats to the species' survival are eliminated, so that long-term survival in nature can be ensured. The goal of the recovery process is to restore listed species to a point where they are secure and self-sustaining in the wild and can be removed from the endangered species list. Under the ESA, the Service and National Marine Fisheries Service were delegated the responsibility of carrying out the recovery program for all listed species.

In a partnership with the Tennessee Chapter of The Nature Conservancy (TNC), Tennessee Wildlife Resources Agency (TWRA), and Tennessee Department of Environment and Conservation (TDEC) Division of Natural Heritage, the Service developed a State Conservation Agreement for Cave Dependent Species in Tennessee (SCA). The SCA targets unlisted but rare species and protects these species through a suite of proactive conservation agreements. The goal is to preclude the need to list these species under the ESA. This agreement covers middle and eastern Tennessee and will benefit water quality in many watersheds within the State.

In an effort to preclude the listing of a rare species, the Service engages in proactive conservation efforts for unlisted species. The program covers not only formal candidates but also other rare species that are under threat. Early intervention preserves management options and minimizes the cost of recovery.

Partners for Fish and Wildlife Program

The U.S. Fish and Wildlife Service established the Partners for Fish and Wildlife Program to restore historic habitat types, which benefit native fishes and wildlife. The program adheres to the concept that restoring or enhancing habitats such as wetlands or other unique habitat types will substantially benefit federal trust species on private lands by providing food and cover or other essential needs. Federal trust species include threatened and endangered species, as well as migratory birds (e.g. waterfowl, wading birds, shorebirds, neotropical migratory songbirds).

Participation is voluntary and various types of projects are available. Projects include livestock exclusion fencing, alternate water supply construction, streambank stabilization, restoration of native vegetation, wetland restoration/enhancement, riparian zone reforestation, and restoration of in-stream aquatic habitats.

HOW TO PARTICIPATE ...

- Interested landowners contact a Partners for Fish and Wildlife Biologist to discuss the proposed project and establish a site visit.
- A visit to the site is then used to determine which activities the landowner desires and how those activities will enhance habitat for trust resources. Technical advice on proposed activities is provided by the Service, as appropriate.
- Proposed cost estimates are discussed by the Service and landowner.
- A detailed proposal which describes the proposed activities is developed by the Service biologist and the landowner. Funds are competitive, therefore the proposal is submitted to the Service's Ecosystem team for ranking and then to the Regional Office for funding.
- After funding is approved, the landowner and the Service co-sign a Wildlife Extension Agreement (minimum 10-year duration).
- Project installation begins.
- When the project is completed, the Service reimburses the landowner after receipts and other documentation are submitted according to the Wildlife Extension Agreement.

For more information regarding the Endangered Species and Partners for Fish and Wildlife programs, please contact the Cookeville Ecological Services Field Office at 931/528-6481 or visit their website at http://*cookeville.fws.gov*.

5.3. STATE PARTNERSHIPS.

5.3.A. TDEC Division of Water Supply. The Source Water Protection Program, authorized by the 1996 Amendments to the Safe Drinking Water Act, outline a comprehensive plan to achieve maximum public health protection. According to the plan, it is essential that every community take these six steps:

1) Delineate the drinking water source protection area
2) Inventory known and potential sources of contamination within these areas
3) Determine the susceptibility of the water supply system to these contaminants
4) Notify and involve the public about threats identified in the contaminant source inventory and what they mean to their public water system
5) Implement management measures to prevent, reduce or eliminate threats
6) Develop contingency planning strategies to deal with water supply contamination or service interruption emergencies (including natural disaster or terrorist activities).

Source water protection has a simple objective: to prevent the pollution of the lakes, rivers, streams, and ground water (wells and springs) that serve as sources of drinking water before they become contaminated. This objective requires locating and addressing potential sources of contamination to these water supplies. There is a growing recognition that effective drinking water system management includes addressing the quality and protection of the water sources.

Source Water Protection has a significant link with the Watershed Management Program goals, objectives and management strategies. Watershed Management looks at the health of the watershed as a whole in areas of discharge permitting, monitoring and protection. That same protection is important to protecting drinking water as well. Communication and coordination with a multitude of agencies is the most critical factor in the success of both Watershed Management and Source Water Protection.

Watershed management plays a role in the protection of both ground water and surface water systems. Watershed Management is particularly important in areas with karst (limestone characterized by solution features such as caves and sinkholes as well as disappearing streams and spring), since the differentiation between ground water and surface water is sometimes nearly impossible. What is surface water can become ground water in the distance of a few feet and vice versa.

Source water protection is not a new concept, but an expansion of existing wellhead protection measures for public water systems relying on ground water to now include surface water. This approach became a national priority, backed by federal funding, when the Safe Drinking Water Act amendments (SDWA) of 1996 were enacted. Under this Act, every public drinking water system in the country is scheduled to receive an assessment of both the sources of potential contamination to its water source of the threat these sources may pose by the year 2003 (extensions were available until 2004). The assessments are intended to enhance the protection of drinking water supplies

within existing programs at the federal, state and local levels. Source water assessments were mandated and funded by Congress. Source water protection will be left up to the individual states and local governments without additional authority from Congress for that progression.

Tennessee's Wellhead Protection Rules were revised as of October 29, 2005 to include requirements for similar protection for public water systems using surface water sources under the heading of Drinking Water Source Protection Rule (1200-5-1-.34) in addition to the previous requirements for wellhead protection for public water systems using ground water sources. The rule addresses surface or ground water withdrawals in the vicinity of public water sources as well as potential contaminant sources threatening public water sources to reflect the amended prohibitions in the 2002 Amendments to the Tennessee Safe Drinking Water Act, TCA 68-221-771. There are additional reporting requirements of potential contaminant source inventories and emergency response for the public water systems as well. The Division of Water Supply will be able to use the Drinking Water Source Protection Rule to work in complimentary fashion with the Division of Water Pollution Control and other Departmental agencies in activities to protect public water sources.

As a part of the Source Water Assessment Program, public water systems are evaluated for their susceptibility to contamination. These individual source water assessments with susceptibility analyses are available to the public at http://www.state.tn.us/environment/dws as well as other information regarding the Source Water Assessment Program and public water systems.

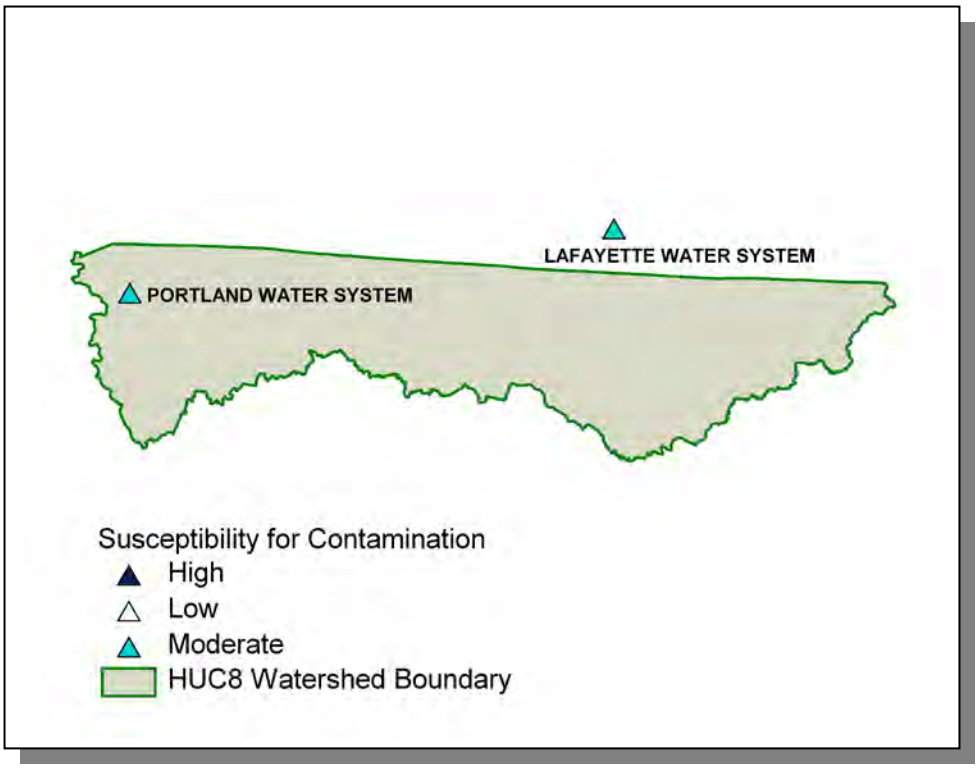

Figure 5-1. Susceptibility for Contamination in the Barren River Watershed.

For further discussion on ground water issues in Tennessee, the reader is referred to the Ground Water Section of the 305(b) Water Quality Report at http://www.tdec.net/water.shtml.

5.3.B. State Revolving Fund. TDEC administers the state's Clean Water State Revolving Fund Program. Amendment of the Federal Clean Water Act in 1987 created the Clean Water State Revolving Fund (SRF) Program to provide low-interest loans to cities, counties, and utility districts for the planning, design, and construction of wastewater facilities. The U.S. Environmental Protection Agency awards annual capitalization grants to fund the program and the State of Tennessee provides a twenty-percent funding match. TDEC has awarded loans totaling approximately $550 million since the creation of the SRF Program. SRF loan repayments are returned to the program and used to fund future SRF loans.

SRF loans are available for planning, design, and construction of wastewater facilities, or any combination thereof. Eligible projects include new construction or upgrading/expansion of existing facilities, including wastewater treatment plants, pump stations, force mains, collector sewers, interceptors, elimination of combined sewer overflows, and nonpoint source pollution remedies.

SRF loan applicants must pledge security for loan repayment, agree to adjust user rates as needed to cover debt service and fund depreciation, and maintain financial records that follow governmental accounting standards. SRF loan interest rates range from zero percent to market rate, depending on the community's per-capita income, taxable sales, and taxable property values. Most SRF loan recipients qualify for interest rates between 2 and 4 percent. Interest rates are fixed for the life of the term of the loan. The maximum loan term is 20 years or the design life of the proposed wastewater facility, whichever is shorter.

TDEC maintains a Priority Ranking System and Priority List for funding the planning, design, and construction of wastewater facilities. The Priority Ranking List forms the basis for funding eligibility determinations and allocation of Clean Water SRF loans. Each project's priority rank is generated from specific priority ranking criteria and the proposed project is then placed on the Project Priority List. Only projects identified on the Project Priority List may be eligible for SRF loans. The process of being placed on the Project Priority List must be initiated by a written request from the potential SRF loan recipient or their engineering consultant. SRF loans are awarded to the highest priority projects that have met SRF technical, financial, and administrative requirements and are ready to proceed.

Since SRF loans include federal funds, each project requires development of a Facilities Plan, an environmental review, opportunities for minority and women business participation, a State-approved sewer use ordinance and Plan of Operation, and interim construction inspections.

For further information about Tennessee's Clean Water SRF Loan Program, call (615) 532-0445 or visit their Web site at http://www.tdec.net/srf.

5.3.C. Tennessee Department of Agriculture. The Tennessee Department of Agriculture's Water Resources Section consists of the federal Section 319 Nonpoint Source Program and the Agricultural Resources Conservation Fund Program. Both of these are grant programs which award funds to various agencies, non-profit organizations, and universities that undertake projects to improve the quality of Tennessee's waters and/or educate citizens about the many problems and solutions to water pollution. Both programs fund projects associated with what is commonly known as "nonpoint source pollution."

The Tennessee Department of Agriculture's Nonpoint Source Program (TDA-NPS) has the responsibility for management of the federal Nonpoint Source Program, funded by the US Environmental Protection Agency through the authority of Section 319 of the Clean Water Act. This program was created in 1987 as part of the reauthorization of the Clean Water Act, and it established funding for states, territories and Indian tribes to address NPS pollution. Nonpoint source funding is used for installing Best Management Practices (BMPs) to stop known sources of NPS pollution, training, education, demonstrations and water quality monitoring. The TDA-NPS Program is a non-regulatory program, promoting voluntary, incentive-based solutions to NPS problems. The TDA-NPS Program basically funds three types of programs:

- BMP Implementation Projects. These projects aid in the improvement of an impaired waterbody, or prevent a non-impaired water from becoming listed on the 303(d) List.

- Monitoring Projects. Up to 20% of the available grant funds are used to assist the water quality monitoring efforts in Tennessee streams, both in the state's 5-year watershed monitoring program, and also in performing before-and-after BMP installation, so that water quality improvements can be verified. Some monitoring in the Barren River Watershed was funded under an agreement with the Tennessee Department of Agriculture, Nonpoint Source Program (U.S. Environmental Protection Agency Assistance Agreement C99944674-04-0).

- Educational Projects. The intent of educational projects funded through TDA-NPS is to raise the awareness of landowners and other citizens about practical actions that can be taken to eliminate nonpoint sources of pollution to the waters of Tennessee.

The Tennessee Department of Agriculture Agricultural Resources Conservation Fund Program (TDA-ARCF) provides cost-share assistance to landowners across Tennessee to install BMPs that eliminate agricultural nonpoint source pollution. This assistance is provided through Soil Conservation Districts, Resource Conservation and Development Districts, Watershed Districts, universities, and other groups. Additionally, a portion of the TDA-ARCF is used to implement information and education projects statewide, with the focus on landowners, producers, and managers of Tennessee farms and forests.

Participating contractors in the program are encouraged to develop a watershed emphasis for their individual areas of responsibility, focusing on waters listed on the Tennessee 303(d) List as being impaired by agriculture. Current guidelines for the TDA-ARCF are available. Landowners can receive up to 75% of the cost of the BMP as a reimbursement.

Since January of 1999, the Department of Agriculture and the Department of Environment and Conservation have had a Memorandum of Agreement whereby complaints received by TDEC concerning agriculture or silviculture projects would be forwarded to TDA for investigation and possible correction. Should TDA be unable to obtain correction, they would assist TDEC in the enforcement against the violator. More information forestry BMPs is available at:

http://www.state.tn.us/agriculture/forestry/bmpmanual.html

The complaint form is available at:

http://www.state.tn.us/environment/wpc/forms/wqlogging_cn1274.doc

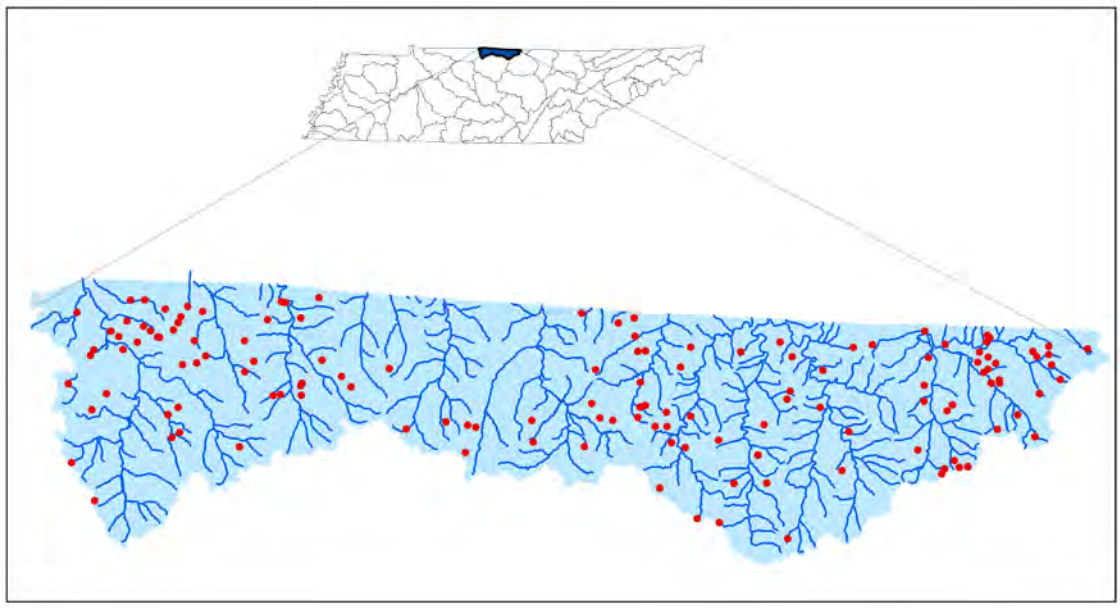

Figure 5-2. Location of BMPs installed from 1999 through 2005 in the Tennessee Portion of the Barren River Watershed with Financial Assistance from the Tennessee Department of Agriculture's Nonpoint Source and Agricultural Resources Conservation Fund Grant Programs. *More information is provided in Appendix V.*

5.3.D. Kentucky Division of Water – Kentucky Watershed Management Framework, The Kentucky Watershed Management Framework is a dynamic, flexible structure for coordinating watershed management across the Commonwealth of Kentucky.

The Watershed Management Framework is not a new program, but rather a way of coordinating existing programs and building new partnerships that will result in more effective and efficient management of the state's land and water resources. Inherent in the design of the Framework is the belief that many stakeholder groups and individuals must have ongoing opportunities to participate in the process of managing the abundant natural resources that characterize Kentucky's watersheds.

Benefits to the people of Kentucky include:

- Better information for decision making
- Increased ability to resolve complex water resource problems
- Improved coordination among governmental agencies
- More opportunities for citizens to get involved
- Increased ability to demonstrate results and benefits of environmental management
- More cost-effective use of public and private funds

Each major river basin in Kentucky is staffed with a Basin Coordinator. Basin Coordinators are staff assigned to serve as a liaison in a given basin management unit among the agencies, the local interests, and the resources concerns. Their job is to specialize in their watershed, to know what resources might be available to address the concerns, and facilitate the watershed process to implement plans that address the problems.

For more information about the KY Watershed Management Framework visit our website at http://www.watersheds.ky.gov/

Watershed Framework activities in the Barren River Watershed are coordinated through the Green/Tradewater River Basin Team. The Green/Tradewater River Basin Team is a multi-agency task force that meets regularly to help in development of monitoring strategies, education and outreach, prioritization of issues and watersheds within the basin, planning, and networking among technical staff and local leaders to apply agency resources to implement fixes. For more info about the Green/Tradewater River Basin Team contact Dale Reynolds, Green/Tradewater River Basin Coordinator at (270) 746-7475 or via email at dalen.Reynolds@ky.gov. The web address is http://www.watersheds.ky.gov/basins/green_tradewater/

Barren River HUC11s:

West Fork Drakes Creek (05110002220)
Sulphur Fork Creek (05110002250)
Middle Fork Drakes Creek (05110002270)
Little Trammel Creek (05110002290)
Trammel Creek above Rough Cr. (05110002290)
Long Creek (05110002140)
Long Hungry Creek (05110002120)
Puncheon Creek (05110002100)
Salt Lick Creek (05110002080)
Barren River near Bowling Green (05110002030)
Line Creek (05110002020)

Geography. These Barren River sub-watersheds collectively drain 456 square miles in Kentucky. Several of the headwater tributaries of the Barren River originate in north central Tennessee and flow northwesterly into Monroe County in Kentucky. Along much of their length, these tributaries cut well into the Mississippian Limestone formations to form 130-190 feet deep gorges as they cross the state line. Tributaries of both Drakes Creek and Trammel Fork are topographically less dramatic, where they enter Simpson and Allen Counties in Kentucky from their Tennessee origins. This flow eventually joins the Barren River near Bowling Green, Kentucky. The terrain along the border is well dissected and well drained by entrenched streams with a more rolling topography downstream. There are large areas of karst topography in this watershed.

Waterways. There are hundreds of miles of Tennessee streams that drain into the Kentucky portion of these watersheds. Major tributaries to Barren River headwaters from Tennessee include Little Trace Creek, Trace Creek, Line Creek, Salt Lick Creek, Long Fork, White Oak Creek, Puncheon Creek, and Long Creek. Other major tributaries that cross into Kentucky to join the Barren River near Bowling Green include: Trammel Creek, Garrett Creek, Little Trammel Creek, Middle Fork Drakes Creek, Sulphur Fork Creek, Webb Branch, and West Fork of Drakes Creek.

There are two drinking water sources on these tributaries: City of Lafayette, Tennessee draws from the upper end of Barren River Lake and the City of Franklin, Kentucky draws from West Fork Drakes Creek.

Land Cover/Land Use. The watershed is mostly agricultural on the ridges and in the wider valleys. Dairy and poultry operations are common. Deciduous forest is common on the steeper slopes of the more entrenched streams valleys.

Agency Data Assessment. Several stream segments have been recently assessed and found to be fully supporting designated uses. These include: Thompson Branch, Sulphur Fork Creek, Little Trammel Creek, Trammel Creek, Puncheon Creek, Long Fork, Salt Lick Creek, Line Creek and West Fork of Drakes Creek from mile 23.4 to 32.8 (state line).

West Fork of Drakes Creek from mile 0.0 to 23.4 is listed on the 2004 303(d) list of impaired waters as partially supporting fish consumption due to PCB's. The source of the impairment is industrial point sources. Declining PCB levels in fish have resulted in downgrading of this stream segment from not supporting to partially supporting.

Barren River from mile 110.0 to 124.3 is listed on the 2004 303(d) list of impaired waters as not supporting primary contact recreation due to pathogens. The source of the pathogens is unknown. This same segment was determined to be fully supporting for aquatic life

Watershed Efforts in the Barren River. No sub watersheds in the Barren River Watershed were selected by the Green/Tradewater River Basin Team as a priority watershed for watershed planning.

5.4. LOCAL INITIATIVES.

5.4.A. The Central Basin RC&D Council. Resource Conservation & Development (RC&D) is a program of the USDA Natural Resources Conservation Service, which is administered at the local level by a non-profit council that is representative of the established area with the assistance of a Federal Coordinator. The Central Basin RC&D area was designated in January of 2002. The Council covers Davidson, Rutherford, Sumner, Trousdale, Williamson & Wilson counties in the Middle Tennessee area. The area is named for the geologic feature known as the Central or Nashville Basin which makes up the majority of the areas land mass with the remainder being part of the Highland Rim.

The Mission of the Central Basin RC&D Council is to promote the wise utilization of natural, cultural and other resources creating managed and sustainable growth that will improve the overall quality of life. The Vision of the Council is to create a diverse, cooperative, productive and effective working atmosphere that will identify and address needs and opportunities.

The RC&D Council works with local government, communities and individuals to make improvements by combining natural resource conservation with economic and social benefits.

5.4.B. The Nature Conservancy (TNC). The Tennessee State Wildlife Action Plan (SWAP), formerly known as the Comprehensive Wildlife Conservation Strategy (CWCS), was developed by the Tennessee Wildlife Resources Agency with assistance from The Nature Conservancy in 2005. Congress mandated that each state and territory in the United States develop a SWAP as a requirement for continued receipt of federal State Wildlife Grant funding. These plans require the completion of 8 key elements of wildlife planning: 1) a list of animal species of greatest conservation need, 2) information about the distribution and abundance of species targets, 3) locations and relative conditions of key habitats, 4) descriptions of problems affecting target species and their habitats, 5) descriptions of conservation actions and priorities for conserving target species and habitats, 6) details for monitoring target species, conservation actions, and adaptive management, 7) discussion of plans to review the SWAP at specific intervals, and 8) information about coordination and implementation of the SWAP with major stakeholders.

In Tennessee, the SWAP was integrated into a spatial model using Geographic Information Systems (GIS) and other database technology. Priority aquatic, terrestrial, and subterranean areas for conservation were identified across the state. Priorities were determined in the GIS model based upon relative differences in species rarity, population viability, and potential mobility of species across habitat units. Priority problems affecting species and needed conservation actions are detailed across each region of the state. For complete information about the Tennessee SWAP, please visit http://www.state.tn.us/twra/cwcs/cwcsindex.html to read or download the full report.

Contact:
Chris Bullington
State Conservation Planning Manager
The Nature Conservancy, TN Chapter
2021 21st Avenue South; Suite C-400
Nashville, TN 37212
phone: (615) 383-9909 x 227

5.4.C. Hull-York Lakeland Resource Conservation and Development (RC&D) Council. The RC&D Council mission is to *"Provide leadership to local communities to improve quality of life and conserve natural resources by organizing partners and facilitating technical and financial assistance resources".*

Hull-York Lakeland RC&D Council covers 14-counties of the Upper Cumberland area. These counties are: Macon, Clay, Pickett, Fentress, Overton, Jackson, Smith, DeKalb, Putnam, Cumberland, White, Van Buren, Warren and Cannon. Recreation in this area is dependant on a high standard of water quality. The main recreational attractions in the RC&D area are Dale Hollow Lake, Center Hill Lake, Cordell Hull Lake, and the scenic trout waters of the Caney Fork River. These resources attract large numbers of visitors to the area each year, and Hull-York Lakeland therefore has a vested interest in insuring the water quality of its watersheds.

Hull-York Lakeland RC&D Council has many local, state, federal and private partners with similar interests in the RC&D area. These partners join forces to engage in programs and projects that help individual land users and communities improve and conserve the natural resources, and engage in projects that enhance community and economic development activities. Hull-York Lakeland was the first RC&D area authorized by USDA in the state of Tennessee, and one of the first in the nation. Hull-York Lakeland was authorized in 1966.

Past projects have included Cane Creek Park and Lake in Putnam County, Camp Discovery in Jackson County, farmers markets is several counties, and emergency services consolidation projects. Current projects include a 319(h) grant for development of a watershed management plan in the Post Oak Creek Watershed. This watershed is 16,000+ acres and has been identified on the Tennessee 303(d) list of impaired waters as not meeting intended uses due to agriculture. The RC&D Council's goal is to develop a plan that identifies needs and problems in the watershed in order to have it removed from the 303(d) list, and then submit a project for funding practices that address those needs and problems.

Hull-York Lakeland RC&D Council has received a grant from the Tennessee Department of Agriculture – Agriculture Resources Conservation Fund (TDA – ARCF) with which they have purchased a tree planter in order to promote tree planting in riparian corridors to improve and enhance water quality. The Council has also received grants from TDA-ARCF, TWRA, and Quail Unlimited in order to purchase a Native Warm Season Grass No-Till Drill. This drill was purchased in May 2006 to promote the planting of Native Warm Season Grasses in the Upper Cumberland Area to create and enhance wildlife habitat, as well as establish buffers and field borders to improve water quality.

In 2006 Hull-York Lakeland has so far received $108,442 in direct grants, and has assisted communities in the receipt of $445,692. These funds are being used to address water quality and community development issues. For more information about Hull-York Lakeland RC&D Council contact Jeff Sanders at (931) 528-6472, ext. 110, or jeff.sanders@tn.usda.gov. You can also go to the council's website at: http://www.hylrcd.org.

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.

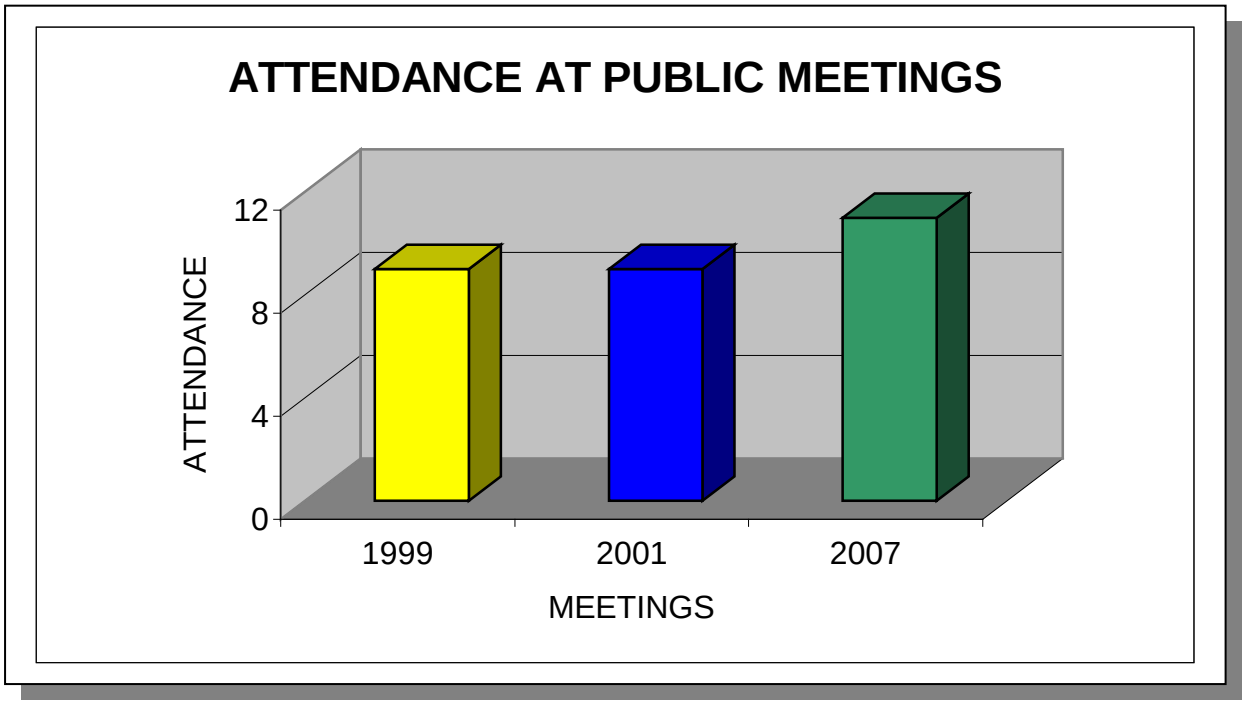

Figure 6-1. Attendance at the Barren River Watershed Public Meetings. *Attendance numbers do not include TDEC personnel. Meetings in 1999 and 2001 represent Barren River and Old Hickory Lake Watersheds joint public meetings. Meting in 2007 represents Barren River, Upper Cumberland River, and Cordell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

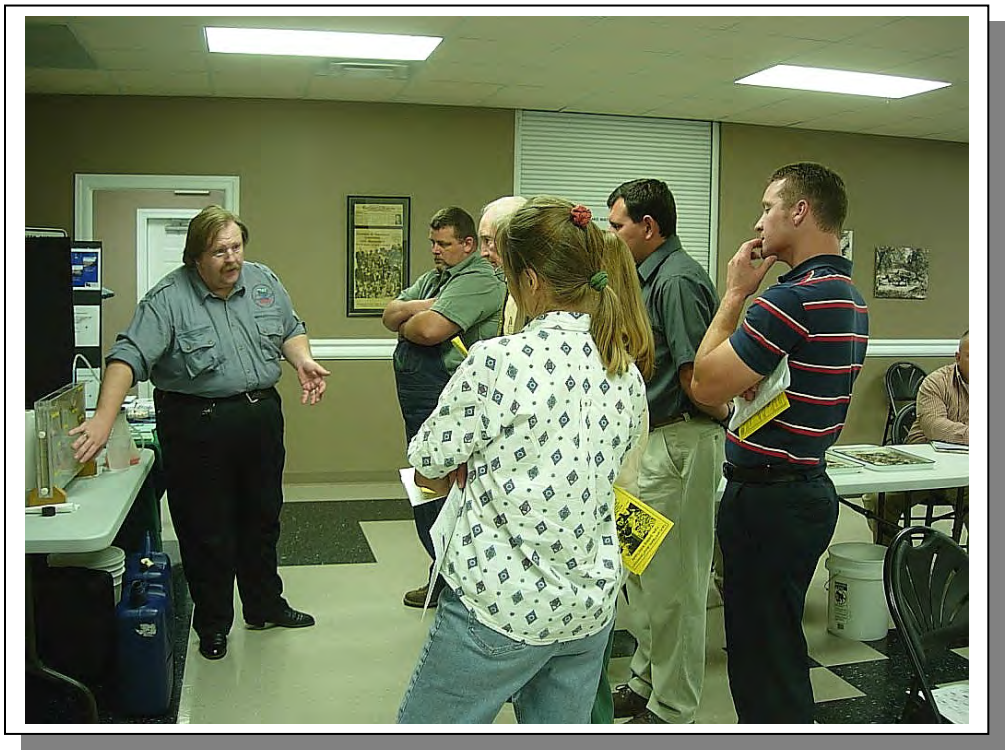

Figure 6-4. Scotty Sorrells (Division of Water Supply) explains the complicated issues involved with groundwater as a source of drinking water.

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.

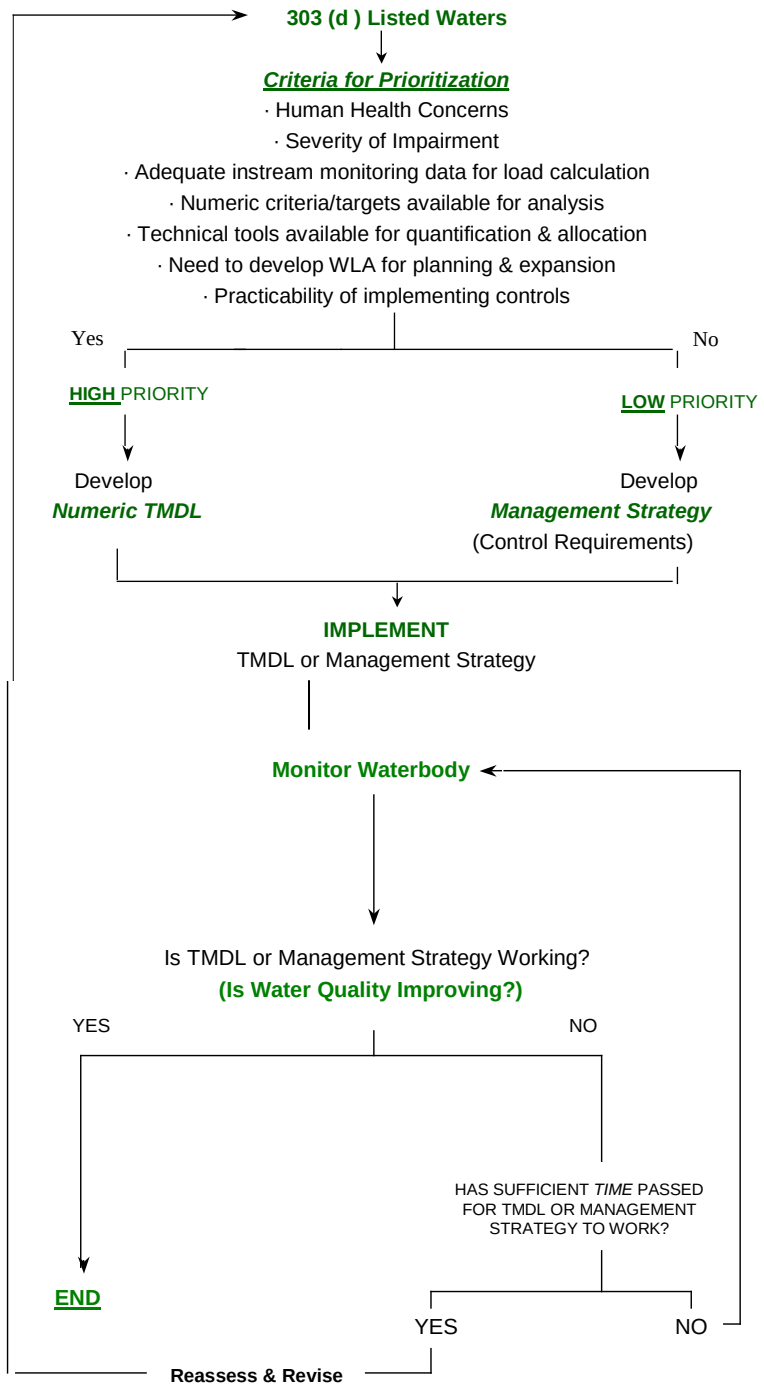

Figure 6-5. Prioritization Scheme for TMDL Development.

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.

APPENDIX II

ID	NAME	HAZARD
567003	Jennings Creek #17	1
567004	Red Boiling Springs	1
837003	City Park (Pine Creek)	H
147002	Jennings Creek #4	2
837002	Norman	3
837004	Sumner County Sportsmen	L
837005	Pine Lake	2
837006	Meadow Brook Game Farm	1
837007	Willow Lake	2
837009	Five Coves Lake	2
837010	Westmoreland City Lake	2
837018	Blasingame #6	2

Table A2-1. Inventoried Dams in the Tennessee Portion of the Barren River Watershed. *Hazard Codes: (H, 1), High; 2, Significant; (L, 3), Low. TDEC only regulates dams indicated by a numeric hazard score.*

LAND COVER/LAND USE	ACRES	% OF WATERSHED
Bare Rock/Sand/Clay	165	0.1
Deciduous Forest	123,807	47.0
Developed Open Space	15,144	5.7
Emergent Herbaceous Wetlands	15	0.0
Evergreen Forest	1,440	0.9
Grassland/Herbaceous	9,080	3.4
High Intensity development	302	0.1
Low Intensity Development	903	0.3
Medium Intensity Development	499	0.2
Mixed Forest	922	0.3
Open Water	308	0.1
Pasture/Hay	89,100	33.8
Row Crops	20,439	7.8
Shrub/Scrub	278	0.1
Total	**263,399**	**100.0**

Table A2-2. Land Use Distribution in the Tennessee Portion of the Barren River Watershed. *Data are from Multi-Resolution Land Characterization (MRLC) derived by applying a generalized Anderson level II system to mosaics of Landsat thematic mapper images collected every five years.*

ECOREGION	REFERENCE STREAM	WATERSHED (HUC 8)	
Western Pennyroyal Karst (71e)	Buzzard Creek (71E09)	Red River	05130206
	Passenger Creek (71E14)	Red River	05130206
Eastern Highland Rim (71g)	Flat Creek (71G03)	Red River	05130206
	Spring Creek (71G04)	Red River	05130206
	Hurricane Creek (71G10)	Upper Elk River	06030003
Outer Nashville Basin (71h)	Flynn Creek (71H03)	Cordell Hull Lake	05130106
	Clear Fork (71H06)	Caney Fork River	05130108
	Carson Fork (71H09)	Stones River	05130203

Table A2-3. Ecoregion Monitoring Sites in Ecoregions 71e, 71g, and 71h.

CODE	NAME	AGENCY	AGENY ID
155	TDEC/DNA Salt Lick Creek Site	TDEC/DNA	S.USTNHP 130
354	TDOT SR 52 Mitigation/Permit Site	TDOT	
426	TDEC/WPC Summers Branch WPC Permit Site	TDEC/WPC	
427	TDEC/WPC Summers Branch WPC Permit Site	TDEC/WPC	
472	TDEC/WPC Portland WPC Mitigation Site	TDEC/WPC	
2686	NRCS Site	NRCS State Office	

Table A2-4. Wetland Sites in the Barren River Watershed in TDEC Database. *TDEC, Tennessee Department of Environment and Conservation; DNA, Division of Natural Areas; WPC, Water Pollution Control; NRCS, Natural resources Conservation Service; TDOT, Tennessee Department of Transportation.* ***This table represents an incomplete inventory and should not be considered a dependable indicator of the presence of wetlands in the watershed.***

APPENDIX III

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (MILES)
Big Trammel Creek	TN05110002010_1000	8.7
Caney Fork Creek	TN05110002008_0200	20.2
Clifty Creek	TN05110002024_0200	3.9
Dry Fork Creek	TN05110002008_0300	8.7
Dutch Creek	TN05110002009_0100	10.6
Grace Creek	TN05110002008_0700	7.4
Hurricane Creek	TN05110002031_0100	8.0
Line Creek	TN05110002031_1000	12.3
Little Puncheon Creek	TN05110002804_0300	4.2
Little Salt Lick Creek	TN05110002027_0200	12.1
Little Trace Creek	TN05110002031_0200	18.6
Long Creek	TN05110002024_1000	12.7
Long Fork	TN05110002027_0400	16.3
Long Hungry Creek	TN05110002027_0300	23.0
Middle Fork Drakes Creek	TN05110002009_1000	6.9
Middle Fork Drakes Creek	TN05110002009_2000	3.1
Puncheon Creek	TN05110002804_1000	12.9
Salt Lick Creek	TN05110002027_1000	10.3
Salt Lick Creek	TN05110002027_2000	8.0
Sulphur Fork	TN05110002009_0200	18.4
Tooley Branch	TN05110002010_0200	6.9
Trace Creek	TN05110002031_0300	30.0
Unnamed Trib to West Fork Drakes Creek	TN05110002008_0500	7.7
Webb Branch	TN05110002008_0100	4.7
West Fork Drakes Creek	TN05110002008_1000	5.8
West Fork Drakes Creek	TN05110002008_2000	11.0
West Fork Long Creek	TN05110002024_0300	10.1
White Oak Creek	TN05110002027_0420	10.5
White Oak Creek	TN05110002027_0425	3.9

Table A3-1. Streams Fully Supporting Fish and Aquatic Life Designated Use in the Tennessee Portion of the Barren River Watershed.

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (MILES)
Donaho Branch	TN05110002008_0600	3.0
Little Trammel Creek	TN05110002010_0500	11.0
Town Creek	TN05110002027_0421	3.7

Table A3-2. Streams Not Supporting Fish and Aquatic Life Designated Use in the Tennessee Portion of the Barren River Watershed.

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (ACRES)
City Lake Portland	TN05110002CITYLKPO_1000	34

Table A3-3. Lakes Not Supporting Fish and Aquatic Life Designated Use in the Tennessee Portion of the Barren River Watershed.

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (MILES)
Davis Branch	TN05110002010_0300	1.6
Dry Branch	TN05110002010_0100	4.1
Dry Branch	TN05110002027_0410	6.2
Garrett Creek	TN05110002010_0510	9.0
Johns Creek	TN05110002024_0100	7.9
Lick Branch	TN05110002804_0100	2.4
Misc Tribs to Line Creek	TN05110002031_0999	13.6
Misc Tribs to Long Creek	TN05110002024_0999	25.7
Misc Tribs to Long Fork	TN05110002027_0499	30.5
Misc Tribs to Salt Lick Creek	TN05110002027_0999	28.6
Misc Tribs to Trammel Creek	TN05110002010_0999	12.5
Misc Tribs to West Fork Drakes Creek	TN05110002008_0999	22.5
Misc Tribs to White Oak Creek	TN05110002027_0429	22.9
Pinchgut Creek	TN05110002078_1000	5.4
Simmons Branch	TN05110002010_0400	2.4
Spring Creek	TN05110002804_0200	3.6
Wattwood Branch	TN05110002008_0400	3.0
York Branch	TN05110002027_0100	5.7

Table A3-4. Streams Not Assessed for Fish and Aquatic Life Designated Use in the Tennessee Portion of the Barren River Watershed.

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (MILES)
Caney Fork Creek	TN05110002008_0200	20.2
Clifty Creek	TN05110002024_0200	3.9
Middle Fork Drakes Creek	TN05110002009_1000	6.9
Salt Lick Creek	TN05110002027_2000	8.0
Sulphur Fork	TN05110002009_0200	18.4
Trace Creek	TN05110002031_0300	30.0
West Fork Drakes Creek	TN05110002008_1000	5.8
West Fork Drakes Creek	TN05110002008_2000	11.0
West Fork Long Creek	TN05110002024_0300	10.1
White Oak Creek	TN05110002027_0420	10.5
White Oak Creek	TN05110002027_0425	3.9

Table A3-5. Streams Fully Supporting Recreation Designated Use in the Tennessee Portion of the Barren River Watershed.

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (MILES)
Donaho Branch	TN05110002008_0600	3.0
Little Trammel Creek	TN05110002010_0500	11.0
Town Creek	TN05110002027_0421	3.7

Table A3-6. Streams Not Supporting Recreation Designated Use in the Tennessee Portion of the Barren River Watershed.

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (ACRES)
City Lake Portland	TN05110002CITYLKPO_1000	34

Table A3-7. Lakes Not Supporting Recreation Designated Use in the Tennessee Portion of the Barren River Watershed.

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (MILES)
Big Trammel Creek	TN05110002010_1000	8.7
Davis Branch	TN05110002010_0300	1.6
Dry Branch	TN05110002010_0100	4.1
Dry Branch	TN05110002027_0410	6.2
Dry Fork Creek	TN05110002008_0300	8.7
Dutch Creek	TN05110002009_0100	10.6
Garrett Creek	TN05110002010_0510	9.0
Grace Creek	TN05110002008_0700	7.4
Hurricane Creek	TN05110002031_0100	8.0
Johns Creek	TN05110002024_0100	7.9
Lick Branch	TN05110002804_0100	2.4
Line Creek	TN05110002031_1000	12.3
Little Puncheon Creek	TN05110002804_0300	4.2
Little Salt Lick Creek	TN05110002027_0200	12.1
Little Trace Creek	TN05110002031_0200	18.6
Long Creek	TN05110002024_1000	12.7
Long Fork	TN05110002027_0400	16.3
Long Hungry Creek	TN05110002027_0300	23.0
Middle Fork Drakes Creek	TN05110002009_2000	3.1
Misc Tribs to Line Creek	TN05110002031_0999	13.6
Misc Tribs to Long Creek	TN05110002024_0999	25.7
Misc Tribs to Long Fork	TN05110002027_0499	30.5
Misc Tribs to Middle Fork Drakes Creek	TN05110002009_0999	21.0
Misc Tribs to Salt Lick Creek	TN05110002027_0999	28.6
Misc Tribs to Trammel Creek	TN05110002010_0999	12.5
Misc Tribs to West Fork Drakes Creek	TN05110002008_0999	22.5
Misc Tribs to White Oak Creek	TN05110002027_0429	22.9
Pinchgut Creek	TN05110002078_1000	5.4
Puncheon Creek	TN05110002804_1000	12.9
Salt Lick Creek	TN05110002027_1000	10.3
Simmons Branch	TN05110002010_0400	2.4
Tooley Branch	TN05110002010_0200	6.9
Unnamed Trib to West Fork Drakes Creek	TN05110002008_0500	7.7
Wattwood Branch	TN05110002008_0400	3.0
Webb Branch	TN05110002008_0100	4.7
York Branch	TN05110002027_0100	5.7

Table A3-8. Streams Not Assessed for Recreation Designated Use in the Tennessee Portion of the Barren River Watershed.

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (MILES)
Big Trammel Creek	TN05110002010_1000	8.7
Caney Fork Creek	TN05110002008_0200	20.2
Clifty Creek	TN05110002024_0200	3.9
Davis Branch	TN05110002010_0300	1.6
Donaho Branch	TN05110002008_0600	3.0
Dry Branch	TN05110002010_0100	4.1
Dry Branch	TN05110002027_0410	6.2
Dry Fork Creek	TN05110002008_0300	8.7
Dutch Creek	TN05110002009_0100	10.6
Garrett Creek	TN05110002010_0510	9.0
Grace Creek	TN05110002008_0700	7.4
Hurricane Creek	TN05110002031_0100	8.0
Johns Creek	TN05110002024_0100	7.9
Lick Branch	TN05110002804_0100	2.4
Line Creek	TN05110002031_1000	12.3
Little Puncheon Creek	TN05110002804_0300	4.2
Little Salt Lick Creek	TN05110002027_0200	12.1
Little Trace Creek	TN05110002031_0200	18.6
Little Trammel Creek	TN05110002010_0500	11.0
Long Creek	TN05110002024_1000	12.7
Long Fork	TN05110002027_0400	16.3
Long Hungry Creek	TN05110002027_0300	23.0
Middle Fork Drakes Creek	TN05110002009_1000	6.9
Middle Fork Drakes Creek	TN05110002009_2000	3.1
Misc Tribs to Line Creek	TN05110002031_0999	13.6
Misc Tribs to Long Creek	TN05110002024_0999	25.7
Misc Tribs to Long Fork	TN05110002027_0499	30.5
Misc Tribs to Middle Fork Drakes Creek	TN05110002009_0999	21.0
Misc Tribs to Salt Lick Creek	TN05110002027_0999	28.6
Misc Tribs to Trammel Creek	TN05110002010_0999	12.5
Misc Tribs to West Fork Drakes Creek	TN05110002008_0999	22.5
Misc tribs to White Oak Creek	TN05110002027_0429	22.9
Pinchgut Creek	TN05110002078_1000	5.4
Puncheon Creek	TN05110002804_1000	12.9
Salt Lick Creek	TN05110002027_1000	10.3
Salt Lick Creek	TN05110002027_2000	8.0
Salt Lick Creek	TN05110002027_1000	10.3
Simmons Branch	TN05110002010_0400	2.4
Spring Creek	TN05110002804_0200	3.6
Sulphur Fork	TN05110002009_0200	18.4
Tooley Branch	TN05110002010_0200	6.9
Town Creek	TN05110002027_0421	3.7
Trace Creek	TN05110002031_0300	30.0
Unnamed Trib to West Fork Drakes Creek	TN05110002008_0500	7.7

Table A3-9a.

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (MILES)
Wattwood Branch	TN05110002008_0400	3.0
Webb Branch	TN05110002008_0100	4.7
West Fork Drakes Creek	TN05110002008_1000	5.8
West Fork Drakes Creek	TN05110002008_2000	11.0
West Fork Long Creek	TN05110002024_0300	10.1
White Oak Creek	TN05110002027_0420	10.5
White Oak Creek	TN05110002027_0425	3.9
York Branch	TN05110002027_0100	5.7

Table A3-9b.

Table A3-9a, b. Stream Impairment Due to Siltation in the Tennessee Portion of the Barren River Watershed.

SEGMENT NAME	WATEBODY SEGMENT ID	SEGMENT SIZE (MILES)
Big Trammel Creek	TN05110002010_1000	8.7
Caney Fork Creek	TN05110002008_0200	20.2
Clifty Creek	TN05110002024_0200	3.9
Davis Branch	TN05110002010_0300	1.6
Donaho Branch	TN05110002008_0600	3.0
Dry Branch	TN05110002010_0100	4.1
Dry Branch	TN05110002027_0410	6.2
Dry Fork Creek	TN05110002008_0300	8.7
Dutch Creek	TN05110002009_0100	10.6
Garrett Creek	TN05110002010_0510	9.0
Grace Creek	TN05110002008_0700	7.4
Hurricane Creek	TN05110002031_0100	8.0
Johns Creek	TN05110002024_0100	7.9
Lick Branch	TN05110002804_0100	2.4
Line Creek	TN05110002031_1000	12.3
Little Puncheon Creek	TN05110002804_0300	4.2
Little Salt Lick Creek	TN05110002027_0200	12.1
Little Trace Creek	TN05110002031_0200	18.6
Little Trammel Creek	TN05110002010_0500	11.0
Long Creek	TN05110002024_1000	12.7
Long Fork	TN05110002027_0400	16.3
Long Hungry Creek	TN05110002027_0300	23.0
Middle Fork Drakes Creek	TN05110002009_1000	6.9
Middle Fork Drakes Creek	TN05110002009_2000	3.1
Middle Fork Drakes Creek	TN05110002009_2000	3.1
Misc Tribs to Line Creek	TN05110002031_0999	13.6
Misc Tribs to Long Creek	TN05110002024_0999	25.7
Misc Tribs to Long Fork	TN05110002027_0499	30.5
Misc Tribs to Middle Fork Drakes Creek	TN05110002009_0999	21.0
Misc Tribs to Salt Lick Creek	TN05110002027_0999	28.6
Misc Tribs to Trammel Creek	TN05110002010_0999	12.5
Misc Tribs to West Fork Drakes Creek	TN05110002008_0999	22.5
Misc tribs to White Oak Creek	TN05110002027_0429	22.9
Pinchgut Creek	TN05110002078_1000	5.4
Pinchgut Creek	TN05110002078_1000	5.4
Puncheon Creek	TN05110002804_1000	12.9
Salt Lick Creek	TN05110002027_1000	10.3
Salt Lick Creek	TN05110002027_2000	8.0
Salt Lick Creek	TN05110002027_1000	10.3
Simmons Branch	TN05110002010_0400	2.4
Spring Creek	TN05110002804_0200	3.6
Sulphur Fork	TN05110002009_0200	18.4
Tooley Branch	TN05110002010_0200	6.9
Town Creek	TN05110002027_0421	3.7
Trace Creek	TN05110002031_0300	30.0

Table A3-10a

SEGMENT NAME	WATEBODY SEGMENT ID	SEGMENT SIZE (MILES)
Unnamed Trib to West Fork Drakes Creek	TN05110002008_0500	7.7
Wattwood Branch	TN05110002008_0400	3.0
Webb Branch	TN05110002008_0100	4.7
West Fork Drakes Creek	TN05110002008_1000	5.8
West Fork Drakes Creek	TN05110002008_2000	11.0
West Fork Long Creek	TN05110002024_0300	10.1
White Oak Creek	TN05110002027_0420	10.5
White Oak Creek	TN05110002027_0425	3.9
York Branch	TN05110002027_0100	5.7

Table A3-10b

Table A3-10a, b. Stream Impairment Due to Organic Enrichment / Low Dissolved Oxygen in the Tennessee Portion of the Barren River Watershed.

APPENDIX IV

LAND USE/LAND COVER	AREAS IN HUC-12 SUBWATERSHEDS (ACRES)				
	0101	0102	0403	0404*	0405
Bare Rock/Sand/Clay			57		2
Deciduous Forest	15,046	2,920	15,115		5,823
Developed Open Space	2,274	1,608	1,631		647
Emergent Herbaceous Wetlands	4	2	3		
Evergreen Forest	965	276	293		60
Grassland/Herbaceous	1,390	28	1,062		395
High Intensity Development	8	59	46		
Low Intensity Development	105	226	32		27
Medium Intensity Development	34	107	36		6
Mixed Forest	192	46	232		47
Open Water	62	97	23		
Pasture/Hay	12,622	7,306	13,828		3,884
Row Crops	1,460	4,027	2,025		1,512
Shrub/Scrub	28	6	108		6
Total	**34,190**	**16,707**	**34,490**		**12,410**

Table A4-1a.

LAND USE/LAND COVER	AREAS IN HUC-12 SUBWATERSHEDS (ACRES)				
	0406	0407*	0408	0501	0502
Bare Rock/Sand/Clay			15	49	9
Deciduous Forest	424		15,501	17,704	20,325
Developed Open Space	110		1,922	1,510	2,240
Emergent Herbaceous Wetlands					2
Evergreen Forest			72	161	86
Grassland/Herbaceous	10		750	892	1,820
High Intensity Development			47	26	75
Low Intensity Development	8		131	80	187
Medium Intensity Development			50	55	134
Mixed Forest			38	155	66
Open Water	2		5	19	7
Pasture/Hay	991		9,739	10,120	9,766
Row Crops	638		3,083	1,642	2,947
Shrub/Scrub			32	17	12
Total	**2,184**		**31,386**	**32,430**	**37,676**

Table A4-1b.

LAND USE/LAND COVER	AREAS IN HUC-12 SUBWATERSHEDS (ACRES)			
	0801	0802	0901	0902
Bare Rock/Sand/Clay	27		6	
Deciduous Forest	8,728	6,309	10,767	4,782
Developed Open Space	817	539	1,115	706
Emergent Herbaceous Wetlands			1	3
Evergreen Forest	24	65	167	268
Grassland/Herbaceous	510	781	1,096	329
High Intensity Development	21	9	12	
Low Intensity Development	39	9	50	8
Medium Intensity Development	47	12	18	2
Mixed Forest	15	40	54	31
Open Water	9	4	18	60
Pasture/Hay	5,154	2,567	7,487	5,352
Row Crops	656	153	719	1,519
Shrub/Scrub	24	10	13	23
Total	**16,070**	**10,499**	**21,522**	**13,083**

Table A4-1c.

Table A4-1a-c. Land Use Distribution in Barren River Watershed by HUC-12. *Data are from 1992 Multi-Resolution Land Characterization (MRLC) derived by applying a generalized Anderson Level II system to mosaics of Landsat thematic mapper images collected every five years. *, No data available.*

HYDROLOGIC SOIL GROUPS
GROUP A SOILS have low runoff potential and high infiltration rates even when wet. They consist chiefly of sand and gravel and are well to excessively drained.
GROUP B SOILS have moderate infiltration rates when wet and consist chiefly of soils that are moderately deep to deep, moderately to well drained, and moderately coarse to coarse textures.
GROUP C SOILS have low infiltration rates when wet and consist chiefly of soils having a layer that impedes downward movement of water with moderately fine to fine texture.
GROUP D SOILS have high runoff potential, very low infiltration rates, and consist chiefly of clay soils.

Table A4-2. Hydrologic Soil Groups in Tennessee as Described in WCS. *Soils are grouped into four hydrologic soil groups that describe a soil's permeability and, therefore, its susceptibility to runoff.*

STATION	HUC 10	STREAM	AREA (MI^2)	DAILY FLOW			3Q2	1Q10	3Q10	7Q10	3Q20
				AVG	MAX	MIN					
3313600	0511000201	West Fork Drakes Creek	0.95	na	na	na	0.1	na	0.1	0.1	0.1

Table A4-3. Stream Flow Data from USGS Gaging Stations in the Barren River Watershed. *Data are in cubic feet per second (CFS). Data were obtained from the USGS web application StreamStats at http://water.usgs.gov/osw/streamstats/. (na, data not available)*

AGENCY	STATION	LOCATION	HUC-12
TDECWPC	CANEY001.3SR	Caney Fork Creek @ RM 1.3	051100020101
TDECWPC	CFORK000.4SR	Caney Fork Creek @ RM 0.4	051100020101
TDECWPC	CFORK002.0SR	Caney Fork Creek @ RM 2.0	051100020101
TDECWPC	CFORK004.4SR	Caney Fork Creek @ RM 4.4	051100020101
TDECWPC	DRY000.2SR	Dry Fork Creek @ RM 0.2	051100020101
TDECWPC	WFDRA063.7SR	West Fork Drakes Creek @ RM 63.7	051100020101
TDECWPC	WFDRA064.4SR	West Fork Drakes Ck @ RM 64.4	051100020101
TDECWPC	WFDRA066.7SR	West Fork Drakes Creek @ RM 66.7	051100020101
TDECWPC	WFDRA069.9SR	West Fork Drakes Creek @ RM 69.9	051100020101
TDECWPC	WFDRA2T1.5SR	UT to West Fork Drakes Creek @ RM 1.5	051100020101
TDECWPC	WHITS000.3SR	Whitson Branch Creek @ RM 0.3	051100020101
TDECWPC	WLAKE001.5SR	Willow Lake Creek @ RM 1.5	051100020101
TDECWPC	1015	UT to West Fork Drakes Creek @ RM 0.35	051100020102
USEPA	470352A	Portland STP at Wolf River	051100020102
USEPA	470352B	Portland STP at Wolf River	051100020102
USEPA	470352C	Portland STP at Wolf River	051100020102
TDECWPC	LWFKCR02	Little West Fork Creek @RM 9.4	051100020102
TDECWPC	SFORK011.0SR	Sulphur Fork Creek @ RM 11.0	051100020102
TDECWPC	WEBB001.4SR	Webb Branch @ RM 1.4	051100020102
TDECWPC	WFDRA060.1SR	West Fork Drakes Creek @ 60.1	051100020102
TDECWPC	HURRI000.2CY	Hurricane Creek @ RM 0.2	051100020403
TDECWPC	LINE000.2CY	Line Creek @ RM 0.2	051100020403
TDECWPC	LTACE000.1CY	Little Trace Creek @ RM 0.1	051100020403
TDECWPC	LTRACE005.0CY	Little Trace Creek @ RM 5.0	051100020403
TDECWPC	TRACE002.3CY	Trace Creek @ RM 2.3	051100020403
TDECWPC	TRACE02.65CY	Trace Creek @ RM 2.65	051100020403
TDECWPC	LPCAM000.1MA	Little Puncheon Camp Creek @ RM 0.1	051100020405
TDECWPC	PCAMP005.1MA	Puncheon Camp Creek @ RM 5.1	051100020405
TDECWPC	CLIFT000.1MA	Clifty Creek @ RM 0.1	051100020408
TDECWPC	LONG015.3MA	Long Creek @ RM 15.3	051100020408
TDECWPC	WFLON000.1MA	West Fork Long Creek @ RM 0.1	051100020408
TDECWPC	WFLON004.0MA	West Fork Long Creek @ RM 4.0	051100020408
TDECWPC	LHUNG000.8MA	Long Hungry Creek @ RM 0.8	051100020501
TDECWPC	LSLIC001.5MA	Little Salt Lick Creek @ RM 1.5	051100020501
TDECWPC	SALTL015.6MA	Saltlick Creek @ RM 15.6	051100020501
TDECWPC	SLICK007.5MA	Salt Lick Creek @ RM 7.5	051100020501
TDECWPC	SLICK014.6MA	Salt Lick Creek @ RM 14.6	051100020501
TDECWPC	SLICK016.0MA	Salt Lick Creek @ RM 16.0	051100020501
TDECWPC	SLICK016.1MA	Salt Lick Creek @ RM 16.1	051100020501
TDECWPC	SLICK14.6MA	Salt Lick Creek @ RM 14.6	051100020501
TDECWPC	LONG003.3MA	Long Creek @ RM 3.3	051100020502

Table A4-4a.

AGENCY	STATION	LOCATION	HUC-12
TDECWPC	TOWN001.1MA	Town Creek @ RM 1.1	051100020502
TDECWPC	TOWN001.3MA	Town Creek @ RM 1.3	051100020502
TDECWPC	WOAK003.3MA	White Oak Creek @ RM 3.3	051100020502
TDECWPC	WOAK011.5MA	White Oak Creek @ RM 11.5	051100020502
TDECWPC	WOAK011.6MA	White Oak Creek @ RM 11.6	051100020502
TDECWPC	WOAK011.8MA	White Oak Creek @ RM 11.8	051100020502
TDECWPC	WOAK012.0MA	White Oak Creek @ RM 12.0	051100020502
TDECWPC	BTRAM005.4SR	Big Trammell Creek @ RM 5.4	051100020801
TDECWPC	DAVIS000.8SR	Davis Branch @ RM 0.8	051100020801
TDECWPC	TOOLE000.9MA	Tooley Branch @ RM 0.9	051100020801
TDECWPC	TRAMM006.5MA	Trammel Creek @ RM 6.5	051100020801
TDECWPC	GARRE003.5SR	Garretts Creek @ RM 3.5	051100020802
TDECWPC	LTRAM005.9SR	Little Trammell Creek @ RM 5.9	051100020802
TDECWPC	LTRAM008.5SR	Little Trammel Creek @ RM 8.5	051100020802
TDECWPC	LTRAM008.7SR	Little Trammell Creek @ RM 8.7	051100020802
TDECWPC	DUTCH000.2SR	Dutch Creek @ RM 0.2	051100020901
TDECWPC	DUTCH002.7	Dutch Creek @ RM 2.7	051100020901
TDECWPC	DUTCH002.7SR	Dutch Creek @ RM 2.7	051100020901
TDECWPC	MFDRA022.0SR	Middle Fork Drakes Creek @ RM 22.0	051100020901
TDECWPC	MFDRA024.5SR	Middle Fork Drakes Creek @ RM 24.5	051100020901
TDECWPC	MFDRA026.6SR	Middle Fork Drakes Creek @ RM 26.6	051100020901
TDECWPC	MFDRA1T0.2SR	Middle Fork Drakes Creek @ RM 0.2	051100020901
TDECWPC	MFDRA1T0.4SR	UT To Middle Fork Drakes Creek @ RM 0.4	051100020901
TDECWPC	WFDRA057.8SR	West Fork Drakes Creek @ RM 57.8	051100020901
TDECWPC	SFORK008.9SR	Sulphur Fork Creek @ RM 8.9	051100020902
TDECWPC	SULPH010.8SR	Sulphur Fork @ RM 10.8	051100020902
TDECWPC	SULPHURFK014.1	Sulphur Creek @ RM 14.1	051100020902
21KY	GRN020	Gasper River Near Hadley	Kentucky
21KY	GRN021	Drakes Creek Near Boyce	Kentucky
21KY	GRN022	Trammel Creek Near Allen Springs	Kentucky
11NPSWRD	MACA_NURE_06	Kentucky	Kentucky
11NPSWRD	MACA_NURE_14	KYWA504R	Kentucky
11NPSWRD	MACA_NURE_25	Kentucky	Kentucky
11NPSWRD	MACA_NURE_26	Kentucky	Kentucky
11NPSWRD	MACA_NURE_27	Kentucky	Kentucky
11NPSWRD	MACA_NURE_31	Kentucky	Kentucky
21KY	PRI072	Barren River Near Woodbury	Kentucky
21KY	PRI073	Barren River Near Holland, Kentucky	Kentucky
21KY	PRI074	Drakes Creek Near Bowling Green	Kentucky

Table A4-4b.

Table A4-4a-b. STORET Water Quality Monitoring Stations in the Barren River Watershed. *NPSWRD, National Park Service Water Resources Division; TDECWPC, Tennessee Department of Environment and Conservation Division of Water Pollution Control; USEPA, United States Environmental Protection Agency. UT, Unnamed Tributary.*

FACILITY NUMBER	FACILITY NAME	SIC	SIC NAME	MADI	WATERBODY	HUC-12
TN0058670	Highland Academy	4952	Sewerage System	Minor	UT @ RM 2.7 to West Fork Drakes Creek @ RM 48.1	051100020101
TN0029254	Highland Manor Nursing Home	4952	Sewerage System	Minor	UT @ RM 3.2 to Westr Fork Drakes Creek @ RM 50.0	051100020101
TN0024058	Hermitage Springs ES	4952	Sewerage System	Minor	Trace Creek @ RM 2.6	051100020403
TN0064939	Westside School STP	4952	Sewerage System	Minor	WWC to West Fork Long Creek @ RM 6.9	051100020408
TN0058025	Tri-County Vocational School	4952	Sewerage System	Minor	UT @ RM 1.8 to UT @ RM 0.7 to Salt Lick Creek @ RM 12.9	051100020501
TN0067547	Red Boiling Springs STP	4952	Sewerage System	Minor	Salt Lick Creek @ RM 15.7	051100020501
TN0020877	Lafayette STP	4952	Sewerage System	Major	Town Creek @ RM 1.3	051100020502
TN0055026	Westmoreland STP	4952	Sewerage System	Minor	Little Trammel Creek @ RM 9.9	051100020802

Table A4-5. NPDES Permittees in the Barren River Watershed. *SIC, Standard Industrial Classification; MADI, Major Discharge Indicator; UT, Unnamed Tributary; WWC, Wet Weather Conveyance.*

FACILITY NUMBER	PERMITEE	WATERBODY	HUC-12
TN0040614	Portland WTP	Donaho Branch	051100020102
TN0078280	Lafayette WTP	Spring Creek	051100020408
TN0066991	Red Boiling Springs WTP	Salt Lick Creek @ RM 18.8	051100020501

Table A4-6. Water Treatment Plants in the Barren River Watershed.

FACILITY NUMBER	PERMITEE	COUNTY	LIVESTOCK	WATERBODY	HUC-12
TNA000117	Allen and Kathy Freeman	Sumner	Poultry	West Fork Drakes Creek	051100020102
TNA000035	Gene Hickman	Clay	Poultry	Little Trace Creek	051100020403
TNA000052	Larry K. Brown	Clay	Poultry	Line Creek	051100020403
TNA000071	Davis poultry	Clay	Poultry	Line Creek	051100020403
TNA000107	G and V Farm	Clay	Poultry	Trace Creek	051100020403
TNA000059	Jim Metzgar Broiler Barn	Clay	Poultry	Wilson Branch	051100020403
TNA000036	Jerry Walker	Macon	Poultry	Carter Branch	051100020408
TNA000037	Opal Walker	Macon	Poultry	Carter Branch	051100020408
TNA000011	D and J Farms	Macon	Poultry	White Oak Creek	051100020502
TNA000055	Patsy P. Carr	Sumner	Poultry	Drakes Creek	051100020901

Table A4-7. CAFO Sites in the Tennessee Portion of the Barren River Watershed.

FACILITY NUMBER	FACILITY NAME	WATERBODY	HUC-12
TNG110104	Garrott Brothers	Metro Storm Sewer to Town Creek	051100020502

Table A4-8. Ready Mix Concrete Plants in the Barren River Watershed.

LOG NUMBER	COUNTY	DESCRIPTION	WATERBODY	HUC-12
NRS02.362	Sumner	Isolated Wetland	Isolated Wetland	051100020102
NRS03.084	Sumner	Wetland Mitigation	Isolated Wetland	051100020102
NRS01.322	Sumner	Fill Isolated Wetland	Isolated Wetland	051100020102
NRS02.379	Macon	Utility Crossing	Salt Lick Creek	051100020501
NRS03.245	Macon	Bridge and Approach	Salt Lick Creek	051100020501
NRS02.378	Macon	Floodwater Retaining Structures (3)	UT to Long Hungry Creek	051100020501
NRS03.245B	Macon	Bridge and Approach	Salt Lick Creek	051100020501
NRS03.245C	Macon	Bridge and Approach	Salt Lick Creek	051100020501

Table A4-9. Individual ARAP Permits Issued January 2000 Through June 2004 in the Barren River Watershed. *UT, Unnamed Tributary.*

FACILITY NUMBER	FACILITY NAME	SECTOR	RECEIVING STREAM	AREA*	HUC-12
TNR050805	Portland Pallet Company	A	West Fork Drakes Creek	4.21	051100020101
TNR051340	State Line Auto Parts	M	UT to Willow Creek	10.25	051100020101
TNR051803	Unipres USA	AA	Grace Creek	50	051100020102
TNR051272	GF Hardwoods	A, E	Line Creek	65	051100020403
TNR051307	Upper Cumberland Solid Waste Landfill	L, P	UT to Little Trace Creek	78	051100020403
TNR056477	Qualls Auto Salvage	M	UT to Puncheon Creek	10	051100020405
TNR052089	Fleetwood Homes	A	Goose Creek	43.25	051100020408
TNR051381	Rich Lumber Company	A	UT to Salt Lick Creek	3	051100020501
TNR050419	Indiana Hardwoods	A	UT to White Oak Creek to Town Creek	19	051100020502
TNR054302	F and M Furniture Manufacturing	W	Metro Storm Sewer to White Oak Creek	1.4	051100020502
TNR053577	Hardwood Mulch	AD	Trammel Creek	4	051100020801
TNR050554	Fleetwood Homes	A, P	Trammel Creek	38.5	051100020801

Table A4-10. Active Permitted TMSP Facilities in the Barren River Watershed. *Area, acres of property associated with industrial activity; UT, Unnamed Tributary. Sector details may be found in Table A4-11.*

SECTOR	TMSP SECTOR NAME
A	Timber Products Facilities
AA	Facilities That Manufacture Metal Products including Jewelry, Silverware and Plated Ware
AB	Facilities That Manufacture Transportation Equipment, Industrial or Commercial Machinery
AC	Facilities That Manufacture Electronic and Electrical Equipment and Components, Photographic and Optical Goods
AD	Facilities That Are Not Covered Under Sectors A Thru AC (Monitoring Required)
AE	Facilities That Are Not Covered Under Sectors A Thru AC (Monitoring Not Required)
B	Paper and Allied Products Manufacturing Facilities
C	Chemical and Allied Products Manufacturing Facilities
D	Asphalt Paving, Roofing Materials, and Lubricant Manufacturing Facilities
E	Glass, Clay, Cement, Concrete, and Gypsum Product Manufacturing Facilities
F	Primary Metals Facilities
G	Metal Mines (Ore Mining and Dressing) (RESERVED)
H	Inactive Coal Mines and Inactive Coal Mining-Related Facilities
I	Oil or Gas Extraction Facilities
J	Construction Sand and Gravel Mining and Processing and Dimension Stone Mining and Quarrying Facilities
K	Hazardous Waste Treatment Storage or Disposal Facilities
L	Landfills and Land Application Sites
M	Automobile Salvage Yards
N	Scrap Recycling and Waste and Recycling Facilities
O	Steam Electric Power Generating Facilities
P	Vehicle Maintenance or Equipment Cleaning areas at Motor Freight Transportation Facilities, Passenger Transportation Facilities, Petroleum Bulk Oil Stations and Terminals, the United States Postal Service, or Railroad Transportation Facilities
Q	Vehicle Maintenance Areas and Equipment Cleaning Areas of Water Transportation Facilities
R	Ship or Boat Building and Repair Yards
S	Vehicle Maintenance Areas, Equipment Cleaning Areas or From Airport Deicing Operations located at Air Transportation Facilities
T	Wastewater Treatment Works
U	Food and Kindred Products Facilities
V	Textile Mills, Apparel and other Fabric Product Manufacturing Facilities
W	Furniture and Fixture Manufacturing Facilities
X	Printing and Platemaking Facilities
Y	Rubber and Miscellaneous Plastic Product Manufacturing Facilities
Z	Leather Tanning and Finishing Facilities

Table A4-11. TMSP Sectors and Descriptions.

APPENDIX V

Land Treatment - Conservation Buffers				
	Field Borders (feet)	Filter Strip (feet)	Streambank / Shoreline Protection (feet)	Riparian Forest Buffer (acres)
FY 2001	10010		5720	5
FY 2002	600		1800	2
FY 2003	8930	3		14
FY 2004				73
FY 2005	1	3		9

Table A5-1a. Land Treatment Conservation Practices (Conservation Buffers), in Partnership with NRCS in the Tennessee Portion of the Barren River Watershed. *Data are from Performance & Results Measurement System (PRMS) for each fiscal year reporting period (October 1 through September 30) from 2001 to 2005.*

Erosion Control		
	Est. soil saved (tons/year)	Land Treated with erosion control measures (acres)
FY 2001	18334	2133
FY 2002	71902	5831
FY 2003	21345	2379
FY 2004		
FY 2005		

Table A5-1b. Erosion Control Conservation Practices, in Partnership with NRCS in the Tennessee Portion of the Barren River Watershed. *Data are from Performance & Results Measurement System (PRMS) for each fiscal year reporting period (October 1 through September 30) from 2001 to 2005.*

Nutrient Management				
	Waste Utilization (acres)	AFO Nutrient Mgmt Applied (acres)	Non-AFO Nutrient Mgmt. Applied (acres)	Total Applied (acres)
FY 2001		280	5649	5929
FY 2002		170	3936	4106
FY 2003		101	3118	3219
FY 2004	178	4210		4388
FY 2005	11	4350		4361

Table A5-1c. Nutrient Management Conservation Practices in Partnership with NRCS in the Tennessee Portion of the Barren River Watershed. *Data are from Performance & Results Measurement System (PRMS) for each fiscal year reporting period (October 1 through September 30) from 2001 to 2005.*

Comprehensive Nutrient Mgmt Plans			
	Planned Comprehensive Nutrient Mgmt Plans (number)	Applied Comprehensive Nutrient Mgmt Plans (number)	Total Comprehensive Nutrient Mgmt Plans (number)
FY 2001			
FY 2002	4	4	8
FY 2003		2	2
FY 2004			
FY 2005			

Table A5-1d. Comprehensive Nutrient Management plans, Conservation Practices in Partnership with NRCS in the Tennessee Portion of the Barren River Watershed. *Data are from Performance & Results Measurement System (PRMS) for each fiscal year reporting period (October 1 through September 30) from 2001 to 2005.*

Pest Management	
	Pest Mgmt. Systems (acres)
FY 2001	3683
FY 2002	4826
FY 2003	3345
FY 2004	4225
FY 2005	3839

Table A5-1e. Pest Management Conservation Practices in Partnership with NRCS in the Tennessee Portion of the Barren River Watershed. *Data are from Performance & Results Measurement System (PRMS) for each fiscal year reporting period (October 1 through September 30) from 2001 to 2005.*

Grazing / Forages				
	Prescribed Grazing (acres)	Fencing (feet)	Heavy Use Area Protection (acres)	Pasture and Hay Planting (acres)
FY 2001	1112			
FY 2002	125			
FY 2003	500			
FY 2004	3365	81600	2	683
FY 2005	839	92530	1	148

Table A5-1f. Grazing/Forages Conservation Practices in Partnership with NRCS in the Tennessee Portion of the Barren River Watershed. *Data are from Performance & Results Measurement System (PRMS) for each fiscal year reporting period (October 1 through September 30) from 2001 to 2005.*

Tree & Shrub Practices				
	Land Prepared for revegetation of Forest (acres)	Land Improved through Forest Stand improvement (acres)	Forestland Re-established or improved (acres)	Use Exclusion (acres)
FY 2001		533	533	
FY 2002		856	856	
FY 2003	52	697	697	
FY 2004		543	543	
FY 2005		455	455	287

Table A5-1g. Tree and Shrub Conservation Practices in Partnership with NRCS in the Tennessee Portion of the Barren River Watershed. *Data are from Performance & Results Measurement System (PRMS) for each fiscal year reporting period (October 1 through September 30) from 2001 to 2005.*

Land Treatment - Tillage & Cropping			
	Tillage & Residue Mgmt Systems (acres)	Conservation Crop Rotation (acres)	Cover Crop (acres)
FY 2001	1035		
FY 2002	13		
FY 2003	199		
FY 2004	97	2664	2620
FY 2005	375	2745	1976

Table A5-1h. Land Treatment Conservation Practices (Tillage and Cropping), in Partnership with NRCS in the Tennessee Portion of the Barren River Watershed. *Data are from Performance & Results Measurement System (PRMS) for each fiscal year reporting period (October 1 through September 30) from 2001 to 2005.*

Waste Management Facilities			
	Waste Storage Facility (number)	Composting Facility (number)	Total Facilities (number)
FY 2001		1	1
FY 2002	3	2	5
FY 2003	1	1	2
FY 2004	2	1	3
FY 2005		2	2

Table A5-1i. Waste Management Conservation Practices in Partnership with NRCS in the Tennessee Portion of the Barren River Watershed. *Data are from Performance & Results Measurement System (PRMS) for each fiscal year reporting period (October 1 through September 30) from 2001 to 2005.*

Wildlife Habitat Management			
	Upland Habitat Mgmt (acres)	Wetland Habitat Mgmt (acres)	Total Wildlife Habitat Mgmt Applied (acres)
FY 2001	543		543
FY 2002	1085	15	1100
FY 2003	779		779
FY 2004	493		493
FY 2005	783		783

Table A5-1j. Wildlife Habitat Management Conservation Practices in Partnership with NRCS in the Tennessee Portion of the Barren River Watershed. *Data are from Performance & Results Measurement System (PRMS) for each fiscal year reporting period (October 1 through September 30) from 2001 to 2005.*

COMMUNITY	AWARD DATE	AWARD AMOUNT
Red Boiling Springs	6/25/90	$2,672,056

Table A5-2. Communities in the Tennessee Portion of the Barren River Watershed that have received Clean Water State Revolving Fund Grants or Loans since the inception of the program.

PRACTICE	NRCS CODE	NUMBER OF BMPs
Technical Assistance	000	3
Waste Storage Facility	313	2
Composting Facility	317	1
Critical Area Planting	342	5
Pond	378	37
Fence	382	21
Riparian Buffer	391	1
Filter Strip	393	1
Grade Stabilization Structure	410	1
Grassed Waterway	412	5
Hedgerow Planting	422	1
Use Exclusion	472	11
Pasture/Hay Planting	512	47
Pipeline	516	7
Prescibed Grazing	528	1
Heavy Use Area	561	36
Spring Development	574	1
Watering Facility	614	13
TOTAL BMPs	**-**	**194**

Table A5-3. Best Management Practices Installed by Tennessee Department of Agriculture and Partners in the Tennessee Portion of the Barren River Watershed.